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Faculty of Social Sciences
Institute of Economic Studies

MASTER'S THESIS

Impact of Potential EU Membership on Economy of Ukraine

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Declaration of Authorship

The author hereby declares that he compiled this thesis independently; using only the listed resources and literature, and the thesis has not been used to obtain a different or the same degree.

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Prague, _____ , 2018

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Signature

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Abstract

Recently the topic of the future of Ukrainian economy has been attracting great attention among economists and politicians. The way how it should develop is widely discussed on the international arena. Economists and politicians cannot reach an agreement to which direction it is better to move for Ukraine. Nowadays a lot of special institutions have been created on both sides: in Ukraine and in Europe. The main goal of those is to control all the processes of transformation to be transparent on all levels; as well as prevent unlikely events. Of course, there are proponents and opponents of the moving to the free trade with the EU as for every global process.

Among the young generation it is very clear, that possibilities, which gives us European Union are much more valuable and gainful. Even now, majority of students and researchers seek to apply or acquire some knowledge in European countries. I'm not an exception and for this reason, being a representative of young generation, we will try to determine potential impact on Economy of Ukraine assuming integration to European Union. It is very important to consider both threats and benefits of such processes as they are taking place on very high level. Therefore, in this work it will be considered both contours of development for Economy of Ukraine. To explore it the synthetic control method will be applied, which gives us opportunity to project past events and apply them on economy of Ukraine. Took main macroeconomic indexes has been taken as indicators for making a decision.

JEL Classification	C01, C12, C15, C53, E23, E60, E65, E69, F02, F29, F53, F63, G18, H70
Keywords	integration, synthetic control method, Ukraine, European Union, agreement, macroeconomic indicators, development

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Abstrakt

Nedávné téma budoucnosti ukrajinské ekonomiky přitahuje velikou pozornost ekonomů a politiků. Cesta, jakou by měla směřovat je široce diskutována na mezinárodní scéně. Ekonomové a politici se nemohou shodnout, jakým směrem by bylo pro Ukrajinu lepší se ubírat. V současné době bylo vytvořeno mnoho speciálních institucí na obou stranách. Jak na evropské, tak na ukrajinské. Hlavním cílem je kontrolovat všechny procesy transformace tak, aby byla transparentní na všech úrovních a zároveň zabránit nechtěným událostem. Samozřejmě existují zastánci i odpůrci tohoto procesu přechodu k volnému obchodu s EU, stejně tak jako pro každý globální proces.

Mezi mladými lidmi převládá názor, že možnosti, které nám dává EU, jsou mnohem cennější a užitečné. Dokonce i nyní se většina studentů a výzkumných pracovníků snaží uplatnit, nebo získat určité znalosti, v evropských zemích. Nejsem výjimkou, a proto se budu, jako zástupce mladé generace, snažit určit možný dopad na ekonomiku Ukrajiny, která předpokládá integraci do Evropské unie. Je velmi důležité zvážit jak klady, tak zápory takového procesu, které probíhají na vladní úrovni. Proto se v této práci zaměřím na oba úhly pohledu vývoje ekonomiky na Ukrajině. Abych toho docílila, použila jsem syntetickou metodu kontroly, která nám poskytuje příležitost promítat minulé události a aplikovat je na ukrajinskou ekonomiku. Pro možnosti rozhodování jsem použila nejdůležitější makroekonomické ukazatele.

Klasifikace	C01, C12, C15, C53, E23, E60, E65, E69, F02, F29, F53, F63, G18, H70
Klíčová slova	integrace, metoda syntetické kontroly, Ukraina, Evropská Unie, dohoda, makroekonomické indikatory, rozvoj

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Acronyms

FTA	Free Trade Agreement
CEE	Centarl and Eastern Europe
GDP	Gross Domestic Product
GRIP	the growth rate of industrial production
I	Inflation
P	Population
UR	Unemployment rate
GD	Government debt volume of export
VE	Volume of Export
EU	European Union
SCM	Synthetic Control Method
CP	Control Pool

Master's Thesis Proposal

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Proposed Topic:

Impact of Potential EU Membership on Economy of Ukraine

Motivation:

Recently the topic of the future of Ukrainian economy has been attracting attention. Economists cannot reach an agreement to which direction it is better to move for Ukraine. There are proponents and opponents of the moving to the free trade with the EU. Those economists who support the association with the EU claim that possible closer European integration can provide the agricultural sector- as an example of an important sector for Ukrainian economy, with a more efficient allocation of resources and a higher productivity.

For example, Stephan von Cramon-Taubadel et al. (2010) argue that though it will be hard for Ukraine to assure that its products will satisfy EU standards, the benefits from free trade agreement (FTA) with the EU must not be underestimated. If it succeeds in this task, the production will become more efficient and the quality of products will level up so that both domestic and international demands for Ukrainian products will increase. Hoekman et al. (2013) claim that under the conditions of free trade with the EU, the EU investments will cause the creation of more jobs and by this decrease un- employment. Furthermore, lower trade costs will simplify the participation of Ukrainian firms on the world market.

Balistreri and Olekseyuk (2014) analyze the free trade between the EU and Ukraine and argue that benefits of free trade agreement (FTA) for different industries can be highly reduced by the fact that the economy is not perfectly competitive. Nevertheless, the authors conclude in their analysis that FTA will bring constant re- turns to economy by simplifying exports. The production in Ukraine is much cheaper and price level in the EU is higher. Therefore, though because of higher standards the cost of production will increase, it is unlikely that they will increase to the level of costs in the EU. Thus, export opportunities to the EU will lead to more profits. This can result in more investment and, consequently, better quality of the products.

On the other hand, the opponents of FTA with the EU argue that poor competitive- ness of Ukrainian products will cause a great decrease in demand for Ukrainian products in case of FTA with EU. Moreover, structurally weak and oligarchic economy may even worsen because of the costs of the association with EU.

Popovych and Kravchuk (2016) argue that even though EU investments will lead to the creation of new jobs, small businesses will suffer so badly that it is very unlikely that the benefits from new jobs created from these investments will lead to lower unemployment. As a result, the Ukrainian economy that now remains in a poor condition will be harmed even more. Moreover, wages in Ukraine are much lower than average EU wages.

Therefore, FTA will cause a higher migration of well-educated workers that will be able to find new jobs in the EU. Thereby, the human capital in Ukraine will fall. Consequently, the production in Ukraine will dramatically decrease. Thus, the authors claim that FTA will not bring benefits to Ukraine.
Frey (2014) in their study of the impact of association with the EU of Ukraine argues that the government should consider that the costs of trade liberalization are much higher under severe economic conditions. Ukraine now experiences a very large government debt and financial crisis. Their study shows that the fact that costs are
higher is very significant while analyzing the effects of the association with the EU on the Ukrainian economy. Therefore, authors suggest that it might be a wrong time now for trade liberalization with the EU.
Thus, considering all previous debates, we can say that it is very important to put new investigation in the topic of real effect of potential Association between Ukraine and EU.

Hypotheses:

Hypothesis #1: Deeper association with the EU will influence economy of Ukraine unevenly.
Hypothesis #2: CEE countries, which accessed the EU in the last 15 years have been influenced unevenly by the accession.
Hypothesis #3: Economy of Ukraine with similar characteristics to CEE countries will develop in a similar way after deeper association with the EU.

Methodology:

I'm going to analyze effects of a possible (though probability of this outcome is very low) full accession of Ukraine to the EU (i.e. Ukraine becomes a Member State of the EU), on the economy of Ukraine. I will use panel data from the official website of State Statistics Service of Ukraine (1997-2016). Following the studies of Matej Opatrny (2016) I will use a Synthetic Control Method Approach to determine the effect of FTA on the Ukrainian macroeconomic determinants (GDP by purchasing power parity, the growth rate of industrial production (GRIP), inflation (I), population (P), unemployment rate (UR), Government debt (GD), volume of export (VE) and its influence on the economy of Ukraine. I will use the Eurostat database to find regional development of the CEEC, and hope that matching of Ukraine and CEE countries will be sufficient.

Expected Contribution:

In present international life, the topic of Ukrainian economic and political situation is very popular. However, situation started to be unordered it is very important to understand and realize, what impact the European Association will have on the Economy of Ukraine. Thus, the possible contribution of this research could be implemented as real impacts of potential EU membership on Economy of Ukraine.

Outline:

1. Introduction (motivation, brief introduction to a development of Ukrainian economy, main incentives to FTA and EU membership);
2. Analysis of the related literature (usage of Synthetic Control Method Approach in the academic papers which were focused on the determining of effects of different strategic programs on the Economies of different countries);
3. Comparative analysis (analyze how countries, that accessed the EU in 2000-20016 developed before and after the accession);
4. Methodology and results;
5. Conclusion.

Core Bibliography

1. VON CRAMON-TAUBADEL, S., S. HESS (2010): "A Preliminary Analysis of the Impact of a Ukraine-EU Free Trade Agreement on Agriculture"
2. FREY, M. (2015): "Income Inequality Effects of Ukraine's Trade Liberalization with the EU. Are there "two Ukraines"?"
3. ANDRES ASLUND (2013): "Ukraine's Choice: European Association Agreement or Eurasian Union?"
4. KRAVCHUK, A., Z. POPOVYCH (2016): "The expected impact of the EU-Ukraine Association Agreement"
5. ARKADIUSZ SARNA (2014): "The transformation of agriculture in Ukraine: From collective farms to agroholdings"
6. DENYS KUZMIN AND IRYNA MAKSYMENKO (2012): "Analysis of the EU – Ukraine relations in the context of the association agreement and related documents and the EU 2014-2020 financial prospective"
7. Matej Opatrny (2016): "Quantifying thje Effects of the CNB's Exchange Rate Commitment: A Synthetic Control Method Approach".
8. All statistics regardig Ukraine is obtained from Ukraine State Statistics Department. URL: http://www.ukrstat.gov.ua/
9. ALBERTO ABADIE, ALEXIS DIAMOND, JENS HAINMULLER (2011):" Synth: An R Package for Synthetic Control Methods in Comparative Case Studies";
10. All statistics regarding Europe is obtained from Ukraine National Statistical Offices for particular countries

Author **Supervisor**

1 Introduction

Recently the topic of the future of Ukrainian economy has been attracting attention. Economists cannot reach an agreement to which direction it is better to move for Ukraine. There are proponents and opponents of the moving to the free trade with the EU. Those economists who support the association with the European Union (EU) claim that possible closer European integration can provide the agricultural sector- as an example of an important sector for Ukrainian economy, with a more efficient allocation of resources and a higher productivity.

In this work effects of a possible (though probability of this outcome is very low) full accession of Ukraine to the EU on the economy of Ukrainie will be analyzed. Annual panel data of Ukraine will be used. The aim of this thesis is to determine insights for Ukraine from the historical experiences that other countries have accumulated from free trade agreements (FTA) with the EU, is to test 3 hypotheses regarding the most important macro-economic variables, such as Gross Domestic Product (GDP by purchasing power parity), the growth rate of industrial production (GRIP), inflation (I), population (P), unemployment rate (UR), Government debt (GD), volume of export (VE) and its influence on the economy of Ukraine. The examination of hypotheses will provide a valid picture regarding the current situation and help the readers to get a full understanding of all the issues, which can occur during the integration. According to Stephan von Cramon-Taubadel (2010) there have been already 208 (WTO 2008) agreements as of April 2008 in Geneva amounted. The aim of this work is to analyze and either prove or disprove the hypotheses stated in my proposal above. Results of analysis can be found in the conclusion, where it will be clearly defined whether EU integration would be beneficial for economy of Ukraine or not.

Following the studies of several Research Working Papers Synthetic Control Method Approach will be applied to determine the effect of Free Trade Agreement (FTA) on the Ukrainian macroeconomic determinants. This approach was firstly used by Abadie and Gardeazabal (2003) to determine the economic costs of conflict connected with terrorism.

This work consists of 5 parts.

First chapter defines the motivation for writing this experimental work, some insides on current economic situation in Ukraine, main incentives and reasons for EU Integration. It is very important to have clear understanding of background of the problem and potential impacts on both counterparts Ukraine as well as European Union.

Second chapter of this work is granted for literature overview. Reader can find brief description of related papers, research works of different scientists for the same topic, so that reader will have clearer picture on theoretical and practical implementation of this method. Usage of Synthetic Control Method Approach in the academic papers which were focused on the determining of effects of different strategic programs on the Economies of different countries. It is very important to provide usage of Synthetic Control Method Approach in the academic papers which were focused on the determining of effects of different strategic programs on the Economies of different countries.

In the next, third, part of thesis, which is called “Comparative analysis” you can find analysis of how different countries, mainly CEE countries, which accessed the EU in the last 15 years have been influenced by the accession. According to the Organization for Economic Co-operation and Development, "Central and Eastern European Countries (CEECs) is an OECD term for the group of countries comprising Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic, Slovenia, and the three Baltic States: Estonia, Latvia and Lithuania».

The fourth chapter will provide information about data and methodology used for examination of hypothesis determined to provide comparative analysis. The reader can find the definition of the Synthetic Control Method as well as theoretical background. To make analysis more complex and complete annual panel data of 28 countries- EU members will be used. The first step will be to determine overall expectations on UA integration comparing to all EU countries. Thus, firstly we will make a simulation for all EU members relatively to Ukraine. At that point of experiment, we can make a conclusion that it is very unlikely that Ukraine will benefit from EU integration.

Very important to mention as a hypothesis for this work are:

1. Deeper association with the EU will influence economy of Ukraine unevenly.
2. CEE countries accessing the EU in the last 15 years have been influenced unevenly by the accession.
3. Ukraine with similar characteristics to some CEE Countries will develop in a similar way as those countries after Ukrainian deeper association with the EU.

Thus, for testing we will additionally exercise two scenarios:

As for the first one we will take as a control unit each of the country out of CEE region and apply SCM. With doing this, we will get coefficients of all main macro indicators. To apply those indicators to Ukraine we will execute OLS method and receive final results for economy of Ukraine.

On the second step pool of control variables will be limited in a way, that each country will be unique by characteristic of accessing EU. For example, for testing how did EU accession influenced economy of Poland the year of accession 2004 will be considered and applying the SCM countries such as: Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Malta, Slovakia, Slovenia, with the same year of accession, will be excluded.

All the data captured for estimations of the potential effect of EU membership is taken from the official websites of State Statistics Services for each country.

The thesis finishes with chapter 5 “Conclusion” where hypotheses and the main findings of this work will be discussed. This work will be interesting for a lot of researchers and further studies as it is very popular nowadays, but at the same time very controversial.

While writing these theses some difficulties and complications were faced, such as not a big enough set of data. The set of data consists of only 20 annual observations for 27 countries, as it is very difficult to find all indexes in the same frequency for all indicators and countries. But even though, following studies of Stephan von Cramon-Taubadel, Sebastian Hess, Bernhard Brümmer and their paper «A Preliminary Analysis of the Impact of a Ukraine-EU Free Trade Agreement on Agriculture», 2010, we took a dataset of 20 years 1997-2016. In their paper authors also use annual data, for comparative analysis of Ukraine’s economy and some European countries.

It is very important to mention that method of Synthetic Control Analysis is used only in case of past events, shocks. For this reason, to determine outcome for Ukraine more precise and to be more correct with all the calculations simple OLS method will be applied.

2 Literature overview

Recently the topic of the future of Ukrainian economy has been attracting attention. Economists cannot reach an agreement to which direction it is better to move for Ukraine. There are proponents and opponents of the moving to the free trade with the EU. Those economists who support the association with the EU claim that possible closer European integration can provide the agricultural sector- as an example of an important sector for Ukrainian economy, with a more efficient allocation of resources and a higher productivity.

But in the real world it is not that simple. A lot of different factors should be considered. Economic performance depends on the regional policy, particularly the ability to take into account all the peculiarities of the regional development process as well the proper selection of priorities for each region, including both national and regional interests.

Thus, we can see that a big number of different researches and papers have been already written on this topic.

For example, Stephan von Cramon-Taubadel et al. (2010) argue that though it will be hard for Ukraine to assure that its products will satisfy EU standards, the benefits from free trade agreement (FTA) with the EU must not be underestimated. If it succeeds in this task, the production will become more efficient and the quality of products will level up so that both domestic and international demands for Ukrainian products will increase.

In this paper, the author simulated two scenarios. The first scenario states that all bilateral tariffs between the counterparts are decreased by a rate of 50%. The second framework is the same, but it also considers a 5% exogenous technological growth in Ukrainian agriculture.

The main finding of his paper is that both counterparts: Ukraine and the EU would benefit from the Free Trade Agreement. The author highlights the increase in productivity of Ukrainian agriculture so that Ukraine is able to draw the greatest possible benefit from the opportunities provided by increased access to EU markets, and to stand up better to the increased competition that goes hand-in-hand with this access.

In this paper, for more demonstrative results, the author uses comparative analysis. He tries to make an analogy with Hungary as it is a member of EU since 1994 (The Europe Agreements were signed in 1991, and effective since 1994). The author chose Hungary because of its geographical, economic and social position. Moreover, it is a natural candidate for comparison in terms of agriculture is Hungary. Nevertheless, a glance at the overall development since 1995 is useful because Ukraine and the CEECs share similar legacies in economic and

agricultural structures, and because Ukraine has stated that it intends to harmonize key elements of its agricultural policy with that of the EU.

Balistreri and Olekseyuk (2014) analyze the free trade between the EU and Ukraine and argue that benefits of free trade agreement (FTA) for different industries can be highly reduced by the fact that the economy is not perfectly competitive.

Nevertheless, the authors conclude in their analysis that FTA will bring constant re- turns to economy by simplifying exports. The production in Ukraine is much cheaper and price level in the EU is higher. Therefore, though because of higher standards the cost of production will increase, it is unlikely that they will increase to the level of costs in the EU. Thus, export opportunities to the EU will lead to more profits. This can result in more investment and, consequently, better quality of the products.

On the other hand, the opponents of FTA with the EU argue that poor competitive- ness of Ukrainian products will cause a great decrease in demand for Ukrainian products in case of FTA with EU. Moreover, structurally weak and oligarchic economy may even worsen because of the costs of the association with EU.

Zoryana Olekseyuk (2015) in the paper "The EU-Ukraine Deep and Comprehensive Free Trade Agreement and the Importance of FDI" tries to analyze the impact of Ukraine's integration with the EU through the Deep and Comprehensive Free Trade Areas (DCFTA). She expanded the model with Foreign Direct Investment (FDI) in business services. The results showed that free trade area occurs to be more beneficial for Ukraine than the EU, which is backed by a rise in real GDP by at most 5.67% and 0.05%, respectively. Thereby, higher and broader reductions of barriers would increase welfare for both trade partners. While the EU can gain from the policy reform only with a small rise of welfare up to 0.06%, Ukraine's benefits are much higher with a welfare increase up to 11,73%. Popovych and Kravchuk (2016) on the contrast do not support EU Association.

In their paper the authors picked out the main costs for Ukraine related to FTA.

The authors, in their paper, criticize Ukrainian oligarchic structure of the economy. Meaning that a big part of economy is concentrated in the hands of few oligarchs. Thus, large sector of the economy and wealth is accumulated in offshore trusts.

Another point mentioned by the author is that Ukrainian industry will struggle to meet higher EU standards and then as consequence it will be deindustrialized due to lack of capital and technologies to fulfill European requirements.

Even though new working places will be created caused by increased EU investments, it will not cover all the costs of Ukraine's domestic business sector and European investors will use poor social situation and low standards inside the country.

Moreover, it will increase the flow of specialized workforce from Ukraine to EU countries, even though one third is already working abroad.

The authors argue that even though EU investments will lead to the creation of new jobs, small businesses will suffer so badly that it is very unlikely that the benefits from new jobs created from these investments will lead to lower unemployment. As a result, the Ukrainian economy that now remains in a poor condition will be harmed even more. Moreover, wages in Ukraine are much lower than average EU wages. Therefore, FTA will cause a higher migration of well-educated workers that will be able to find new jobs in the EU. Thereby, the human capital in Ukraine will fall. Consequently, the production in Ukraine will dramatically decrease. Thus, the authors claim that FTA will not bring benefits to Ukraine.

Frey (2014) in their study of the impact of association with the EU of Ukraine argues that the government should consider that the costs of trade liberalization are much higher under severe economic conditions. Ukraine now experiences a very large government debt and financial crisis. Their study shows that the fact that costs are higher is very significant while analyzing the effects of the association with the EU on the Ukrainian economy. Therefore, authors suggest that it might be a wrong time now for trade liberalization with the EU. Randolph Bruno Nauro Campos Saul Estrin Meng Tian (2017) in their discussion paper try to measure and provide possible outcomes of FDI (foreign direct investments) and trade after the European Union integration. In their paper they use different methods such as Gravity model. The authors examined two alternative scenarios: 1. Countries join EU directly, thus their FDI and trade are influenced unevenly; 2. When countries will never be a part of EU, but will have some agreements such as membership of EFTA and NAFTA. Main findings of such analysis that EU membership influence FDI inflows by increase between 14% and 38% depending on the choice of econometric technique. Researchers state in their paper that “deep economic integration such as developed within the EU has the most marked effects on trade, but simultaneously does increase FDI significantly to a level within our original range of estimates.”

Movchan & Giucci (2011) investigate a broader range of Ukraine’s integration strategies. They compare the effects of different FTAs with the EU on the one hand and Ukraine’s deeper integration within the customs union of Russia, Belarus and Kazakhstan on the other hand. Simulating the DCFTA with a 2.5% reduction of border dead-weight costs on trade in addition to tariff elimination, they find a long-run welfare effect of 11.8% which is significantly higher than the impact of a simple FTA (4.6%). Thus, an alternative implementation of a joint external tariff in case of the customs union would lead to a welfare loss up to 3.7%.

Thus, considering all previous debates, we can divide the arguments into two parts. First- are authors who despite all the costs and disadvantages would recommend the acceptance of EU association.

To summarize related papers, used in this work, it is worth to point out main findings and arguments of authors.

Their main arguments are:

a. Integration with EU will bring economic of Ukraine to the new level. Ukrainian market will be more open; thus, dead-weight costs will decrease for a 2,5%. According to Zoryana Olekseyuk calculations real GDP will grow by 5,67%.

b. Another point is that market itself will be more diversified, because for being on a certain (efficient) level, country should investigate and meet the expectations of the global market.

c. According to different authors and their techniques, main economic indicators such as GDP, FDI and international trade increase significantly for countries after EU accession.

The main points of opponents of the Agreement are:

a. The costs are too big: association appears harmful to a small business.

b. Standards are too high for Ukrainian industrial producers

c. It is very difficult to include in the analysis shocks which have occurred in Ukraine since 2014. Some parts of territories of Ukraine are occupied and thus analysis cannot be that precise for entire Ukraine.

3 Comparative analysis

3.1 History

First step towards European integration after First World War played The International Pan European Union, also referred to as the Pan European founded in Vienna in 1923 in which preserved Europe's leading role, as opposed to both the growing influence of Bolshevik Russia and the economic domination of the United States.

In April 1948 for the effective distribution of American assistance (March 12, 1947 - "Truman Doctrine" help to Greece, Turkey; June 5, 1947 - Marshal's Plan (Secretary of State).

16 Western European countries formed the European Organization for Economic Cooperation (ECOS).

In 1948 - Brussels Treaty on the formation of the Western Union. The goal of this Union was to protect Western Europe from communism and ensure greater public security. Governors wanted to reach it via cultural and social channels. For this reason, they created a special authority named: 'Consultative Council'. Close co-operation between Western countries was believed to help limit spread of Communism.

March 1951 - European Coal and Steel Community was established. The organization of the European states-producers of coal, iron and steel, which existed during the period of 1952-2002. The plan for the creation of the ECSC was developed by the French economist J. Monet and proposed by the French Minister of Foreign Affairs R. Schumann. The agreement on the creation of the ECSC for a period of 50 years was signed in Paris on 18.4.1951 by representatives of France, Germany, Italy, Belgium, the Netherlands and Luxembourg (entered into force on 23.7.1952). The purpose of the ECSC was to promote the economic development of the member countries by creating a common market for the products of the coal and metallurgical industries. The ECSC headquarters was located in Luxembourg, the information office in Washington, London, Paris, Rome and Bonn. The formation of a common market for coal and steel was carried out in stages in 1952-1957. The creation of the ECSC was the result of structural changes taking place in the economy of capitalism after the Second World War of 1939-194545 and the growth of inter-imperialist contradictions, which had a

direct impact on the nature of the unification. Along with economic factors, the political plans of the imperialist states that sought to organize a military-political bloc in Western Europe played a big role in the formation of the ECSC.

In October 1954 Paris signed an agreement on the enlargement of the Brussels Pact and the formation of a Western European Union (WEU). WEU is a regional military-political organization of Europe countries set up to ensure the collective self-defense of its members. Founded in accordance with the Paris Agreements (ratified in 1954, ratified in 1955), which amended the Brussels Treaty (pact) on economic, social and cultural cooperation and the collective defense between Belgium, Great Britain, Luxembourg, the Netherlands and France in 1948.

In March 1957 in Rome, several agreements were signed on the formation of two new international state monopoly associations - the European Economic Community (the "Common Market") and the European Atomic Energy Community (Euroatom).

1960 – establishment of European Free Trade Association (domestic trade in industrial products).

The European Union is an economic and political union of 15 European countries, formed in January 1, 1993. based on the European Communities. The EU-Treaty was signed at the European Council meeting in Maastricht (The Netherlands) on February 7, 1992.

May 1, 2004 - 10 countries were dipped into EU: Poland, Hungary, Czech Republic, Slovenia, Lithuania, Latvia, Estonia, Cyprus, Malta.

In the 90s, the foreign policy orientation of Ukraine towards integration into the European community was crystallized. The European choice opens out new prospects for Ukraine's cooperation with developed countries of the continent, economic development, social and intellectual development, and strengthening the position of the state in the international system.

For Ukraine, European integration is a way of modernizing the economy, attracting foreign investment and new technologies, increasing the competitiveness of the domestic commodity producer, and the possibility of entering the single EU internal market.

In the political aspect, European integration destroys the modernization of the legal field of the Ukrainian state, the democratization of its political and institutional

systems. Cooperation with the EU will help to bring Ukraine's social conditions closer to high European standards, to increase the standard of living and well-being of the population. In the cultural and civilization aspect, European integration is a way to intensify the interchange between Ukrainian and Western European humanist cultures, the simultaneous development of Ukraine as an integrated part of the global society and nationality itself. Finally, membership in the EU guarantees the strengthening of Ukraine's national security, protection against aggression and territorial claims.

At the same time, in the process of rapprochement of Ukraine with the EU, inevitably, the negative factors of European integration will also operate. Among them: the failure to bear the financial burden of contributions to the EU; an increase in competition by firms in the EU member states in the process of liberalization and increase the openness of the national economy, which will be accompanied by the elimination of noncompetitive enterprises with negative social consequences. However, the potential benefits of European integration significantly outweigh the potential losses and risks, which has been convincingly proven by the experience of all European countries that have chosen this path. "Return to Europe" was proclaimed the key direction of politics of Ukraine from the beginnings of non-dependence. Already in the Resolution of the Verkhovna Rada of the Ukrainian Soviet Socialist Republic dated December 25, 1990 "On the Implementation of the Declaration on the State Sovereignty of Ukraine in the Field of Foreign Relations," the Government was entrusted with "directing efforts to ensure the direct participation of the Ukrainian SSR in the All-European Process and European structures."

In 1993, the Verkhovna Rada of Ukraine adopted a resolution "On the main directions of foreign policy of Ukraine", which for the first time formulated Ukraine's position on the EU at the legislative level: "the prospective goal of foreign policy is the membership of Ukraine in the European communities ... In order to Supporting stable relations and European Communities! Ukraine will conclude with them the Partnership and Cooperation Agreement, the implementation of which will be the first stage of advancement to the associate, and subsequently - until its full membership in this organization. "

The desire of Ukraine to become a full member of the EU was expressed by the President of Ukraine Leonid Kravchuk on June 14, 1994 in Luxembourg during the

signing of the Partnership and Cooperation Agreement between Ukraine and the EU (PCA). The date of the signature of the PCA can be considered as the completion of the initial stage of the establishment of relations between Ukraine and the EU during which the recognition of an independent Ukrainian state by the EU and its member states took place. The division of bilateral relations at this stage was complicated by the demands of Brussel on the acquisition of Ukraine's non-nuclear status. The EU set the main condition for the development of cooperation and the signing of the PCA of the withdrawal of nuclear weapons from Ukraine and its accession to the Treaty on the Non-Proliferation of Nuclear Weapons. Other acute problems that aroused EU concern were the closure of the Chernobyl Nuclear Power Plant and nuclear safety of new reactors. The conclusion in Moscow in January 1994 of the agreement between the United States, Russia and Ukraine on the withdrawal of nuclear weapons from Ukraine opened the way for the signing of the PCA and the expansion of cooperation between Kiev and Brussels.

The gradual intensification of relations between Ukraine and the EU was evidenced by the opening of the Representation of the Commission of the European Communities (October 1993) and the Representative Office of the European Communities (Brussels, July 1995) in Kyiv, as well as the beginning of bilateral talks on some directions of branch cooperation and trade relations (1994). An important mechanism for implementing the European course of Ukraine was (since 1993) the Interdepartmental Committee on European Communities as the State Agency for Coordination and Coordination of Ukraine's Policy on European Communities, which is accountable to the Cabinet of Ministers of Ukraine.

Since March 1995, the Joint Committee, established by the parties, has been established and is intended to monitor economic and trade cooperation.

The second stage of the development of relations between Ukraine and the EU was completed by the acceptance by the European Council of Helsinki of the EU Common Strategy on Ukraine. During the second half of the 1990s happened several events that by their nature became milestones in the process of rapprochement of Ukraine with the European Union. Among them is Ukraine's membership in the Council of Europe and the OSCE; membership in the Partnership for Peace program; signature in Madrid in July 1997.

Charter on a special partnership between Ukraine and NATO; ratification by Ukraine of the European Convention on Human Rights; the beginning of negotiations on Ukraine's accession to the WTO. Ukraine has sent peacekeepers to the Balkans and acted as the guarantor of peace in Moldova. At the EU summit in Florence (July 1996), Ukraine was recognized as a transitional country. The political signal of Ukraine's support by the EU was the Action Plan adopted by the EU Council on December 6, 1996, which defined the directions of the EU's engagement with Ukraine and outlined ways to promote its development.

On September 5, 1997, the first Ukraine-EU summit took place, during which the importance of bilateral relations was reaffirmed and an exchange of views on current problems and ways of cooperation in the future took place.

The Presidential Decree of February 24, 1998 established the Ukrainian part of the Cooperation Council between Ukraine and the EU headed by the Prime Minister of Ukraine. The decree foresees the formation of all cooperation units with the EU from all state authorities. The National Agency of Ukraine for Development and European Integration was created as well.

On June 11, 1998, the Decree of the President of Ukraine approved the Strategy of Ukraine's Integration into the European Union, which formulated the main directions of cooperation between Ukraine and the EU. The strategy defined the governmental structures of Ukraine responsible for ensuring the integration process, as well as the ways of organizational, financial, legal and informational support for Ukraine's integration into the EU. During the Cologne Summit of the EU (3-4 June 1999) in the conclusions of the EU presidency in Germany, it was noted the achievement of a qualitatively new level in the relations of the European Union with Ukraine.

The adoption of the EU Common Strategy on Ukraine during the Helsinki Summit has shown that cooperation with Ukraine is a special interest for EU member states. The EU's Common Strategy, adopted based on the PCA, has identified the priority areas of policy of the member states and the European Union institutions with respect to Ukraine for a four-year term. The joint strategy for the first time declared the European Union's political recognition of European aspirations of Ukraine and confirmed the course on strategic partnership with it.

The integration of Ukraine into the EU was proclaimed the key foreign policy priority in the inaugural speech of President Leonid Kuchma (November 1999) and defined in the government program (beginning of 2000) as a strategic goal of the state. These dates can be considered as the beginning of a new stage in the development of Ukraine's relations with the EU. The government program adopted by the Cabinet of Ministers of Viktor Yushchenko up to 2004 ("Reforms for Prosperity") defined the construction of an appropriate basis for Ukraine's membership in the EU and the formation of a pro-European majority in society, as the main strategic goals of Ukraine.

The following stages of Ukraine's progress towards EU membership were identified:

Acquisition of membership in the WTO, which involves bringing the Ukrainian legislation in line with the standards of a country with market economics.

1. Ukraine's accession to the EFTA and EEA. Implementation of the PCA.
2. Establishment of the Ukraine-EU Free Trade Area.
3. Acquisition of the status of an associate member of the EU (a possible model of the European partnership agreement, which opens the prospect of future EU membership, or the model of association relations established by the Community in Turkey in the 70's with the Middle East countries).

Summing up the stage of the development of Ukraine's foreign policy, it should be noted that during this period Ukraine confidently entered the world community, took a worthy place in the European space. Unfortunately, at the end of the second cadence of L. Kuchma, the international authority of our country has deteriorated significantly due to the Gongadze case. However, the achievements of Ukrainian diplomacy over these ten years were more than disadvantages. The third stage of Ukraine's foreign policy is linked to the activities of President Viktor Yushchenko. It began in January 2005 and ended in February 2010.

After the Orange Revolution of 2004, Ukraine was perceived in the world with great enthusiasm and hope. Since 2005, Ukraine has opened new opportunities for active foreign policy.

After the Orange Revolution, Ukraine had real chances of joining the European Union. Speaking before the Sejm of the Republic of Poland, the President of the European Parliament, Josef Borel, said that the EU countries must turn their eyes on the East: “Ukraine and Belarus are part of this space, for which we will have to decide whether

they will become part of the European Union or will remain under Russian influence”
On February 5, 2008, a meeting of the WTO General Council took place in Geneva, on which the Protocol on Ukraine's accession to the WTO was signed. The same day, Ukrainian President Viktor Yushchenko and WTO leaders signed an agreement on Ukraine's accession to the organization.

The third stage of Ukraine's foreign policy started on March 5, 2007. Ukraine and EU started negotiations on an Association Agreement. The main purpose of this document was to replace previous agreement, which is: The Partnership and Cooperation Agreement. At the same time, this document aims to: create a new basis for cooperation between Ukraine and the EU; to deepen the relationship in all realms; to intensify political association and economic integration. During the reign of Yushchenko, activation of the dialogue on a visa-free regime for Ukraine has taken place. On January 1, 2008, the Visa Facilitation Agreement entered into force. The implementation of this document greatly facilitated the procedure for obtaining visas by Ukrainian citizens in the consulates of EU member states that are part of the Schengen zone.

The next stage in Ukraine's foreign policy falls on Yanukovych's presidency, namely February 2010 - February 2014.

In July 2010, the Verkhovna Rada of Ukraine adopted the Law "On the Principles of Internal and Foreign Policy", which consolidated the refusal of the Euro-Atlantic aspirations of our state and declared the non-aligned status of its foreign policy.

On September 18, 2013, the Cabinet of Ministers of Ukraine decided to suspend the process of preparation for the conclusion of the Association Agreement between 2 counterparties: Ukraine and the European Union together with European Atomic Energy Community and their member states. Thus, at the Eastern Partnership Summit in Vilnius on November 29, 2013, Ukraine once again confirmed that all of Yanukovych's statements about the European choice are just a bluff and an attempt to shield their pro-Russian orientation.

The fifth stage in the foreign policy of Ukraine began in February 2014 and continues to this day. The events of the Revolution of Dignity in the late 2013 and early 2014 returned Ukraine to the bosom of democratic states of the world, created the conditions for further integration of our state into European and Euro-Atlantic structures.

At the same time, the Russian leadership perceived events in Ukraine as a threat to their own existence. The annexation of the Crimea, and subsequently the invasion of Russian troops and mercenaries to the Donetsk and Lugansk regions of Ukraine, destroyed the international security system that developed after the Second World War. The new President of Ukraine, elected to this post in June 2014, received strong international support.

On March 21, 2014, a political part was signed, and on June 27, 2014, the economic part of the Association Agreement with the European Union of Ukraine.

Thus, P. Poroshenko proved his commitment to European integration. However, the situation in the Donbass has led the Ukrainian leadership and the EU to delay the temporary application of the provisions of deep and comprehensive free trade between the EU and Ukraine by December 31, 2015, while continuing the autonomous trade preferences of the EU for Ukraine.

During his presidential term, P. Poroshenko established good contacts with the leadership of the EU and the US, the leaders of the European Union and NATO. The visit of the President of Ukraine to the United States on September 17-18, 2014 demonstrated the full support of America by our country, but the question of giving Kiev the status of the main partner of the United States outside of NATO and the promise of supplying arms to the Ukrainian Army were postponed to a later date.

3.2 Overview of Ukrainian Economy

Over the last decade Ukrainian economy experienced the periods of boom (in 2004–2008), bust (in 2008–2009), rapid recovery (in 2010–2011), stagnation (in 2012–2013) and recession (in 2013–today). Despite the political turmoil, Ukraine's economy was in a good condition until the middle of 2008. Real GDP growth exceeded 7% in 2006-07 because of the rise in world prices for steel, which composes the largest share in exports, and high domestic consumption that was stimulated by the growth of pensions and wages. Nevertheless, during the global financial crisis Ukraine economy's output declined by almost 15% in 2009. This was considered as one of the worst economic performance in the world. Fortunately, growth restored in 2010. Next, during the phase of boom economy of Ukraine experienced large capital inflows and credit explosion. Economic growth was also supported by favorable prices for Ukrainian exports.

However, fixed exchange rate regime led to double-digit inflation. Consumer prices almost doubled between 2008 and 2013. In 2015 GDP per capita in Ukraine was 7449.77 US dollars, adjusted by purchasing power parity (PPP), which is equivalent to 42 % of the world.

	2008	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***	***2015***	***2016***	***2017***
GDP, %	1,4	-2,1	4,0	2,7	2,3	2,4	3,1	-0.7	2.3	2.5
Trade, %	3,0	-10,4	12,6	5,8	3,2	4,5	5,8	2.3	5.7	6.0
GI, %	2,3	-5,6	5,3	4,8	4,6	5,3	6,0	-4.5	1.8	5
E, %	1,1	0,4	1,4	1,5	1,3	1,3	1,3	0.5	0.7	0.8
FDI, %	-9,5	-33,0	14,1	16,2	-18,7	7,7	17,1	-10.1	9	15

Table 1. Changes in main macroeconomic indicators of economy of Ukraine

After relatively successful 2010-2011 years the World economy could not keep a new trend of growth. Although indicators of world development in 2012-2013 were mostly positive, but at the same time noticeably worse than in the previous two years.

It is clear that the factors and components that formed a high pre-crisis dynamic (primarily, export expansion of developing countries), in most cases, will no longer be the economic drivers of growth in individual countries and regions in the coming decade. It should be noted that the modernization of production, the spread of new technologies, the improvement of the skills of employees, and the upgrading of management do not occur automatically, and therefore countries (mainly emerging economies) face the risk of losing "traditional" (for them) niches and markets, and with the need considerable time for the development of new competitive productions (with a relatively high added value), which is not painless for the economy.

Of course, the leaders of the current period of economic recovery are trade and investment. In a modern world it is very important to follow the tendencies not to lose market share and one of them it is a need to accelerate trade, protectionist measures that have a deterrent effect on trade development, and thus investment, remain very

popular. However, if international trade is gradually restoring positive dynamics, in the context of low trust between governments and economic agents, it is the international investment flows that show high sensitivity to political and economic disadvantages. Because complications debt in EU countries and a slowdown in China led to a sharp deterioration in investor intentions, Direct foreign investment (FDI) experienced a significant reduction (albeit much smaller compared to the 2009 crisis.). Preliminary figures for 2013-2014 indicate the possibility of restoring investment flows, which, however, will depend on the level of international economic confidence.

The inflow of FDI to developing countries amounted to $ 703 billion (from $ 1.35 trillion), or 52% of global volumes, exceeding the inflow of developed countries to $ 142 billion. In this, four developing countries entered the top five the world's largest recipients of FDI, which also indicates a change in the structure of global FDI flows compared with the period of crisis deployment. From the Table 1. we can see, that FDI inflow in Ukraine slightly decreased after crisis and then during the period of conflict between Ukraine and Russian Federation (starting in 2014). On the Figure 1. we can see the structure of FDI inflow in Ukraine mostly from European countries. The Gross Investments amounted to $38,5 billion. The main «Investor» in 2009 was Cyprus - $8,2 billion; then Germany with $6,5 bil investments; Netherlands came with $6,5 bil.

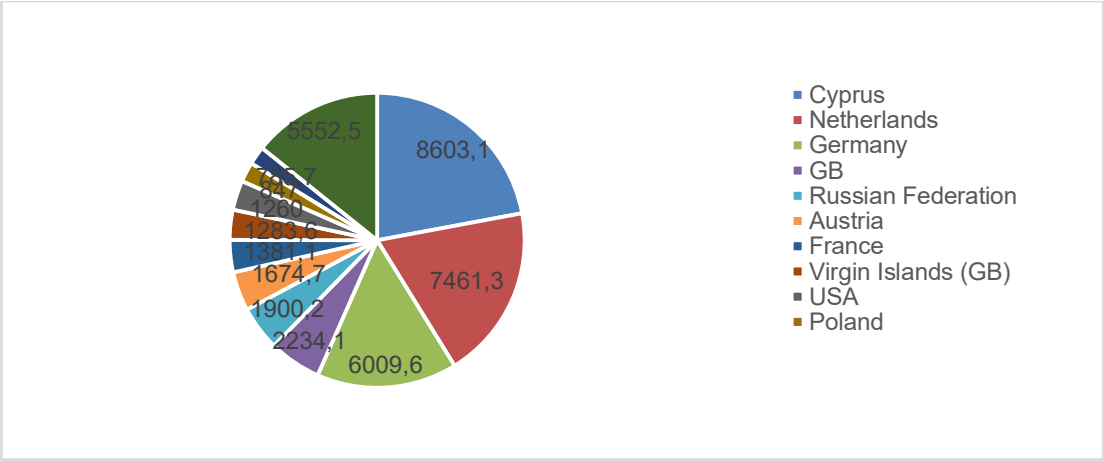


Figure 1. FDI inflow in Ukraine, 2009 (mil USD$)

In 2016 amount of FDI inflow decreased by $2 bil, and now amounted by $36,2 bil. We can see a that structure changed a little bit. Even though the main investor is still Cyprus with $9,7 bil, on the second place we still can see Netherlands with $5,7 bil of investments. The third place now taken by the Russian Federation with total

investments of $4,3 bil. (Figure 2.). Countries such as Poland, Swiss, Netherlands found Ukraine market less attractive, thus decreased their investments by 10-13%. Unlike Luxembourg, which increased investments by 2 times: in 2009 FDI from Luxembourg were $263 mil but already in 2016 FDI became $965 mil.

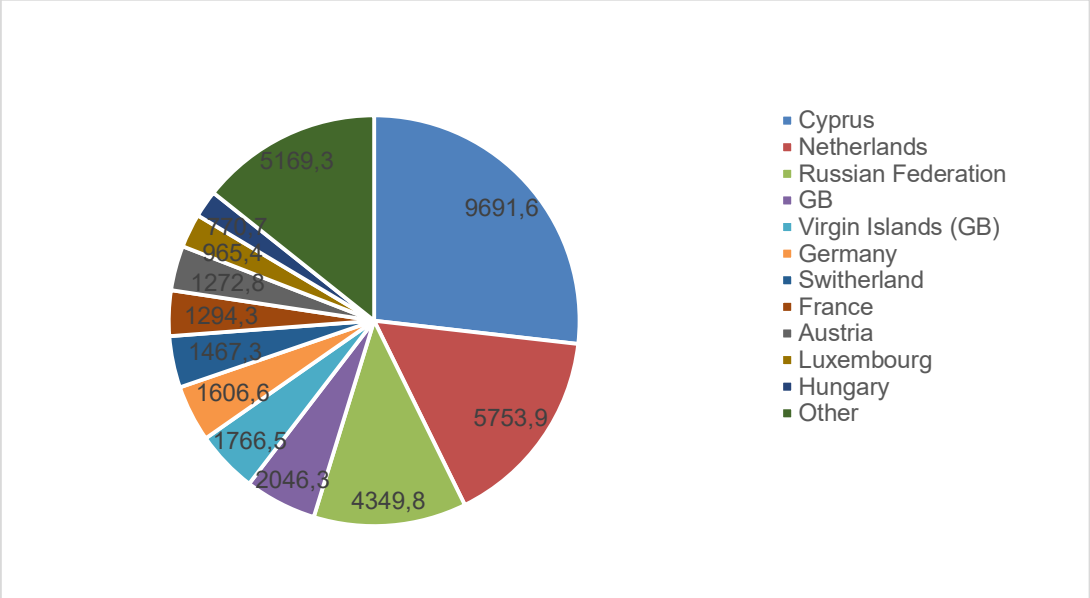


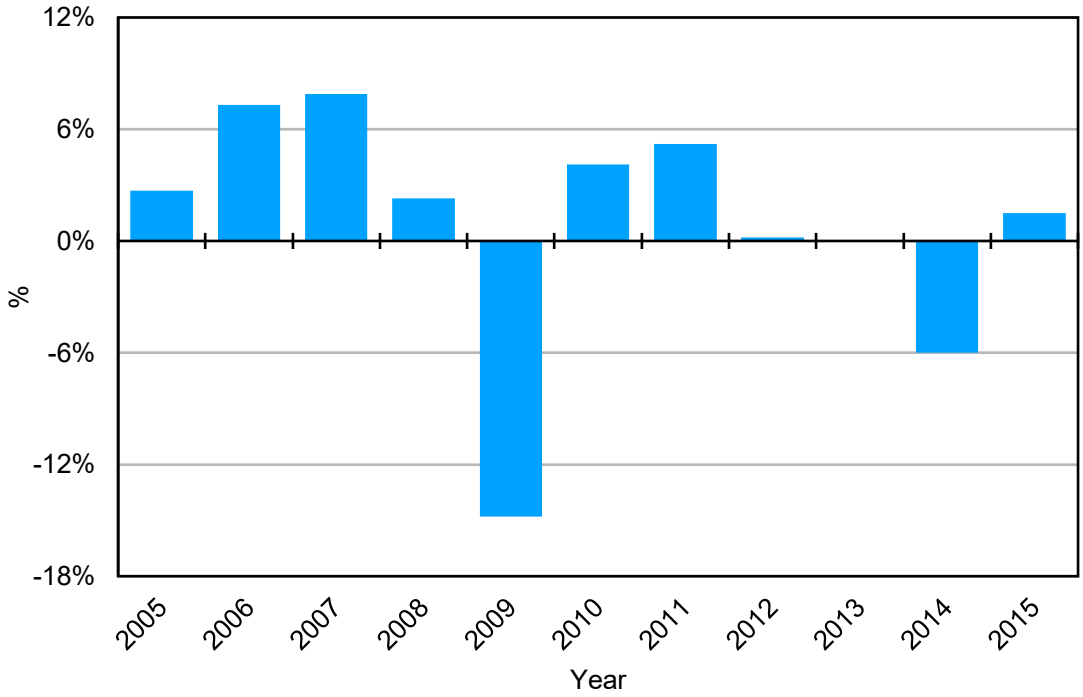
Figure 2. FDI Inflow in UA, 2016 (mil USD$)

It is not ungrounded to assert that in Ukraine, the crisis processes of 2013-2014 can be interpreted as a renewal and continuation of crisis processes 2008-2009. Thus, in 2008, the manifestations of the global crisis intensified, and in 2009, became a burden for Ukraine. 2010-2012 can be characterized only as a period of "crawl" of the country from a crisis collapse. The deepening of economic imbalances in 2013 substantially weakened macroeconomic stability, which ultimately led to a new collapse of Ukraine's economy in 2014, as well as a result of external aggression.

Although the crisis of 2008-2009 once again proved the weaknesses of the Ukrainian economy and, therefore, should have stimulated transformation processes to create a more modern competitive economy, but for the Ukrainian economy, at least during the last decade, remains:

- low productivity and energy efficiency;
- poorly diversified and uncompetitive;
- dependence on monopoly external sources of raw materials and energy.

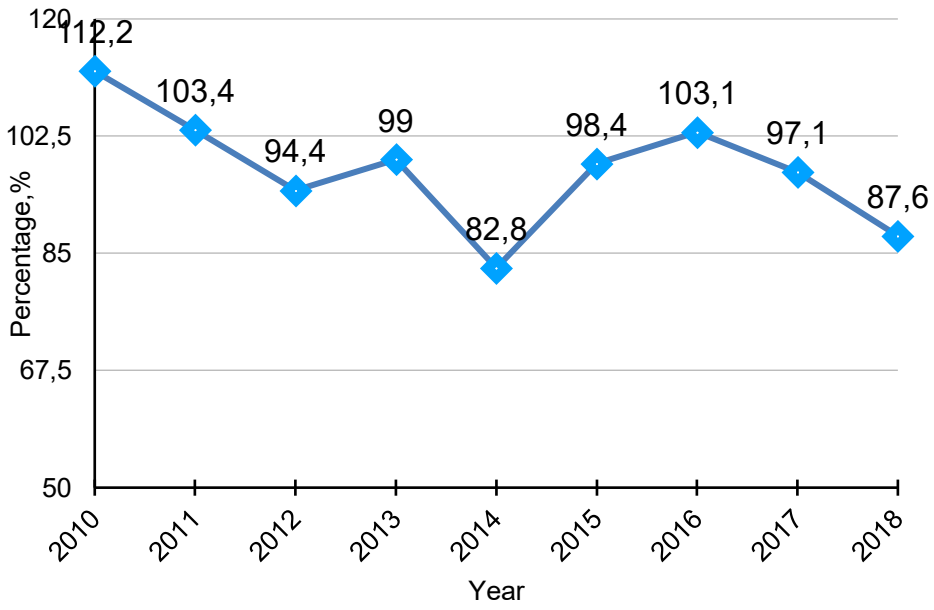
So far, the crisis waves have not prompted various Ukrainian government to make the necessary structural changes in the domestic economy. Even in 2010-2012, during which major changes were to take place, were years of further preservation of the structure of the national economy, strengthening administration and corruption, deepening government intervention in the economy - the consequence was, on the one hand, public disappointment in the correctness of the chosen country road, on the other - the restoration of depressive trends in the economic environment. Therefore, proper mechanisms for preventing and counteracting the threats of subsequent crisis



shocks were not developed.

If the crisis of 2008-2009 in Ukraine, as in the whole world, was unexpected, then before the crisis of 2013-2014 the country "approached" consistently. Although during 2010-2011, there was a positive dynamic of real GDP, but the dynamics of those years cannot be classified as "steady growth", since in fact there was only a partial "compensation" of the losses (fall) of the 2009 crisis (Figure 3.).

Figure 3. Changes in real GDP, %



Therefore, rather it should be said that the positive dynamics of GDP in 2010-2011 in many respects was mainly due to the "low base effect", rather than structural improvement or increased competitiveness. In fact, zero growth in 2012-2013 meant that the country does not create a basis for sustainable economic recovery and, in fact, has a restrictive effect on aggregate demand, and hence on the business environment. Therefore, the next economic collapse should have been predicted, especially in the context of increasing external negative influences. The Global

Figure 4. Index of industrial production of Ukraine.

Financial Crisis from 2008-2009 had a devastating impact on Ukraine, first of all, on the sector of industry, the volume of production of which during the autumn-winter period 2008-2009 after a few years of growth dropped by half.

The period of post-crisis recovery from 2010-2011 was not successfully used in Ukraine, incentives for structural changes remained weak, and the "low base" factor was already exhausted in mid-2011.

Therefore, it is not surprising that already in early 2012, against the backdrop of a slowdown in the European economy (because of the build-up of debt problems in EU countries), the negative trends have intensified in the Ukrainian economy.

Although the fall of industry in 2012-2013 was similar as during 2008-2009, but losses in industry continued to fall, and the index of industrial production at the end of the first half of 2014 was at the level of the lowest indicators of 2009.

On the Figure 4. we can see the index of industrial production. As per Investopedia, the IPI measures levels of production by the main sectors of economy of the particular country. For Ukraine it is agriculture, manufacturing sector, mining – including oil and gas. It also measures capacity, an estimate of the production levels that could be sustainably maintained.

The "bottom" of the global crisis. We emphasize that such a consistent fall was not a consequence of short-term political and economic shock and Russian aggression, but it was precisely the result of the weak economic policy of the government in previous years.

Permanent crisis manifestations directly influenced the structure of GDP, primarily in terms of displacement of investments. The lion's share of the domestic product is used for consumption, the level of which in Ukraine has increased from 77-80% of GDP in the pre-crisis period to 90-93% in recent years. That is, virtually all the resources received - both households and the public sector - are spent on maintaining the current level of consumption and well-being.

Under such conditions, the inevitable consequence of the intensification of crisis processes is the collapse of investments. Thus, there was some accumulation investment, which laid the potential long-term growth, the crisis of 2008-2009 destroyed the investment capacity of Ukraine. The same is not the same investment policy 2010-2013, which in fact diverted (national and international) investors from Ukraine, resulting in a further leaching investment potential (the share of investment in GDP has remained at 18-19%, which is very little for the implementation of accelerated economic recovery).

During the crisis of 2013-2014 Ukraine entered a very weak position without visible prospects of investment strengthening. In upcoming years only a weak recovery it is expected of vestment processes that may continue to restrain economic recovery in general.

Therefore, we can make some short conclusions about the economy development of Ukraine during last years:

- periods of economic weakening and resource conservation is primarily due to the reduction of long-term costs, including the investment nature, and therefore the reduction of investment costs is much more significant, compared with the decrease in consumers spending;
- during periods of economic recovery (as observed in the pre-crisis period) accelerated growth is more clearly manifested in the expansion of investment, including the expenses connected to raising of the level of savings of the population;
- in the crisis period, the fall in consumption is usually much lower than the drop-in investment. Therefore, at the end of the crisis, consumption returns to the usual level rather quickly (in a few years, if the economy has not suffered a complete collapse). Restoration of the same investment (given the need to return investor confidence in the country's economic policy) requires a decade (in the absence of systemic reformation achievements).

We emphasize that the containment of investment expansion means the impossibility of economic acceleration, as the positive long-term dynamics of GDP is an essential component of strengthening investment potential.

However, today there are no visible factors that can significantly improve the country's investment position (the "corrupt tax", which in Ukraine is forced to associate with investments, cannot be liquidated in the short term).

In addition, uncertainty in the sustainability of consumer demand and constant devaluation expectations restrain economic agents from the risk of investing in new production.

It should also be noted that the Ukrainian model of growth of the pre-crisis period, based on export expansion of goods with low value added, will no longer be effective in the medium-term, nor in the long-term, given the change in the structure and factors of the growth of the global economy.

3.3 Basic directions of the integrated process

According to Oleksandr Sushko, Olga Zalins'ka and their work "Association Agreement Ukraine-Ukraine: Roadmap for Reforms" as well as official department of Ukraine "Mission of Ukraine to the EU" it is very important to mention in this work a

Basic directions and requirements for Integration process of Ukraine into European Union.

1. Adaptation of Ukrainian legislation to the EU legislation, ensuring human rights.

Adaptation of the legislation of Ukraine to the EU legislation is to bring it closer to the modern European system of law, which will ensure the development of political, business, social and cultural activity of Ukrainian citizens, economic development of the state within the framework of the EU, and will contribute to the gradual growth of the welfare of citizens, bringing it to the prevailing level. Member states of the EU.

The stages of legal adaptation are the implementation of the Partnership and Cooperation Agreement, the conclusion of sectoral agreements, the bringing of Ukraine's current legislation in line with EU standards, and the creation of a mechanism for bringing draft laws of Ukraine into conformity with EU norms.

2. Economic integration and development of trade relations between Ukraine and the EU.

The globalization of the world economy, the unification of national economies on the basis of the GATT / WTO, economic trends in the EU member states regarding the consolidation of the single currency of the European Union, the potential mutual benefit of free trade are important factors of economic integration and trade development between Ukraine and the EU.

3. Integration of Ukraine into the EU in the context of pan-European security.

Ukraine's security in the context of pan-European security is based on the fact that the development and strengthening of the EU deepen the pan-European security in all its dimensions.

The principle of non-separation of European security is equally important for both Ukraine and the EU and its full and affiliated member states. Co-operative security, the search for approaches to which, along with other European and transatlantic structures, is actively leading the EU, must become a guarantee of Ukraine's own security.

The development of cooperation with the EU within the framework of the Common Foreign Policy Security Policy and the Common European Security and Defense Policy will also contribute to the strengthening of the competitiveness of Ukraine's defense industry, the implementation of principles, rules and mechanisms that provide openness, the transparency of access to the products of this industry on the EU internal

market and prevent its discrimination, the accelerated exit of the Ukrainian producers of goods and services in the priority international specialized sectors and sectors of the economy and significant diversification of military-technical and scientific-technical ties.

4. Political Consolidation and Strengthening Democracy.

Political consolation implies a steady deepening of the political dialogue and the improvement of the overall atmosphere of relations between Ukraine and the EU (summits, ministerial consultations, meetings on an expert level).

It is aimed at:

• guaranteeing political stability both in Ukraine and throughout the European continent;

• ensuring peaceful development and good co-operation among all European nations;

• strengthening democratic foundations in the Ukrainian community.

5. Adaptation of the social policy of Ukraine to the EU standards.

The adaptation of Ukraine's social policy is to reform the insurance, health, pension, employment policy and other sectors of social policy in line with the EU standards and gradual achievement of the European-wide level of social security and protection of the population.

6. Cultural-educational and scientific and technical integration.

The integration process in the relevant areas consists in the implementation of European norms and standards in education, science and technology, the dissemination of their own cultural and scientific and technical achievements in the EU. As a result, such steps will work to promote Ukraine's European cultural identity and integration into a pan-European intellectual and educational and scientific and technical environment.

7. Regional integration of Ukraine.

The practical implementation of the integration process is possible only with the addition of a pan-European standard of cooperation and regional integration and deepening of sectoral cooperation between Ukraine and the EU. Given the EU-wide tendency expressed by the EU: "From the Union of the States to the Union of Regions", this direction becomes important.

Regional integration involves establishing and deepening direct contacts between individual regions of Ukraine and the Member States and candidates for EU membership, their development in the areas defined in this Strategy for the gradual transfer of the main weight of the integration process from central executive authorities to the regions, to the bodies of local self-government, Territorial communities and, ultimately, the widest possible involvement of Ukrainian citizens.

8. Sectoral cooperation.

Industry cooperation is a coordination of interaction between Ukraine and the EU in specific industries and spheres of economic activity. The priority for the next years in the field of cooperation will be to extend the scope of trans-European transport, including main gas and oil pipelines, electricity and information networks, cooperation in the field of justice, prevention and combating of organized crime and the spread of drugs, customs, research and development, industrial and agricultural co-operation, etc. Cooperation in the field of the use of atomic energy for peaceful purposes is a separate and exclusive area of the sectoral co-operation.

9. Co-operation in the field of environmental protection.

Environmental protection is a recognized priority of state policy and the subject of increased attention of the public in European countries, one of the main areas of activity of the European Union and an actual problem for Ukraine, caused not only by the consequences of the Chernobyl accident, but also the general state of the environment in Ukraine.

INTERNAL PROVISION OF INTEGRATED PROCESS.

1. Internal Support

The internal support of the process of integration of Ukraine into the EU lies with the higher, central and local executive authorities of Ukraine in cooperation with the legislative authorities, relevant local self-government bodies.

The President of Ukraine will manage the strategy of integration of Ukraine into the EU.

The Cabinet of Ministers of Ukraine provides the realization of the Strategy of Ukraine's Integration into the European Union.

2. Organizational support.

Ensuring the formation and implementation of sectoral and regional programs of cooperation with the EU in the part for which the Ukrainian side is responsible.
Creation of new programs in the system of education, internship and improvement of qualification for the employees of legislative, executive and local self-government bodies in the areas of European integration of Ukraine, introduction of specialization on EU issues within the framework of educational programs of universities.

3. Financial support

Development of the program of financing of measures on the integration of Ukraine into the EU in accordance with the Strategy of Integration.
Financing of measures aimed at the integration of Ukraine into the EU at the expense of budget funds with a wide involvement of non-budgetary funds, private individuals and EU assistance programs to Ukraine.

4. Legal support

Ensuring legal approximation of regulatory acts adopted by the executive authorities to the requirements of the EU.
Review educational programs of legal education in order to adapt them to the EU programs, study the legal basis of the activities of the EU institutions, study the processes in the legal field both in the member states and in the candidate countries of the EU.

5. Information Security

Ensuring a large-scale aggressive informational national campaign to promote Ukraine's integration into the EU. Development and introduction of a program for informing the public about the situation in the EU, the problems and prospects that are on the way of Ukraine's integration into the EU.

6. Provision of access to European legal, bi-libraphy and other information databases.

Establishment of a National Center (Bank) for the EU With the creation of the National Program of Integration Strategy, an Action Plan to implement the strategic course of Ukraine on integration into the European Union.

3.4 Economical reasoning

More than five years of intense negotiations on March 30, 2012, the initialing of the Association Agreement between the European Union and Ukraine began in Brussels.

After signing each of the 160 pages of the political text on July 19, 2012, 1100 pages of the voluminous political section on the establishment of an in-depth and comprehensive FTA (Free Trade Area) were initialed.

It covers the following aspects of cooperation:

The rapprochement between Ukraine and the EU based on shared values and enhanced participation of Ukraine in the European Union.

Cross-border cooperation in the field of foreign and security policy, in particular - in conflict prevention and in the military sphere.

It brings Ukraine closer to European standards in law and home affairs by promoting the rule of law, democracy and human rights. It supports the fight against corruption, establishing effective work of justice.

The association agreement with the EU regulates the gradual economic and political rapprochement between Ukraine and the EU.

The first sections deal with general principles, political dialogue and reforms, rapprochement of foreign policy and security, and justice.

Strengthening cooperation in economy through a deep and comprehensive free trade area between the EU and Ukraine and setting sectoral cooperation in more than 30 areas, including - in agriculture, industry, energy or consumer protection. Establishment of new formats of cooperation, providing financial assistance, creating a platform of civil

Unlike the classical free trade zone, which implies the creation of a grouping of two or more customs territories that abolish tariff restrictions on significant volumes in the trade of territories, the format of an in-depth and comprehensive free trade zone includes not only the trade in goods, but also services, capital and Labor, provides access to public procurement markets, etc.

The signing of agreements in the FTA + format presupposes a number of specific provisions regarding: deep liberalization of trade in goods and services, which differ significantly from the provisions of relevant WTO agreements; Liberalization of foreign investment regimes; Liberalization of the public procurement regime; The introduction of new rules on certain aspects of competition policy, including state aid; Application of more stringent measures to protect intellectual property rights; Introduction of common environmental norms and standards.

The positive consequences of the establishment of FTAs are:

- Improving the access of Ukrainian goods, services, capital and technology to the enlarged EU market;
- improving the conditions for the export of Ukrainian products together with obtaining a price advantage by abolishing the import duty;
- re-equipment and modernization of domestic enterprises;
- an increase in the volume of investments from EU-28 countries to the economy of Ukraine, including for the creation of joint ventures;
- increase in bilateral trade and increase in foreign exchange earnings;
- increase the efficiency of the allocation of labor resources;
- expanding the range of goods and services on the domestic market;
- increasing the competitiveness of domestic products, which will lead to introduction of new standards;
- harmonization of customs procedures and increase of efficiency of the activities of customs authorities in the context of trade facilitation;
- creation of a harmonized legal framework for ensuring the activities of trade entities by convergence of Ukrainian legislation with EU legislation;
- the introduction of European standards will allow introducing mechanisms to combat tax evasion and tax fraud. The result may be a decrease in the share of the shadow economy and a reduction in the flow of smuggling of excisable goods;
- establishment of an export credit agency (ECA). Public or private ECAs act as intermediaries between exporters and national governments, providing export guarantees, insurance, loans, technical assistance to eliminate economic and political risks when selling goods on international markets;
- stimulating competition and limiting monopolism;
- improving access to quality imported equipment, seeds, plant protection products;
- Ukraine will become an important connecting trade and economic bridge, and subsequently a platform for the development of mutually beneficial relations between the EU and members of new integration projects in the post-Soviet space.

The negative consequences of the establishment of FTA could be as follows:

- the need to attract significant financial resources to ensure the adaptation and implementation of new legislative acts;

- increasing the financial costs of producers due to high standards of production and quality. The result of increased competition will be the exclusion of small and medium-sized business (SME) producers from the market;
- strengthening of competitive pressure in the domestic market of Ukraine;
- loss for certain industries of the domestic market of Ukraine due to their low level of competitiveness;
- an increase in the negative balance of bilateral trade in Ukraine due to a deterioration in the structure of exports due to the reorientation of domestic exporters from finished products for the export of raw materials and semi-finished products;
- deficiency of domestic goods in the domestic market due to the export reorientation of producers;
- increase in the level of import dependence of the domestic market
- the need to modernize production to 20 thousand EU standards in a short time, which will require large expenditures both from the state budget and from the subjects of small and medium-sized businesses;
- the likelihood of the countries of the Customs Union (CU) applying protective duties for goods from Ukraine;
- breaking up of cooperative ties with the countries of the Customs Union (especially with the Russian Federation) in high-tech industries (space, aircraft construction), OPK;
- limited ability to provide protection to "young" sectors of the economy that have not reached the appropriate level of competitiveness and need state;
- liberalization of trade in industrial and agricultural goods: the cancellation or substantial reduction of import duties for more than 95% of tariff lines, as well as the abolition of the export duty on commodities;
- further expansion of the second-hand market will lead to a decline in the domestic light industry, especially small and medium business.

So, let me cite some conditions of the contract, which directly affect the economy of Ukraine: customs duties on goods of Ukrainian exports to the EU for most commodity groups are higher than for exports of the EU to Ukraine.

For the majority of commodity groups, Ukrainian customs tariffs are higher for goods of Ukrainian export than for goods that the European Union exports to Ukraine. In

addition, many sensitive products for the Ukrainian economy use strict quotas that limit Ukrainian exports and the development of the Ukrainian economy. In addition, the most evocative and absurd from the point of view of the concept of free trade are the "free" customs tariffs of the European Union for such highly sensitive products of Ukrainian exports as products made of ferrous metals and agricultural machinery.

Thus, if the owners of enterprises or the Government of Ukraine behave differently than the EU wants, then the EU can raise customs rates for these groups of goods without any restrictions. Such cooperation can hardly be called a "free trade zone", it is more like cooperation of the colony (Ukraine) and the metropolis (European Union).

According to Annex 1-C, 1-D to the Agreement, Ukraine, within 10 years, gradually refuses all currently existing export duties. This will lead to a sharp decline in budget revenues by 10-15% and a decrease in the volume of social payments.

As Per Annex 1-B to the Treaty, Ukraine within 5 years reduces and cancels the customs duty on clothes that were in use (clothes - Second Hand). A huge amount of this garment will be pouring into our market, and the budget from this will not receive income from customs duties, let alone that the use of second-hand clothes is a sign of a poor and colonial society.

Considering all previous debates, we can say that it is very important to put new investigation in the topic of real effect of potential Association between Ukraine and EU for the entire economy of Ukraine.

In my work I’m going to analyze how European Association influenced economies of different countries. Economies of each country will be compared by the GDP. These countries are: Estonia, Latvia, Lithuania, Czech Republic, Slovakia, Poland, Hungary, Slovenia, Romania and Bulgaria, Belarus and Italy.

3.5 Comparative statistics

In this section readers will be provided with insights of how CEE countries developed before and after EU accession. As it was already mentioned**,** for more comprehensive analysis SCM has been applied for countries of this region as well. You will find primarily results already in this paragraph. Analysis of several countries is provided below. Countries were chosen chose by geographical principle, thus you can find description only about Poland, Czech Republic and Romania. Analysis for 7 other countries you can find in Appendix C.

Poland

In 2004, Poland joined the EU together with Cyprus, the Czech Republic, Estonia, Lithuania, Latvia, Malta, Slovakia, Slovenia, Hungary.

According to the Polish Office of the Committee for European Integration, during first five years in EU membership, the country received EUR 30 billion from the European Community and contributed 16 billion euros to the general budget. A lot of public projects have been donated with money from EU, such as: the construction of highways, bridges, schools, libraries, stadiums, and cultural institutions. European financial funds supported growth of small and big business, therefore the economy of Poland has become stronger.

From the EU budget during the period of 2007-2013, Poland received approximately 60 billion euros, which helped to overcome the economic crisis.

According to published statistical reports already during the first five years in the European Union, we can say that economic showed successful results. GDP is an indicator of the wealth of the country, since 2004 it has grown by a third, and unemployment has fallen from 19% in 2004 to 9% this year, partly due to the opening of labor markets of other EU countries to Poland. With membership in the EU, the cyclical recovery of the economy coincided in 2005-2008.

On the Figure 5. we can see a path of GDP during a period before and after EU accession. Main macroeconomic indicator for Poland have been tested as well, using SCM. Therefore, my analysis becomes more complex and comparative. From this graph we can say, that the economy of Poland showed a slight increase after it became an EU member. And during first years after EU accession it shows rapid growth.

The Polish economy is rapidly Europeanized - goods are produced for other countries and imported goods are bought. Since joining the EU, exports and imports have doubled due to the elimination of trade barriers between Poland and the countries of the Community, while foreign trade turnover has increased from 136 to 259 billion euros.

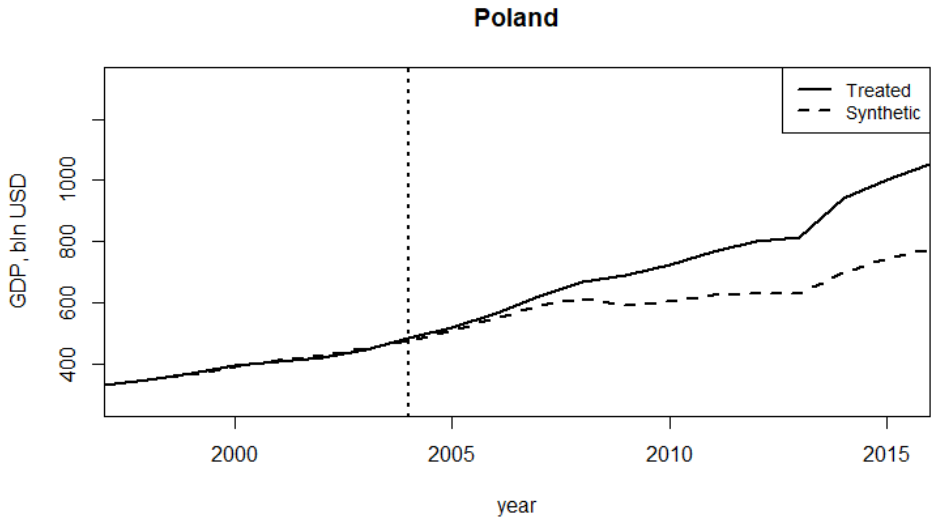


Figure 5. GDP bln USD, Poland.
Treatment Unit- Poland. Control Pool – all other 27 EU Member states.[1]

If in 2003 the EU market received almost two thirds of Polish food exports, then in 2007 it was already more than 80%.

In the pan-European division of labor, Poland now has a mediocre niche of production, but gradually the country is moving profitable industries - for example, the transfer of the Dell plant from Ireland to Poland.

Together with economic integration, the reality is becoming more dependent on international crises, but even in this case membership in the EU has brought more benefits than threats, at least until now. The lack of a common currency proved to be a drawback, but affiliation to common economic bloc and the prospect of a transition to the European currency saved Poland against the heavy overrun on the international markets, which currently facing another non-EU member countries. Among the positive results is the growth of direct foreign investments. The record in this area was 2007, when the Polish economy was invested 16.6 billion euros (Figure 6.).

[1] Step 1. As per first step I did not exclude countries with the same year of accession. Reason – results did not change. Details, please follow in a section ().

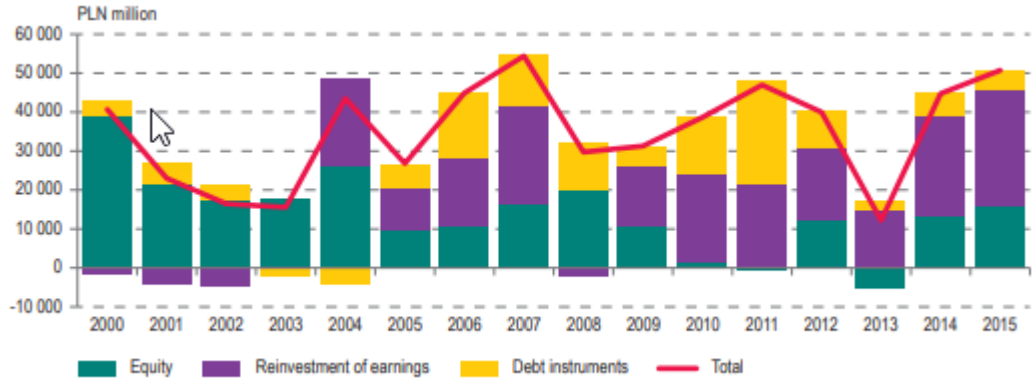


Figure 6. FDI composition, Poland (mil PLN)
Source: NPB "Foreign direct investment in Poland and Polish direct investment abroad in 2015

However, there are still few disadvantages that Poland faced after EU accession. Mass migration has caused a shortage of labor force on the domestic market of Poland. In some areas, this problem reached its extreme point. A side effect of this phenomenon was a rapid increase in the level of earnings, which is positive and negative at the same time. It is positive, because it is better to earn, and the negative, because not everywhere the growth of earnings was associated with the growth of labor productivity and caused an impulse to inflation, although not that high.

Also, due to migration of workers abroad, Poland began to lose an important advantage to foreign investors who created new jobs - previously, labor was considered relatively cheap. There was also a public negative - the young families are hard at work carrying over the situation of immigration separation.

Czech Republic

After collapse of the Soviet Union, the European and Euro-Atlantic integration of the Czech Republic is defined as the main priority of the country's national development. The process began with the Czech Republic's application for membership in the European Union in January 1996. After the country met the criteria for EU membership, in May 2004 it was formally accepted as an organization. Since then, the Czech Republic, as a member country of the European Union, has been actively involved in the implementation of major EU programs, primarily the Common Foreign and Security Policy (CFSP), as well as the Eastern Partnership.

The Czech Republic actively contributes to the economic and institutional development of the European Union. Thus, the main directions of the Czech presidency in the EU in the first half of 2009 were to promote the development of European Union

markets, improve business conditions, solve unemployment problems, implement a common agricultural policy and enhance Europe's energy security.

An important achievement during the Czech Republic's stay in the EU can be considered the creation of prerequisites for the economic development of the country, which was quite dynamic before the crisis in Europe, caused by the world financial and economic crisis. Despite the current problems, the Czech Republic has every chance to restore positive processes in the economy. For example, the volume of foreign trade of the Czech Republic with other EU countries increased in the second half of 2012.

The peak point was in 2005 and reached appx 10 bln USD (Figure 7.).

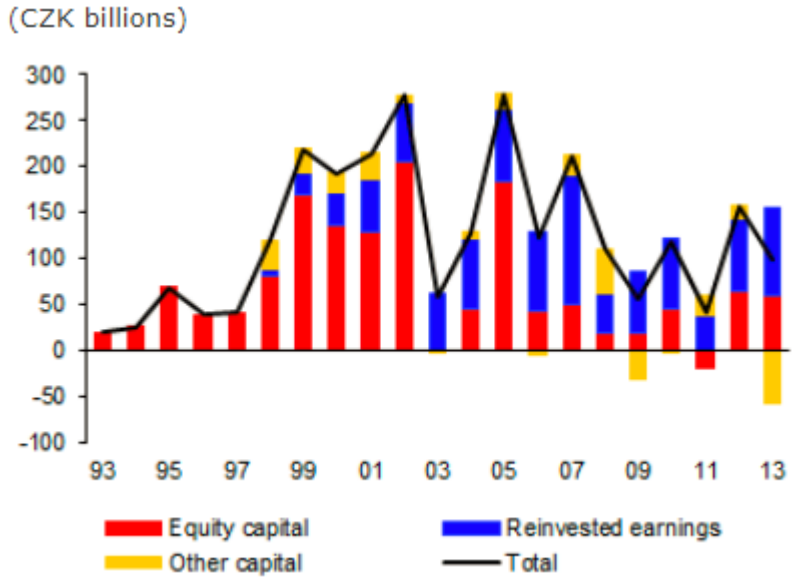


Figure 7. FDI composition, Czech Republic (bil CZK)
Source: CNB "Foreign direct investment in Czech Rebublic,2013

The Czech Republic in the first quarter of 2015 year came first in the European Union in terms of economic growth - compared to the last quarter of 2014, GDP growth was 2.8%, according to a report from the Central Statistical Office of the republic (CSU). Growth of the Czech Republic's GDP in 2015 in comparison with the first quarter of 2014 was 3.9%. The economic growth has also responded positively to the employment market in the Czech Republic: unemployment has fallen by 0.7 percentage points in comparison with the last quarter of 2014, and by 1.1 percentage points, and is about 6.7% year-on-year.

On the picture below, we can see that Czech Republic has a strong economy. GDP of Czech Republic was checked using SCM. From Figure 8. we can say, that economy of Czech Republic also showed a rapid increase after EU accession.

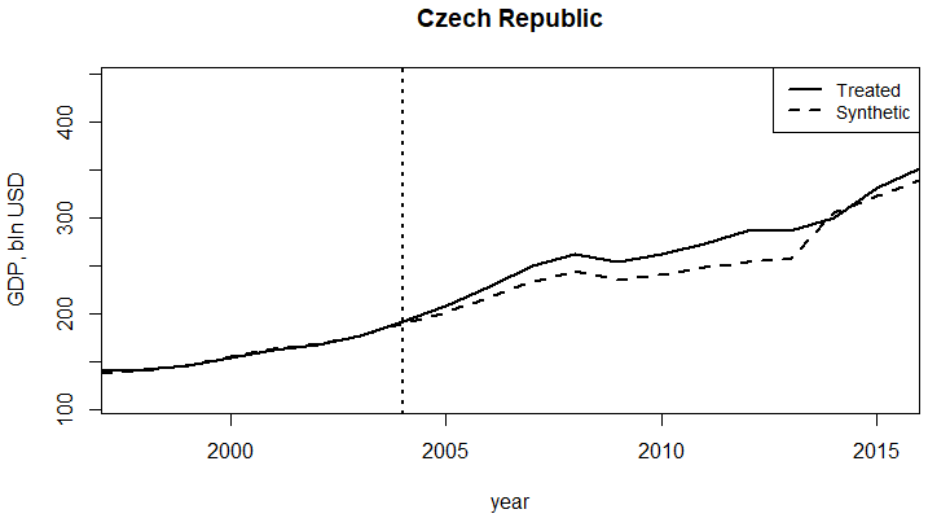


Figure 8.GDP, Czech Republic.
Treatment unit - Czech Republic,
Contol pool - all other 27 Member states of EU.[2]

Romania

On January 1, 2007, Romania became a member of the EU, giving European space the most optimistic European citizens.

The basic principles of Romanian statehood are actively transformed, the most difficult problems of the country are eliminated quite professionally, radically, as expected, the Romanian economy is being updated, where European models of economic activity are actively being implemented. By adhering to democratic principles in public life, the Romanians tirelessly eradicate corruption in public authorities.

The tangible achievements on these important issues (although problems still exist) have enabled Romania to develop its economy and attract foreign investment. At the same time, as it turned out, the most positive significance was the modernization of its economic sector, which in fact became the locomotive of the country's economic growth.

At the same time, Romania has become one of the most consistent members of the EU, which actively promotes the interests of the European Union towards the Black Sea, defending them in the Danube and Balkan regions.

[2] Step 1. As per first step we did not exclude countries with the same year of accession. Reason – results did not change. Details, please follow in a section ().

After the accession of Romania to the EU, the country has received a number of brand-new opportunities for development political and economic conditions of life and is close to the level of the most developed the EU states. European strategic development programs and funds sent their activities to improve the standard of living of ordinary Romanians, today European citizens. In the period of European integration Romania has made significant efforts to reorganize its structural and political institutions in order to defend themselves against provocations and take advantage of them of the status of a Member State of the European Union.

Among the main achievements of the political organization of Romania after joining The EU should note administrative reform.

The ability of political and administrative institutions to adapt to requirements and changes in the environment of the country is the most important priority of this reform. It was carried out both at the central and on the local levels, and was intended to create and the dissemination of open policies and national regulations, in line with EU standards, and the creation of an adequate constituent team to implement the administrative and financial decentralization process. Achievement of this goal made it possible to adopt and use new methods and instruments for the implementation of domestic and foreign policy.

Thanks to EU membership, Romania has the following benefits: a new status on the international stage the arena; the possibility of reforming the political sector and directing it him to a single European policy; proceeds from EC financial assistance for reforming the country and its approach to EU standards; innovation of all state structures; provision of employment of able-bodied population, growth production; the ability to influence processes that occur not only within the framework of EU, but also beyond its borders; new conditions for the development of economy and culture.

Even though Romania is still considered to be one of the poorest countries in the EU, it shows a really good result. At the end of 2016 Romania took the second place after Ireland according to the growth rate of economy in the European Union having 5% growth rate.

Dramatic effects of the 2008-2009 crisis were visible in lack of investment, but lately this is changing. But on the other hand, we can say that capital flows became freer and investments are rising within the Romania. After accession another further step has

been done in the field of Small and Medium Enterprises. They (enterprises) slowly but surely spread their business; mostly within the service sector and little in production. Moreover, The Romanian Central Bank implemented new monetary policy: eased some preconditions for credits and it is now easier to lend money, which also helped in the economy growth.

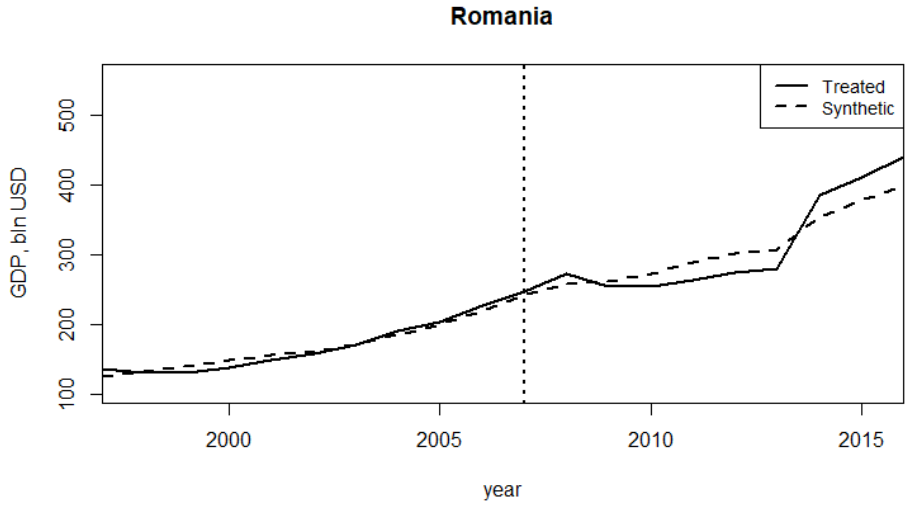


Figure 9. GDP, Romania.
Treatment Unit – Romania, Control Pool – all other 27 Member States of EU.[3]

As well as with previous countries European Union affected growth of the Foreign Direct Investment (FDI) in Romania. In 2015 net flow of investments in Romania has reached EUR 4,51bn, but still rises. Since production factors are comparatively cheap there, and foreign companies found it to be moreprofittable, they transferred their production and factories in Romania. Significant part of those enterprises belongs to car industries. It is helped to those factories safely overcome the crisis without major losses. Other main areas of FDI are: metallurgy industry, banking and insurance, wholesale and retail, energy, construction and telecommunications. The main investors in Romania are traditionally France, Austria, the Netherlands and Germany. Today we can compare Romanian economy with economies of much more developed countries as Estonia, Poland, and Slovakia in the terms of developed technological and start-up market.

[3] Step 1. As per first step we did not exclude countries with the same year of accession. Reason – results did not change. Details, please follow in a section ().

Together with Poland, Czech Republic, we can see positive changes for economy of Romania. On the graph below, GDP path increases over the period 2007-2016 (Figure 9.). Due to the weak economy, Romania stressed a shock during the crisis in 2008. It took few years to recover, but in 2014 it sharp leap in the economy.

4 Methodology

4.1 Method

A big part of Social Science research is concentrated on answering questions about possible effects of different events- shocks e.g. political, social on aggregate units – regions, countries. A classic methodology for of answering such questions is the comparative case study. The general idea of such method is to compare outcomes for the unit(s) affected by shock (the treated group) to outcomes for one or more unaffected units (the control group). This method is mostly used for comparative analysis of the impact of shocks (economic, social, political etc.), which occurred within some regions or states. The rationale behind this method is to use the control group's outcome to approximate the outcome that would have been observed for the treated group in the absence of intervention. It is up to researcher to choose control units, together with selection of degree to which control units can credibly determine for treated units' eligible outcomes.

Following studies of Abadie et al. we will analyze the Impact of Potential EU Membership on Ukrainian Regions with a help of Synthetic Control Method (SCM). Firstly, SCM was introduced by Abadie and Gardeazabal (2003) in their seminar work, in which authors implemented this approach to comparative case studies. After that, this method started to be very popular within the researchers of such a topic. Resonance works of the authors two papers, where they tested the effect of California's tobacco control program and another paper, in which they examined the economic impact of the terrorist conflict in the Basque Country Abadie and Gardeazabal (2003).

Another topic, which was recently analyzed with a help of this method are: The Labor Market Effects of a Refugee Wave: Applying the Synthetic Control Method to the Mariel Boatlift (Giovanni and Yasenov, 2017).

Sarazin (2013) in his paper examines the impact of the euro on the German economy. As measurements of impact the author takes into consideration the development of the most significant macroeconomic determinants among European countries such as Spain, Greece, Ireland, Portugal, France and Great Britain. As a

takeaway from his paper we can generalize that that EU countries would benefit more from keeping their own currencies.

Nauro F. Campos, Nauro F. Campos Fabrizio Coricelli Luigi Moretti (2014) in their paper "Economic Growth and Political Integration: Estimating the Benefits from Membership in the European Union Using the Synthetic Counterfactuals Method" actually proved that there is strong evidence on positive pay-offs from EU membership, despite considerable heterogeneity across countries. They also showed that for particular countries such indicators as GDP and labor productivity significantly increased with EU membership.

Following all these studies we can say that SCM is the appropriate method for dealing with the questions of evaluation of effects of EU integration. Particularly we are interested on estimating of potential EU membership on Ukrainian Economy.

This method has several advantages which address the shortcomings of the original Mariel Boatlift study. First, the formalized procedure reduces the "ad-hoc" nature of choosing the control group. Second, we validate its quality by checking the pre-treatment differences of the outcome variable (wages or unemployment) between the treated and the Synthetic Control units. Finally, by constructing a synthetic control for every available city we can obtain a distribution of observed effects. Then we can calculate a p-value for how significant the post-treatment difference is compared to the pre-treatment one for Miami relative to the whole distribution, thus conducting inference with idiosyncratic city-specific shocks.

As per Jens Hainmueller and Alexis Diamond (2014) the synthetic control is an approach, which allows estimate effect in settings where a single unit (a state, country, firm, etc.) is exposed to an event or intervention. It provides a data-driven procedure to construct synthetic control units based on a weighted combination of comparison units that approximates the characteristics of the unit that is exposed to the intervention. A combination of comparison units often provides a better comparison for the unit exposed to the intervention than any comparison unit alone.

With Synthetic Control Method we can determine the weighted average of non-treated units that best reproduces characteristics of the treated unit over time, prior to treatment.

For this purpose, the idea of this method is to define two sets of data; first one is the data of the of countries which were affected by the shock (economical, political etc.) and another one in which intervention did not take place.

Synthetic control group - pool of countries in which intervention took place and we can observe what changes have occurred in the economy after it. The set of control units is called the donor pool.

Treated country - country in which intervention did not take place and we want to determine the potential effect of this shock on it.

The idea of the method is to create a reliable comparison analysis unit of treated country as a weighted average of other countries with a similar economic, political, geographical and social measurements (donor pool).

Suppose that we have J + 1 countries (Ukraine and other countries) for time periods t = 1,…,T.

Synthetic Control Method takes into a consideration 2 periods of time: pre-intervention and after. Without loss of generality, suppose also that only the first region is exposed to the intervention of interest, so that we have J remaining regions as potential controls. Also without loss of generality and to simplify notation, assume that the first region is uninterruptedly exposed to the intervention of interest after some initial intervention period. Let's denote T0 as time period before shock and T1 as positive number of post intervention periods, so that T=T0+T1. The intervention takes place at t T0 + 1 and therefore 1, 2, ..., T0 are the pre-intervention periods and T0 + 1, T0 + 2, ..., T are the post-intervention periods.

As per Abadie et al. (2015) synthetic control can be defined as a vector of weights

$$(J \times 1)\ W = (w2,...,wj+1)',$$

$$\text{where } 0 \leq wj \leq 1 \text{ for } j=2,...J \text{ and } w_2+...w_{j+1} = 1.$$

Let X_1 be a $(k \times 1)$ vector containing the values of the pre-intervention period of the treated unit and let X_0 be the $k \times J$ matrix collecting the values of the same variables for the units in the donor pool. For treated units the difference between the pre-intervention period and a synthetic control is defined by the vector $X_1 – X_0W$. The synthetic control is chosen as $W*$, that minimizes the size of this difference.

Let Y_{jt} be the outcome of unit j at time t. In addition, let Y_1 be a $(T_1 \times 1)$ vector collecting the post intervention values of the outcome for the treated unit. That is, Y_1

= (Y_1 T_0+1,...,Y_1T)′. Similarly, let Y_0 be a (T_1 × J) matrix, where column j contains the post intervention values of the outcome for unit j + 1. The synthetic control estimator of the effect of the treatment is given by the comparison of post intervention outcomes between the treated unit, which is exposed to the intervention, and the synthetic control, which is not exposed to the intervention, $Y_1 – Y_0W$.

In this analysis the treated country will be Ukraine as the goal is to determine the potential impact of EU integration on the Economy of Ukraine.

Before implementation of Synthetic Control Method for my set of data it is very important to predetermine assumptions.

1. Deeper association with the EU will influence economy Ukraine unevenly.

This assumption implies that we consider all EU countries as comparable to Ukraine, as we want to determine overall effect on the Ukrainian economy.

2. CEE countries accessing the EU in the last 15 years have been influenced unevenly by the accession.

Having set this, it would allow us to make analysis more concrete and precise. It is very crucial for a Synthetic Control Method to take appropriate treatment Units. CEE region has been chosen because of few reasons:

1. Geographical position.

Ukraine is the largest state in Europe. It has a favorable geographical location and favorable natural conditions for the development of economy and life of the population. By land Ukraine borders on seven countries: Russia, Belarus, Poland, Slovakia, Hungary, Romania and Moldova. Ukraine is located in Eastern Europe at the intersection of important transport routes, borders on seven states and has access to the Black and Azov Seas. Significant proportions of Ukraine have caused the diversity of its natural conditions and resources.

2. Similarity of economic structure
3. Common markets – financial, services and goods

Considering the fact that Ukraine is located very close to Europe, traditional historical relations and mutual economic interest create favorable conditions for the multifaceted linkages between neighboring countries and Ukraine to develop actively.

The main goods that Ukraine sells to neighboring countries are iron and steel products, steel pipes, machinery and equipment, mineral fertilizers, chemical products, grain, and

food products. Ukraine transport pipelines through its territory to natural gas and oil from Russia to the countries of the European Union.

Belarus supplies us tractors, trucks and lift equipment, Moldova - fruits and vegetables, Slovakia - vehicles, cosmetics, paper and cardboard, Hungary - cars, pharmaceuticals, food, Romania - furniture, footwear, textile products.

From Poland to Ukraine technical equipment, fabrics, fruits, medicines, clothes and shoes are brought. Many Ukrainian students are educated in colleges and universities in Warsaw, Cracow, Wroclaw. Poland provides Ukraine with significant support on its way to the European community.

Until 2014, Russia was the largest trade partner of Ukraine. However, due to the deterioration of political relations, the volume of trade between the states is shrinking. The countries of the European Union provide Ukraine with political and financial support in conducting various reforms.

Among other European countries, the most active are ties between Ukraine and Germany, Italy, Cyprus, Lithuania, Latvia, and Estonia.

CEE region includes Poland, Czech Republic, Slovakia, Hungary, Ukraine, Belarus, Lithuania, Latvia.

The main features of the EHP are the position on the western borders of Russia, the border with the developed countries of Europe, the direct exit of Poland, Ukraine and the Baltic countries to the seas. Through this region there are transport routes connecting Russia with the countries of Western and Southern Europe, which favors broad pan-European cooperation. The countries are compact in relation to each other.

The CMEA and the Warsaw Pact ceased to exist. There was a new organization - the Central European Initiative, which included Hungary and Ukraine from the countries of this region.

Some countries in this region have joined the NATO bloc - Poland, Hungary, the Czech Republic.

The similarity of natural conditions, mild climate and flat terrain create good conditions for people's life and economic activity. But the abundance of precipitation with small evaporation contributes to water logging (from 80% of the territory in Estonia to 34% in Poland).

The economic and geographical situation of the countries of Central and Eastern Europe can be assessed as very profitable. It has a great influence on the location of production in them, favors the development of economic integration and the creation of border free economic zones.

Since 1991, Central Europe has a sub-regional grouping - the Visegrad Four: Poland, Hungary, Czech Republic, Slovakia. It carries out a gradual exemption from quantitative restrictions and customs borders in the trade between the members of the Quartet.

After determining all assumptions, exercising of donor pool will be done in two steps: as we want to determine potential impact of accessing EU, reasonable will be to take all EU countries and test how it will influence Ukrainian economy.

Therefore, on the first step donor pool consists of all European countries (Table 2.).

Country	***Year of accession***	***Country***	***Year of accession***
Austria	1995	***Ireland***	1973
Belgium	1958	***Italy***	1958
Bulgaria	2007	***Latvia***	2007
Croatia	2013	***Lithuania***	2004
Cyprus	2004	***Luxembourg***	1958
Czech Republic	2004	***Malta***	2004
Denmark	1973	***Netherlands***	1958
Estonia	2004	***Poland***	2004
Finland	1995	***Portugal***	1986
France	1958	***Romania***	2007
Germany	1958	***Slovakia***	2004
Greece	1981	***Slovenia***	2004
Hungary	2004	***Spain***	1986
Sweden	1995	***United Kingdom***	1973

Table 2. Donor pool. List of EU countries[4]

As it was already stated that for the next step very important to assume that not all countries in EU have similar characteristics with Ukraine. For this purpose, every next exercise treatment Unit need to be changed – each country from CEE region. At first

[4] Donor pool for the Step 1 of implementation of Synthetic Control Method

stage countries with the same year of accession will not be excluded. The CEE countries are further subdivided by their accession year to the EU. First-wave accession countries that joined the EU on 1 May 2004 (Estonia, Latvia, Lithuania, Czech Republic, Slovakia, Poland, Hungary, and Slovenia), second wave of accession happened on 1 January 2007; that were Romania and Bulgaria. The third-wave accession country that integrated on 1 July 2013 is Croatia.

4.2 Data

The study of the impact on the Ukrainian economy of its potential entry into the European Union will be based on macroeconomic data from the 28-member countries of the European Union and Ukraine in particular for the period 1997-2016. That will help alleviate the stresses of the enlargement of the European Union in 2004-2013.

The macroeconomic indicators characterizing the socio-economic system of the countries under study include:

1. Gross domestic product by purchasing power parity, which sufficiently covers the economic opportunities of states. Gross domestic product (GDP) is one of the most important indicators, expressing the aggregate value of the final product (products, goods and services) calculated at market prices, created within a year within the country, using production factors belonging to that country and to other countries. In the system of national accounts, GDP is used as a key macroeconomic indicator.

Nominal GDP is the sum of all goods and services produced in a country for a certain period (in this case: yearly)

GDP at purchasing power parity (PPP) is necessary in order to compare between different countries. Each country, of course, has its own currency. For comparison of the countries it is necessary to translate data on GDP into one single currency - the US dollar. If we translate GDP at a market rate, we find that products that are identical or strongly similar in their consumer properties in different countries have different values in US dollars. The reasons for this difference may be a lower cost of labor in developing countries than developed countries, sharp fluctuations in market exchange rates etc.

2. The growth rate of industrial production - an indicator of the dynamics of the volume of industrial production, its rise or decline, is defined as the ratio of the current production volume in monetary terms to the volume of industrial production in the

previous or other base year. It is determined by selecting the goods-representatives, characterized as the most important types of industrial products. This index can be considered as one of the parts of GDP because it expresses the change in the volume of production in the country in the following sectors: mining; manufacturing industries; production and distribution of electricity, gas and water. This index characterizes the change in GDP due to the fundamental branches of the economy, accordingly takes into account the industrial potential.

3. Inflation is the depreciation of money, a decrease in its purchasing power. Inflation is a phenomenon of the violation of monetary circulation and is associated with various monetary factors: the emission of signs of value, the volume of money supply, the speed of money turnover, the amount of mutual payments. Obviously, inflation is a process caused by the interaction of two factors: price creation and monetary. On the one hand, the depreciation of money is a process associated with rising prices, on the other hand, the drop in the purchasing power of money can also occur under the influence of a change in their quantity in circulation. This factor should be considered in the study, as it characterizes the stability of the state financial system and its stability in pricing policy.

4. Population - one of the demographic indicators, in general - the number of people in a certain set of them, constantly changing due to birth, death, migration, measured and evaluated at a certain point in time, this is the initial basis indicator, in analyzing the socio-economic situation in any country in the world.

5. Unemployment rate. Unemployment is an economic condition characterized by the fact that part of the adult able-bodied population does not have a job and is in search of it. The total number of employed and unemployed makes up the labor force. The unemployment rate, being a socio-economic indicator, specifies such indicators as the gross domestic product, the population and the growth rate of industrial production. On the one hand, the unemployment rate is a negative indicator, and on the other hand - the potential for growth in industrial production and GDP in general, with active state policy.

6. The public debt is the amount of the state's debt on issued and outstanding government loans (including interest accrued on them). Depending on the placement market, loan currency and other characteristics, public debt is divided into internal and

external. Depending on the maturity period, the public debt can be current or capital. It consists of the debts of the central government (the bulk of the debt), local authorities, state enterprises. The public debt acts as a result budget deficit. Public debt is the total number of financial loans taken by the state to cover budget deficits. The amount of public debt is expressed either in national currency or in US dollars. For objective comparison, it is indicated as a percentage of the country's gross domestic product (GDP).

7. The volume of exports. Export - the export from the customs territory of the country abroad of goods and services without the obligation of their return. Export of goods means the sale of goods to foreign entities of economic activity.

Thus, the elements of the model for assessing the impact of Ukraine's accession to the European Union will be:

- "1" - gross domestic product - gross domestic product (GDP), billion dollars. USA;
- "2" - the growth rate of industrial production-growth rate of industrial production (GRIP), %;
- "3" - inflation - inflation (I), %;
- "4" - unemployment rate - unemployment rate (UR), %;
- "5" - the volume of exports - volume of exports (VE), billion dollars. USA;
- "6" - state debt - state debt (SD), % to GDP;
- "7" - population - population (P), mln.

Moreover, the element "1" will be an indicator (characteristic) of the effectiveness of Ukraine's accession to the European Union. And the data elements "1" - "7" for the member countries of the European Union will be used as factors of influence.

The statistical data for these indicators (elements "1" - "7") are presented in Appendix B and C.

4.3 Application of the method

To implement the proposed analysis, we will use the R-Studio program and the Synth package, which provides for the implementation of the synthetic control method. To do this, the given statistics will be used as a database (bbb). The first step is to install packages “Datapreparation” and “Synth” – having asked the commands install.packages("dataPreparation") and install.packages("Synth").

The next step is to upload the Data set, as already mentioned in this work it is called “bbb”, by asking a command: library(readxl)
bbb <- read_excel("DATA/bbb.xlsx") - please specify roadmap to the Excel file “bbb.xlsx” View(bbb).
Before uploading data is needed to reorganize the data set into a suitable format, which is suitable for the main function of evaluating synth (). As a base for exploring and studying the package Synth a paper, written by Jens Hainmueller together with AlexisDiamond (2015) has been chosen. In this paper authors in a very simple way described this method and application of it. As per authors, at a minimum, synth () requires four data matrices X1, X0, Z1 and Z0, which are necessary for constructing a synthetic control unit, as inputs. Although the user can choose to provide pre-processed data matrices and load them into synth (), the package in question provides a convenience function called dataprep (), which the user can run first to properly organize the data. In this study, dataprep () will be used, since it makes it convenient to extract and package all the necessary inputs for synth () into one list object that can be passed to synth () without additional arguments. The list returned by dataprep () is also used by other convenient functions, such as synth.tables (), path.plot () and gaps.plot () to create tables and sentences that summarize and illustrate the results. The dataprep () function also performs a number of checks that warn the user about the absence of data and inconsistencies in the extracted objects.
Additional examples and information about extracting data are available in the dataprep () help file. To get X1 and X0, we define the predictor variables, as well as the operator (average) and the time period (1997: 2016) applied to these variables. We indicate the dependent variable (GDP), a variable that identifies the names of the blocks (countryname) and the numbers (countryid), defining the variable time periods (year), the processed unit (country number 29, which is the country Ukraine), control units (country numbers c (1 : 28)), the period of time to be optimized (for example, the pre-treatment period of 1997: 2012), and the time period over which the results data should be constructed (for example, 1997: 2012).
The dataprep () function returns a list object dataprep.out, which contains several elements, among them dataprep.out $ X0 and dataprep.out $ X1, denoting X0 and X1,

respectively. Both of these objects are easy to interpret, since variable labels are stored.

For example, here's how X1 is saved.

```
R> dataprep.out[["X1"]]
GDP  265.835000          P    46.855000
GRIP   2.657895          SD   39.605000
I    13.630000
UR    8.935000
VE   38.284211
```

At the same time, the significance of the influence of each European country on Ukraine and its factorial characteristics is distributed as follows:

	GDP	GRIP	I	UR	VE
Nelder-Mead	0.8874522	0.03742418	0.00162124	0.01655031	0.0103375

	SD	P
Nelder-Mead	0.0466146	8.929012e-10

Command:

```
R>gaps<- dataprep.out$Y1plot-( dataprep.out$Y0plot%*%synth.out$solution.w ) ; gaps
```

gives an opportunity to summarize that the key impact on the Ukrainian GDP on PPP will be 21 (Poland - 0.12) and 27 (Romania 0,461):

Number	***Country***	***Weight***
21	Poland	0,120
27	Romania	0,461

Table 3. Output log, Ukraine, weights (Step 1.)

Get the following analysis of the Synth package:

$tab.pred

	Treated	***Synthetic***	***Sample Mean***
GDP	265,84	265,71	498,29
GRIP	2,66	2,66	1,62
I	13,63	13,59	5,22
UR	8,94	8,94	9,07
VE	38,28	45,10	150,39
SD	39,61	39,59	53,08
P	46,86	17,81	17,73

Table 4. Output log, application of Synth package.
Treated Unit – Ukraine, Control pool – EU member states.

In this case, for Ukraine, the GDP value for purchasing power would be:

Year	*Delta, billion USD*
1997	-15,60
1998	-15,59
…	…
2008	4,05
2009	-30,20
2010	-19,58
…	…
2013	-24,51
2014	-97,90
2015	-167,04
2016	-184,25

Table 5. potential GDP of Ukraine, delta.
Treated Unit- Ukraine, Control pool – EU member states.

From the Table 5. we can see that potential GDP would be even less than actual one. Therefore, as pre-conclusion we can say, that it is not beneficial for Ukraine to gain EU membership. In addition it allows us to make the following conclusion: the main factor characterizing the economy at the macro level is PPP GDP, the weak characteristics are the population size and the unemployment rate. The remaining factors are not factors of influence.

However, the method of synthetic control allowed to determine the scenario of Ukraine's accession to the European Union on the basis of 46,1% of the data of the Romanian economy and 12% of the data of the Polish economy (Table 3). What is the positive level of GDP for PPP for Ukraine in this case would be in the period from 2003 to 2007, with a subsequent negative trend.

Therefore, we can assume that Ukraine's accession to the European Union is not promising in the current macroeconomic situation.

But as earlier mentioned, it is very important to make additional assumptions before presenting the latest results. For more precise and accurate analysis, this experiment was repeated firstly for CEE countries. Only after all coefficients were gathered for CEE countries, results for the economy of Ukraine can be defined.

All results you can find in Appendix B and C showing all concrete numbers for each country.

To briefly conclude results, it is very important to mention that according to results of SCM, we can say that this method describes the trajectory very well. It is noticeable that the synthetic results for Czech Republic, Poland, Bulgaria are very similar to the original data in term of values of: GDP per capita, Growth Rate of Industrial Production, Inflation, Unemployment rate, Volume of Export, State Debt to GDP and population. It is noticeable that until the year of accession lines of treated and synthetic data are almost coinciding. From the Table below, we can see the small differences in some values, which can be described as effect of Intervention, together with the fact, that even though we took economies, which can be compared, all countries are unique and have their own economy cycle. For these reasons variables cannot be perfectly matched comparing to other countries.

Czech Republic:

Czech Republic joined EU in 2004. On the Figures 10,11 we can see that there is no major difference between the Treated GDP (Actual data) and Synthetic (Constructed by method), thus we can say that Synthetic Control Method applied to this country describes the sample very well. It is worth mentioning that on this stage we can see more comprehensive analysis, as adjusted Control pool was adjusted –countries with the same year of accession and after were excluded. The main reason for setting this assumption is because it allows us to test how did pure EU members influenced the economy of treated country (e.g. Czech Republic). Following example with Czech Republic, the root cause of it is that in 2004 European Union had different construction. It included only 13 countries: Belgium, France, Germany, Italy, Luxembourg, Netherlands, Denmark, Ireland, Greece, Portugal, Spain, Austria and Finland. Thus, for examining Czech Republic (treatment variable) as a Donor Pool we took only countries listed above. From the Tables 6,7 as well as on the figures 10, 11 we can see that results did not change a lot, but we can make a conclusion that they became more precise as the difference between the treated line and control one slightly decreased. Moreover, we can see that there was no major difference between both lines before the year of accession, therefore we can make a conclusion that difference occurred after 2004 is an effect of EU integration.

	Treated	*Synthetic*	*Sample Mean*
GDP	159,63	159,61	392,65
GRIP	2,16	2,16	2,12
I	4,34	15,91	10,04
UR	7,56	7,57	8,96
VE	34,11	42,49	102,73
SD	22,00	22,04	43,68
P	10,26	10,90	17,63

Table 6. Output log, SCM, Czech Republic Treatment Unit- Czech Republic. Control pool – all EU member states.

	Treated	*Synthetic*	*Sample Mean*
GDP	159,625	159,637	578,587
GRIP	2,157	2,162	1,947
I	4,337	22,809	12,99
UR	7,562	7,546	8,017
VE	34,114	36,127	157,356
SD	22	22,3	50,087
P	10,262	13,748	23,987

Table 7. Output log, SCM, Czech Republic Treatment Unit- Czech Republic. Control pool – limited EU member states (Step 2)[5]

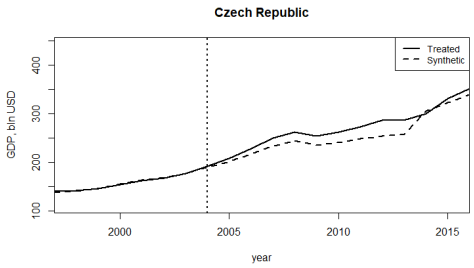


Figure 10. GDP, Czech Republic Treated Unit – Czech Republic, Control Pool – All EU member states

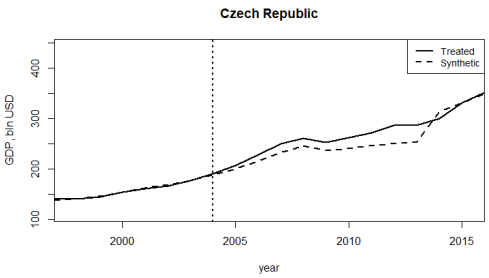


Figure 11. GDP, Czech Republic, Treated Unit – Czech republic, Control Pool – limited donor pool[6]

Poland:

From the Table 8. we can say that for Poland Synthetic variables pretty much coincide with real data. On the Figure 12. we can see that, before EU acceptance Synthetic and Treated GDP are very close to each other, and only after Intervention we can see some differences in trajectories. As already mentioned**,** this can be described by effect of Economic shock in our case EU integration and recovery of economy after it. Together with this, it is important to mention that after few years of Poland became an EU member, there was another shock- crisis of 2008, which also affected the economy of Poland.

[5] Step 2 – means that for implementation of SCM at this stage we excluded all other countries with the same year of accession. Logic behind this is that we test how did countries from EU influenced economy of Treated unit. And e.g in 2004 not all countries have been already included.
[6] Limited Donor pool (Step 2) – All EU member states excluding items, that have the same accession year together with states, which joined EU later on.

	Treated	*Synthetic*	*Sample Mean*
GDP	402,14	402,12	383,67
GRIP	3,31	3,04	2,08
I	6,98	7,05	9,94
UR	16,08	15,40	8,64
VE	30,57	61,68	102,86
SD	41,35	44,05	42,96
P	38,64	19,11	16,58

Table 9. Output log, SCM, Poland
Treatment Unit- Poland.
Control pool – all EU member states.

	Treated	*Synthetic*	*Sample Mean*
GDP	402,14	402,36	578,59
GRIP	3,31	2,22	1,95
I	6,98	7,13	12,99
UR	16,08	11,03	8,02
VE	30,57	76,51	157,36
SD	41,35	41,44	50,09
P	38,64	18,52	23,99

Table 8. Output log, SCM, Poland
Treatment Unit- Poland.
Control pool – Limited donor pool (Step 2)

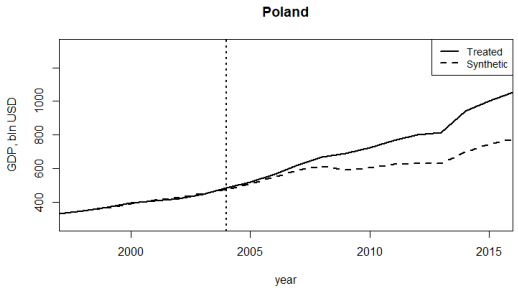


Figure 12. GDP, Poland
Treated Unit – Poland,
Control Pool – All EU member states

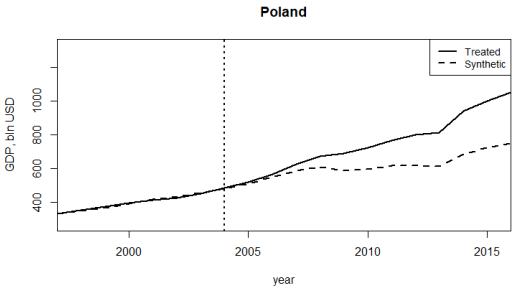


Figure 13. GDP, Poland
Treated Unit – Poland,
Control Pool – limited CP

On the Figures above we can see that results from 2 tests are the same. Also we can see that there was no difference between Synthetic and Treated lines before 2004 - which means that difference arised after 2004 – is the effect of Integration itself.

Bulgaria

For Bulgaria, we also can say that Synthetic Control Method is appropriate one for determination of effect of EU acceptance. Even after testing second scenario, where we excluded from control Pool all the countries with the same accession year, Synthetic Variables are changes unevenly.

	Treated	*Synthetic*	*Sample Mean*
GDP	62,13	62,21	429,24
GRIP	4,51	4,50	2,64
I	103,22	8,38	4,46
UR	13,85	12,00	8,29
VE	6,49	8,64	117,54
SD	25,49	20,74	44,32
P	7,89	5,46	17,78

Table 10. Output log, SCM, Bulgaria
Treatment Unit- Bulgaria.
Control pool – all EU member states.

	Treated	*Synthetic*	*Sample Mean*
GDP	62,13	62,12	460,31
GRIP	4,51	4,46	2,57
I	103,22	3,01	4,47
UR	13,85	10,93	7,97
VE	6,49	10,42	126,57
SD	25,49	25,45	46,70
P	7,89	4,16	18,93

Table 11. Output Log SCM, Bulgaria
Treated Unit – Bulgaria,
Control Pool – limited CP

For this country it is noticeable from the Figures 14,15 that before shock, treated and Synthetic GDP are almost coincided. Thus, the difference between Synthetic and Treated line on the Figure can be described as an effect of EU membership.

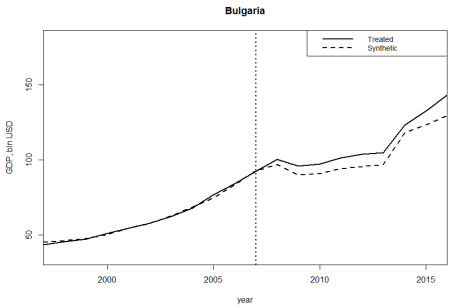


Figure 14. GDP, Bulgaria
Treated Unit – Bulgaria,
Control Pool – All EU member states

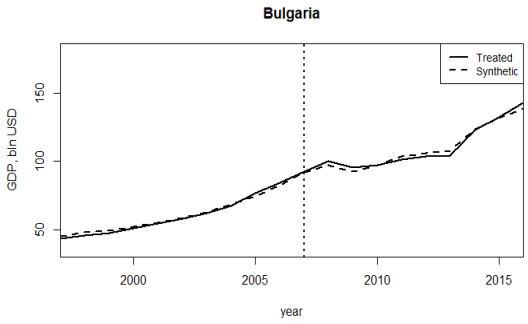


Figure 15. GDP, Bulgaria
Treated Unit – Bulgaria,
Control Pool – limited CP

Abadie, Diamond, and Hainmueller in their research paper on Germany reunification (2012) concluded that separate country weights obtained by Synthetic Control Method are more precise than weights obtained in a simple regression analysis. The main reason for it is that in regression analysis, mostly all units contribute to fit the regression, and considering the fact that different variables have different weights, the

contribution of units with larger positive weights may be imbalanced by the units with negative weights.

To perform results for Ukraine a pool of data can be constructed as follows: coefficients from SCM results for all 10 countries (Table 12.).

	GDP	*GRIP*	*I*	*UR*	*VE*	*SD*	*P*
Latvia	24,42	3,245	7,186	10,279	6,106	9,924	1,904
Lithuania	38,64	4,405	4,952	10,605	7,338	14,728	2,826
Poland	402,12	3,044	7,054	15,399	61,683	44,054	19,114
Slovak Republic	64,51	1,344	7,745	13,671	8,363	14,433	5,065
Slovenia	36,08	2,271	7,05	6,738	9,027	25,182	1,995
Czech Republic	159,61	2,16	15,91	7,57	42,49	22,04	10,90
Estonia	15,18	2,163	3,481	10,986	2,376	27,883	1,692
Bulgaria	62,21	4,501	8,38	12,001	8,642	20,737	5,458
Romania	170,69	4,02	37,271	12,881	19,661	23,89	15,465
Croatia	65,25	1,69	4,41	11,856	11,626	28,839	3,645

Table 12. Consolidated data for OLS implementation

To find values for Ukraine Simple OLS model in Gretl software is used.

Before starting a test, it is needed to define hypothesis:

H_0 – it is unfavorable for Economy of Ukraine to access the EU

H_1 – Economy of Ukraine will benefit from Accession

Output Log from Gretl you can find below in the tables:

	Coefficients
Const	-18,8045
GRIP	1,05763
I	-3,72554
UR	0,173381
VE	0,777511
SD	0,735814
P	18,4216

Table 13. Coefficients from OLS

Statistics	
R-squared	0,989473
Adjusted R-squared	0,968419
S.E. of regression	20,88728
Log-likelihood	−38,56092
P-value(F)	0,002998

Table 14. Statistical report from Gretl (OLS implementation)

From which we can say that according to p-value, it is reasonable to decline

H_0 – EU integration will not be beneficial for Ukraine, but otherwise.

To make my analysis more comprehensive new GDP* will be calculated. GDP* is defined as:

$$GDP^* = const + GRIP + I + UR + VE + SD + P$$

And can show us potential GDP of Ukraine after assuming integration with EU.

The Integration process for Ukraine started earlier in 2012, for this reason it will be considered as a starting point of EU Accession. Before 2012 there were no changes for Economy of Ukraine – therefore GDP will remain as real one. Starting from 2012, as per assumption of EU integration, we can see from the Table that GDP of Ukraine would be almost doubled, which allows us to make additional conclusion, taking side for EU integration for Ukraine.

Year	GDP	GDP*
1997	149,10	149,10
1998	147,90	147,90
1999	149,70	149,70
2000	161,90	161,90
...	...	...
2009	291,00	291,00
2010	306,60	306,60
2011	327,40	327,40
2012	335,40	896,94
2013	337,40	875,48
2014	373,10	837,92
2015	334,20	689,66
2016	349,80	832,96

Table 15. Comparison of real GDP with Potential assuming potential accession of EU in 2012.

Year	GDP	GDP*
1997	149,10	149,10
1998	147,90	147,90
1999	149,70	149,70
2000	161,90	161,90
...	...	...
2009	291,00	291,00
2010	306,60	306,60
2011	327,40	327,40
2012	335,40	683,72
2013	337,40	517,46
2014	373,10	478,70
2015	334,20	340,03
2016	349,80	514,27

Table 16. Comparison of real GDP with Potential assuming potential accession of EU in 2012. (Step 2)

The results in Table 15 confirm, that the economic benefits for economy of Ukraine from potential EU membership estimated above are significant. That is, the differences between the synthetic counterfactual series and the actual series are statistically significantly different from zero. We can see that potential GDP is increasing from year to year, thus it allows us to make a conclusion that it will be profitable for Ukraine to access the European Union. And can show us potential GDP of Ukraine under EU.

An additional test is required for examining Step 2 – where limited Control Pool is introduced by excluding items with the same year of accession.

But even having tested this, we still can make a conclusion that it would be beneficial for Ukraine to Access the EU. OLS data pool can be found in Appendix C.

The results in Table 16. confirm, that the economic benefits for economy of Ukraine from potential EU membership estimated above are significant. That is, the differences between the synthetic counterfactual series and the actual series are statistically significantly different from zero. We can see that potential GDP is increasing from year to year, thus it allows us to make a conclusion that it will be profitable for Ukraine to access the European Union.

Changes after applying Step 2 is arising in difference in main coefficients as well as statistical results[7]. P- value 0, 0,00429 - increased but still is still significant enough to reject H_0 - Accession of EU will not be beneficial for Ukraine.

[7] Results can be found in Apendix

5 Conclusion

The aim of this work was to determine the potential impact on economy of Ukraine after EU accession.

To estimate the effect 3 Hypothesis were determined, which have been examined with using Synthetic Control Method. As additional step, we determined additional limitations and test new Hypothesis using Gretl applying OLS approach.

In third part of this Diploma Thesis "Comparative analysis" you can find information about key prerequisites to the EU accession. Also, in the third part was introduced a development path for different European countries before and after EU integration. To make analysis more complex main indexes were tested for CEE countries with SCM. All results can be found in there and in the last part of this work.

Obtained results suggest that it will be beneficial for Ukraine to join European Union, of course after accomplishment of all required steps and applying all reforms.

It was very important to make additional step in determining latest results. Having set limitation for Control Pool - exclusion of the countries with the same year of accession and after, we obtained desired results. And according to statistical output we can make a trustful result, rejecting null Hypothesis – it is not favorable for Ukraine to enter European Union. Therefore, we can say that Ukrainian economy with similar characteristics to some CEE countries will develop in a similar way as Ukraine after deeper association with the EU and will pay off from integration.

As a main determinant of development of Ukrainian Economy, below indicators were studied: GDP by purchasing power parity (DGP), the growth rate of industrial production (GRIP), inflation (I), population (P), unemployment rate (UR), Government debt (GD), volume of export (VE) and its influence on the economy of Ukraine. Eurostat database- is the main source of data for all purposes required by this work.

The enlargement of the EU is great task for Ukraine. One of them is the acceleration of the constitutional reforms, economic transformations in general and restructuring production, as an opportunity to take advantage of the EU membership in many respects determined by the level of democratization of the political system and the

dynamics of the Ukrainian economy, its development and the ability to quickly adapt to changes at international level markets. In addition, it is necessary to strengthen the domestic competitiveness of the national an economy oriented towards a gradual achievement European socio-economic parameter of development and the creation of a free trade zone Ukraine - EU based on asymmetric market opening in favor of Ukraine.

As for internal transformation, Ukraine should carry out many fundamental transformations:

1) in the economic sphere:

- implement the strategy of anticipatory development, which should ensure the annual growth rate GDP in Ukraine is at least 6-7% (1.5-2 times higher than in the EU as a whole), a significant overcoming on this basis, the gap in GDP per capita between Ukraine and the EU member states;
- to master the innovative model of restructuring and growth, the implementation of which should provide significant increase in competitiveness of the Ukrainian economy;
- maintain high-tech perspectives of industries military-industrial complex, first of all the space industry;

2) in the social sphere:

- to provide purposeful preconditions for reducing the gap in the level and quality of life standards with the EU countries, the approval of the middle class as the basis of political stability and democratization society;
- to form a reliable national security in the field of migration and receiving of citizenship of Ukraine;
- in the context of the development of education and science in Ukraine to provide a differentiated approach to perception the main points of the Bologna system of education, avoiding privatization of the educational process;
- to intensify the work in solving the demographic the problem is that accession to the EU has not been resonant an earthquake that destroys the Ukrainian nation;
- to create and implement an effective development program of healthcare system;

3) in the political sphere:

- to actively participate in the formation of the strategy that furthers the development of the EU using both democratic and liberal, in order to protect the national and pan-European interests;
- explore the possibility of conducting a concerted with RF customs policy, as an important condition of formation free trade zone between two countries, acquisition Ukraine associate membership in EurAsEC within allowing to continue the European integration course.

So, the main prospects of Ukraine's accession to the EU can be attributed to: the establishment of stable political systems; perception of Ukraine as an important one subject of political relations; development of small and medium business; introduction of standards EU in production; the formation of the middle class; reforming education, health, social protection.

Existing advantages include: European collective security; macroeconomic stability; additional investments into the Ukrainian economy; subsidizing the degrading rural economy; obtaining a positive balance trade balance; common customs tariffs; quantitative import restrictions; anti-dumping policy; protectionism and export control; effective protection of human rights in EU institutions; discovery of borders for free movement of the population; software a high standard of living for the population.

To the weaknesses that may occur in the ashes of entry can be attributed to: partial loss of sovereignty; uncertainty EU development strategies; worsening of relationships with countries CIS; loss of competitiveness in certain industries; the complexity of the transition to the European price level; quotas for certain types of goods; complication of the visa regime with eastern neighbors.

To threats: the danger of Ukraine's involvement in conflict between civilizations between the West and Muslim the world; it is possible to move harmful to Ukraine productions; use of Ukraine as a raw material appendage; use of Ukrainians as cheap labor strength; deepening of the demographic decline; illegal migration and outflow of labor force.

To make a conclusion it is worth noting that with entrance in the EU, Ukraine will receive a number of significant benefits. But from the other hand to avoid existing threats, it is needed to gradually implement strategic directions of EU development in Ukrainian economy and develop a program of action to make it less rough, taking into account the intrinsic threats and the experience of the countries that have joined the EU.

Bibliography

VON CRAMON-TAUBADEL, S., S. HESS (2010): "A Preliminary Analysis of the Impact of a Ukraine-EU Free Trade Agreement on Agriculture";

FREY, M. (2015): "Income Inequality Effects of Ukraine's Trade Liberalization with the EU. Are there "two Ukraines"?";

ANDRES ASLUND (2013): "Ukraine's Choice: European Association Agreement or Eurasian Union?";

KRAVCHUK, A., Z. POPOVYCH (2016): "The expected impact of the EU-Ukraine Association Agreement";

ARKADIUSZ SARNA (2014): "The transformation of agriculture in Ukraine: From collective farms to agroholdings";

DENYS KUZMIN AND IRYNA MAKSYMENKO (2012): "Analysis of the EU – Ukraine relations in the context of the association agreement and related documents and the EU 2014-2020 financial prospective";

Matej Opatrny (2016): "Quantifying the Effects of the CNB's Exchange Rate Commitment: A Synthetic Control Method Approach";

All statistics regarding Ukraine is obtained from Ukraine State Statistics Department. URL: http://www.ukrstat.gov.ua/;

NAURO F. CAMPOS, FABRIZIO CORICELLI, LUIGI MORETTI (2014)" Economic Growth and Political Integration: Estimating the Benefits from Membership in the European Union Using the Synthetic Counterfactuals Method";

RANDOLPH BRUNO, NAURO CAMPOS, SAUL ESTRIN, MENG TIAN (2017): CEP Discussion Paper No 1518 "Economic Integration, Foreign Investment and International Trade: The Effects of Membership of the European Union";

GIOVANNI PERI, VASIL YASENOV (2017): “The Labour market effects of a refugee wave: applying the Synthetic Control Method to the mariel boatlift”;

ALBERTO ABADIE, ALEXIS DIAMOND, JENS HAINMULLER (2011):” Synth: An R Package for Synthetic Control Methods in Comparative Case Studies”;

JENS HAINMUELLER ANDALEXIS DIAMOND (2015): “Synthetic Control Group Method for Comparative Case Studies”;

KAUL, A., KLÖBNER, S., PFEIFER, G., SCHIELER, M. (2015): “Synthetic Control Methods: Never Use All Pre-Intervention Outcomes as Economic Predictors.”

HONCHARENKO O. M., BAGATERENKO A. O., BACAL E. B (2012): “Problems and prospects of the European integration of Ukraine / National Aviation University / Institute of International Relations”;

OLEKSANDR SUSHKO, OLGA ZALINS’KA, ROBERT HOROLSKIJ, VERONIKA MOVCHAN, IRYNA SOLONENKO, VIKTORIA GUMENJUK (2012) “Association Agreement Ukraine-Ukraine: Roadmap for Reforms”

NATALIA A. KUKHARSKA (2016): “Free-trade area Ukraine – European Union: outlook and risks of Implementation”;

ZORYANA OLEKSEYUK, HANNAH SCHÜRENBERG-FROSCH (2016): Ukraine’s unconsidered losses from the annexation of Crimea: What should we account for in the DCFTA forecasts? “;

ZORYANA OLEKSEYUK (2015): The EU-Ukraine Deep and Comprehensive Free Trade Agreement and the Importance of FDI;

https://ukraine-eu.mfa.gov.ua/en/ukraine-eu/relations - Ukraine-EU Relations, EU-Ukraine Association Agreement

Appendix A: Output Log (Shares affected)

Below you can find a table with output Logs from SCM. Shares of countries, which affect the specific Treatment Unit. Step 1 – Control Pool – all EU Member States. Step 2 – Limited Control Pool. For examination countries with the same year of accession are excluded.

Estonia

Step 1

# of country	Name of the country	Share, %
18	Latvia	0,64
20	Malta	0,36
4	Luxembourg	0,01

Appendix A. Table 1. Countries by which Estonia was affected (Step 1)

Step 2

# of country	Name of the country	Share, %
4	Luxembourg	1

Appendix A. Table 2. Countries by which Estonia was affected (Step 2).

Latvia

Step 1

# of country	Name of the country	Share, %
26	Bulgaria	0,22
25	Estonia	0,86
22	Slovakia	0,095

Appendix A. Table 3. Countries by which Latvia was affected (Step 1)

Step 2

# of country	Name of the country	Share, %
19	Lithuania	0,30
25	Estonia	0,69
4	Luxembourg	0,002

Appendix A. Table 4. Countries by which Latvia was affected (Step 2)

Lithuania

Step 1

# of country	Name of the country	Share, %
18	Latvia	0,81
22	Slovakia	0,023
4	Luxemburg	0,077

Appendix A. Table 5. Countries by which Lithuania was affected (Step 1)

Step 2

# of country	Name of the country	Share, %
8	Denmark	0,001
26	Bulgaria	0,33
4	Luxemburg	0,669

Appendix A. Table 6. Countries by which Lithuania was affected (Step 2)

Czech Republic

Step 1

# of country	Name of the country	Share, %
27	Romania	0,261
25	Estonia	0,153
4	Luxembourg	0,170
17	Cyprus	0,12

Appendix A. Table 7. Countries by which Czech Republic was affected (Step 1)

Step2

# of country	Name of the country	Share, %
12	Portugal	0,29
27	Romania	0,41
3	Belgium	0,109
4	Luxembourg	0,103

Appendix A. Table 8. Countries by which Czech Republic was affected (Step 2)

Step 1

# of country	Name of the country	Share, %
28	Croatia	0,95
26	Bulgaria	0,028

Appendix A. Table 9. Countries by which Slovak Republic was affected (Step 1)

Step2

# of country	Name of the country	Share, %
4	Luxembourg	0,54
26	Bulgaria	0,22

Appendix A. Table 10. Countries by which Slovak Republic was affected (Step 2)

Poland

Step 1

# of country	Name of the country	Share, %
22	Slovakia	0,628
11	Spain	0,311

Appendix A. Table 11. Countries by which Poland was affected (Step 1)

Step2

# of country	Name of the country	Share, %
27	Romania	0,843
2	Germany	0,157

Appendix A. Table 12. Countries by which Poland was affected (Step 2)

Slovenia

Step 1

# of country	Name of the country	Share, %
4	Luxembourg	0,315
25	Estonia	0,245

Appendix A. Table 13. Countries by which Slovenia was affected (Step 1)

Step2

# of country	Name of the country	Share, %
4	Luxembourg	0,91
26	Bulgaria	0,06

Appendix A. Table 14. Countries by which Slovenia was affected (Step 2)

Romania

Step 1

# of country	Name of the country	Share, %
15	Estonia	0,35
26	Bulgaria	0,34
21	Poland	0,31

Appendix A. Table 15. Countries by which Romania was affected (Step 1)

Step2

# of country	Name of the country	Share, %
25	Estonia	0,64
21	Poland	0,357

Appendix A. Table 14. Countries by which Romania was affected (Step 2)

Bulgaria

Step 1

# of country	Name of the country	Share, %
22	Slovakia	0,21
18	Latvia	0,63
27	Romania	0,1

Appendix A. Table 17. Countries by which Bulgaria was affected (Step 1)

Step2

# of country	Name of the country	Share, %
22	Slovakia	0,225
19	Lithuania	0,692
27	Romania	0,01

Appendix A. Table 18. Countries by which Bulgaria was affected (Step 2)

Croatia

Step 1

# of country	Name of the country	Share, %
18	Latvia	0,80
17	Estonia	0,05
10	Greece	0,09

Appendix A. Table 17. Countries by which Croatia was affected (Step 1)

Step2

# of country	Name of the country	Share, %
18	Latvia	0,80
17	Cyprus	0,18
25	Estonia	0,05

Appendix A. Table 18. Countries by which Croatia was affected (Step 2)

Appendix B: Output Log (Coefficients)

In this Appendix you can find the information about Coefficients received after applying SCM. Tested both Scenarios with full Donor Pool and Limited one.

Estonia

Step 1

	Treated	*Synthetic*	*Sample Mean*
GDP	14,79	15,18	398,02
GRIP	0,00	2,16	2,17
I	5,05	3,48	10,01
UR	10,99	10,99	8,83
VE	3,16	2,38	103,88
SD	5,49	27,88	44,29
P	1,40	1,69	17,96

Appendix B. Table 1. Output Log from SCM. Treated Estonia, CP[8]- All EU States (Step 1)

Step 2

	Treated	*Synthetic*	*Sample Mean*
GDP	14,79	24,36	578,59
GRIP	0,00	5,21	1,95
I	5,05	2,14	12,99
UR	10,99	3,08	8,02
VE	3,16	8,11	157,36
SD	5,49	6,53	50,09
P	1,40	0,00	23,99

Appendix B. Table 2. Output Log from SCM. Treated Estonia, CP- Limited (Step 2)

Latvia

Step 1

	Treated	*Synthetic*	*Sample Mean*
GDP	24,027	24,416	430,646
GRIP	4,59	3,245	2,637
I	4,936	7,186	8,101
UR	11,591	10,279	8,378
VE	3,2	6,106	117,666
SD	10,045	9,924	44,889
P	2,345	1,904	17,982

Appendix B. Table 3. Output Log from SCM. Treated Latvia, CP- All EU States (Step 1)

Step 2

	Treated	*Synthetic*	*Sample Mean*
GDP	24,03	24,38	472,39
GRIP	4,59	3,46	2,53
I	4,94	3,94	3,11
UR	11,59	9,60	7,97
VE	3,20	5,26	131,15
SD	10,05	8,14	48,40
P	2,35	1,83	18,80

Appendix B. Table 4. Output Log from SCM. Treated Latvia, CP- Limited (Step 2)

Lithuania

Step 1

	Treated	*Synthetic*	*Sample Mean*
GDP	38,60	38,64	444,43
GRIP	4,41	4,41	2,65
I	1,40	4,95	8,41
UR	9,47	10,61	8,28
VE	6,72	7,34	121,81
SD	14,79	14,73	45,70
P	2,83	2,83	18,48

Appendix B. Table 5. Output Log from SCM. Treated Lithuania, CP- All EU States (Step 1)

Step 2

	Treated	*Synthetic*	*Sample Mean*
GDP	38,60	39,83	624,21
GRIP	4,41	5,05	2,19
I	1,40	35,18	10,19
UR	9,47	6,85	7,71
VE	6,72	9,36	175,92
SD	14,79	12,91	50,61
P	2,83	2,92	24,08

Appendix B. Table 6. Output Log from SCM. Treated Lithuania, CP- Limited (Step 2)

[8] CP - Control Pool

Czech Republic

Step 1

	Treated	*Synthetic*	*Sample Mean*
GDP	159,63	159,61	392,65
GRIP	2,16	2,16	2,12
I	4,34	15,91	10,04
UR	7,56	7,57	8,96
VE	34,11	42,49	102,73
SD	22,00	22,04	43,68
P	10,26	10,90	17,63

Appendix B. Table 7. Output Log from SCM. Treated- Czech Republic, CP- All EU States (Step 1)

Step 2

	Treated	*Synthetic*	*Sample Mean*
GDP	159,625	159,637	578,587
GRIP	2,157	2,162	1,947
I	4,337	22,809	12,99
UR	7,562	7,546	8,017
VE	34,114	36,127	157,356
SD	22	22,3	50,087
P	10,262	13,748	23,987

Appendix B. Table 8. Output Log from SCM. Treated- Czech Republic, CP- Limited (Step 2)

Slovakia

Step 1

	Treated	*Synthetic*	*Sample Mean*
GDP	64,48	64,51	547,85
GRIP	3,84	1,34	1,83
I	7,74	7,75	13,70
UR	16,63	13,67	8,75
VE	13,04	8,36	147,86
SD	38,60	14,43	40,86
P	5,40	5,07	23,15

Appendix B. Table9. Output Log from SCM. Treated - Slovak Republic, CP- All EU States (Step 1)

Step 2

	Treated	*Synthetic*	*Sample Mean*
GDP	64,48	64,67	578,59
GRIP	3,84	3,85	1,95
I	7,74	37,81	12,99
UR	16,63	6,86	8,02
VE	13,04	13,38	157,36
SD	38,60	16,73	50,09
P	5,40	5,38	23,99

Appendix B. Table 10. Output Log from SCM. Treated Slovak Republic, CP- Limited (Step 2)

Poland

Step 1

	Treated	*Synthetic*	*Sample Mean*
GDP	402,14	402,12	383,67
GRIP	3,31	3,04	2,08
I	6,98	7,05	9,94
UR	16,08	15,40	8,64
VE	30,57	61,68	102,86
SD	41,35	44,05	42,96
P	38,64	19,11	16,58

Appendix B. Table 11. Output Log from SCM. Treated Poland, CP- All EU States (Step 1)

Step 2

	Treated	*Synthetic*	*Sample Mean*
GDP	402,14	402,36	578,59
GRIP	3,31	2,22	1,95
I	6,98	7,13	12,99
UR	16,08	11,03	8,02
VE	30,57	76,51	157,36
SD	41,35	41,44	50,09
P	38,64	18,52	23,99

Appendix B. Table 12. Output Log from SCM. Treated Poland, CP- Limited (Step 2)

Slovenia

Step 1

	Treated	*Synthetic*	*Sample Mean*
GDP	35,90	36,08	397,24
GRIP	2,27	2,27	2,12
I	7,05	7,05	9,94
UR	6,74	6,74	8,99
VE	9,60	9,03	103,64
SD	25,18	25,18	43,56
P	2,00	2,00	17,93

Appendix B. Table 13. Output Log from SCM. Treated Slovenia, CP- All EU States (Step 1)

Step 2

	Treated	*Synthetic*	*Sample Mean*
GDP	35,90	35,95	578,59
GRIP	2,27	4,96	1,95
I	7,05	10,44	12,99
UR	6,74	3,96	8,02
VE	9,60	10,16	157,36
SD	25,18	9,10	50,09
P	2,00	1,40	23,99

Appendix B. Table 14. Output Log from SCM. Treated Slovenia, CP- Limited (Step 2)

Romania

Step 1

	Treated	*Synthetic*	*Sample Mean*
GDP	170,43	170,69	425,22
GRIP	3,63	4,02	2,67
I	37,27	37,27	6,90
UR	8,06	12,88	8,51
VE	16,58	19,66	117,17
SD	5,82	23,89	45,05
P	22,06	15,47	17,25

Appendix B. Table 15. Output Log from SCM. Treated Romania, CP- All EU States (Step 1)

Step 2

	Treated	*Synthetic*	*Sample Mean*
GDP	170,43	171,44	472,39
GRIP	3,63	3,60	2,53
I	37,27	5,24	3,11
UR	8,06	11,73	7,97
VE	16,58	20,56	131,15
SD	5,82	18,58	48,40
P	22,06	14,67	18,80

Appendix B. Table 16. Output Log from SCM. Treated Romania, CP- Limited (Step 2)

Bulgaria

Step 1

	Treated	*Synthetic*	*Sample Mean*
GDP	62,13	62,21	429,24
GRIP	4,51	4,50	2,64
I	103,22	8,38	4,46
UR	13,85	12,00	8,29
VE	6,49	8,64	117,54
SD	25,49	20,74	44,32
P	7,89	5,46	17,78

Appendix B. Table 17. Output Log from SCM. Treated Bulgaria, CP- All EU States (Step 1)

Step 2

	Treated	*Synthetic*	*Sample Mean*
GDP	62,13	62,12	460,31
GRIP	4,51	4,46	2,57
I	103,22	3,01	4,47
UR	13,85	10,93	7,97
VE	6,49	10,42	126,57
SD	25,49	25,45	46,70
P	7,89	4,16	18,93

Appendix B. Table 18. Output Log from SCM. Treated Bulgaria, CP- Limited (Step 2)

Croatia

Step 1

	Treated	*Synthetic*	*Sample Mean*
GDP	65,45	65,25	480,77
GRIP	0,00	1,69	1,59
I	3,37	4,41	6,22
UR	13,53	11,86	8,74
VE	8,69	11,63	148,21
SD	28,35	28,84	50,55
P	4,45	3,65	18,11

Appendix B. Table 19. Output Log from SCM. Treated Croatia, CP- All EU States (Step 1)

Step 2

	Treated	*Synthetic*	*Sample Mean*
GDP	65,45	65,25	480,77
GRIP	0,00	1,69	1,59
I	3,37	4,41	6,22
UR	13,53	11,86	8,74
VE	8,69	11,63	148,21
SD	28,35	28,84	50,55
P	4,45	3,65	18,11

Appendix B. Table 20. Output Log from SCM. Treated Croatia, CP- Limited (Step 1)

Appendix C: OLS

OLS Data set for implementation Step 1.

	GDP, bln USD	*GRIP*	*I, bln USD*	*UR*	*VE, bln USD*	*SD*	*P, mln*
Latvia	24,42	3,245	7,186	10,279	6,106	9,924	1,904
Lithuania	38,64	4,405	4,952	10,605	7,338	14,728	2,826
Poland	402,12	3,044	7,054	15,399	61,683	44,054	19,114
Slovak Republic	64,51	1,344	7,745	13,671	8,363	14,433	5,065
Slovenia	36,08	2,271	7,05	6,738	9,027	25,182	1,995
Czech Republic	159,61	2,16	15,91	7,57	42,49	22,04	10,90
Estonia	15,18	2,163	3,481	10,986	2,376	27,883	1,692
Bulgaria	62,21	4,501	8,38	12,001	8,642	20,737	5,458
Romania	170,69	4,02	37,271	12,881	19,661	23,89	15,465
Croatia	65,25	1,69	4,41	11,856	11,626	28,839	3,645

Appendix C. Table 1. OLS Data set. Step 1 (Coefficients received from SCM for CEEc)

Results

Year	*GDP*	*GRIP*	*I*	*UR*	*VE*	*SD*	*P*	*GDP**
1997	149,10	0,00	15,90	9,80	0,00	29,90	50,40	149,10
1998	147,90	-1,00	10,50	11,30	0,00	48,10	50,00	147,90
1999	149,70	4,30	22,70	11,90	11,60	61,00	49,50	149,70
2000	161,90	12,90	28,20	11,50	14,60	45,30	49,20	161,90
2001	180,60	14,20	11,90	10,80	17,30	36,50	48,80	180,60
2002	193,10	6,00	0,70	9,60	18,10	33,50	48,40	193,10
2003	216,10	15,80	5,20	9,10	23,60	29,40	48,10	216,10
2004	248,80	16,50	9,00	8,60	32,90	24,70	47,70	248,80
2005	263,00	3,20	13,50	7,20	38,20	17,70	47,40	263,00
2006	292,00	6,30	9,10	6,80	38,90	14,80	46,70	292,00
2007	323,00	6,00	12,80	6,40	49,80	12,30	46,30	323,00
2008	336,60	-5,00	25,20	6,40	67,70	20,50	46,00	336,60
2009	291,00	-23,80	15,90	8,80	40,40	35,40	45,70	291,00
2010	306,60	8,00	9,40	8,10	52,20	42,30	45,40	306,60
2011	327,40	6,50	8,00	7,90	69,40	35,90	45,10	327,40
2012	335,40	7,60	0,60	7,50	70,20	36,60	44,90	896,94
2013	337,40	-5,00	-0,30	7,20	59,10	40,30	44,60	875,48
2014	373,10	-9,00	12,10	9,30	53,90	70,30	44,30	837,92
2015	334,20	-15,00	48,70	10,50	35,50	79,40	44,40	689,66
2016	349,80	2,00	13,50	10,00	34,00	78,20	44,20	832,96

Appendix C. Table 2. Results from OLS, Estimated potential GDP*

Gretl Results:

```
Model 1: OLS, using observations 1-10
Dependent variable: GDP
Heteroskedasticity-robust standard errors, variant HC1

             coefficient   std. error   t-ratio    p-value
  ---------------------------------------------------------
  const      -18,8045      142,300      -0,1321    0,9032
  GRIP         1,05763       6,62927     0,1595    0,8834
  I           -3,72554       4,29864    -0,8667    0,4499
  UR           0,173381     11,2839      0,01537   0,9887
  VE           0,777511      3,86634     0,2011    0,8535
  SD           0,735814      0,662036    1,111     0,3474
  P           18,4216       16,8296      1,095     0,3537

Mean dependent var   103,8692   S.D. dependent var   117,5351
Sum squared resid    1308,835   S.E. of regression   20,88728
R-squared            0,989473   Adjusted R-squared   0,968419
F(6, 3)              63,43172   P-value(F)           0,002998
Log-likelihood      -38,56092   Akaike criterion     91,12185
Schwarz criterion    93,23994   Hannan-Quinn         88,79830

Excluding the constant, p-value was highest for variable 4 (UR)
```

Step 2. Control Pool changed.

OLS Data set:

	GDP, bln USD	*GRIP*	*I, bln USD*	*UR*	*VE, bln USD*	*SD, bln USD*	*P, mln*
Latvia	24,375	3,46	3,937	9,604	5,256	8,144	1,829
Lithuania	39,829	5,052	35,183	6,849	9,36	12,913	2,921
Poland	402,355	2,215	7,13	11,031	76,513	41,444	18,52
Slovak Republic	64,666	3,845	37,808	6,856	13,379	16,729	5,377
Slovenia	35,949	4,958	10,435	3,958	10,158	9,101	1,396
Czech Republic	159,637	2,162	22,809	7,546	36,127	22,3	13,748
Estonia	24,364	5,212	2,139	3,075	8,114	6,525	0,000425
Bulgaria	62,121	4,458	3,01	10,932	10,42	25,446	4,156
Romania	171,435	3,596	5,236	11,726	20,559	18,584	14,669
Croatia	69,527	1,328	3,448	11,107	10,96	40,943	3,44

Appendix C. Table 3. OLS Data set. Step 2- Limited CP (Coefficients received from SCM for CEEc)

Results:

Year	*GDP*	*GRIP*	*I*	*UR*	*VE*	*SD*	*P*	*GDP**
1997	149,10	0,00	15,90	9,80	0,00	29,90	50,40	149,10
1998	147,90	-1,00	10,50	11,30	0,00	48,10	50,00	147,90
1999	149,70	4,30	22,70	11,90	11,60	61,00	49,50	149,70
2000	161,90	12,90	28,20	11,50	14,60	45,30	49,20	161,90
2001	180,60	14,20	11,90	10,80	17,30	36,50	48,80	180,60
2002	193,10	6,00	0,70	9,60	18,10	33,50	48,40	193,10
2003	216,10	15,80	5,20	9,10	23,60	29,40	48,10	216,10
2004	248,80	16,50	9,00	8,60	32,90	24,70	47,70	248,80
2005	263,00	3,20	13,50	7,20	38,20	17,70	47,40	263,00
2006	292,00	6,30	9,10	6,80	38,90	14,80	46,70	292,00
2007	323,00	6,00	12,80	6,40	49,80	12,30	46,30	323,00
2008	336,60	-5,00	25,20	6,40	67,70	20,50	46,00	336,60
2009	291,00	-23,80	15,90	8,80	40,40	35,40	45,70	291,00
2010	306,60	8,00	9,40	8,10	52,20	42,30	45,40	306,60
2011	327,40	6,50	8,00	7,90	69,40	35,90	45,10	327,40
2012	335,40	7,60	0,60	7,50	70,20	36,60	44,90	805,58
2013	337,40	-5,00	-0,30	7,20	59,10	40,30	44,60	775,48
2014	373,10	-9,00	12,10	9,30	53,90	70,30	44,30	784,38
2015	334,20	-15,00	48,70	10,50	35,50	79,40	44,40	755,18
2016	349,80	2,00	13,50	10,00	34,00	78,20	44,20	801,21

Appendix C. Table 4. Results from OLS, Estimated potential GDP*

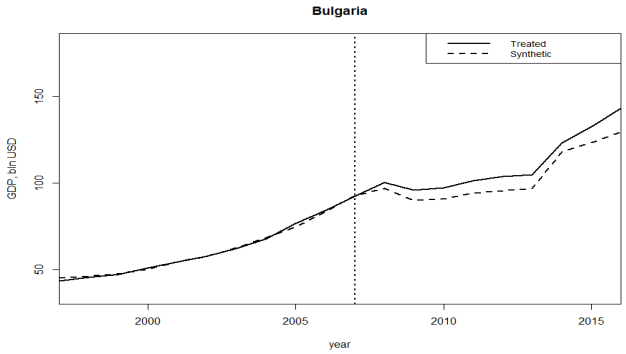
Gretl output log:

```
Model 1: OLS, using observations 1-10
Dependent variable: GDP

             coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------
  const      -76,5190      53,0601      -1,442    0,2449
  GRIP         9,76029      8,58636      1,137    0,3382
  I           -0,505226     0,542590    -0,9311   0,4205
  UR           3,59995      4,17045      0,8632   0,4515
  VE           3,95282      0,848563     4,658    0,0187  **
  SD           0,696646     1,21939      0,5713   0,6078
  P            4,52885      2,80525      1,614    0,2048

Mean dependent var   105,4258   S.D. dependent var   116,6946
Sum squared resid    1219,281   S.E. of regression   20,16003
R-squared            0,990051   Adjusted R-squared   0,970154
F(6, 3)              49,75857   P-value(F)           0,004290
Log-likelihood      -38,20654   Akaike criterion     90,41308
Schwarz criterion    92,53118   Hannan-Quinn         88,08954

Excluding the constant, p-value was highest for variable 6 (SD)
```

Appendix D: Graphs (CEEC)

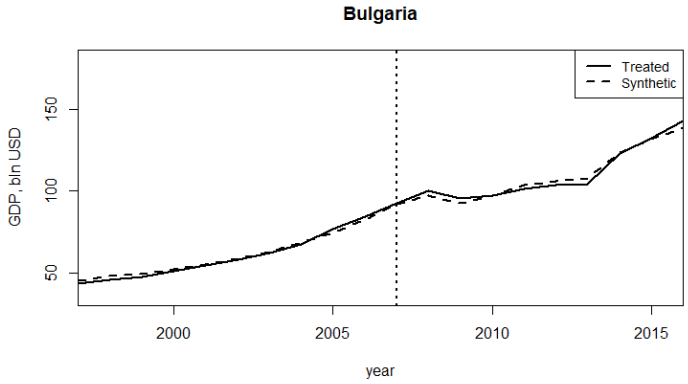
In this Appendix you can find all Figures related to analysis done by SCM in R-Studio for each country from CEE region. Both Analysis are presented here. Step 1- Control Pool – All EU Member states; Step 2 – Limited CP: excluded countries with the same accession year and later.

Bulgaria (Step 1)



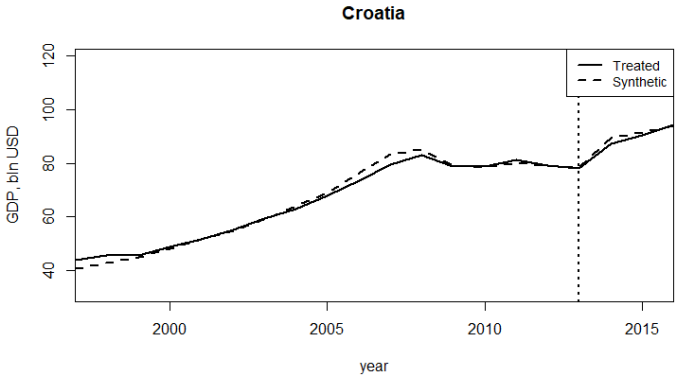
Appendix D. Figure 1. GDP Path (Step 1)
Treated Unit- Bulgaria; CP – All EU Countries

Bulgaria (Step 2)



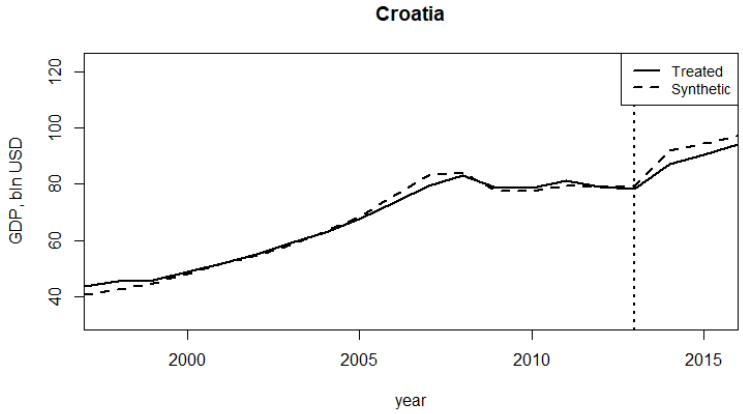
Appendix D. Figure 2. GDP Path (Step 2)
Treated Unit- Bulgaria; CP – Limited

Croatia (Step 1)



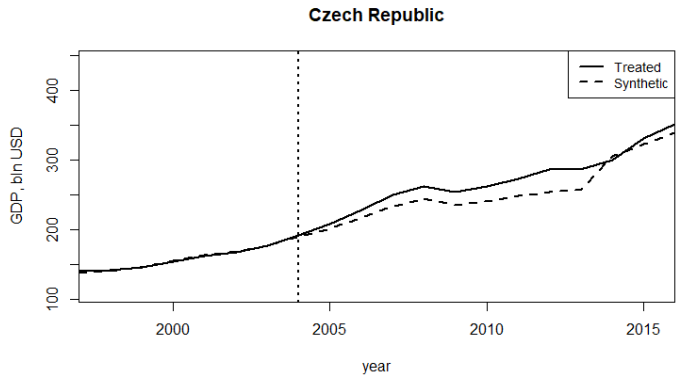
Appendix D. Figure 3. GDP Path (Step 1)
Treated Unit- Croatia; CP – All EU Countries

Croatia (Step 2)



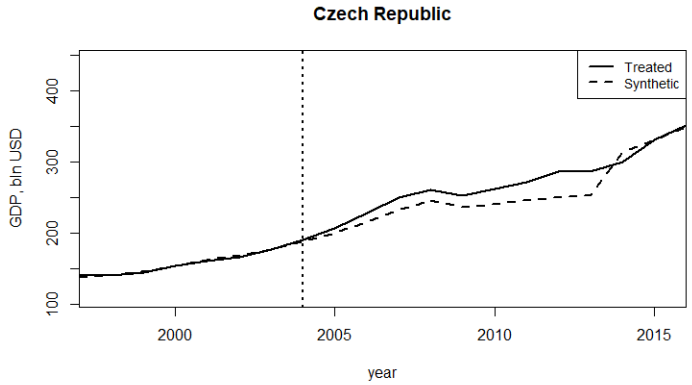
Appendix D. Figure 4. GDP Path (Step 2)
Treated Unit- Croatia; CP – Limited

Czech Republic (Step 1)



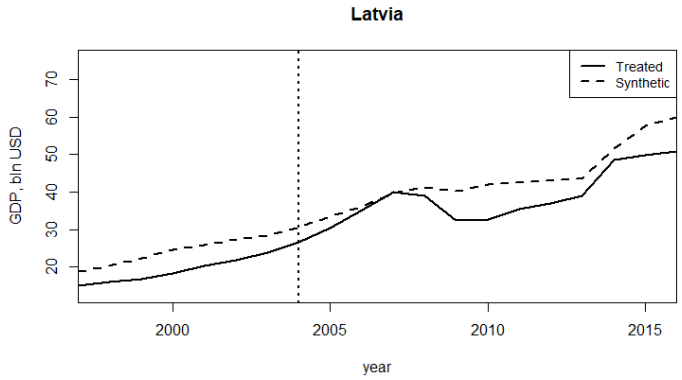
Appendix D. Figure 5. GDP Path (Step 1)
Treated Unit- Czech Republic; CP – All EU Countries

Czech Republic (Step 2)



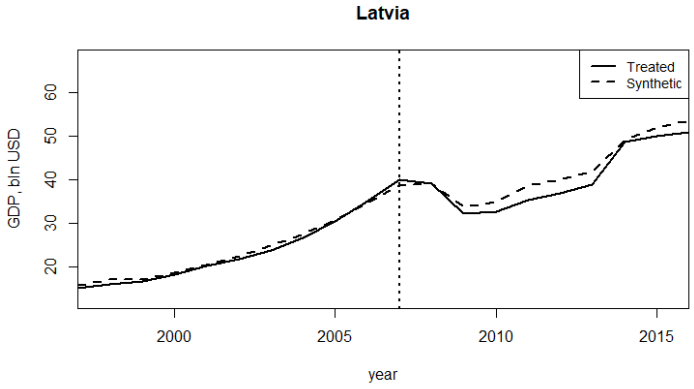
Appendix D. Figure 6. GDP Path (Step 2)
Treated Unit- Czech Republic; CP – Limited

Latvia (Step 1)



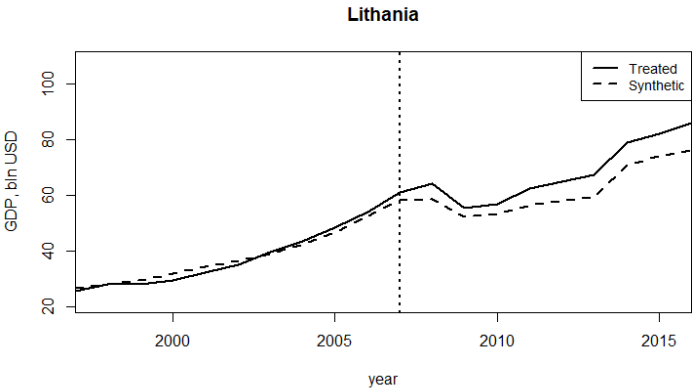
Appendix D. Figure 6. GDP Path (Step 2)
Treated Unit- Latvia; CP – Limited

Latvia (Step 2)



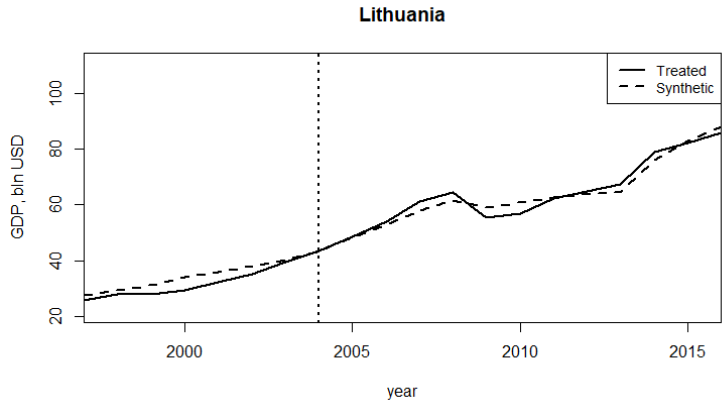
Appendix D. Figure 8. GDP Path (Step 2)
Treated Unit- Latvia; CP – Limited

Lithuania (Step 1)



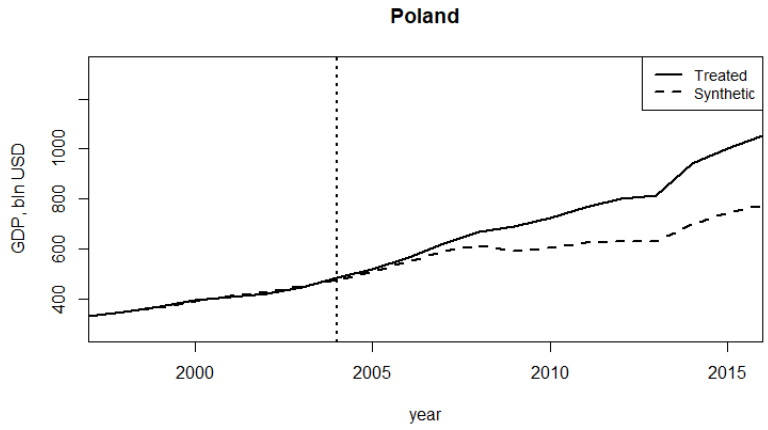
Appendix D. Figure 9. GDP Path (Step 1)
Treated Unit- Lithuania CP – All EU Countries

Lithuania (Step 2)



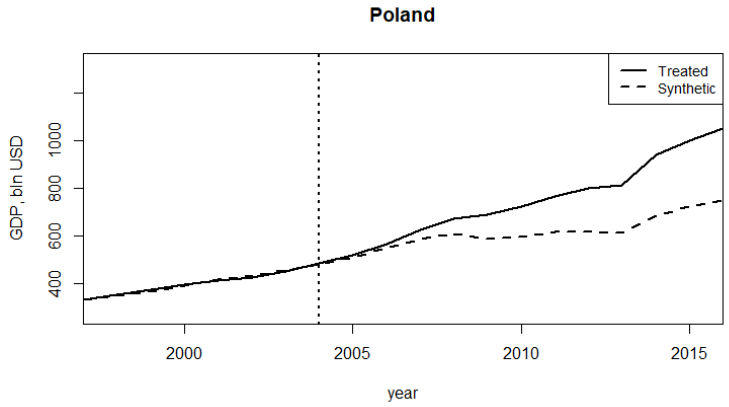
Appendix D. Figure 10. GDP Path (Step 2)
Treated Unit- Lithuania; CP – Limited

Poland (Step 1)



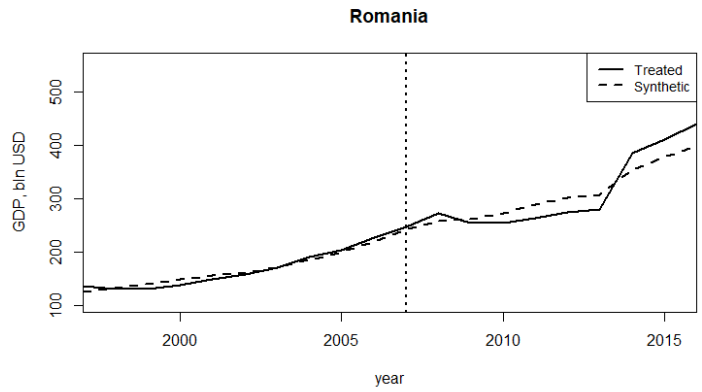
Appendix D. Figure 11. GDP Path (Step 1)
Treated Unit- Poland; CP – All EU Countries

Poland (Step 2)



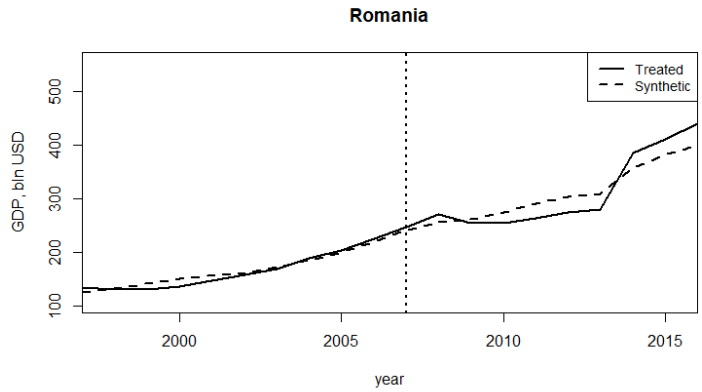
Appendix D. Figure 12. GDP Path (Step 2)
Treated Unit- Poland; CP – Limited

Romania (Step 1)



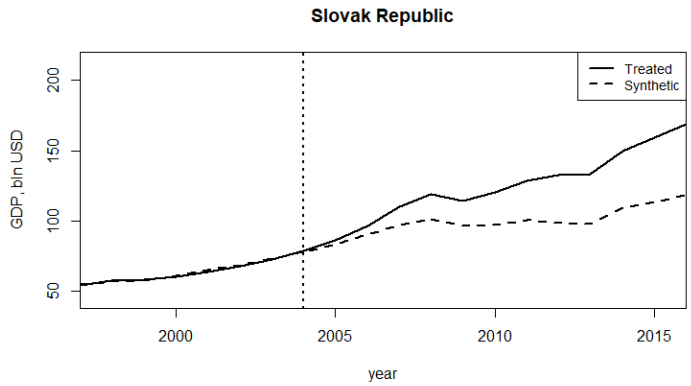
Appendix D. Figure 13. GDP Path (Step 1)
Treated Unit- Romania; CP – All EU Countries

Romania (Step 2)



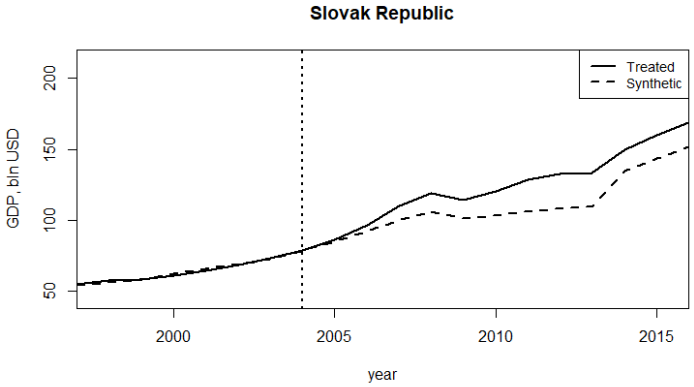
Appendix D. Figure 14. GDP Path (Step 2)
Treated Unit- Romania; CP – Limited

Slovak Republic (Step 1)



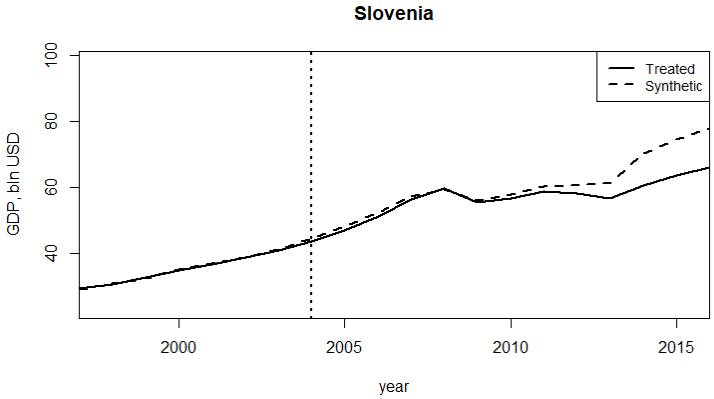
Appendix D. Figure 15. GDP Path (Step 1)
Treated Unit- Slovak Republic; CP – All EU Countries

Slovak Republic (Step 2)



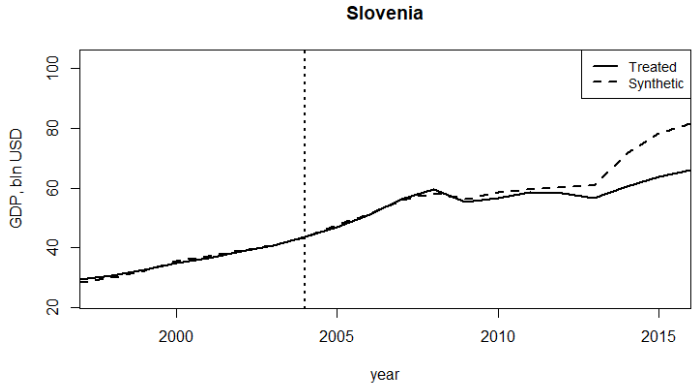
Appendix D. Figure 16. GDP Path (Step 2)
Treated Unit- Slovak Republic; CP – Limited

Slovenia (Step 1)



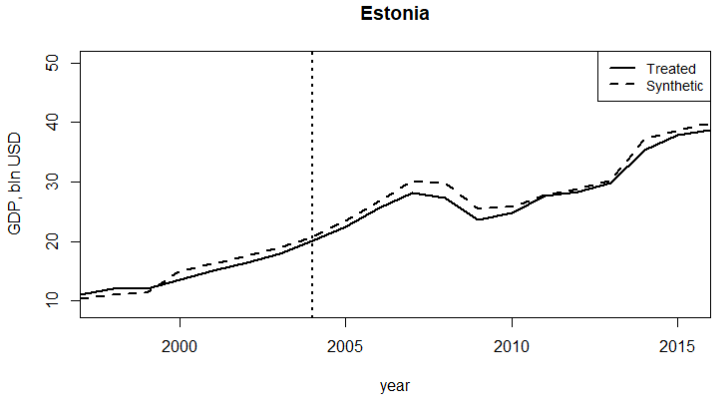
Appendix D. Figure 17. GDP Path (Step 1)
Treated Unit- Slovenia; CP – All EU Countries

Slovenia (Step 2)



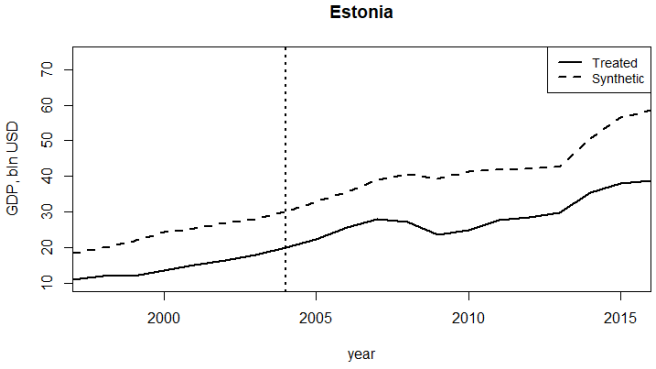
Appendix D. Figure 18. GDP Path (Step 2)
Treated Unit- Slovenia; CP – Limited

Estonia (Step 1)



Appendix D. Figure 1. GDP Path (Step 1)
Treated Unit- Estonia; CP – ALL EU Countries

Estonia (Step 2)



Appendix D. Figure 1. GDP Path (Step 2)
Treated Unit- Estonia; CP – Limited