Proceedings of the 11th International Conference
European Entrepreneurship Forum 2017
Eurozone: Evolution or Revolution?

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PROLOGUE

In October 2017, NEWTON College organized the 11th International Conference from the cycle European Entrepreneurship Forum with over 80 participants. The topic of this conference was "Eurozone: Evolution or Revolution?".

The conference was held under the auspices of the Vice Governor of the Czech National Bank Mr Vladimír Tomšík. The conference was attended not only by academics but also practitioners, policy makers and students. Among the keynote speakers were Mr. Vladimír Tomšík, Ms. Eva Zamrazilová (Chief Economist of Czech Banking Association) and Stefan Rychtarik (National Bank of Slovakia).

The eleventh year of the European Entrepreneurship Forum laid conditions for active participation of domestic and foreign attendees.

Conference details are available on conference web site www.efp.cz.

Ľudomír Šlahor

NEWTON College

Prague, Czech Republic

EVALUATION OF EFFECTIVITY OF INVESTMENT PROJECTS

Alena Bašová

Abstract

A business entity that decides for the implementation of the investment project aims to achieve the highest positive outcome and at the same time minimizing all risks associated with the implementation of the intended investment project. Evaluation of investment projects is an important tool for decision-making on the acceptance or rejection of a given project. Investment decisions take into account risk, uncertainty, new opportunities, that brings innovation, marketing, financial corporate strategy.The objective of this contribution is the evaluation of the efficiency of a specific investment project to modify the foundry sands. The company, which conducted this project does not want to be named, therefore we identify it as the company "SAND".

Keywords: investment project, economic efficiency, net present value, payback time

JEL Classification: G11

Introduction

The investments represent part of the assets used in the manufacturing process of the goods of a consumer or of a capital nature [1]. Jack Clark Francis considers the investment for the use of means, which is associated with the risk of the uncertain return in the future [2]. The success of the planned investment is not guaranteed and requires clearly defined objectives, thus obtaining the final value of the investment. Kohout states that the basic objective of investment may not just be achieving maximum yield [3] and is true that not everyone considered to be a financial objective to maximize yield. The investment project can be characterised as the investment of resources and the satisfaction of our needs during a given time period [4]. The effectiveness of investment projects is greatly influenced by the discount rate that reflects the risk even inflation, can be defined as the opportunity cost of funds invested in the project [5].

From a macroeconomic perspective, we know investment be defined as the part of savings, which is designed for use in the production of capital goods, on the acquisition of human capital, is necessary to the development of new technologies. It represents the difference between gross domestic product (GDP) and the sum of net exports (Z), consumption (S) and public expenditures (V): I=GDP- (S + V + Z) [6].

1. CHARACTERISTIC OF A SELECTED INVESTMENT PROJECT

In the following part of the contribution we evaluate the investment project of a company that does not want to be named, so called " SAND ". The aim of the project was the construction of the production equipment, which is used to adjust foundry sands, and by glow process changes the structure and properties of the foundry sand to such an extent, that repeated use is almost impossible [7]. Modified foundry sand is intended for sale to the Slovak market and the neighboring country of Slovakia. The company, which implements the project, considered before actual implementation of the project with the sale price of € 40 per tonne of processed foundry sand, but during the implementation of the project, however, there have been unexpected situations, and the influence of the entry of new firms to this market had to analyze

a company " SAND " to reduce the sales price of the foundry sand from the planned € 40 to € 20 per tonne of treated sand. Company " SAND " has set before the beginning of the implementation of the project 20 annual expected number of years of operation. In the calculations we will consider the target the highest by the throughput of sand to the level of 50 t/hour, i.e. the anticipated annual amount of the adjusted foundry sand is set at a level 297 600 tonnes/year. In the calculations also estimated number of realizing the project considered the intended selling price €40 for a tonne of modified foundry sand. During the realization of the project there occured unexpected situation. Due to entry of new companies on the market the company SAND has been forced to decrease the selling price of the foundry sand from intended €40 to €20 for a tonne of modified sand. The company SAND defined an expected terminal of 20 production years well before beginning of the realization of the project. In our calculations we shall consider the aim of highest rate of the sand mass flow as 50 tonnes/hour. So the expected year amount of the processed foundry sand is determined at a level of 297 600 tonnes/year. In our calculation we are not considering inflation in the outcome of the project. From these reasons we shall calculate the effectivity of the investment project for two versions of the project. The first version is denoted as the project P1, where we suppose the real selling price of the modified foundry sand €20/t.

The second version of the project called P2 supposes the originally planned selling price €40 /t. Total amount of the investment costs for realization of the both projects reached €20 886 937,39. Foreign resources were repayable bank credit in amount €4 400 000,00, and a subsidy from the European Union in the sum € 5 000 000,00, which takes the form of an irreversible financial source for both projects. The company received the subsidy for environmental technology.

1.1 Evaluation of the effectivity of the project P1:

The P1 project is in revenue only from 2017, which we set as the first year of project life. In calculating sales revenue, we assumed that the total annual adjusted amount of foundry sand of 297,600 tonnes in the same year was sold by the company at a fixed price of € 20/ t of modified sand. Our company is a legal person, so we will use the statutory rate when calculating the income tax. In calculating sales revenue, we assumed that the total annual adjusted amount of foundry sand of 297,600 tones in the same year was sold by the company at a fixed price of € 20 / t of modified sand. The amendment to the Income Tax Act reduces the corporate income tax rate from the previous 22% to 21% for the tax period beginning on 1.1.2011 [8]. Since the operation of both P1 and P2 projects starts in January 2017, we will use the 21% tax rate for each year's tax calculations. In the following years we will assume that this income tax rate will remain unchanged.

1.2 Calculation of cash flow of project P1

When calculating the financial flows, we use the straight-line method of calculating the cash flow, which is based on items expressing income and expense, ie, expressing net write-downs and cash inflows. According to this method, the movement of money does not affect depreciation and profit, as it is not possible to determine real gains and decreases in earnings. Terms such as revenue and expense are often confused about the revenue and costs we receive by profit. Changing these terms is not correct, especially from the evidence of time and content [9].

Table 1- Calculation of cash flow of the investment project P1

Financial flows		implementation	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Discont factor			1,00	0,93	0,86	0,79	0,74	0,68	0,63	0,58	0,54	0,50	0,46
CF	€	-20886937,39	-12075737,39	1755661,06	1297399,76	1364556,35	1391656,67	1418456,43	1444943,80	1471106,45	2058884,93	2049599,26	2111048,96
DCF	€		-12075737,39	1625612,09	1112311,18	1083228,82	1022909,20	965377,61	910559,69	858376,48	1112351,46	1025309,91	977824,13
Cumulated. DCF	€		-12075737,39	-10450125,30	-9337814,12	-8254585,29	-7231676,10	-6266298,48	-5355738,79	-4497362,31	-3385010,84	-2359700,93	-1381876,80

Financial flows		implementation	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Discont factor			0,43	0,40	0,37	0,34	0,32	0,29	0,27	0,25	0,23	0,21
CF	€	-20886937,39	2029919,64	2019496,35	2160715,34	2149456,91	2137756,04	2125595,26	2112956,44	2099820,70	2086168,42	9127544,41
DCF	€		870597,74	801969,79	794490,55	731806,34	673909,86	620440,99	571066,52	525478,09	483390,39	1958298,29
Cumulated.. DCF	€		-511279,06	290690,72	1085181,27	1816987,61	2490897,47	3111338,46	3682404,98	4207883,07	4691273,46	6649571,75

Source: Own processing

Credit financing has led to a cash flow being determined in the 0-year (2016) as the sum of the total investment expenditure, the amount of credit received in the year, the expenditure paid, and in our case also the expenditure on the P1 project (the project has not yet achieved the revenue from sand sales) marketing (-20 886 937,39+9 400 000-488 800-100 000 = -12 075 737,39). In subsequent years of the project life (1st to 20th year), we determine the amount of cash flow by deducting expenses and income tax from income. In 2036, the cash flow is higher due to the addition of a residual value of the investment project of € 7055565,19, which is why the cash flow value of this year amounts to € 9,127,544.41. In subsequent years of the project life (1st to 20th year), we determine the amount of cash flow by deducting expenses and income tax from income. In 2036, the cash flow is higher due to the addition of a residual value of the investment project of € 7055565,19, which is why the cash flow value of this year amounts to € 9,127,544.41. In calculating the discount factor, it is most important to choose the correct discount rate because this rate takes into account many factors that by their nature affect the investment project [10]. These factors include inflation, risk and time value of money, ie the amount of alternative costs of the invested funds into the project [1]. The discount rate used in our P1 and P2 calculations was set at 8%. As stated in Valach‘s publication, the net present value belongs to dynamic methods and we express it as the “difference between the discounted cash proceeds from the investment project and the capital expenditures“ [11]. The accumulated discounted cash flow is expressed through the sum of all discounted cash flows from the 0th year (2016) after the last 20th year (2036) of the life of the project. The value of the cumulative discont cash flow we obtain, if to the amount from the line of the "DCF" in the year add amount from same row but from the first year of the life of the project. Consequently, the amount we recorded in the line "Cumulation DCF" in the column of the first year of the life of the project, add the amount from the second year of the life of the project and the line "DCF". This amount(s) in the line "Cumulation DCF" of the second year of the life of the project and in this way, we are progressing to 20. year. The last value of the cumulative discont cash flow in the last 20. year life of the project at the same time expresses the net present value of project P1. Since in this calculation is the investment expenditure expressed separately, as in the 0th year, it was necessary to value the cash flow just by the amount of investment expenditure to modify and thus has a value € 8 811 200 (-1207573,39-(-20886937,39)).

The calculation of NPV using the respective formula gets the net present value of project P1 〖NPV〗_1= € 6 649 571,75, as shown in table 1, in the year 2036.

$$NPV_1 = -20886937{,}39 + \frac{8811200}{(1+0{,}08)^0} + \frac{1755661{,}06}{(1+0{,}08)^1} + \frac{1297399{,}76}{(1+0{,}08)^2} + \frac{1364556{,}35}{(1+0{,}08)^3} + \frac{1391656{,}67}{(1+0{,}08)^4} + \frac{1418456{,}43}{(1+0{,}08)^5} + \frac{1444943{,}80}{(1+0{,}08)^6} + \frac{1471106{,}45}{(1+0{,}08)^7} + \frac{2058884{,}93}{(1+0{,}08)^8} + \frac{2049599{,}26}{(1+0{,}08)^9} + \frac{2111048{,}96}{(1+0{,}08)^{10}} + \frac{2029919{,}64}{(1+0{,}08)^{11}} + \frac{2019496{,}35}{(1+0{,}08)^{12}} + \frac{2160715{,}34}{(1+0{,}08)^{13}} + \frac{2149456{,}91}{(1+0{,}08)^{14}} + \frac{2137756{,}04}{(1+0{,}08)^{15}} + \frac{2125595{,}26}{(1+0{,}08)^{16}} + \frac{2112956{,}44}{(1+0{,}08)^{17}} + \frac{2099820{,}70}{(1+0{,}08)^{18}} + \frac{2086168{,}42}{(1+0{,}08)^{19}} + \frac{9127544{,}41}{(1+0{,}08)^{20}}$$

$$NPV_1 = 27\,536\,509{,}14 - 20\,886\,937{,}39 = 6\,649\,571{,}75 \qquad (1)$$

Implementation of the project P1 has reached the positive value of NPV, which means that with a rise in the value of the business and therefore the project is profitable to implement [12]. For the enterprise is therefore the most advantageous solution to implement only such projects which have positive present value and the higher this value, this is a project for the enterprise more favorable [13]. The advantages of this project is also confirmed by the calculation using

the index of profitability, which determines the size of the present value of the future net cash income, the value of the investment. The main difference between the NPV and the index of profitability is that the index of profitability is relative and can be understood as a relative version of the NPV [14]. Using the calculation of the claim we will look at:

$$IZ = \frac{\sum_{n=1}^{N} P_n * \frac{1}{(1+i)^n}}{K} \quad (2)$$

$$IZ_1 = \frac{27\ 536\ 509{,}14}{20\ 886\ 937{,}39} = 1{,}3184 \quad (3)$$

By calculating the index of profitability IZ_1 in the value of 1,3184 we have confirmed that if the value of the NPV is greater than 0, so the index of profitability has a value greater than 1. Payback period expresses the year in which the accumulated discounted cash flow varies from negative value to positive value. This time we can calculate exactly, for years and days, quantified in more detail for the years and days, but in practice it is impossible to fulfil the assumption of the smooth collection of cash flow [15]. In our project, the P1 is the payback period in the 12. year (year 2028), in which the cumulated DCF achieves for the first time positive value.

At the end of the 11. year (year 2027) is missing in the return on investment € 511 279,06, the value of the DCF in 12. the year is € 801 969,79 and thus part of the year, which indicates an additional number of days repayment in 12. the year is:

$$number\ of\ days\ of\ payback = \frac{+511\ 279{,}06}{801\ 969{,}79} * 365\ days\ = 0{,}6375 * 365 = 233\ days \quad (4)$$

The return on the investment project P1, we expect about 12 years and 233 days. Whereas it is calculated payback period is less than the lifetime of the project (20 years), the project is profitable to implement.

1.3 Evaluation of the effectiveness of the project P2

In the following part of the contribution we evaluate the effectiveness of the project P2, in is the originally planned price of €40/t. The period of operation of the project remains unchanged, for 20 years. In the calculations we consider the same variables as in the project P1. In the calculations we also neglect inflation, and for the sake of simplicity we consider with a durable overall annual result is a lot of sand to level 297 600 tonnes/year, which in that year sold at a fixed selling price of €40/t.

1.4 The cash flow calculation of the project P2

For the calculation of the calculation of the financial flows we use again a direct method of calculating cash flow, which is based on the items indicating the income and outcome items, we so clean disposals and acquisitions of cash.

Table 2 - The cash flow calculation of the project P2

Financial flows		implementation	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Discont factor			1,00	0,93	0,86	0,79	0,74	0,68	0,63	0,58	0,54	0,50	0,46
CF	€	-20886937,39	-12075737,39	6457741,06	5999479,76	6066636,35	6093736,67	6120536,43	6147023,80	6173186,45	6760964,93	6751679,26	6813128,96
DCF	€		-12075737,39	5979389,87	5143586,90	4815891,53	4479078,37	4165534,25	3873667,69	3601995,00	3652738,98	3377520,58	3155796,97
Cumulated.. DCF	€		-12075737,39	-6096347,52	-952760,62	3863130,91	8342209,28	12507743,53	16381411,22	19983406,22	23636145,20	27013665,78	30169462,74

Financial flows		implementation	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Discont factor			0,43	0,40	0,37	0,34	0,32	0,29	0,27	0,25	0,23	0,21
CF	€	-20886937,39	6731999,64	6721576,35	6862795,34	6851536,91	6839836,04	6827675,26	6815036,44	6801900,70	6788248,42	13829624,41
DCF	€		2887239,25	2669230,45	2523435,60	2332681,39	2156201,57	1992933,32	1841892,75	1702169,05	1572919,05	2967121,13
Cumulated.DCF	€		33056702,00	35725932,44	38249368,05	40582049,44	42738251,01	44731184,34	46573077,09	48275246,14	49848165,19	52815286,31

Source: own processing

Credit financing caused, that in the year 2016, which represents a 0year (2016) of the project P2 (in this year the project is nedosahoval revenue from the sale of sand) cash flow determined

as the sum of capital expenditures, the amount of the loan received in the given year, paid expenses, and in our case, also the expenditure on marketing (-20 886 937,39 9 400 000-488 800-100 000 = -12 075 737,39). Since in this calculation is the investment expenditure expressed separately, as in the 0th year, it was necessary to value the cash flow just by the amount of investment expenditure to modify and thus has a value € 8 811 200 (-1207573,39-(-20886937,39)). In the following years the life of the project (1. up to 20. year), we will determine the amount of the cash flow from the income we subtract the expenditure and the income tax. In the year 2036 is the value of the cash flow greater due to the addition of the residual value of the investment project in the amount of € 7 055 565,19 , thanks to this is the value of the cash flow in this year amounting to € 13 829 624,41. The calculation using the formula of NPV is as follows:

$$NPV_2 = -20886937{,}39 + \frac{8811200}{(1+0{,}08)^0} + \frac{6457741{,}06}{(1+0{,}08)^1} + \frac{5999479{,}76}{(1+0{,}08)^2} + \frac{6066636{,}35}{(1+0{,}08)^3} + \frac{6093736{,}67}{(1+0{,}08)^4} + \frac{6120536{,}43}{(1+0{,}08)^5} + \frac{6147023{,}80}{(1+0{,}08)^6} + \frac{6173186{,}45}{(1+0{,}08)^7} + \frac{6760964{,}93}{(1+0{,}08)^8} + \frac{6751679{,}26}{(1+0{,}08)^9} + \frac{6813128{,}96}{(1+0{,}08)^{10}} + \frac{6731999{,}64}{(1+0{,}08)^{11}} + \frac{6721576{,}35}{(1+0{,}08)^{12}} + \frac{6862795{,}34}{(1+0{,}08)^{13}} + \frac{6851536{,}91}{(1+0{,}08)^{14}} + \frac{6839836{,}04}{(1+0{,}08)^{15}} + \frac{6827675{,}26}{(1+0{,}08)^{16}} + \frac{6815036{,}44}{(1+0{,}08)^{17}} + \frac{6801900{,}70}{(1+0{,}08)^{18}} + \frac{6788248{,}42}{(1+0{,}08)^{19}} + \frac{13829624{,}41}{(1+0{,}08)^{20}}$$

$$NPV_2 = 73\,702\,223{,}70 - 20\,886\,937{,}39 = 52\,815\,286{,}31\,. \qquad (5)$$

By calculation of NPV using respective formula we get the net present value of project

$$\text{P2 NPV}_2 = 52\,815\,286{,}31. \qquad (6)$$

The positive value of NPV_2 means that the project is advantageously implemented, which we will confirm by calculation of the index of profitability

$$\text{IZ} = \frac{73\,702\,223{,}70}{20\,886\,937{,}39} = 3{,}5286\ . \qquad (7)$$

By calculating the index of profitability IZ_2 in the value of 3,5286 we prove that if the value of NPV is greater than 0, so the index of profitability has a value greater than 1. Investment project "P2" is therefore worthwhile to implement. In determining the discounted payback period of the investment project P2 on the basis of the year in which the cumulative discounted cash flow changes from negative value to positive value. In our case, we are talking about 3. year of operation of the project (year 2019), in which the cumulated DCF achieves for the first time positive value. At the end of the 2nd year (2018) is missing in the return on investment € 952 760,62, the value of the DCF in 3. year of operation is € 4 815 891,53 and thus an additional number of days the payment in 3. year, we will determine as follows

$$Number\ of\ days\ of\ payback = \frac{+952\,760{,}62}{4\,815\,891{,}53} * 365\ days\ = 0{,}1978 * 365 = 72\ days$$

Return on investment in case of project P2, we 72. the days of the 3 year life of the project.

Again, the calculated payback period is less than the lifetime of the project, so the project is considered feasible.

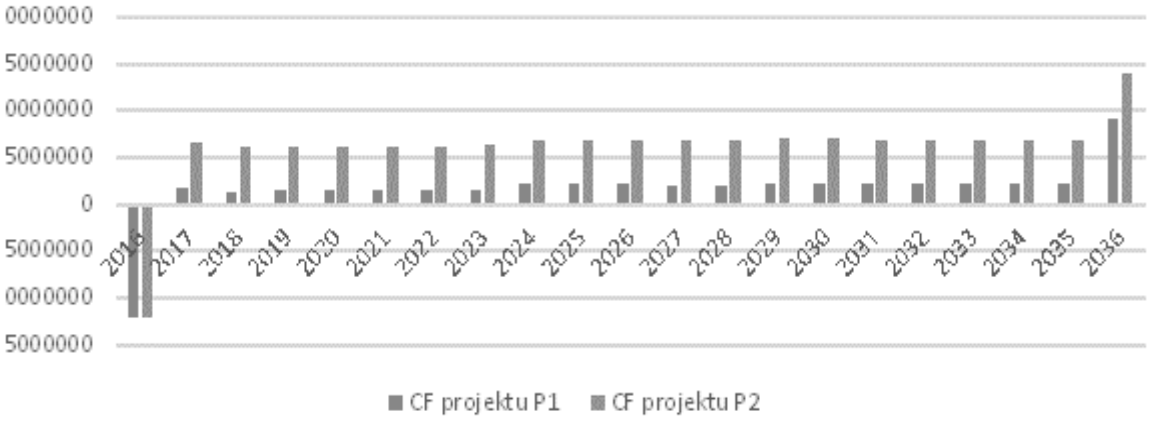
2. COMPARISON OF THE RESULTS OF THE ANALYSED PROJECTS

Realization of the investment project aimed to modify foundry sands was damaged by the entry of new competitors on the market. It caused large differences in the results of the assessment of economic efficiency of the project implemented. The first version of the project was P1, in which we were based on the actual sales price of the modified foundry sand € 20 /t.

A second version of the project we identified the name of the project P2 and the unfolding of the originally planned amount of the selling price € 40 /t.

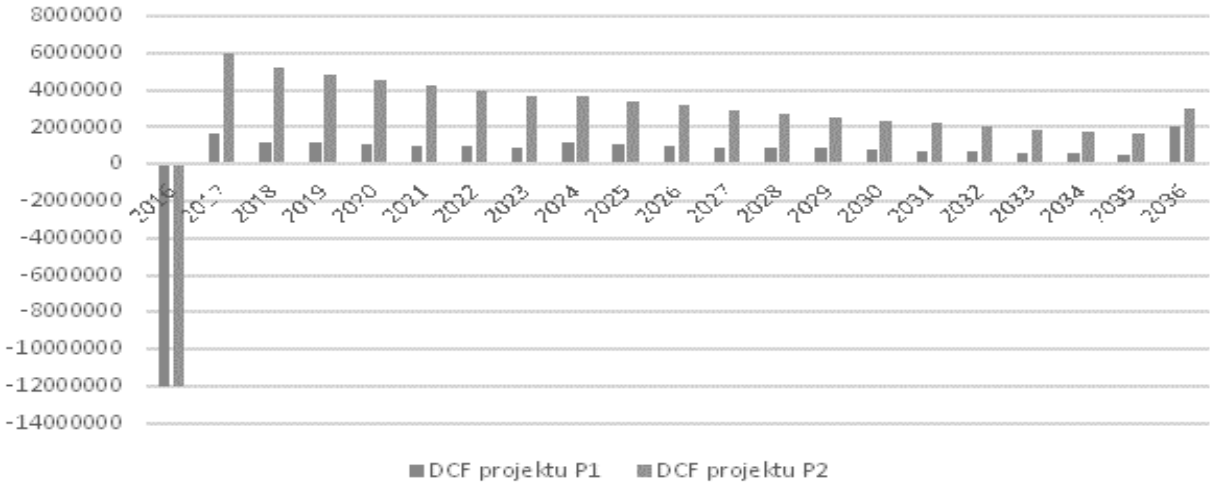
When comparing the values of the NPV is better off the project reaching the higher value of this indicator, in the project P1 (the price of €20) is the NPV in the amount of € 6 649 571,75 for the project P2 (the price of € 40) has a NPV value of € 52 815 286,31, which is almost 8-times higher value. The total difference between the values of the NPV is to 46 of € 165 714,56. A higher value of the index of profitability is the project P2 in the amount of 3,5286, which is 2,2102 more than achieved the index of profitability of the project P1 in the value of 1,3184. In the case of the evaluation of the effectiveness of the project using the discounted payback period, it is preferable to carry out the project with a lower value, discounted payback period, which has again a project P2. The following graphs we compare both the projects and the evolution of their cash flows – cash flow, discounted cash flow and cumulative discounted cash flow during the years of 2016 to 2036.

Chart 1 – Comparison of cash flow of investment projects P1 and P2 in the years 2016-2036



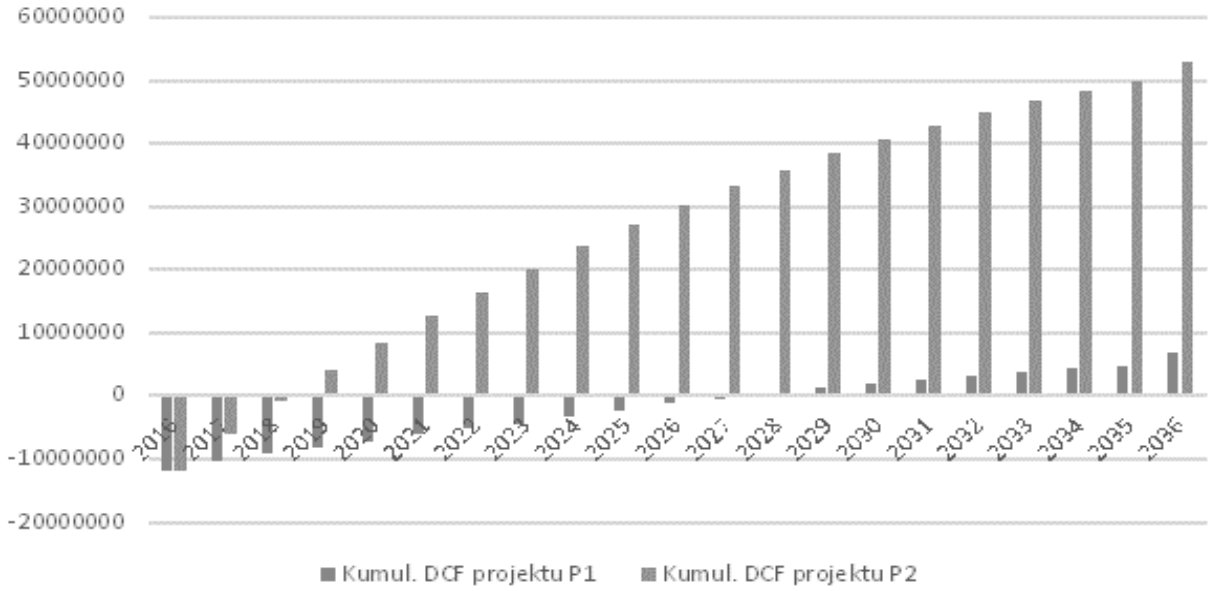
Source: own processing

Chart 2 – Comparison of the discont cash flow of the investment projects P1 a P2 in the years 2016 – 2036



Source: own processing

Chart 3- Comparison of the cumulated discont cash flow of the investment projects P1 a P2 in the years 2016 – 2036



Source: own processing

Conclusion

The objective of this contribution was to recognise and to assess what impact resulted 50% decrease in the selling price of the modified sand on the efficiency of the investment project. Therefore we set the two versions of our investment project, the Project P1 with a fair price of €20 and the project P2 with a projected price of €40. We all know that the competitive environment is in some cases unpredictable and the entry of new competitors in the market has caused important changes in the calculations of the efficiency of the investment project as we pointed out in the calculations presented here. At the same time, we wanted to highlight the

importance of thorough market research before actually implementing the investment project and the importance of obtaining the greatest amount of information in the area in which the planned business entity to carry out its business activities, especially if we know that construction activity is among the most risky area of business.

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ANALYSIS OF POLICY OF EXTREMELY LOW INTEREST RATES AND UNLIMITED MONEY PRINTING ON THE REAL ECONOMY

Roman Brauner

Abstract

The paper analysis contemporary ways of interest rates utilising complemented with practically unrestricted "money printing" within the framework of monetary regulations of central banks, with special attention to cases when extremely low or even negative interest rates are announced. The first part is focused on theoretic definition of the importance and functions of interest rates and on the necessity to keep restricted amount of money in the financial and economic system, in the sense of "standard" economic theory, or in accordance with individual theoretic approaches respectively. Subsequently, we analyse the influence of utilitarian exploiting of extremely low or even negative interest rates, supported by extreme money printing, on the operation of economic subjects, first and foremost on individual kinds of financial institutions. And subsequently, in contrast with theoretical economic principles, impacts of this monetary policy, combined with deficit fiscal policies of governments to operation of real economy are analyzed; before all with focus on the most imporiant national or multinational economic units of the world. In conclusion, based on acquired knowledge future development is predicted, not only from the point of view of future development of the world economy, but from the point of view of the future of human society.

Keywords: Interest Rates, Printing Money, Risk Faciors, Financial Markets, Market Economy

JEL Classification: E43, E44, GOI, G17

Introduction

At present, it is increasingly possible to encounter non-standard tools of monetary regulation. This is due to the financial crisis of 2008 so far has not been resolved and the functioning of both the financial systems of the world's most important countries and the world economy is already beginning to be jeopardized. And because it is no longer possible to solve by standard instruments of fiscal and monetary regulation, central banks are increasingly using non-standard instruments, despite the fact that their effects are not yet empirically validated and therefore may not always yield positive results.

1. PROBLEM FORMULATION

In the contemporary management of national, transnational economies are getting bigger monetary policy. This is because today's crisis factors are not the same as in the "traditional" economic crises that took place in economic cycles. The current problems are mainly reflected in financial systems, so there is a financial crisis. However, since every financial system is an integral part of the economic system that is related to it, its problems must be seriously affected by it related real economy. This means that if you cannot solve the contemporary financial crisis, the collapse of the real economy at all levels can be expected in the future.

2. METHODS

The methodology used is a combination of qualitative and quantitative analysis. The qualitative component of the research is represented by standard knowledge economic theories, which are

then compared with the current management of the most important world economies. In terms of economy, these are used theoretical approaches: "Classical Interest Theory", "Interest Theory of Preference Liquidity", "Theory of Loanable Funds", “Interest Theory of Rational Expectation of Fisher's Quantitative Theory of Money" presented by his "exchange equation". And if it is a quantitative component, empirical analysis is based on data taken from the database Trading Economics, Eurostat and the World Bank.

3. ANALYSIS OF THE PROBLEM

The current problems of the world economy are the result of a number of causes, erroneous or possibly even deliberate destructive activity by people. Therefore, in order to be identified and then resolved, it is necessary to compare the "standard" economic theory with the results of the empirical analysis of the contemporary economy and economy management their subsequent impacts, both on individual types of economic subjects and on economy as a whole.

3.1 Theoretical assessment of the importance of interest rates and the amount of money in circulation

Economic theory considers interest rates as one of the most important factors market functioning of financial markets. This view is confirmed by the fact that above interest rates, respectively. or simply determine the expectation of their changes the fundamental behavior and decision making of all participants traded on financial markets. And as both borrowers and investors can to switch between its individual segments, interest rates are the factor that all the financial market interconnects and helps keep it in balance. And because it is to understand the financial market as part of a financial system that is related to it a significant subsystem of the economy, their extraordinary importance is evident individual national economies, as well as in the global economy.

Interest rates provide the most significant features [8]:

- streamline the flow of normal savings into investment, thus supporting economic growth
- allocate the allocation of available cash resources to the most profitable investments, respectively. into investments with the shortest payback time
- balance supply and demand for money
- represent an extremely important regulatory tool for the state

It follows that economic theory considers interest rates to be extraordinary an important factor that keeps the economy in equilibrium and hence in an efficient way and that their correct amount and high flexibility are necessary to ensure that, so the economy can fulfill its unique function of succession increasing final consumption of the population and thus increasing the general welfare and quality of human life. How do individual theoretical approaches (economic theory) build on the economic importance of interest rates? The "classical interest rate theory" considers interest on the remuneration paid to creditors for "sacrificing their current consumption" for promising future consumption, or for providing their available funds to realize investments that should increase the production capacity of the economy that should the apartment can then better meet the needs of its citizens. On the other hand, the "Liquidity Preference Interest Theory" treats interest as a remuneration for providing the liquidity that the money-owner has sacrificed for exchanging less liquid investment instruments (in this case for bonds), and the amount of interest also depends on the length of that victim's " lending funds ", it also considers interest as the main factor affecting the exchange rate, in the way that the higher the interest rates in the home country than abroad, the higher the demand for domestic bonds,

and as a result, the domestic currency exchange rate (and vice versa). As far as the "Interest Rationale Expectation" is concerned, it defines meaningful information about the future development of interest rates (as is the case with inflation). Essentially, it is a transfer of the principle "Inertia inflation" on the principle of "inertial interest rate developments", which means that if public opinion is generated about the future direction of interest rates, this will subsequently affect the future development of nominal interest rates.

For all these theories and interest means two things. First, that the importance of interest rates is indisputable in the economy, and second, that they all "work" exclusively at positive interest rates, so the negative rates are from theoretically in the normal functioning of the economy de facto unthinkable.

Monetary regulation, however, is the second one besides the absolute level of interest rates related instrument, which is the purposeful influence of the amount of money in circulation. Also there are a number of economic approaches in this area that work in a variety of ways with the so-called quantitative theory of money, the basic postulate of which is that the offer money (money supply) has a direct effect on the price level. As an important theory of this kind, the Fisher Transformation Equation [2] formulated an opinion that the value of money changes inversely in proportion to the amount of money in circulation:

$$M . V = P . T \quad (1)$$

Where: M- means the money supply (the amount of money in circulation), V - their speed circulation, P - average price level and T - volume of physical transactions of goods and services

The left side of this equation expresses the flow of money over a certain period of time, the right side then the monetary value of the transactions that took place during that period. In other words it is a "macroeconomic condition of equilibrium" which, if not met, will activate mechanisms that restore the equilibrium by changing the price level.

3.2 Analysis of the consequences arising from the use of extremely low or even negative interest rates and excessive "printing" of money

Extremely low interest rates signal serious macroeconomic problems negative interest rates show extreme problems. Currently uses negative interest rates of five major central banks. First of all, the European Central Bank and the central banks of Japan and Switzerland, as well as the central banks of Denmark and Sweden. Meanwhile, they are mostly only deposit rates, which are short-term interest rates [1]by which central banks pay over-the-counter deposits of commercial banks, thus trying to make them more active in lending to non-bank economic entities. In connection with this, however, a very important question arises: "What would happen if the negative interest rates were also affected by non-bank economic entities, what are the risks to the financial system and hence to the economy?

Obviously, the current policy of extremely low interest rates of central banks can not be examined in isolation, but always as part of an expansive monetary policy. At present, the central banks of the vast majority of the state are doing their job to revive the domestic economy, but with the current extreme indebtedness of state and business households, the use of classical instruments is becoming less and less effective. This is a search for non-standard tools. And these are extremely low and even negative interest rates used in conjunction with "extreme money printing." Their increasingly frequent and intensive use is both the

[1] With the exception of the Swiss central bank, which has negative not only deposit, but also the so-called main rate.

consequence of central bank policy to weaken domestic currencies to support export, domestic consumption and investment, to reduce the impact of the ever-increasing indebtedness of more and more practically all kinds of economic subjects.

This way of monetary regulation can, however, cause both predictable and so in particular, various unforeseeable consequences. For example, Goldman Sachs analysts have warned central banks that: "unconventional stimulus steps have their limits, and in the final they can also harm economies to help them." [11] Furthermore, they have stated an interesting view that "excessive and unconventional central bank activity may cause" companies that should, above all, seek to revive economic growth, so it may even have opposite effects in this respect, and it may be extremely difficult later to push stimulus measures. "Similar views are held by other economists, CNB Governor Singer said [9] that at a meeting Of the International Monetary Fund, its participants argued that "negative interest rates are no salvation in terms of demand for central banks". At the same time, he expressed the opinion that "monetary policy alone can hardly ensure the return of the world economy to the long-term growth path", which is in line with economic theory that: "the monetary policy mission is not to influence long-term economic trends but to dampen the fluctuations in economic cycle "[4].

When analyzing the purposeful use of extremely low interest rates supported extreme printing of money on the activity of individual economic entities and the economy as a whole, two principles must be respected:

A. Interest rates and the amount of money in circulation are economic indicators that, cannot be considered in isolation. This means that they need to be approached to significant, but not the only, macroeconomic indicators and their action needs to be considered in a broader economic context.
B. Since the functioning of the contemporary world economy depends mainly on economies large countries, it is necessary to analyze especially the situation of the states with the highest GDP.

The following table shows the selected macroeconomic indicators of Sixteen economically the most powerful countries of the world (including the euro area as a whole) whose gross domestic product exceeded one trillion (or more specific $ 1,6 trillion) in 2016. Contribution of top ten economies is 67.44 percent and 61.21 percent of total global wealth in nominal and ppp terms, respectively. USA itself has share of 24.7%.

Table 1 - Selected macroeconomic indicators of the world's most powerful economies

Ranking of countries by size of GDP (2017)	Annual GDP (dec.2016) (Billion $)	GDP annual growth rate (dec.2016) (%)	Goverment debt to GDP (dec.2016) (%)	The ECB's main interest rate (dec.2016)	Yield of ten-year government bonds (dec.2016)	Credit rating (dec.2016)
1. USA	18569.10	-4.1	106.10	1.25	2,331	AA+
2. EU	16397.98	-5.4	83.50	0.00	1,149	AA
3. China	11199.15	3.8	46.20	4.35	3,990	A+
4. Japan	4939.38	-8.8	250.40	-0.10	0,036	A+
5. Germany	3466.76	-6.8	68.30	0.00	0,339	AAA
6. United Kingdom	2618.89	-5.9	89.30	0.50	1,260	AA
7. France	2465.45	-3.8	96.00	0.00	0,676	AA
8. India	2263.52	-5.2	69.50	6.00	7,056	BBB-
9. Italy	1849.97	-7.2	132.60	0.00	1,793	BBB
10. Brazil	1796.19	-5.8	69.49	7.50	10,17	BB
11. Canada	1529.76	-4.1	92.30	1.00	1,866	AAA
12. South Korea	1411.25	-7.3	38.60	1.25	2,510	AA
13. Russia	1283.20	-11.2	17.00	8.25	7,650	BB+
14. Spain	1232.09	-4.3	99.40	0.00	1,476	BBB+
15. Australia	1204.62	-3.4	41.10	1.50	2,510	AAA
16. Mexico	1046.00	-9.1	47.90	7.00	7,220	BBB+
World	75,213					

Source: Trading Economics a World Bank

The following table shows the following:

1. Economic development is very different in the world. While the majority of the Eurozone and Japan do not do much, on the contrary, the "eastern economies" and China. At the same time, we can not forget today's problems of Russia and especially of Brazil.
2. The highest public debt vis-à-vis GDP is reported mainly by Japan and the US, as well as by the Eurozone, which (except Greece and Portugal[2]) has the highest indebtedness (with the exception of Germany) of the most economically significant country, namely Italy, Spain and France. They are not too indebted.
3. The highest central bank interest rates are in Brazil, Russia and India; negative rates, especially in Japan and Switzerland[3]. In the euro area, they are still zero, but the ECB has already made use of the negative deposit rate.
4. Current country ratings do not match their indebtedness.

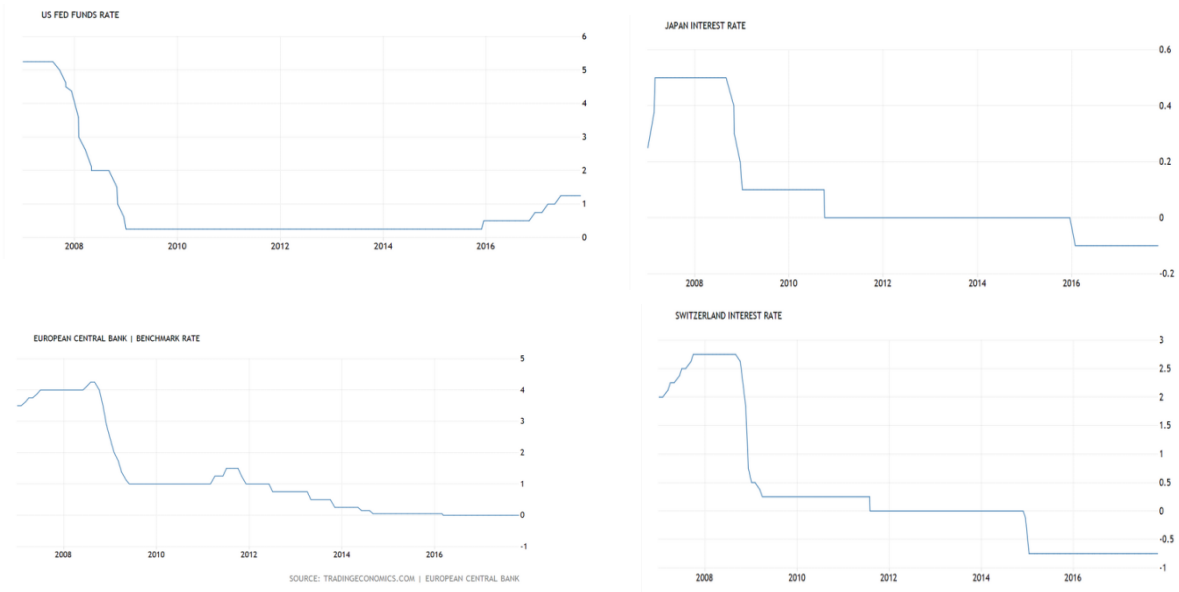
From the selected economic data of the most powerful countries in the world, that the world economy is no longer working on the market principle because it is "overregulated". This shows above all the links between the indicators of indebtedness and the yields (in this case ten-year) government bonds. They show that the most distorted are the "Eurozone" as a whole, followed by Japan (as well as Switzerland), or those countries, whose central banks have already

[2] Greece has a public debt of 176.90%, Portugal 129.00%
[3] In Switzerland, the main interest rate is currently -0.75%

introduced negative deposit rates. Nowadays states that negative returns already bear bonds totaling over 13 trillion dollars (representing about one third of all existing government bonds in the world) and their volume is growing rapidly. And at the same time it is very strange that renowned rating agencies do not take this fact into account, as evidenced by the previous columntables. It shows that the Standard & Poor's International Rating Agency (but concerns even Moody's or Fitch) evaluate practically all the most economically efficient, though highly indebted states, credit ratings within the investment band (with the exception of the Brazil and above all Russia, which, on the contrary, is much less indebted).

The fact that central bank interest rates have been very low for a long time and that they are falling further, is illustrated by the following picture showing the ten-year development of key interest rates the US Federal Reserve, the European Central Bank and the central banks of Switzerland and Japan (whose currencies are generally considered to be major majors).

Picture 1 - Development of key central bank interest rates on four major world currencies



Source: http://www.macrotrends.net

What are (or will be) the effects of using negative interest rates as a tool monetary policy of central banks supplemented by de facto unrestricted money printing?

These are the following areas of concern:

A. Suppress the market allocation of available cash resources to the most profitable investment projects: This is a denial of the fundamental importance of interest rates in the sense of the "Classic Theory of Interest Rates" in the sense that, if there is no the interest paid by borrowers as a reward for borrowing money cannot be cost-effective. The validity of this theory can be documented at present, for example, by the current bankruptcies of oil and natural gas extractors from slate boreholes, which would not be opened under the "normal" level of interest costs.

B. Suppressing the interest in saving and investing in debt instruments: At low Interest rates are declining to save or invest in any debt instruments; at negative interest rates, it is pointless to save money at all to banks, respectively. is to exchange for any conventional debt investment instruments.

C. Redirect interest from debt to equity investments: Extremely low or even negative interest rates reduce the return on investment debt instruments, which subsequently leads investors to find alternative financial ones investment instruments, which are primarily shares. Following on from the equity courses are growing, creating speculative stock bubbles, especially when they are the purchase of the share is also attended by a commercial bank and even a central bank (which d facto violate their mission). And moreover, the management of some corporations in an effort to maintain their share price growth even with stagnant (or even with deteriorating) economic outcomes emit new bonds to make of this of the money raised could buy back and then withdraw part of the shares managed by them companies out of circulation. While they achieve the profit on existing shares is still growing, however, in the next additional debt of corporations.

D. Investing in Real Assets: Extremely low (or negative) interest rates rates also cause the general interest in investing in real investment instruments (while reducing interest in financial investment). First of all, with regard to the minimum interest rates on mortgages, it is increasing the demand for real estate, whose prices consequently increase. This is simultaneously creates speculative bubble on the real estate market. At the same time, prices rise other types of real investment instruments, especially precious metals.

E. Change in the standard features of financial investment assets and liabilities: Financial investment instruments are assets that bring revenue to their owner (or are expected to bring it to him in the future); on the other hand (financial) liabilities can be in this case, characterize as liabilities. What happens to the investment assets and liabilities to economic entities (primarily financial institutions) of its balances in the event of negative interest rates? In these cases it may happen that their properties are called "turn", which would mean that the assets would bear a negative (nominal) yield and would, on the other hand, generate liabilities (nominal) yield positive. This would, however, change the behavior of the participants trading on financial markets with disastrous consequences. It would happen in particular, that the bonds would only be purchased as a result of negative returns speculators and for the sole purpose of short-term possession and, moreover, only if would expected an even deeper fall in interest rates).

F. Disallowing correct valuation of financial investment instruments: Extremely low or even negative interest rates make it impossible to use the overwhelming majority traditional valuation methods of financial (but also real) investment instruments. IN related to the above-mentioned problems with the nonstandard characteristics of assets and liabilities the use of balance-sheet methods is considerably restricted. Methods can also be mentioned based on the discounted future cash flow to the present value (in particular, the "net present value method" and the "internal rate of return method"), whose disclosure ability to discourage the zero or even negative discount rate (used in the denominators of the relevant equations). Finally, it is also worth mentioning that it is also considerable weaken the reporting ability of many indicators or financial analysis models.
However, the inability to properly measure investment instruments increases mistrust not just investors, but practically all participants in financial market trading. This is reflected in high volatility, or instability in market prices at all segments of the financial market. And, unprecedentedly, the most dangerous situation for derivatives is emerging for further development. First, due to the existence financial leverage, and that valuation of financial derivatives is often complex and often dependent on a number of predefined input assumptions for the existing non-standard market conditions may not apply.

G. Growth of Catastrophic Collapse Risk in Derivative Markets: Currently, estimates that the value of existing derivative instruments, or term derivative instruments and structured products already exceed the global billiards (thousand trillion) USD [10]. And many of them are interest, currency or credit, which may cause changes in the valuation or interest rate on their underlying assets unexpected price developments, or may (in the case of credit derivatives) be activated.

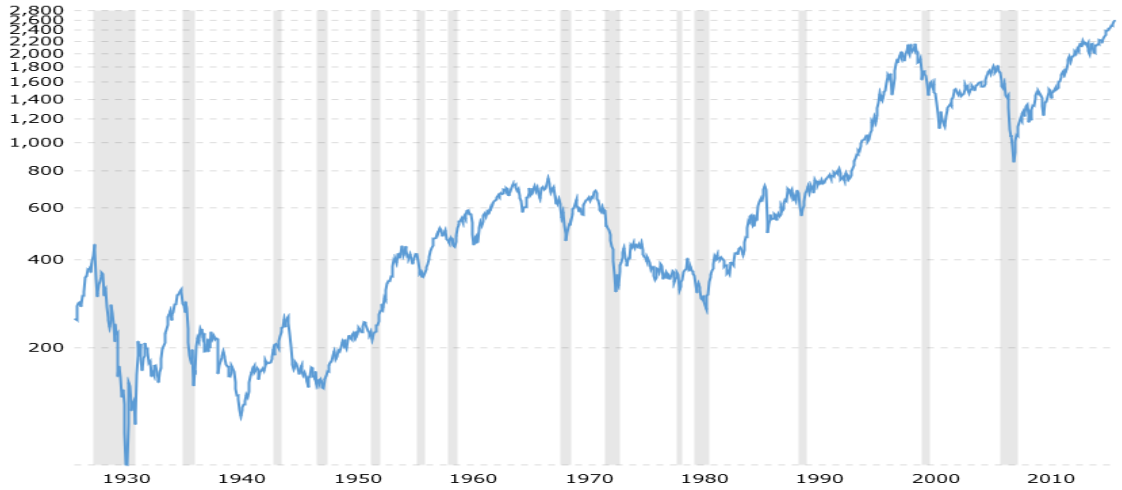
H. Strengthening the importance of central banks: The risk factor of this factor lies in the fact that, that central banks are gaining increasing influence and are increasingly engaged in management economics. This means that even though their representatives are not elected bodies so I'm still deciding on economic (and de facto also political) direction States. At present, it has already reached so far that in trading financial of investment instruments does not apply the principle that I decide on the development of their market prices mainly the economic outcomes of their issuers, but the rule begins to apply: "the worse, the better." [7] This is because it is generally expected that each the new issue will cause further monetary policy liberalization.

I. Promoting further indebtedness: Extremely low or even negative interest rates lead to further indebtedness mainly to states and households, but also to companies. And since can be considered as the proven opinion of Goldmen Sachs analysts [11] that "stimulation leads to further stimulation ", it is clear that the longer this tool will be monetary policies, the more difficult it will be to change it. Nowadays, we can do extra also fearing that the general indebtedness rate has already exceeded the "point of no return" so de facto there may not be a way back.

J. Creating conditions for hyperinflation, resp. for monetary reforms: In the theoretical the area deals with monetary economics. Despite the fact that it is It is about a few partially different theoretical approaches, it is for all of them in common, they emphasize the principle that if the central banks start unlimited to "print" the money, it will lead to inflation. In the introductory theoretical part was quoted "Fisher's exchange equation" from which it follows that if in the contemporary "printing" the money has increased their circulation speed, at least inflation will fall; where the later the inflation rate will be higher in the future.

At the moment, however, another factor is significant. Even though it is still listed and statistically proves that inflation currently does not exist de facto (or that there are many the economy deflated), it does not have to be so in a broader sense. It depends on how the rate of inflation is measured. If this is the commonly used method using a consumer basket, then it is because it only contains some selected types of goods and services. If, however, it were to extend it to the most important financial investment instruments (mainly shares), and in this "investment- consumer basket "would have a weight corresponding to their total monetary value, was it would otherwise. This is illustrated by the following figure 2 showing the development of the most used one of the US S & P 500 index (including 500 prominent US) stock titles). This shows, on the one hand, the long-term growth of US stock prices, which began around 1990, and an extreme growth of 735 points (after the fall in equity markets in March 2009) to the current approximately 2600 points.

Picture 2 - Development of the US S & P 500 index from 1930 to present



Source: http://www.macrotrends.net

This, of course, results in a rise in market capitalization of shares that has already exceeded worldwide USD 70 trillion; in the case of bonds it is estimated at about 300-400 trillion USD [6].

Picture - 3: Development of the US S & P 500 index from 2008 to present

Source: http://www.macrotrends.net

K. Negative impacts on the activity of most types of financial institutions: Extremely low interest rates have a negative impact on the management of the vast majority of financial institutions, which jeopardizes the stability and functionality of financial systems at all levels.

1. Worsening Business Banking: It is a generally valid rule bank assets tend to be long-term, but are short-term liabilities. It follows that commercial banks benefit from the difference between short and long term long-term interest rates. In case of extremely low interest rates however, the yield curve is deformed and its standard shape is so called "flattening" [1]. And

because of the differences between short and long term long-term interest rates are decreasing, as are the profits of commercial banks, which in the event of negative deposit rates, they are also forced to provide loans which they would not normally have provided in terms of their risk.

2. Threat to the activities of pension companies, pension funds: This is an extremely important risk factor related to the fact that pension funds are one of the most important investors in long-term bonds and secondly are obliged to adhere to very strict safety rules as to their composition portfolios (or the risks of the investments made). At the same time, that at present there are, besides pension funds paying only the amount that they have the citizen "saved" (increased only by the appreciation achieved by the fund) and the funds, which are have undertaken to pay their subscribers pre-agreed amounts. And these funds interest rate cuts are most threatened.

As the pension fund liabilities are calculated using the discounted future method of obligations, it is clear that the lower the interest rates will have pension funds in their balance sheets higher liabilities, as a result need more assets (which would have to be in the case of negative interest rates) exceed the nominal value of liabilities). This leads their management to risky shops, and sometimes even technical insolvency.
It is clear that pension funds are still owned by the formerly issued and therefore also relatively well-bonded bonds, which, however, are not capable of completing theirs maturity to be re-invested, and you can not ignore that if you do issuers of previously issued bonds have anchored in the issue terms their earlier withdrawal from circulation, are now making the most of this option. And there is still the fact that the continuing indebtedness of corporation and state causes a number of previously so called "safe" bonds to gradually become risky bonds, with the result that pension funds (irrespective of their interest rate) required to deactivate their portfolios.

3. Disposal of Investment and Mortgage Bonds: It is demonstrable that extremely low or even negative yields on bonds are beginning to become increasingly serious threaten the existence of existing or the creation of new bond funds.

4. Threat to the functionality of the insurance sector: The importance of insurance in the financial sector of the system is absolutely indisputable. At the same time it is evident that about a third the funds are acquired by insurance companies from long-term investments in "risk-free" (mainly government) bonds. It follows that their current development profitability seriously jeopardizes the functionality of this sector with the direst consequences for the whole economy and human society.

5. Extreme Growth in Central Bank Balance: Central Banks of the Majority of States is currently trying to support domestic exports by weakening domestic currencies. This creates currency wars that use both interest rate cuts, so "to print" the money. This is often done through issuing state bonds bonds first purchased by commercial banks from which they are then redeemed central bank. This is a method known as "quantitative easing" thereby bringing the government bonds into central bank balances are currently growing significantly. In practice, however, it depends on whether they are countries with so-called "reserve" currencies that are being bought by practically all the central banks of the world into of its foreign exchange reserves, or it is a so-called "subsidiary" or "exotic" currency other countries. This is important because countries with reserve currencies are actually borrowed by other states and can

therefore "live on debt", because economically the weaker country is actually buying and holding their currencies de facto.

Discussion

In analyzing the impact of using extremely low interest rates it is necessary to consider besides their absolute amount also the factor of time. He is playing an important role both in their effects and in the consequences they cause. While short-term announcement of extremely low or slightly negative deposit interest rates can only be assessed as an instrument of operational management (rather psychological) character), their long-term use, supplemented by extra money printing has already strategic importance. First, it helps temporarily "pseudo stabilize" economy, which is, of course, "paid" by the growth of further indebtedness soon to go beyond the "critical limit", which would force additional monetary expansion, including even more faster "printing" of other money and even more intensive interest rate cuts (or their shift to even more negative values). That would be the commercial banks they would have to introduce a negative interest rate on bank deposits, which would have caused them panic collection of cash, thus creating a virtually unsatisfactory demand for liquidity. This would appear to be limiting and phasing out cash and to the violent transition to electronic money only, which would mean the end of economic and therefore personal freedom. This would result in mass unrest and collapse economic (and, of course, political) systems at all levels.

And if, after exceeding the critical level of indebtedness (or after exceeding the point irretrievable, which can not be precisely determined, but is generally believed to have been already in some countries, the central bank has attempted to further debt growth stopped and interest rates increased, all interest rates would rise at the same time. It would but has brought many economic subjects (including the entire state council) to bankruptcy, with a domino effect through the banking and financial system spread throughout the world and would result in the same end as in the previous case.

Conclusion

The analysis shows that negative (yet mostly only deposit) interest rates of central banks can now be understood as psychological an instrument used to pressure commercial banks to more willingly provide credit non-financial corporations and to weaken domestic currencies within ongoing currency wars. However, if they move in the future to more negative values and v As a result, they will be transferred to commercial bank clients and will become an economy extremely dangerous, the longer they will be used, the more serious the consequences cause. And as far as the extreme "printing" of money is concerned, it can also be considered extremely dangerous. On the one hand it makes it possible to deal with the critical one operationally problems, however, they are always only temporary solutions that will still come in the future bigger problems. And it is also important that the endless increase in money printing is impossible.

However, it is necessary to understand at the same time that either negative interest rates or the printing of money are not the causes of the current crisis. They are only its consequences, respectively, non-traditional instruments that are being used as a result of the current critical situation. Primary problems the world economy is not only economic in nature [5], it is related with many other problems of mankind, which is primarily the moral aspect of people. Those in the hunt after money and property, more and more scissors are being opened between "human skirt" and " the rest of the company. And if one percent of the population already owns more than half of existing property, it is clear that on the one hand it is impossible to spend money

and on the other hand the inability to buy the goods and services offered. And if not this extreme mismatch is satisfactorily resolved, it will not be able to increase the demand for goods and services. As a result, existing production capacities will not be used, so it will not even interest you to innovate manufacturing technology and increase productivity. AND therefore, the world economy will not grow satisfactorily under these conditions and will not (and nor will it be able to fulfill its basic mission in improving the quality of life of people.

In conclusion, we can confirm the opinion of Bill Grosse [3], that: "Debt the new debt can not be resolved, because this "new debt" does not generate growth. We divide that new jobs are not being created, investments are historic minimum consumption, consumption decreases at the expense of savings and GDP growth is anemic. "At the same time, to agree with his conclusion that: "one day this financial supernova must explode."

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PUBLIC EXPENDITURE EFFICIENCY AND THE OPTIMAL SIZE OF GOVERNMENT IN EUROPEAN UNION*

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Abstract

This paper investigates public expenditure efficiency and its relation to the optimal size of government. It gives an insight into methods developed for estimating efficiency and possible constraints of the analysis. Literature review of related papers covering European Union and OECD countries shows significant differences in efficiency coefficients across countries with most countries having the potential for increased efficiency of public spending. Specifically, there is large space for reduction of government size by raising the efficiency. The literature includes the aggregate expenditure efficiency analysis and efficiency analysis of its main components. More disaggregated analysis of individual public functions seems to be more adequate to capture the efficiency and determine the main drivers of inefficiency and draw policy implications. In that respect, the paper gives an insight into the structure of government expenditure by function across EU countries and its changes over the period 2002-2015. Differences in tradition and priorities in financing public goods and services can be noted between countries. Due to high sensitivity of non-parametric methods to data heterogeneity, this should be taken into account when selecting the sample for the analysis.

Keywords: government expenditure efficiency, optimal size of government, functional classification

JEL classification: H11, H50, E60

Introduction

In recent years European Union (EU) countries are facing severe challenges in public finance management. Globalization (free movement of capital induces tax competition and causes revenue erosion) and demographic trends (aging population causes social protection and health expenditure to rise) have exerted pressure on both revenue and expenditure side of the budget. Given that the countries are bound to fiscal discipline through Stability and growth pact, space for further indebtedness is limited. With light on these problems, question of reduction of size of government comes to the forefront. The key question is: Is it possible to reduce the size of the government without hampering the economy's growth? If so, how can it be done?

A number of researches investigated the size of government-growth nexus. Size of the government is commonly proxied by general government expenditure in % of GDP. There have been mixed results regarding this relationship. While some researchers find positive (Ram, 1986), others find negative effect of size of government on growth (Afonso & Jalles, 2011). Recent papers describe the size-growth relationship as inverted U shaped relation. This connection is in literature often named the BARS (Barro–Armey–Rahn–Scully) curve (Barro, 1990; Rahn & Fox, 1996; Scully, 1998, 2003). Barro's (1990) endogenous growth model was first to introduce the non-monotonic relationship between size of government and growth. This

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relation implies existence of size of the government which maximizes the growth rate. His theory suggests that, while its size is small, government expenditure encourages growth. When invested in infrastructure, health care, education and law enforcement, government expenditure boosts human and physical capital productivity. However, higher expenditure needs to be financed with higher taxes. Growing government exerts more pressure on private sector, and consequently squeezes out private investment. Raising tax burden distorts incentives resulting in inefficient allocation of resources. Marginal benefit of public expenditure is diminishing and after a certain point it turns negative. The question is: How to find the optimal government size?

There are several ways of finding the optimal size of government. Most studies are based on parametric approach which implies estimating a nonlinear growth regression which needs to be maximized with government size being the independent variable. Equalizing the function's first derivation by expenditure to zero, the optimal government size can be found. Many researchers have applied this methodology and found that most countries suffer from excessive size of their government (Mutascu & Milos, 2009). The authors found the optimal size of government to be 30.42 % of GDP in the EU-15 and 27.46 % of GDP in the EU-12.

More recent line of research incorporates a slightly different approach to government size-growth relationship. Nonparametric approach to estimating the optimal size of government incorporates efficiency analysis giving this relation a new dimension. Efficiency analysis on aggregate level puts in relation the government size, usually measured by total government expenditure (% of GDP), with the economic growth. Input inefficiency gives information on whether the existing growth rate could have been reached with lower government size. Bađun et al. (2014) calculate the efficiency scores through Data envelopment analysis (DEA)/Tobit approach for a sample of EU member states and find that most countries are being inefficient. The results show that, the optimal size of government for the reviewed sample is 39.21% of GDP, meaning that countries could have attained the same growth rate with 3.54 percentage points lower government expenditure, on average. De Witte & Moesen (2010) apply the same methodology on a sample of 23 OECD countries and find that the same output could have been attained with, on average, 3.74 percentage points lower general government expenditure.

Angelopoulos et al. (2008) and Rahmayanti & Horn (2011) have gone further and combined both nonparametric and parametric approach to investigate the government size-growth relationship. Angelopoulos et al. (2008) have calculated efficiency scores applying Stohactic frontier analysis with total government expenditure (% of GDP) as the input and GDP growth as the output variable for a sample of 52 countries between 1995 and 2000. The authors incorporated these efficiency scores into a growth regression and found that efficiency has a significant role in size-growth relationship. Specifically, the efficiency-size mix is significant in explaining the relationship. The model includes efficiency threshold above which the size-growth relationship becomes negative. Rahmayanti & Horn (2011) calculate the efficiency scores for 63 developing countries between 1990 and 2003 applying DEA analysis. The scores they afterwards incorporate into standard Barro growth regression, only to find that, after a certain threshold, efficiency reduces the optimal size of government expenditure needed to maximize growth. Therefore, the higher the efficiency the more government expenditure can be saved.

These studies show a significant effect of efficiency and imply that examining the overall government size-growth relationship without controlling for efficiency can easily lead to biased results. Countries can reduce their government size by raising their efficiency with no negative effect on the economy. With most countries facing severe challenges in public finance management, efficiency is being given more attention in the literature. For that reason it will be the focus of this paper.

The aim of this paper is to investigate the efficiency of public expenditure and its relation to the optimal size of government in European Union countries. In that respect, methodology and literature review on government efficiency will be given. The aim is to accentuate the importance of decomposing government expenditure due to different structure of government expenditure across EU countries. The countries have different traditions in financing public goods and services and different priorities. Taking only the overall expenditure could cause losing valuable information.

The paper is organized as follows. The first part introduces the concept of public sector efficiency, second part surveys measurement techniques developed for efficiency estimation, third part gives a brief overview and discussion of the previous literature on government efficiency, fourth section gives a brief insight in size and the structure of the government expenditure of the EU countries and the last section concludes.

1. THE CONCEPT OF GOVERNMENT EXPENDITURE EFFICIENCY

Prevailing measurement of utility from public activities in general public is the amount of budget allocated to certain function. Higher budget would imply proportionally larger utility from a certain activity. In reality, that is not necessarily the case. Concept of efficiency is being introduced to explain the relation between the input and the output and to objectively measure the performance of public activities.

When it comes to efficiency, it is important to distinguish technical from allocative efficiency. Technical efficiency reveals whether the same output could have been attained with lower quantity of inputs (input inefficiency) or higher output could have been attained with the same quantity of inputs (output inefficiency). It puts unit's performance in relation with the best output-input ratio that could have been attained. On the other hand, allocative efficiency shows the best possible allocation of inputs with respect to their market prices and includes the cost and benefit analysis. Together they form the overall economic efficiency (Farrell, 1957). However, concept of efficiency is often confounded with productivity. While productivity is a simple ratio of output over input, it does not give information on the highest output-input ratio attainable.

Analysis can be conducted for aggregate level of government expenditure (Adam et al. 2011; Afonso et al., 2005a, 2010; Agasisti, 2011; Angelopoulos et al., 2008; Bađun et al., 2014; De Witte, 2009; Rahmayanti & Horn, 2011) and for each of the government services separately. Also, some researchers conduct the analysis on local government level (Balaguer-Coll et al., 2007; Afonso & Fernandes, 2008).

Aggregate level efficiency analysis has several drawbacks. Since composition of government expenditure varies among countries, data can be highly heterogeneous and lead to spurious results. Furthermore, such analysis gives weak information on environmental factors that can affect efficiency. Inefficiency can be detected but its main drivers remain unfound. In that respect, disaggregated analysis of specific government activities is more frequent recently. Most researched public expenditure functions are health and education (Adam et al. 2011; Afonso et al. 2005a; Afonso & St Aubyn, 2005b; Aristovnik, 2009; Hauner & Kyobe, 2010; Herrera & Pang, 2005; Jafarov & Gunnarsson, 2008; Prasetyo, 2013), education alone (Aristovnik, 2011; Afonso & Aubyn, 2006) while a number of researchers deal with public investment and public administration efficiency (Afonso et al., 2005a; Adam et al., 2011; Bađun et al., 2014).

2. METHODS FOR MEASURING EFFICIENCY

Methods for measuring government efficiency usually rely on formulation of a production possibility frontier. Most common methods can be divided into parametric and non-parametric methods. The main difference between them is that non-parametric methods do not require a predetermined form of the production function while the parametric do. Non-parametric methods use input-output data from the sample to form a production possibility frontier which links the best performing units in the sample following a mathematical linear programming method. Once formed, best practice frontier is used to calculate the efficiency scores based on distance of each unit to frontier.

Data Envelopment Analysis (DEA) is a non-parametric method mostly used in recent research. It was originally introduced by Charnes et al. (1978). This method uses input-output data to form the best practice frontier. The frontier is calculated as linear combination of the best performing units. Units positioned on the frontier are given the score of 1, while the units inside the frontier have an efficiency score between 0 and 1. However, the fact that a unit is positioned on the frontier does not imply that it is fully efficient. It means the unit is more efficient relative to the other units. DEA analysis can be input or output oriented. Input oriented DEA reveals how much resources can be saved maintaining the output unchanged, while the output oriented DEA shows if higher output can be reached without changing the inputs.

The main advantage of DEA analysis is simplicity of its application, given that it does not require a predetermined production function. It is mainly data driven, simply takes the output-input data, and does not need input or output prices so it is appropriate for analyzing non-profit institutions. However, this method has its downsides. Important shortcoming of this method is the sensitivity to outliers and measurement errors since it interprets random errors as inefficiency. Having that in account, homogenous data would be a prerequisite for the analysis, which is already an issue given the fact that expenditure is relatively heterogeneous among countries. Another shortcoming of this method, it does not account for possible exogenous macroeconomic and environmental factors that could affect efficiency which could result in biased efficiency coefficients.

There are many ways to deal with this issue. The most common is the two stage DEA/Tobit approach while some researchers use simple least square regression (OLS). Both approaches are parametric methods. Tobit approach is commonly considered appropriate due to censored nature of the efficiency coefficients. It is a maximum likelihood method used for limited data with lower and upper bound (efficiency coefficients range between 0 and 1). The coefficients, previously calculated through DEA, are being regressed on a number of possible determinants. This approach has been recently criticized for being inconsistent since efficiency scores are estimated through nonparametric method, while the efficiency determinants are detected by using parametric method. Alternative approach is using nonparametric approach in first and in the second stage applying single and double bootstrap procedures.[1]

Another nonparametric method for efficiency estimation is Free Disposal Hull (FDH) suggested by Deprins et al. (1984) and Tulkens (1986). FDH poses the least restrictions compared to the other methods. The units that are efficient under DEA are efficient under FDH method but not necessarily vice-versa. The only difference between the two is that in DEA analysis any linear combination of the efficient units forms the frontier, while FDH does not require convexity.

An example of a parametric approach for estimating efficiency is stochastic frontier analysis (SFA). Its advantage is it can include other exogenous and environmental factors affecting

[1]For more details on bootstrapping techniques, see Simar and Wilson (2007)

efficiency aside from the production inputs which gives more robust results. Its most important shortcoming is that it requires a predetermined shape of the production function.

Composite indicators are another measure that can be used to compare different countries' performance and efficiency. They can serve as input or output indicator in the efficiency analysis or an overall efficiency indicator. Developed by Afonso et al. (2005a) the Public Sector efficiency index (PSE) takes the performance (PSP) of each of selected disaggregated government functions and compares it to related expenditure. Afterwards, the calculated sub indicators are given weights and composed into a composite overall indicator of government efficiency. However, the results are dependent on the arbitrary selection of sub indicators and given weights and can vary substantially depending on the sample selection.

A few important issues regarding input and the output measurement in the efficiency analysis need to be noted. Inputs are usually defined in monetary but can also be referred to in physical terms. When measuring resources in monetary rather than physical terms, countries that have comparably more expensive resources can wrongly result to be inefficient. On the other hand, countries where the resources are less expensive can have overestimated efficiency scores. The former is called the Baumol (1967) effect. Moreover, some issues with output measurement can occur. Since public goods are not tradable, there is no information on their prices. With no information on output prices it becomes difficult to take the quality of the output in account. By comparing only quantity, important information might be omitted causing biased results.

3. REVIEW OF THE RECENT LITERATURE ON GOVERNMENT EXPENDITURE EFFICIENCY

Systematic review of the related papers on efficiency and the optimal size of government can be found in the appendix. While a number of them apply on EU countries, OECD countries are the most investigated in this field. Considering that most EU countries are members of OECD, literature review includes papers based on both samples. The results suggest that there is high space for reducing the government expenditure by using the resources more efficiently (Afonso et al., 2005a, 2010; Afonso & St Aubyn, 2005b; Aristovnik, 2009, 2011; Bađun et al., 2014). Afonso et al. (2005a) find that the average input efficiency of the 15 EU shows that the same level of output could be attained using only 73% of the inputs. Bađun et al. (2014), on the other hand, find that the average optimal size of government in old EU countries is larger than that in new EU countries. Moreover, old EU member states have, on average, more efficient governments than new EU countries regarding education expenditure, health care, public investment and public administration.

Research in individual spending areas is more frequent than aggregate level analysis with health and education in the lead. Usual monetary input for education is public expenditure on education (% of GDP) or (public) expenditure per student (% of GDP per capita), while quantitative is hours per year in school. The education output is usually test results (PISA), secondary or tertiary school enrollment or teacher/pupil ratio. Usual monetary input for health sector is average public spending on health (% GDP) or health spending per capita (private and public) while quantitative inputs are number of doctors, nurses, hospital beds etc. The most common health outputs are infant mortality rate and life expectancy at birth. For the efficiency at aggregate level the usual input is total government expenditure (% GDP) and the output is per GDP growth rate or a public sector performance composite indicator (PSP). Some researchers use Human development index as the output (Prasetyo, 2013).

As mentioned previously, recent papers include the analysis of determinants of efficiency. As the analysis has a more in-depth scope, determinants of efficiency become more specific and targeted. Due to limited space, only the most frequent ones are reviewed in this paper. One of them is the size of government expenditure. Afonso et al. (2005a) find that "small" governments are the most efficient among industrialized countries, implying diminishing marginal products of higher public spending. Hauner & Kyobe (2010) and Herrera & Pang (2005) come to the same conclusion for health and education sector, that higher government expenditure (% of GDP) is associated with lower efficiency. Aristovnik (2009) finds negative effect of high public spending on health efficiency. On the other hand, at local government level, the efficiency scores are found to be higher for large municipalities. (Balaguer - Coll et al., 2007).

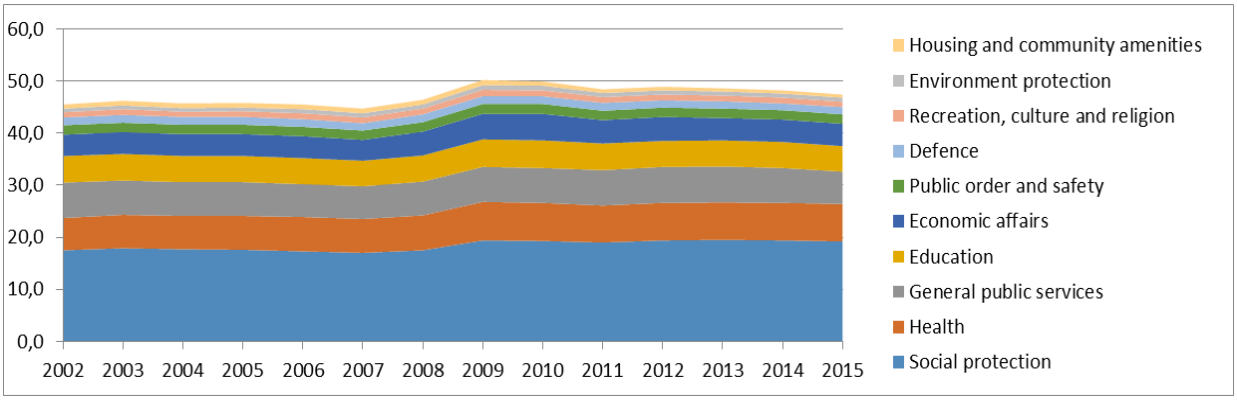
Another determinant is income per capita, was found to have a positive effect of efficiency on aggregate level (Agasisti, 2011; Afonso et al. 2010) and for health and education (Herrera & Pang, 2005; Afonso & Aubyn, 2006; Hauner & Kyobe, 2010). Country's openness was found to have a negative effect on efficiency (Bađun et al., 2014; De Witte & Moesen, 2010). The explanation would be that open economies are more sensitive to external shocks and need a larger government take on a role of a stabilizer of the economy (Rodrik, 1998*).*Family size is shown to have a positive effect on gross efficiency (Bađun et al., 2014; De Witte & Moesen, 2010). Countries with larger average family size can attain the same growth rates with lower government expenditure. Findings show that higher degree of urbanization has a positive effect on aggregate level efficiency (De Witte & Moesen, 2010), also in health and education (Herrera & Pang, 2005). Higher urbanization enables providing public services at lower costs through the economy of scale. Regarding capital stock of a country, Afonso et al. (2010) point out that physical capital has a positive effect on government efficiency. Countries with larger physical capital stock, measured by the share of gross investment in GDP, can attain the same growth rates with less government expenditure (Bađun et al. 2014). Higher population density, similar as urbanization, was found to have a positive effect on efficiency due to economies of scale which enable the provision of public goods and services at a lower cost (Herrera and Pang, 2005; De Witte & Moesen, 2010). Higher population density was also found to improve the performance in education and health (Hauner & Kyobe, 2010).

4. THE STRUCTURE OF GOVERNMENT EXPENDITURE IN EUROPEAN UNION

The average EU-28 general government expenditure is continuously stagnating, since its peak in 2009 (induced by the economic crisis, increases in unemployment and social protection) when it amounted to 50.1% of GDP. It decreased from 47.3% of GDP in 2015 to 46.6% of GDP in 2016. The highest reduction was reported in Greece, Bulgaria and Slovakia respectively. General government expenditure in EU varied between 29.4% of GDP in Ireland and 57.0 % of GDP in both France and Finland in 2015. Regarding the general government expenditure structure, notably four government functions amount to 79.2% of total expenditure in 2015. Those are respectively social protection (40.6% of total), health (15.2% of total), general public services (13.1% of total) and education (10.3% of total).

Growing share of government expenditure in GDP was primary driven by growing social protection and health expenditure. Social protection expenditure as the largest function is becoming more important in terms of share of GDP and in share of total expenditure. It rose in share of GDP by 1.7 p.p. between 2002 and 2015. A slight slowdown can be noticed in the last two years when it decreased from 19.4% of GDP in 2014 to 19.2% of GDP in 2015. It was accompanied by total general government expenditure slowdown. Health expenditure kept a stable share in the last 4 years (7.2% of GDP). The evolution of EU 28 general government expenditure by function as share of GDP between 2002 and 2015 is illustrated in graph 1.

Graph 1 - EU-28 average general government expenditure by function 2002 - 2015 (% of GDP)

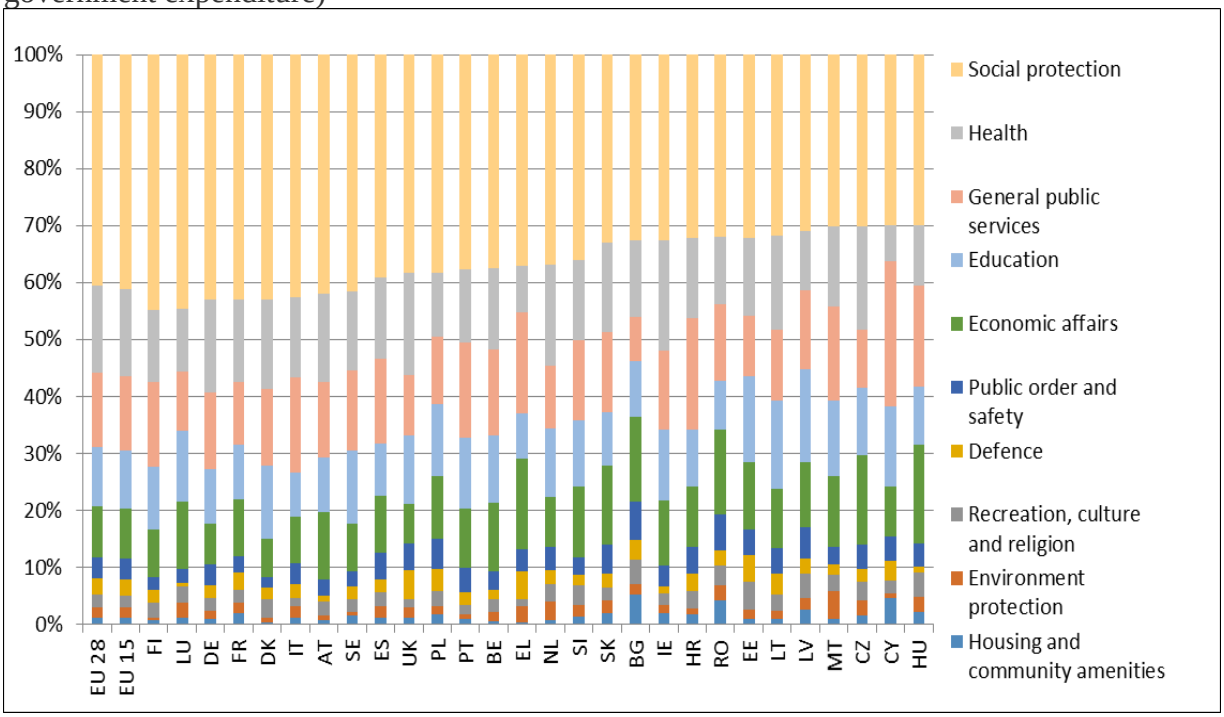


Source: Eurostat; author's calculations

Regarding the average shares of total expenditure, social protection in EU increased in share of total expenditure from 38.4% in 2002 to 40.6% in 2015, and is continuing upwards. Health expenditure increased from 13.7% in 2002 to 15.2% in 2015, while education is on a downward trend in the last years (from 11.1% in 2002 to 10.3% in 2015). General public services ranged from 14.9 % in 2002 to 13.1 % of total expenditure in 2015. The shares of each function in total expenditure are considerably stable. However, a trend towards increase in social protection (+2.2 p.p.) and health (+1.5 p.p.) shares at the expense of general public services (-1.8 p.p.), education (-0.8 p.p.), housing and community amenities (-0.6 p.p.) and defence (-0.4 p.p.) shares can be noticed in period 2002-2015.

Looking at government expenditure structure across EU countries, from Graph 2 it is evident that shares show significant heterogeneity. Relatively higher shares of social protection are reported in the old EU member states compared to the new EU member states (joined 2004 or after). Social protection varies from 29.9% of total in Cyprus to 44.9% of total expenditure in Finland. The divergence across EU countries is can be noted in public health expenditure. It ranges from 6.4% in Cyprus to 19.3% of total government expenditure in Ireland.

Graph 2 – EU-28 General government expenditure by function in 2015 (% of total government expenditure)



Source: Eurostat; author's calculations

With the fact that education and health have features of private goods, it is important to account not only for the public expenditure but include also the private expenditure on education and health. According to WHO data, high variety can be found across countries. Public expenditure on health in EU amounted to, on average, 73 % of total health expenditure in 2014. The reported range is between 45% of total in Cyprus and 87% of total health expenditure in Netherlands. Public expenditure on education is generally larger in share to private, when compared to health expenditure. Public expenditure accounts for on average 88% of education expenditure with range from 79% in United Kingdom to 98% of education expenditure in Finland in 2011 (Eurostat, 2017).

Reported data show a large variety of government expenditure size and structure across countries which can be a serious drawback in efficiency analysis. Moreover, with different tradition of financing the public services among countries (private vs. public funding), some countries are not suitable for comparison. Leaving out the private sources of health and education expenditure could result in serious bias. All of these constraints need to be born in mind when selecting the sample, conducting the research and interpreting the results.

Conclusion

In environment of government expenditure cuts being in center of attention of both economists and the public, the question of optimal size of government and its efficiency is taking the center stage. Numerous researches have been conducted on this topic, both parametric and non-parametric. From the literature review it can be concluded that most countries suffer from government inefficiency and could retain the same output with lower government size. With fiscal pressure most countries are facing, these findings give a positive sign that substantial resources can be saved without hampering the economy's growth. However, more recent

researches include 2-stage or 3-stage approaches to investigate the possible exogenous environmental factors affecting efficiency. These newer, more sophisticated methods are able to distinguish inefficiency from other factors that affect the performance that are out of control of policy makers. Substantial gains in measurement techniques have been made in the last years, but yet the availability of data is being a drawback in the analysis. For future research, it would be useful to track efficiency progress in countries over time. Given the drawback of non-parametric methods and their sensitivity of results to sample variation it would be beneficial to apply the parametric methodology to check the robustness of the results. The future lays in a more targeted analysis on specific public functions where the inputs, outputs and drivers of efficiency can be more accurately measured. A more in-debt analysis can help create a targeted policy mix to improve efficiency and asses the performance of public sector. A more detailed research of causes of inefficiency in specific public services would help reveal the mystery behind the varying efficiency coefficients across countries. Nowadays, efficiency analysis is a developing area of research, expected to become even more important in the future years with substantial contributions to public finance management.

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Appendix: Literature review

Author	Analysis subject	Method and sample	Input and output	Results
Adam et al. (2011)	efficiency of public spending on: education, health, social security and welfare, general public services, economic affairs, overall government spending	**1.Input oriented DEA** **2.SFA (**to account for environmental factors) **3. DEA sensitivity analysis** **Sample** 19 OECD countries 1980–2000	INPUT: Government spending (% GDP) for each function OUTPUT: EDUCATION:(secondary school enrollment, quality indicator) HEALTH: (infant mortality rate, life expectancy at birth) WELFARE: (GINI coefficient) ECONOMIC AFFAIRS: (the electric power transmission losses, standard telephone access lines) GENERAL PUBLIC SERVICES: (the corruption in government, the bureaucratic quality measures) GENERAL GOVERNMENT: general economic performance indicator (unemployment rate, GDP per capita, annual GDP growth rate) and economic stability indicator (standard deviation of the GDP growth rate, the inflation rate)	-The results in all 3 stages are not significantly different, implying than sound governance is more important than the environmental factors. **Efficiency determinants** -urbanization rate, the population density, the proportion of population above 65 years of age, international market openness, government stability measure, the investment profile variable, general proxy of the socioeconomic conditions
Afonso et al. (2005a)	-public sector performance (PSP) -public sector efficiency (PSE) composite and 7sub-indicators (administrative, education and health outcomes, quality of public infrastructure, the rule of law, allocation, distribution and stabilization functions)	-PSP -PSE -FDH (input and output efficiency) **Sample** 23 industrialized countries 1990, 2000	INPUT: PSP, PSE, total public spending, average spending on goods services, transfers, functional spending on education and health and public investment OUTPUT: Administration (corruption, red tape, quality of the judiciary, the size of the shadow economy) The education indicator(secondary school enrolment, OECD educational attainment indicators) The health performance indicator(infant mortality, life expectancy) public infrastructure indicator(communications quality, transport infrastructure quality) Income distribution (income share of the poorest 40% of the households) Economic stability (the coefficient of variation of output growth and average inflation) Economic performance (per-capita GDP, GDP growth, unemployment) FDH-INPUT: Public spending % GDP OUTPUT: PSP indicator	-small governments are the most efficient among industrialized countries, implying diminishing marginal products of higher public spending. -large potential for expenditure savings in many countries FDH: -The average input efficiency of the 15 EU shows the same level of output could be attained using only 73% of the inputs -The output efficiency score implies that with given public expenditures, PSP is 82% (or 18% less) of what it could be attained with the same level of expenditure

Afonso & St Aubyn, 2005b)	Education efficiency Health efficiency	DEA, FDH input and output efficiency (quantity and monetary inputs) **Sample:** 30 OECD	INPUT: 1. monetary – Spending per student (secondary) 2. quantitative - Hours per year in school, teachers per 100 students OUTPUT:PISA results INPUT: 1.monetary - Health spending per capita (private and public) 2. quantitative-doctors, nurses, hospital beds. OUTPUT: The infant survival rate, life expectancy	**FDH education** -In the education sector, the average input efficiency varies between 0.859 and 0.886 In health, between 0.832 and0.946 - There is scope for attaining higher output using the existing resources.
Afonso &Aubyn, (2006)	Secondary education efficiency	DEA/Tobit, Single and double bootstrap **Sample:** 25 OECD	INPUT: teachers per student, time spent at school OUTPUT:PISA results	-countries could attain higher output by 11.6% using the same resources, on average **Efficiency Determinants:** Country's wealth and parents' education levels is associated with higher education efficiency
Afonso et al. (2010)	General government spending efficiency	PSP,PSE DEA/Tobit **Sample**: 12 EU	INPUT: the total Government spending (% GDP) OUTPUT: PSP	-countries with public expenditure around 30% of GDP are the most efficient according to PSP and PSE -from the average input scores countries could attain the same output with 45% less resources -Average output scores show that countries are attaining around two-thirds of the output they could attain with the same resources **Efficiency Determinants:** higher income, civil service competence, education levels and the security of property rights prevent government inefficiency
Afonso & Fernandes (2008)	efficiency of Portuguese local municipalities	DEA/Tobit approach **Sample:** 278 Portuguese municipalities, 2001	INPUT: level of per capita municipal spending for the input measure. OUTPUT: composite local government indicator of municipal performance	-results suggest that most municipalities could attain higher output with the same resources
Angelopoulos et al.(2008)	General government spending efficiency and growth	PSP, PSE,SFA, growth regression **Sample:** 64develpoing countries1980-2000	INPUT: Total government expenditure % GDP OUTPUT:PSP Growth regression: INDEPENDENT VARIABLES: Total government expenditure (% GDP), PSE, TE, control variables DEPENDENT VARIABLE:GDP per capita growth	-when the fiscal size is measured by the government consumption share in GDP, the size-efficiency mix is significant in explaining the size-growth relationship.
Aristovnik (2009)	Health and education efficiency	DEA, FDH **Sample:** EU new member states	Health: INPUT: average public spending on health (% GDP) in 2001-2004 OUTPUT: standardized death rates (per 100,000 people) Education: INPUT: average public spending on health (% GDP) in 2001-2004 period	-efficiency and effectiveness differs across the sample -health inefficiencies are related to high public spending -education inefficiencies appear in the transforming intermediate output into real outcomes. -space to reduce public (health and education) spending and retain the same output.

			OUTPUT:PISA test scores	
Aristovnik (2011)	**Education efficiency (primary, secondary, tertiary and total)**	DEA output oriented **Sample:** 37 EU, OECD	INPUT: -(public) expenditure per student, tertiary (% of GDP per capita) - total expenditure on education (% GDP) OUTPUT: school enrolment tertiary, teacher/pupil ratio, primary completion rate, unemployment with tertiary education, labor force with tertiary education, and PISA 2006 average score.	-new EU member states show relatively high efficiency in tertiary education efficiency -CEE countries, Hungary, Estonia and Slovenia have high efficiency in primary, secondary and tertiary education, respectively. -most CEE countries have potential for increased efficiency in (public) spending
Bađun et al. (2014)	Total government spending efficiency, optimal government size, Public investment efficiency, public administration efficiency	DEA/Tobit approach **Sample**: EU member states plus Iceland and Norway	Total: INPUT: general government expenditure % GDP , OUTPUT: average GDP growth rate Public investment: INPUT: general Government gross investment in% GDP OUTPUT: The public infrastructure quality Public administration: INPUT: share of expenditure on general government employees' salaries in GDP OUTPUT: government effectiveness, 2) regulatory quality and 3) rule of law efficiency of the legal framework in settling disputes and the number of days to start a business (both from GCR).	-The average optimal size of government in old EU countries is larger than that in new EU countries -the optimal government size for the sample is 39.21%, thus countries should, on average, reduce their general government expenditure (% GDP) by 3.54 p. p. **Efficiency determinants** -family size has appositive effect on gross efficiency, Openness has negative effect on efficiency -GDP per capita, the share of population over 65, total population, population density, are insignificant. -Countries with larger physical capital stock can achieve the same growth rates with less government expenditure. -countries with longer life expectancy show a larger optimal government size with given growth rates.
De Witte & Moesen (2010)	Optimal government size	DEA/Tobit regression **Sample:** 23 OECD, 1999	INPUT: General government spending OUTPUT: GDP growth, PSP composite indicator	-the public sectors should decrease by3.74 p. p. to reach an overall tax burden of 41.22% of GDP. **Efficiency determinants:** larger exports negative effect on efficiency, GDP per capita shows a positive but insignificant effect on efficiency, family size, country size, population density and urbanization show a positive effect on efficiency
Herrera & Pang (2005)	Efficiency of government spending in health and education	DEA, FDH, input and output oriented **Sample:** 140 countries 1996 - 2002.	INPUT: Public expenditure on health per capita in PPP terms, Public expenditure on education per capita in PPP terms OUTPUT: Education- Primary school enrollment, secondary school enrollment, literacy of youth, average years of school, first level complete, second level complete, and learning scores. Health- Life expectancy at birth, immunization, the disability, adjusted life expectancy	- higher expenditure levels ,the wage bills a larger share of the total budget, publicly financed service provision, the prevalence of the HIV/AIDS epidemic, income inequality, and the degree of external aid financing(negatively associated with efficiency) - the degree of urbanization (positively correlated with efficiency)

Jafarov & Gunnarson (2008)	Health care, education, social protection efficiency	DEA **Sample:** Social spending in Croatia is evaluated against Frontiers estimated for the EU-15, the EU-10, Cyprus, Malta, and OECD countries.	INPUT: public health expenditures (PPP per capita), public expenditure social benefits (PPP dollars per capita) OUTPUT: -Health care: intermediate output (the density of physicians, pharmacists, and healthcare workers, number of hospital beds, number of immunization vaccines.), outcome (infant, child, and maternal mortality rates; the standardized death rate from all causes per 1,000people, incidences of tuberculosis, healthy average life expectancy) -Education: Intermediate output indicator (primary pupil-teacher ratios, enrollment rates, rates of progression to secondary education, and graduation rates), outcome indicator (PISA). -Social protection: The key outcome indicator is poverty rates	-evidence of significant inefficiencies in Croatia's social spending (inadequate cost recovery for health and Education services, weaknesses in the financing mechanisms and institutional arrangements, weak competition in the provision of social services, and weaknesses in targeting benefits. **Efficiency determinants:** -inefficiencies in health spending in Croatia partly related to high pharmaceutical spending, long stays in hospitals, low levels of out-of-pocket spending and of private participation. -positive relationship between overall efficiency and the share of current expenditure in total education, classroom size, parent's education and school quality and autonomy indicators
Prasetyo (2013)	government expenditure efficiency in health, education, transfers and subsidies	DEA, Malmquist Index **Sample:** 81 countries, 2006-2010	INPUT: government expenditures per capita on education and health sectors and also on subsidies and other transfers OUTPUT: Human development index	-Armenia, Australia, Bangladesh, Chile, Georgia, Japan, Korea Republic, Lao PDR, Madagascar, Niger, Norway, Philippines, Sierra Leone, Singapore, US, and Zambia remained efficient in the sample period
Rahmayant & Horn (2011)	-Government efficiency -optimal government size	DEA, panel fixed effect regression, (GMM-HAC) **Sample**: 63 developing countries 1990-2003	INPUT: Government share to GDP (%) OUTPUT: -literacy rate for education (%), electricity use for infrastructure, life expectancy for health (%)	-Above a certain threshold, efficiency reduces the government expenditure required to maximize growth. - Optimal size for government expenditure exists if country's efficiency score is higher than 0.865. -with the average sample efficiency score of 0.89, the optimal government expenditure is around 15% of GDP.

THE INFLUENCE OF EUROPEAN SANCTIONS ON THE DIRECT INVESTMENTS AND THE ACTIVITY OF RUSSIAN ENTERPRISES

Elena Fedorova, Igor Lukasevich, Daria Sukhurokova

Abstract

The article examines some aspects of the impact of sanctions on restrictions on the implementation of direct investment in the Russian economy. Based on DEA methodology the impact of sanctions on operational and technical efficiency of Russian enterprises is assessed; short-term and long-term consequences of their introduction are observed.

Keywords: sanctions; spillovers; foreign direct investment; operational effectiveness; technical efficiency; DEA method; crisis; investments; economic analysis; import substitution

JEL Classification: D51, C54

Throughout 2014-2015 the Russian economy is developing in unprecedented external and internal conditions that were formed under the combined impact of both political and economic factors of a global nature. The large-scale international sanctions imposed on the Russian Federation are primarily manifested in limited access to Western financial markets, the ban on the export of advanced technologies, the reduction of foreign and domestic trade, the reduction of foreign investment, etc., which causes an increase in the uncertainty of the results of the activities of economic agents.

Let us look into several of these factors in more detail.

Firstly, it is the negative impact of sanctions on the foreign trade turnover of enterprises (on both suppliers and consumers of products outside the Russian Federation zone). According to the statistics of the Federal Customs Service of the Russian Federation, in 2014 the value of goods turnover fell by $ 61.3 bln (or almost 7.3%), goods exports – by $ 29.5 bln, or 5.7%, commodity imports – by $ 31.8 bln or by 10.0%. At the same time, the foreign trade balance of the Russian Federation remained at tlevel of recent years - $ 210.9 bln.

Such dynamics shows the continuation of the trend towards stagnation in the sphere of foreign trade relations in 2012-2013, after a period of rapid growth in the pre-crisis period of 2003-2008 and post-crisis period of 2010-2011. According to the official data of the Federal Customs Service of the Russian Federation the leaders in the foreign trade with the Russian Federation are the members of the European Union (EU), among which the Netherlands remained at the forefront (the Rotterdam effect) [4, p. 25], Germany and Italy. They accounted in total for 51% of the total mutual trade turnover between the EU and the Russian Federation. As a collective partner of the Russian Federation, the European Union lost only 1.4 percentage points for 2014, but the situation differs very much for individual countries.

Secondly, it is the import substitution and the rise in prices on products. Sanctions and counter-sanctions cut off the Russian Federation from the world financial market and some commodity markets as well. Combined with the continuing global systemic economic crisis, which the Russian Federation is a part of, they are making the development of import-substituting industries (and as a result the long-term problem of self-reliance policy) not only a short-term social necessity but also a long-term alternative to the raw-material model of economic development [8, p. 49-68].

As for the results of economic activity of enterprises, the price factor, which manifests itself both in the short-term (1-2 years) and in the medium-term (3-5 years) period deserves special attention here. In the short run, price growth is capable of both supporting import substitution (if the outpacing growth in prices is observed for finished goods produced by domestic companies), and undermining its potential (if the prices on raw materials and components necessary for import substituting production increase rapidly) [8, pp. 49-68].

Thirdly, it is the impact of counter-forces on the proceeds of domestic enterprises. The Russian Federation imposed an embargo on the import of a wide range of agricultural and food products (including fish products) from the US, the EU, Canada, Australia and Norway, and limited purchases of several types of imported products for state needs.

The fourth factor is the appreciation of the currency rate. The sanctions have somewhat changed the supply-demand ratio in the Russian foreign exchange market. An additional problem after the introduction of sanctions for Russian banks is connected with closer attention to the structure of their loan portfolio. Earlier, the main issue of interest for foreign investors concerned the concentration of credit risks on affiliated borrowers, but now their attention is focused on the volume of loans issued to companies from the sanctions list, which forces Russian banks to make adjustments to their credit strategies in order to meet the needs of international investors [7, pp. 54-66].

The fifth factor is the outflow of foreign direct investment (FDI). The volume of foreign investment in Russia has been low for several years.

According to the Central Bank of the Russian Federation, in 2014 the inflow of FDI into Russia fell threefold, from 69 bln to 21 bln dollars (at least since 2005), with all inflows falling for the first half of the year (i.e. before the sanctions began). Then there was an outflow for two quarters – there was no such thing in Russia since 1994. For the first nine months of 2015, the non-banking sector of the Russian Federation totaled $6.3 bln, which is 3,2 times less than in the same period last year. At the same time, it is noted that in the third quarter of 2015, FDI amounted to $1.5 bln, which is 37.5% less than in the II and I quarters ($2.4 bln).

Formally, the sanctions relate to future investments and do not affect the investment projects that are currently implemented, but the supply of products and services is difficult for them. Below are examples of suspension of investment cooperation of foreign and domestic companies after the introduction of economic sanctions.

The Italian oil refinery company Saras has postponed its plans to establish a joint venture with Rosneft Open Joint Stock Company (Rosneft) for oil and oil products sales.

The French company Renault Trucks Defense, owned by the Swedish Volvo concern, suspended the development of the Atom infantry fighting vehicle project that they are working on together with the Russian company Burevestnik (a member of the Uralvagonzavod Corporation).

The Italian company Finkantieri suspended a project with the Central Design Bureau of Marine Equipment "Rubin" to develop a small non-nuclear submarine S-1000.

The French company Total stopped the implementation of a joint project with LUKOIL to develop hard-to-recover hydrocarbons in Western Siberia; froze the purchase of shares of NOVATEK, the second largest producer of natural gas in Russia.

The Anglo-Dutch Shell has changed plans to expand cooperation with Gazpromneft for the extraction of shale oil.

Italian oil refining company Saras has postponed the creation of a joint venture with Rosneft to sell oil and oil products.

The given list is not complete and can be extended with examples from other areas of economic activity.

Since FDI is one of the most important factors in the development of the economy, its technological and innovation potential, this paper presents the analysis of this particular factor.

The paper focuses on several hypotheses.

Hypothesis 1. The investing country is important for the effectiveness of companies with FDI. Companies work more efficiently if a developed country acts as an investor, since the sanctions were imposed mainly by developed countries, the sanctions they imposed will negatively affect the Russian economy.

It is assumed that enterprises of developed countries possess advanced technologies and experience in more efficient production of goods and services that can be transferred to the enterprises of the recipient country.

In this connection, developed countries, which carry out the largest investments in the domestic economy, were chosen for the analysis: the USA, Austria, Germany, Italy and France.

Scientists from China were the first to discover differences between the effectiveness of foreign investment depending on the source of funding [8, pp. 677-691]. They analyzed the influence of foreign capital on export- and import-oriented industries receiving funds from two different groups of investors – Western (representatives of the Organization for Economic Cooperation and Development (OECD)) and eastern (Hong Kong, Taiwan, Macao). The results of the research showed that investments of a group of developed countries affect the national economy positively, while investments of developing countries contribute to the strengthening of negative horizontal effects.

Hypothesis 2. It is assumed that FDI affects not only the company's efficiency but also the competitiveness of the industry, i.e. the technology chain of suppliers and contractors, as well as export/import in the industry. Therefore, the negative effect of imposed sanctions will be significant.

Methodology of the study. As a criterion for assessing performance, the following indicators were selected: return on assets and technical efficiency.

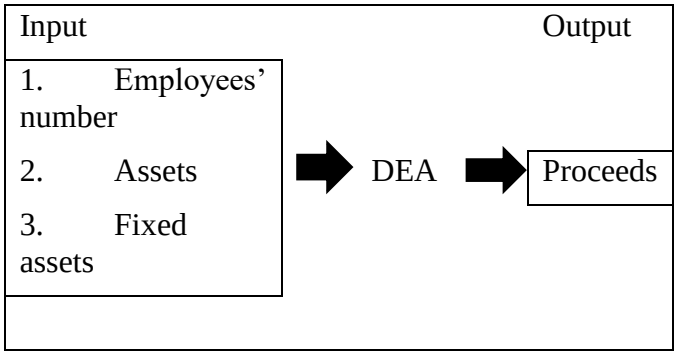
The evaluation was carried out on the basis of the DEA methodology. It is worth noting that the DEA method is now widely used in the Russian Federation. For example, T. Ovchinnikova. [6, pp. 20-26] conducted a study of the competitiveness of dairy enterprises in the Voronezh Region based on the DEA method. In the course of the research the task was to minimize costs at the expense of intangible assets while maintaining output volumes.

The work of A.I. Ampilogova [3, pp. 5-29] considers the assessment of the risks of bankruptcy of Russian firms using this method on the example of the companies that produce equipment for the petrochemical industry. The valuation was carried out according to the data of 73 companies for the period from 2007 to 2009 using CCR and BCC models in two groups of variables. The first group of variables is a classic set of indicators from the Altman model, in the second group, the proceeds from the sale of products and fixed assets were selected as the initial ones, and the payables, short-term loans and credits, and the difference between payables and proceeds.

Fedorova E.A., Korkmazova B.K. and Muratova M.A. present the results of the research on the application of the DEA methodology for assessing the efficiency of companies with FDI by industry for domestic companies in their article by [8, pp. 47-63].

To assess technical efficiency classical indicators for input and output were used.

Figure 1 - Evaluation model of technical efficiency



Source: own proposition

Also, horizontal and vertical spillovers were used to estimate the propagation effect.

Horizontal spillovers are effects that arise within a certain set of enterprises directly within the industry and the region in which the company with foreign participation is located. Their influence is calculated by the following formula (1):

$$HORIZ_{jt} = \frac{\sum_{i, i \in j, FS_{i,j,t} \geq 0,1} FS_{i,j,t} FA_{i,j,t}}{\sum_{i, i \in j} FA_{i,j,t}}, \quad (1)$$

where $HORIZ_{jt}$ – horizontal spillover for industry j;

$FS_{i,j,t} \geq 0,1$ – share of foreign capital in firm i for period t in sector j;

$FA_{i,j,t}$ – the cost of capital assets of firm i for period t in sector j.

Vertical external effects (vertical spillovers) are inter-branch effects in the supplier-buyer chain. They arise in one of the industries in response to changes in the other one that is located at the different level of the same technological chain. In literature there are two types of vertical spillovers – forward and reverse.

Forward spillover effects is the effect transmitted from the supplier to the consumer, which is determined by the formula (2):

$$FORW_{jt} = \beta_{kj,t} HORIZ_{jt}, \quad (2)$$

where $FORW_{jt}$ – forward spillover effect for industry j;

$\beta_{kj,t}$ – consumption share of sector k of the products from sector j for period t.

Reverse spillover effect is the effect transmitted from the consumer to the supplier, which is determined by the formula (3):

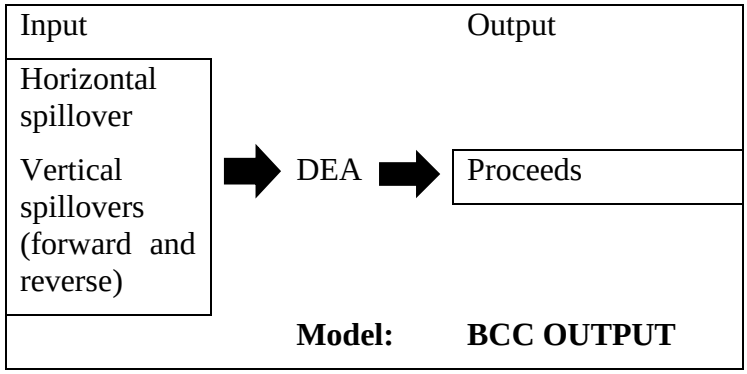
$$BACK_{jt} = \beta_{jk,t} HORIZ_{jt}, \quad (3)$$

where $BACK_{jt}$ – reverse spillover effect for industry j;

$\beta_{jk,t}$ – production share of sector j of the products consumed by sector k for period t.

To assess the technical efficiency the classical input values of horizontal and vertical spillover effects were used (Fig. 2).

Figure 2 - Evaluation model of technical efficiency for horizontal and vertical spillovers



Source: own proposition

To assess the technical efficiency of the impact of FDI on exports and imports, export-import spillovers were used.

Import spillover effect is the effect transmitted from suppliers from foreign countries to the consumer - a resident of the Russian Federation. This effect is determined by the formula:

$$IMPORT_{jt} = \alpha_{jk,t} HORIZ_{jt}, (4)$$

$IMPORT_{jt}$ – import spillover for industry j;

$\alpha_{jk,t}$ – consumption share of the Russian economic sectorд j for period t of the products that came from the foreign economic sector k.

In the case of a positive sign of the import spillover the conclusion is that the Russian companies depend heavily on imported suppliers. Consequently, in conditions of limited supplies from abroad, the Russian economy will experience a decline until the program of import substitution of goods enters into full force.

Export spillover effect is an effect transmitted from buyers from foreign countries to Russian companies. This effect is determined by the formula:

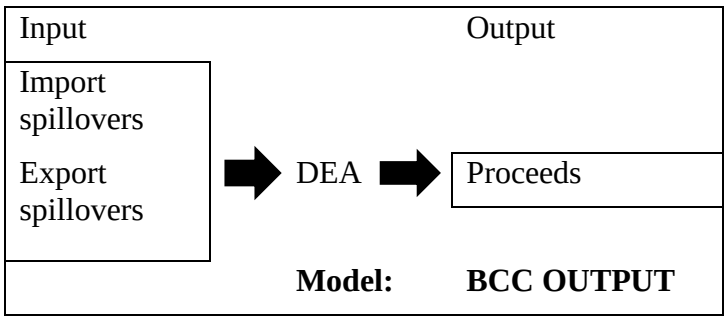
$$EXPORT_{jt} = \alpha_{kj,t} HORIZ_{jt}, (5)$$

$EXPORT_{jt}$ – export spillover for industry j;

$\alpha_{kj,t}$ – consumption share of the foreign economic sector доля k of the products for period t produced by Russian sector j.

To assess the technical efficiency the input indicators of import and export spillover effects were used (Figure 3).

Figure 3. Evaluation model of technical efficiency for import and export spillovers



Source: own proposition

For analysis of sectoral effects, the data bank of Russian companies for 2004-2013 was used. (source – 'Ruslana' database, 2014) containing information on balance sheet indicators, profit and loss of enterprises, capital structure, number of employed employees and industry. Companies are divided into enterprises with and without FDI. Enterprises were selected according to the following criteria: the organizational legal form of the enterprise (open joint-stock companies and closed joint-stock companies, limited liability companies), the number of employees in the enterprise (from 50 people), and the share of foreign capital (at least 10 % for the period 2005-2014). The total number of analyzed companies was 24,219. The results of the study are presented in Table 1.

As follows from Table 1, the operating efficiency of companies with foreign investors from developed countries in comparison with companies with investments from China is indeed higher. If we consider the period 2006-2009, then the highest efficiency among enterprises with investors from Italy, the United States and Germany. Separately, I would like to note companies with FDI, where the investor is a developing country - China, their effectiveness is the lowest throughout the study period. For example, in 2013 the operating efficiency of the company's return on assets with investments from China was only 2.6%.

Table 1 - Evaluation of the company's performance in terms of sources of FDI, expressed through the DEA in the pre-crisis, crisis and post-crisis periods

Countries	Period		
	2006-2009	2010-2012	2013
Austria	10,7	7,4	8,2
Germany	18,3	17,0	14,7
Italy	21,5	30,0	21,7
Cyprus	11,9	10,0	9,8
China	9,2	3,5	2,6
USA	21,2	17,6	14,2
France	16,2	12,7	10,9
Offshores	22,4	10,1	6,89
Sanctions	16,7	15,7	13,2
Average	14,81	12,4	10,219

Source: own calculation

The average efficiency decreases with time from 14.81% in 2006 to 10.21% in 2013, which confirms the initial hypothesis. As for the offshore companies it is true that in 2006-2009 the operational profitability of companies, where the investor is a country from offshore zones, is higher: it is 22,4% in 2006-2009, however, it decreases to 6,89% in 2013.

At the same time, for companies with investments from Cyprus operating efficiency was below average throughout the period. However, it still exceeded the same figure for companies with investments from China.

It is easy to see that companies with investments from countries that have imposed sanctions are working more efficiently. However, operational efficiency may not fully reflect the real efficiency.

Therefore, the technical efficiency was evaluated by using the DEA method to test the hypotheses put forward.

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It is easy to see that companies with investments from countries that have imposed sanctions are working more efficiently. However, operational efficiency may not fully reflect the real efficiency.

Therefore, the technical efficiency was evaluated by using the DEA method to test the hypotheses put forward.

Table 2 - Evaluation of the company's performance in terms of sources of FDI by the DEA method in the pre-crisis, crisis and post-crisis periods

Investing countries	DEA classics			Dea_tech			Dea_export		
	2006-2009	2010-2012	2013	2006-2009	2010-2012	2013	2006-2009	2010-2012	2013
Austria	0,44	0,47	0,53	0,30	0,15	0,22	0,37	0,21	0,21
Germany	0,36	0,46	0,56	0,16	0,12	0,14	0,71	0,51	0,52
Italy	0,51	0,66	0,69	0,79	0,79	0,80	0,41	0,23	0,27
Cyprus	0,13	0,20	0,40	0,11	0,05	0,04	0,09	0,08	0,06
China	0,87	0,80	0,94	0,85	0,84	0,99	0,86	0,20	0,26
USA	0,43	0,45	0,54	0,12	0,21	0,18	0,20	0,30	0,27
France	0,65	0,52	0,56	0,61	0,67	0,64	0,39	0,32	0,33
Offshores	0,12	0,16	0,20	0,10	0,04	0,03	0,34	0,32	0,35
Sanctions	0,33	0,39	0,39	0,14	0,15	0,14	0,16	0,12	0,21
Average	0,46	0,39	0,52	0,37	0,33	0,34	0,50	0,33	0,26

Source: own calculation

In accordance with the model technical efficiency varies from zero to one, the closer this index is to unity, the higher the technical efficiency is. Technical efficiency is highest for companies with China as the main investor. Companies with investments from China most influence the spread of FDI effects along the technology chain, as well as the competitiveness in the industry and export-import activities.

Let us consider technical efficiency for companies with investments from developed countries. The most effective are companies with investments from France (0.65 in 2006-2009, 0.52 in 2010-2012 and 0.52 in 2013).

Companies with investments from Italy are also effective in terms of impact on technological chains and competitiveness in the industry, but they have little impact on export-import activities.

Companies with investments from the US are effective at an average level, but in fact, they do not have a significant impact on export-import activities and technological chains.

Companies with investments from Germany have the most influence on export-import activities.

The technical efficiency of enterprises with investments from companies registered in offshore zones is the lowest – 0.12 for 2006-2009 with an average efficiency of 0.46 (i.e., actually four times lower). In this case, FDI from offshore does not affect competitiveness in the industry and the technology chain. This is explained by the fact that these are investments of domestic companies, and they do not introduce any innovations.

The results of the research lead to the conclusion that the technical efficiency of companies with investments from countries that have imposed sanctions is not particularly high and is below the average level. This shows that sanctions for FDI from specific, individual countries are more important for the Russian economy than the ones from the developed countries in general.

At the same time, although the sanctions are of a short-term nature, they definitely have long-term consequences.

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CHANGEOVER TO EURO IN LATVIA: EXPECTATIONS AND OUTCOMES

Aleksandrs Fedotovs, Oksana Sakalosh

Abstract

During 2011-2015, the three Baltic states, Estonia, Latvia, and Lithuania, joined euro area. It was officially hailed as a great success. On the other hand, public attitude towards the single EU currency has never been unanimous. Promised advantages and more reluctantly admitted potential losses from changeover to euro in the Baltic states were similar to those supposed in other countries. The aim of paper is to verify the most typical expectations concerning effects, both positive and negative, of single currency, in the case of the Baltic states and Latvia in particular. Research methods used include application of economic theory, analysis of statistical data, authors' calculations, and correlation analysis. Authors conclude that neither the most optimistic promises nor the most pessimistic predictions proved true. Introduction of euro in the Baltic states didn't have any essential effect on foreign trade, foreign investment, or overall economic situation. Euro proves to be primarily a political project to enhance the European unity and to tighter bound member states to the EU.

Keywords: European Union, euro, eurozone, optimum currency area, Baltic states, economy of Latvia

JEL Classification: F45

Introduction

Since January 1, 2011, the three Baltic states, Estonia, Latvia, and Lithuania, one by one joined the euro area. After regaining their national sovereignty in the beginning of the 1990s, these states returned to their former national currencies used in the 1920s – 1930s: Estonian krona, Latvian lat and Lithuanian litas. Fixed exchange rates were chosen for the restored currencies: Estonian krona (EEK) was pegged to DEM, Lithuanian litas (LTL) to USD, and Latvian lat (LVL) – to SDR currencies basket. After becoming the EU members in 2004, the three Baltic countries immediately started striving for changeover to euro, aspiring to achieve this goal as soon as possible. However, before the 2008-2009 global crisis they didn't succeed since the Maastricht criteria had not been met by their economies. Estonia was the first granted permission to introduce euro from January 1, 2011; Latvia followed from January 1, 2014, and Lithuania from January 1, 2015. The three Baltic nations, like all other EU new member states, had no right to "opt out" since joining the EU automatically predetermined for them adopting the single EU currency. Changeover to euro was an important event glorified as a great success in each of the three countries.

1. THEORETICAL DEBATE AND POLITICAL AMBITIONS

In economic theory, the concept of optimum currency area has a long history dating back to the 1960s (Tower and Willett, 1976). At present, optimum currency area is usually defined as a group of regions with economies closely linked by trade in goods and services and by factor mobility (Krugman et al., 2015, p. 682). More specifically, this concept implies high labour mobility or single and synchronized fluctuations of aggregate supply and demand (Samuelson and Nordhaus, 2007). Besides, some additional conditions are mentioned as necessary for successful single currency area: similarity of economic structure in member states, fiscal

federalism, and banking union. Taking all this into account, doubts on whether the European Union satisfies the criteria of optimum currency area, turn out quite reasonable (Krugman et al., 2015, Стариков, 2013). In the case of the EU, macroeconomic fluctuations remain unsynchronized while the labour mobility still appears limited.

The gains promised from a single currency use to be (Mankiw et al., 2013; Krugman et al., 2015; McConnell et al., 2015):

- ending the inconvenience and expenses of exchanging currencies;
- greater price transparency, price convergence and reduction;
- less exchange rate risk and uncertainty;
- enhancing mutual trade within the currency union;
- encouraging foreign investment;
- convergent and lowering interst rates;
- ultimately, greater economic stability and rising living standards.

As concerns some of the above-mentioned outcomes, effects of single currency on mutual trade between the members of currency union have been analysed by different authors with changeable results (Rose, 2000, Rose & Wincoop, 2001, Baldwin, 2006); also, price behaviour in the EU single market has been studied by several authors (Engel & Rogers, 2004, Cuaresma et al., 2007). Some degree of price convergence seems to be recently demonstrated by Eurostat data**.** However, price convergence with more rich EU countries is hardly benefitting population of more poor countries given much lower income levels.

As potential losses under single currency, asimmetric shocks in case of unsynchronized economic development and loss of independent monetary policy are typically mentioned. It had been demonstrated long ago by R. Mundell and M. Fleming that monetary policy under fixed exchange rate and perfect mobility of capital proves inefficient as international flows of capital offset any attempts of the domestic central banks to carry out their monetary policies. This was exactly the case of small open economies of the Baltic states since they chose fixed exchange rates for their restored national currencies. Transition to euro ultimately excluded existence of own monetary policy for these states. It is also stated in economic theory that currency union without optimum currency area may "sentence" backward regions to permanently low growth rates and high unemployment (Samuelson & Nordhaus, 2005).

Aim to join eurozone was set in the Baltic states simultaneously with joining the EU. Governments, political elites, central bank's management, bankers and big part of business persistently imposed this idea on public. In Latvia, the first step towards transition to euro was made by re-pegging Latvian lat from SDR to euro from January 1, 2005. The bulk of Latvia's population didn't feel much effect of this as most of people earned and spent their incomes in lats. For individuals and businesses who had taken loans in euros, currency risks actualy disappeared, but increased for those borrowing in USD. That's why mass convertion of debt residuals to euro was observed. Entrepreneurs who already set deals in euros gained from reduced transaction and hedging costs. Investors seemed to benefit of a more transparent currency regime. Consumers and business became able to more easily compare prices in different EU countries. On the other hand, companies making transactions in USD or other currencies, as well as all residents having USD in possession, were losers as they faced higher currency risks. Bigger exchange rate fluctuations against other foreign currencies (first of all, against US dollar) proved the most visible effect after pegging lat to euro since national currency now fluctuated together with euro. With growing role of euro in Latvia's foreign

transactions this effect of fluctuations against other currencies became less important for national economy.

Hope for admission to eurozone was cherished before the economic crisis of 2008-2009 and initially it was planned to achieve this aim on January 1, 2008. However, the Maastricht criteria were not met by Latvian economy, the main obstacle being too high inflation rate.

After the crisis the ruling elite resumed to pull Latvia at any expense into eurozone. It was openly admitted that it is first of all a political decision. Moreover, it seemed that tool was confused with aim. Joining eurozone which should be merely a tool to raise economic welfare of the country actually became an end in itself.

2. PUBLIC ATTITUDE TOWARD EURO

As compared to other new EU member states, population of Latvia and Estonia was from the very beginning among the most sceptical towards joining the European Union. In the EU accession referendums in 2003, 33% voted against joining the European Union in Estonia and 32% in Latvia (Ministry of Economics, 2003). It is worth mentioning that by the time of referendum essential part of the population in Estonia and Latvia was deprived of voting rights. Citizens of former USSR having in independent Latvia status of "non-citizens" accounted for about 1/3 of the total country's population. So, merely 2/3 of the country's population had the opportunity to vote; out of them, only 71% actually voted, and only 67% of the votes were in favour of the EU. Therefore, joining the EU was decided by hardly 1/3 of the population.

Although population of the Baltic states was deprived of making decision on changeover to euro, public opinion polls on this issue were regularly carried out. In Latvia introduction of euro was never supported by the majority of population.

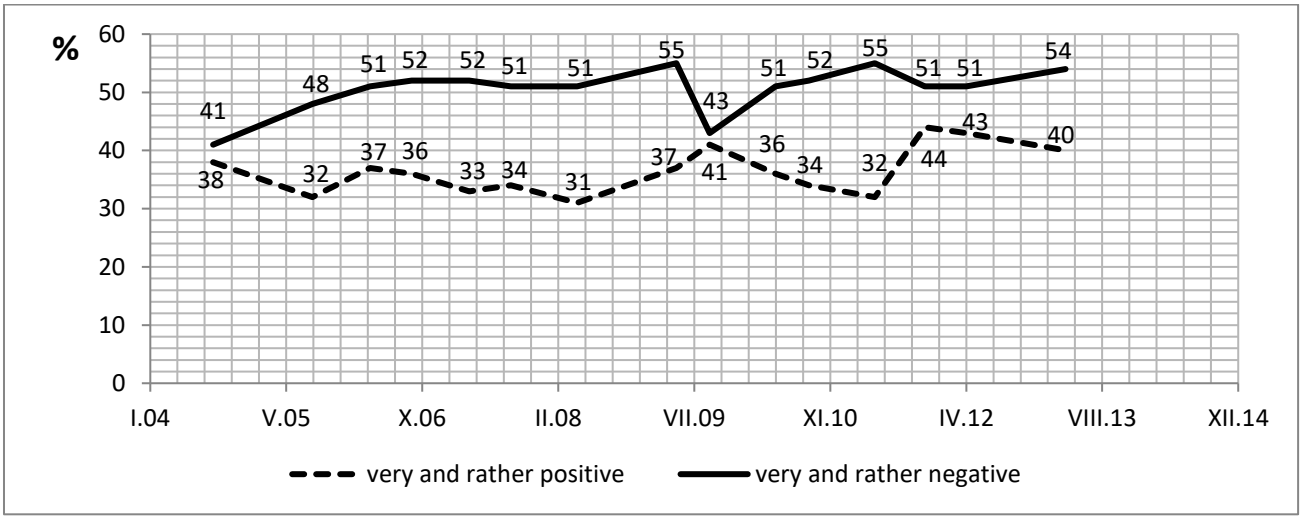
In Latvia polls were periodically carried out by Centre for public opinion studies (*Sabiedriskās domas pētījumu centrs*, SKDS) during 2003-2005, in the time when the first attempt to join eurozone was made. These polls steadily showed that replacement of national currency by euro was supported by minority of Latvia's population. In August 2003, 50% of population were against euro, 46.5% were against in August 2004, 37.2% in April 2005, and 49.1% in August 2005. Percentage of euro supporters equalled 35.4% in August 2003, 41.1% in August 2004, 34.5% in April 2005, and 38.2% in August 2005 while the rest proved neutral or could not decide (www.skds.lv). Transition to euro was more often supported by young people. In distribution of respondents by age, the only age group in which supporters of euro outnumbered the opponents was the 18 – 24 years old cohort. The higher was the respondents' age, the greater proved percentage of euro opponents.

Attitude of Latvia's population towards euro was primarily based upon economic considerations such as spearing money on currency convertion, easier travel, and decrease in transaction costs for business. Among the reasons of apprehention towards euro was fear of possible price increase. And yet, the most important was the belief that each country must have its own currency – a symbol of statehood as much important as national flag, coat of arms, and anthem.

Similar results appeared in regular Eurobarometer surveys during 2004-2013. The surveys demonstrated that the population of Latvia was among the most sceptical in the EU new member states in regard to euro. Majority of the country's population believed that transition to euro should be postponed. In 2005, only 39% of Latvia's population was interested in changeover to single European currency which proved to be the lowest percentage in the new EU states. Population of Latvia, more than that of other new EU members, apprehended loss of

national identity in case if national currency were replaced by euro. 59% feared of this in 2005. Also, in Latvia, more than in other new EU member states, population was afraid that introduction of euro would lead to loss of government control over economic processes. 51% were anxious about that (LETA, 2005). Those expecting negative consequences for national economy steadily outnumbered those who believed in positive effects of euro (Figure 1). Situation looked similar in Lithuania.

Figure 1 - Consequences of introduction of euro as perceived by population of Latvia, %



Source: Flash Eurobarometer 377, 2013

Public scepticism towards euro continued to be manifest when the government and Bank of Latvia resumed efforts of changeover to euro after the 2008-2009 crisis. Opponents of euro argued that:

- decision on joining the EU and, subsequently, to adopt euro, was in fact made by votes of minority of Latvia's population;
- many other EU countries still sticked to their national currencies;
- lat was not just an emotional symbol of Latvian statehood, but also a tool of national economic policy so necessary to carry out economic reforms;
- recent problems of Eurozone (especially the Greek crisis) proved unability of euro to provide economic safety and stability.

These and other reasons were summarized in 2013 in open letter to Kabinet of Ministers and Parliament (Saeima) of Latvia, "For lat, against euro!", signed by a number of intellectuals and public activists. Authors of the letter demanded to postpone replacement of lat by euro and to hold people's referendum on the issue. Posters against euro could be seen in the streets. All this, however, was ignored.

3. AFTER THE CHANGEOVER: PROMISES AND RESULTS

3.1 The first assessment attempts

The main gains from changeover to euro promised to population of Latvia were those traditionally suggested in other countries:

- convenience of single currency, eliminated costs of currency exchange; as a result, easier doing business with other countries or living in them; lower travel costs and cheaper bank transactions (according to Bank of Latvia, business' and consumers' expenses on currency conversion in 2007-2011 amounted to approximately 600 million euros);

- excluded foreign exchange rate risk against euro, gone concerns about devaluation of Latvian lat; as a result, for population and enterprises – more safety in savings, ability to make more rational financial decisions;

- higher international credit ratings for Latvia; due to that, lower interst rates on foreign loans, less cost of serving government debt and releasing the state budget funds for other priorities;

- lower domestic interest rates due to lower currency exchange risk and country risk (interest rates on loans in lats were indeed higher than interest rates on loans in euros in Latvia); this should facilitate economic activity and economic growth;

- greater confidence of foreign investors, therefore, surge of foreign investment;

- opportunity for any person to participate with his/her money in huge single European financial market, e.g., via using bank services, purchasing securities etc.;

- euro supporters always entertained hopes that it would facilitate mutual trade between the countries using single currency;

- greater transparency of prices and easier price comparisons across the EU countries; as a result, more tough competition entailing price decrease within the single market.

Bank of Latvia was lavish with promises. Small business was promised lower interest rates and greater opportunities in the broad European market (Kreituss & Pavare, 2014), tourism sector – increased motivation for both outbound and inbound tourism, export industries – growing volumes of exports, banking sector – higher stability and broader opportunities, the population as a whole – more jobs and increase in incomes. Ultimately, as was promised, in the long run the changeover would contribute to macroeconomic stability in Latvia, encourage economic activity, raise wefare of population and facilitate Latvia's convergence with the EU living standards.

Among potential negative effects were admitted:

- possible price increase because of "rounding" them upwards during transition to euro;

- loss of national currency (this effect was, however, qualified as just "emotional" one);

- loss of independent monetary policy;

- greater fluctuations of exchange rate against other currencies except euro (actually, this already came into effect with pegging lat to euro).

First attempts to assess the actual effects appeared by the end of 2014, one year after the changeover. Experts of Bank of Latvia and major Latvia's commercial banks, *SEB, Swedbank, Nordea, DNB,* stated neither stunning achievements nor accidents. Most of the benefits for

business were attributed to elimination of currency conversion costs. Serving the foreign debt became cheaper and, as was stated, Latvia took advantage of this in 2014. It was admitted, however, that interest rates on Latvian debt securities decreased due to overall trends in global financial markets and it was not a result of accession to eurozone.

Experts asserted also that euro contributed to overall stability of Latvian economy, especially in the end of 2014, under the circumstances of weakening Russian ruble. It was admitted simultaneously that euro itself could not make Latvian economy more resilient to external shocks.

The consumer price increase was neglectible. Introduction of euro was believed to raise the annual inflation rate by 0.1– 0.2 percentage points – even less than it was experienced in other new euro area countries.

The only negative item mentioned were expenses of companies on adapting their systems and cash registers to work with euro. These costs were not huge. According to the Bank of Latvia, they might equal some 250 million euros or less than 1% of GDP.

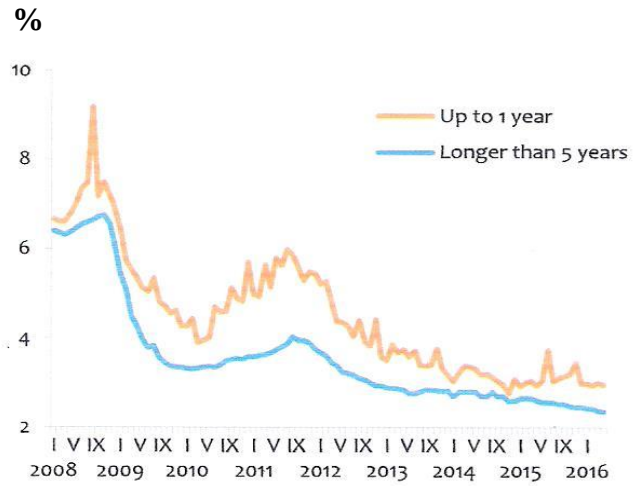
It was stated that one year was too short time to give precise estimates of the impact of euro on national economy. The major economic benefits were still promised in subsequent years. At present, when several years have already passed, the results might become clearer. But, on the other hand, the more time passes, the more difficult is to separate effects of euro from those of other economic or political factors.

3.2 International ratings and interest rates

All major international rating agencies upgraded the credit rating of Latvia in 2014. For instance, Standard & Poor's raised Latvia's credit rating in 2014 from BBB + to A- and reaffirmed this in the subsequent years. On the other hand, sceptics argued that rating agencies considered joining eurozone as a reason to upgrade a country's rating in a particular year, but afterwards the ratings might decline again. As examples, Slovenia, Cyprus, Malta, Slovakia, and Estonia were mentioned. Standard & Poors, Fitch, and Moody's had raised (or held constant) ratings of these countries immediately after their changeovers to euro, but lowered again in subsequent years. Thus, in the long run other considerations than belonging to eurozone prove more essential for the rating agencies.

Improved credit ratings were expected to result in lower domestic interest rates. Interest rates used indeed to decrease in all countries preparing for introduction of euro since it was necessary requirement to meet the Maastricht criteria. Interest rates continued to decline in Latvia after changeover to euro as they did it in preceding post-crisis years (Figure 2). Long-term interst rates reached their historical minimum (2.36%) by April 2016; short-term interest rates also decreased on the whole, though with more pronounced fluctuations. Once again, it cannot be asserted that the changeover to euro was the direct reason for the dynamics of interest rates.

Figure 2 - Weighted average interest rates on loans in credit institutions in Latvia, 2008-2016



Source: Ministry of Economics, June 2016, p. 80.

Ratings of the Baltic states in terms of Global competitiveness index (GCI) have not substantially changed during a decade and there is no obvious link between adoption of euro and fluctuations of the GCI (Table 1).

Table 1 - Global competitiveness indexes for selected states, 2007 – 2017

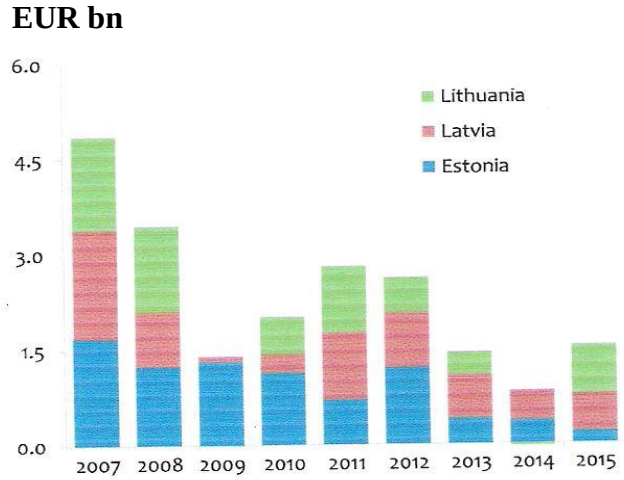
Country	2007 – 2008		2012 – 2013		2013-2014		2014 – 2015		2015-2016		2016-2017	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Estonia	4.74	27	4.64	34	4.65	32	4.71	29	4.74	30	4.78	30
Lithuania	4.49	38	4.41	45	4.41	48	4.51	41	4.55	36	4.60	36
Latvia	4.41	45	4.35	55	4.40	52	4.50	42	4.45	44	4.45	44

Sources: The Global Competitiveness Reports, 2007 – 2016.

3.3 Dynamics of foreign investment

Among unfulfilled promises, the effect of euro changeover on foreign investment should be mentioned. The promised surge of investment has not occurred. Foreign direct investment (FDI) dynamics in Latvia, as well as in other Baltic states, remained much lower than in the pre-crisis years (Figure 3). No doubt, international investment flows slowed down on the global scale because of overall instability of world economy and geopolitical uncertainty. It is unknown also what would be the influx of foreign investment in case the Baltic states didn't adopt euro. Dynamics of FDI in Latvia still looks unstable: in 2015, their intensity tended to increase while in the first 3 quarters of 2016 the FDI flow was negative (Ministry of Economics, 2016; LR Ekonomikas Ministrija, Centrālā Statistikas Pārvalde, 2016).

Figure 3 - Inflow of FDI in the Baltic states (EUR bn)



Source: Ministry of Economics, June 2016, p. 72.

There are some signs that the adoption of euro has encouraged investment in real estate. Critics of euro, however, interpret this as increased ease of selling out the last remainders of Latvia's land, property, and natural resources to foreigners.

The Doing Business ratings are, with some fluctuations, improving for the Baltic states in the recent years. In the 2017 rating, Latvia was placed in the high 14th place in the world (http://www.doingbusiness.org/). This flattering evaluation of business environment in Latvia, in fact, looks quite questionable if one takes into account unceasing mass emigration and a new alarming trend – that the number of liquidated enterprises in the country since 2016 started to exceed the number of founded new ones (Ķirsons, 2017).

Authors carried out correlation analysis between the Doing Business ratings and change in total volume of foreign direct investment in Latvia (Table 2). Low coefficient of correlation = 0.148 supports the assumption that the rating has no effect upon the dynamics of FDI.

Table 2 - Doing Business rating and changes in total volume of FDI in Latvia, 2006-2017.

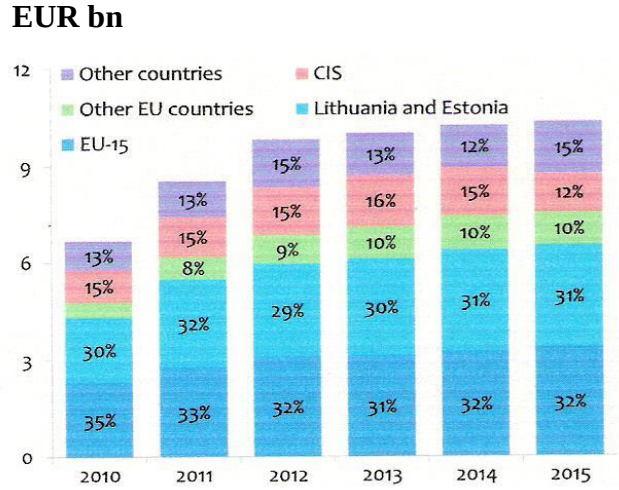
Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Rating	28	24	26	29	27	24	21	25	24	22	17
FDI (EUR million)	1543	1765	660	-54	111	1176	898	1312	742	1234	-308 (I-IX)

Sources: www.doingbusiness.org; Ministry of Economics, Republic of Latvia, 2016; LR Ekonomikas Ministrija, Centrālā Statistikas Pārvalde, 2016; authors' calculations.

3.4 Volume and structure of exports

No essential changes took place in volume or structure of Latvia's exports since adoption of euro (Figure 4). More than 70% of exports continue to head to the EU market though distribution of exports between the EU-15 and the rest of the EU underwent noteworthy change.

Figure 4 - Total volume and structure of Latvia's exports by groups of countries (EUR bn and %)



Source: Ministry of Economics, June 2016, p. 28.

What is essential, after 2000 share of the EU-15 countries in Latvia's exports steadily declined, dropping from 65% in 2000 to 32% at present. In its turn, share of the Baltic neighbours, Lithuania and Estonia, consistently increased, exceeding 30% instead of 9% in 1995. Thus the EU-15 market for Latvian exports is gradually replaced by the regional Baltic market. Changeover to euro had no effect on this trend.

Conclusion

Common currency was intended first of all as a political project to foster European unity. The initial euphoria about euro has gone now (Кузнецов & Хесин, 2013). Introduction of euro is not an end in itself and introduction of single currency neither solves any country's economic problems nor guarantees economic stability.

Given the big share of the EU in Latvia's exports, pegging of lat to euro was justified. The following changeover to euro did not cause drastic additional changes. Introduction of euro in the Baltic states was a political decision, like the preceding joining the EU. Public scepticism towards euro was always strong in Latvia and in case of referendum the vote threatened to be negative.

As to economic effects of the changeover to euro, neither the best nor the worst predictions proved true. It was officially hailed as a great achievement of Latvia though actually it had no appreciable impact on foreign trade, foreign investment or overall economic situation.

What had actually happened was loss of national currency and of the last remainders of independent monetary policy. It was not just an "emotional" effect as euro enthusiasts try to diminish it. Some analysts noted it wasn't a big loss because Latvia never afforded independent monetary policy even at the times it had chance to do it. Nonetheless, it meant giving up one more part of national sovereignty and turning into a province of eurozone. The next step is already revealed: it is going to be the single EU's Ministry of finance and strong fiscal coordination promoted by the EU politicians.

Changeover to euro in the Baltic states remains the last extension of eurozone by now. In future, euro can be used as an additional barrier hampering potential new exits of countries from the European Union. Ultimately, however, the future of euro will depend on stability of the EU. In case of disintegration, euro will not save the EU like Soviet ruble didn't save the former Soviet Union.

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2017 – YEAR OF THE CRYPTOCURRENCY

Ivan Katrenčík, Monika Zatrochová

Abstract

The world needs and likes innovations. Maybe it is time for a massive innovation in financial sector. Cryptocurrencies are seen by many as this massive innovation. On one hand it can be a huge benefit for people who can make fast payments, with relatively low fees and high security to anyone around the world. On the other hand, the offered anonymity and decentralized network can be abused by grey economy with money laundering or tax evasion. Even some criminals have shown interest in cryptocurrency and its possible use in drug, weapons and other illegal trade. Either way, cryptocurrencies are happening, and it may soon signal a new dawn of economy. For now, mainstream investors views cryptocurrencies as too volatile, difficult to analyze and the prize of cryptocurrencies are determined mainly per demand, which makes difficult for these companies to invest here other people's money. However, the rich families and persons view cryptocurrency as a perfect independent way to enlarge their funds.

This paper offers a few insights in the world of cryptocurrency with basic theoretical background and statistics about important events and developments happening in this year. The conclusions of statistical research are in this paper shown in graphs and tables. The objective of this paper is to clarify functioning of cryptocurrency system and based on data obtained from publicly accessible sources research and evaluate the events and development that has happened in cryptocurrency so far this year.

Keywords: investment, risk management, bitcoin, cryptocurrency, blockchain

JEL Classification: G12, G11, G32

Introduction

"Virtual currencies, perhaps most notably Bitcoin, have captured the imagination of some, struck fear among others, and confused the heck out of the rest of us."

– Thomas Carper, US-Senator

1. THEORETICAL BACKGROUND

There are several theories and models describing the process of investment decision making. Within the basic criteria for decision making that is evident in several models we can include risk, profit and liquidity. In various literatures, this criteria model is also called the magic triangle. Its basic premise is that the individual criteria contained in the apexes of the triangle are considered in great conflict. If the investor wants to achieve high profit he/she must undergo considerable degree of risk. In this case, high profit compensates for the uncertainty the investor must undergo. On the contrary, with little risk the investor can only reach small profit. Therefore, if we want to make more contribution to one of the apexes of the triangle, we can only do so at the expense of one of the other two apexes - higher the profit, the higher the risk and smaller liquidity, smaller the risk, the smaller the profit, the more investment liquidity usually results in the profit and risk being smaller (Bikár & Kmeťko, 2015).

In present, still more and more people are interested in venture capital and assets with big revenue, but also big risk. New trend in this area are cryptocurrencies.

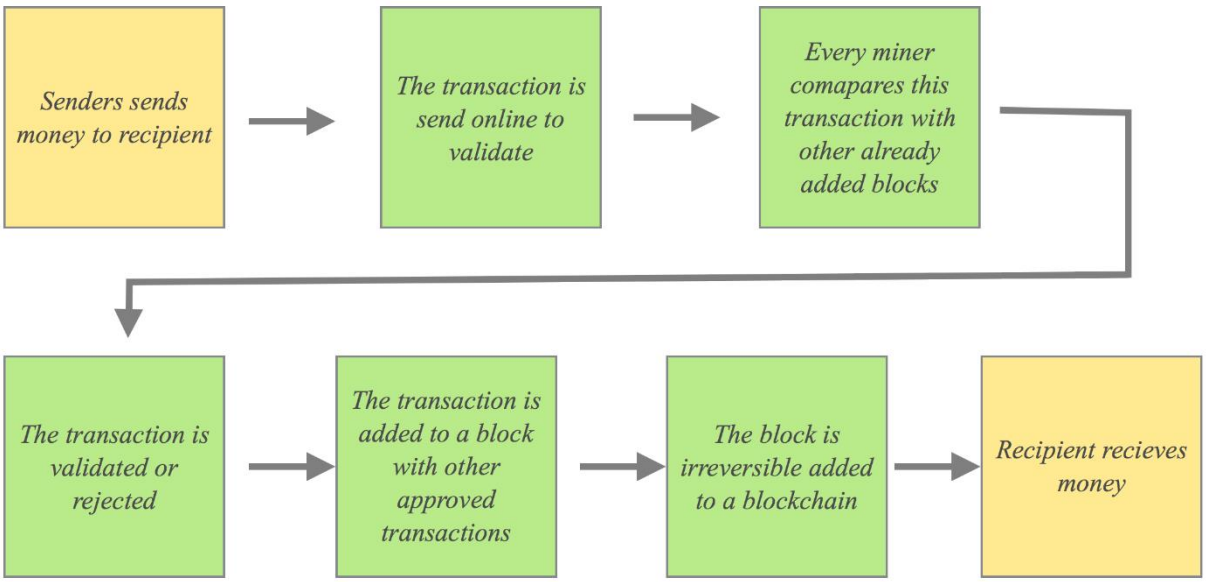
Cryptocurrency (digital currency or virtual currency) is a form of digital money designed to work as a medium of exchange using cryptography[1] to secure transactions and to control the creation of additional units of the currency. When the first successful cryptocurrency Bitcoin was founded in 2009, the idea of digital money had not been new. For many years there had been credit cards, PayPal and even the digital gold in many games and application e.g. World of Warcraft. The major difference of Bitcoin was, that it only exists on internet and is not depend on any government or company. The Bitcoin is collectively maintained by thousands of computers all over the world. Those computers are owned mainly by individuals. Because of this the Bitcoin is very special and offers many advantages.

Bitcoin was founded by a person called Satoshi Nakamoto. He has built a cash system without any central entity. Why it is so important? Imagine that to realize digital cash you need a payment network with accounts, balances, and transaction. One major problem every payment network must solve is to prevent double spending, to prevent that one entity spends the same amount twice. Usually, this is done by a central server who keeps record about the balances and in case of double spending central server declare the correct transaction or state of balance. Satoshi came with a peer to peer system that can even without central server tell the which transaction is correct and absolutely forbit double spending. In this network, every single peer has a list with all transactions a can check if future transactions are valid and thus of a balance of every account.

When a transaction is made, the information of this transaction is send to every peer and awaits confirmation. The confirmation is made at certain intervals and when the transaction is confirmed it is added to the so called blockchain. Blockchain consists of blocks containing information of transactions. Blocks have extremely complicated mathematical properties and thus are very hard to create. The confirmation of transactions and creating of blocks are made by miners – people who lend their computer power to Bitcoin system. To create a block miner needs to spend a lot of energy to create one valid block. Every new block contains a special transaction, a reward for miner´s work - a bit of Bitcoin. In the beginning of Bitcoin, for every new made block the miner was awarded with 50 Bitcoins. As the system grows, the computing power to made new blocks is even greater. Miner needs to make more than trillion guesses before he finds a valid block. At this moment miner gets for every new block 12,5 Bitcoins. This is the only way to create Bitcoin. On the other hand, every new block is closely tied with previous block and when other new blocks are made, they contain information about previous ones. These properties of block are intentionally made to create secure this system. When you consider how many thousand computers are working in this system to make it work it is impossible for one entity to false same transaction. Actual rate is one block every 10 minutes. Nowadays the mining of Bitcoin has become specialized and is done by professionals with special hardware. When to block is added to blockchain there is absolutely no way to change it. It is irreversible, and no one can change it.

[1] *Cryptography* is a method of storing and transmitting data in a particular form so that only those for whom it is intended can read and process it.

Figure 1 – Blockchain simplified scheme



Source: authors

This is how it works in Bitcoin. Bitcoin was first and it is similar in every other cryptocurrency that are using blockchain technology.

Initial coin offering or ICO is "a fundraising mechanism in which new projects sell their underlying crypto tokens in exchange for bitcoin and ether."[2]. ICO is used by startups to bypass the rigorous and regulated capital-raising process required by venture capitalists or banks. In an ICO campaign, a percentage of the cryptocurrency is sold to early backers of the project in exchange usually for Bitcoin. It starts with a plan, which states what is the goal of the project, what needs to be done, how much money it needs, what kind of money (cryptocurrency) is accepted, how long will the project take, how much will the investor get and how much will the founders keep for themselves. An ICO coins are distributed to markets and investor can buy them with FIAT[3] or other coins. If the money that ICO founders received form investors does not meet the minimum required funds stated in ICO plan, the moneys are returned to backers and the ICO is unsuccessful. If the minimum required funds are met the money are used to complete or initiate the intended project.

Investors usually buys ICO coins or tokens in hope, that someday in the future the crypto value of this coins will be higher that the value at which they have bought the ICO coins. It is not so in every ICO, but it is a risk investor needs to undertake if he is interested in making profit. A very successful ICO project was Ethereum. In 2014 the project was announced and it raised 18 million dollars in Bitcoin. Its pre-sale value was 2000 Eth = 1 Bitcoin (approx. 0,3 dollars). The project started in 2015 and now the value of 1 Eth is 294 dollars (98 000% growth) with market capitalization more than 28 billion dollars.

[2] BitcoinMagazine, „What is an ICO" https://bitcoinmagazine.com/guides/what-ico/

[3] *Fiat*, Latin „it shall be ", is called by cryptocurrency community every currency that the a government has declared to be a legal tender, e.g. dollar, euro, pound.

2. CRYPTOCURRENCY - DATA

Nowadays there are more than one thousand ICO's and cryptocurrencies. The highest value has the oldest of the coins – Bitcoin, more than 5.000 Euros. There are 24 coins with prize more than 10 Euros per coin (Table 1).

Table 1 – List of coins with prize more than 10 Euros per coin (October 2017)

Name	**Prize – Euro per coin**	**Name**	**Prize – Euro per coin**
Bitcoin	€ 4 947,95	DigixDAO	€ 53,03
Bitcoin Cash	€ 283,40	Litecoin	€ 48,09
Ethereum	€ 249,49	Regalcoin	€ 33,35
Dash	€ 235,06	NEO	€ 24,11
Zcash	€ 177,94	Decred	€ 20,21
BitConnect	€ 170,10	Blocknet	€ 18,50
Byteball Bytes	€ 160,84	Gas	€ 17,40
Monero	€ 72,88	ZenCash	€ 17,32
BitcoinDark	€ 65,42	Augur	€ 13,91
Gnosis	€ 62,52	Factom	€ 12,78
Veritaseum	€ 54,47	FirstCoin	€ 11,85
		ZCoin	€ 10,10

Source: own processed

Another important fact about cryptocurrency is its market capitalization. It refers to the market value of company's outstanding shares. In our case it states how much money there are invested in a coin. If you multiply current amount of coin with its current prize per stock, you get market capitalization, commonly referred as market cap. Total market cap as of October 2017 is more than 143 billion EUR. Table 2 shows top 20 cryptocurrencies with highest market cap. Bitcoin is the leader and has more than half of total market cap of all coins.

Table 2 – Top 20 cryptocurrencies with highest market cap (October 2017)

Currency	Market cap	Currency	Market cap
Bitcoin	€ 82 409 958 304	IOTA	€ 952 084 452
Ethereum	€ 23 848 269 256	Ethereum Classic	€ 883 552 841
Ripple	€ 6 622 505 600	Qtum	€ 661 329 275
Bitcoin Cash	€ 4 763 072 465	OmiseGO	€ 622 725 247
Litecoin	€ 2 578 189 487	Cardano	€ 599 850 342
Dash	€ 1 799 046 507	Stellar Lumens	€ 492 562 525
NEM	€ 1 559 944 457	Lisk	€ 457 229 980
BitConnect	€ 1 232 546 176	Zcash	€ 436 209 193
NEO	€ 1 201 105 753	Tether	€ 372 026 712
Monero	€ 1 117 276 489	Hshare	€ 298 815 373

Source: own processed

1.1 Development and important events in 2017

The reasons why cryptocurrencies are doing so good in this year are many. Over the past few years the cryptocurrency has triggered interest among the people as an alternative money. It has grown exponentially. Analysts says there are several key factors behind the cryptocurrency success.

In 2017 there are notable growing interest in cryptocurrency among people, especially among finance professionals and financial sector. In August 2017 several of the world's largest banks have revealed their blockchain project called Utility Settlement Coin USC, which will help global banks make transactions with each other using blockchain technology. The working group includes Barclays, CIBC, Credit Suisse, HSBC, MUFG, State Street, UBS, BNY Mellon, Deutsche Bank, Santander, NEX. UBS director of strategic investment and fintech innovation, Hyder Jaffrey, for CoinDesk said "It may well inform the way central banks choose to move things forward. We see it as a stepping stone to a future where central banks issue their own [cryptocurrency] at some point". (Castillo, 2017). Japan, a leading world innovator, has been opened to the idea of digital currencies. According to CBNC Japanese banks are looking to launch they their own digital currency called the J-coin. J-coin would launch in time for Tokyo Olympics games 2020. It should be used as payments and transfers method using a mobile app. (CNBC, 2017).

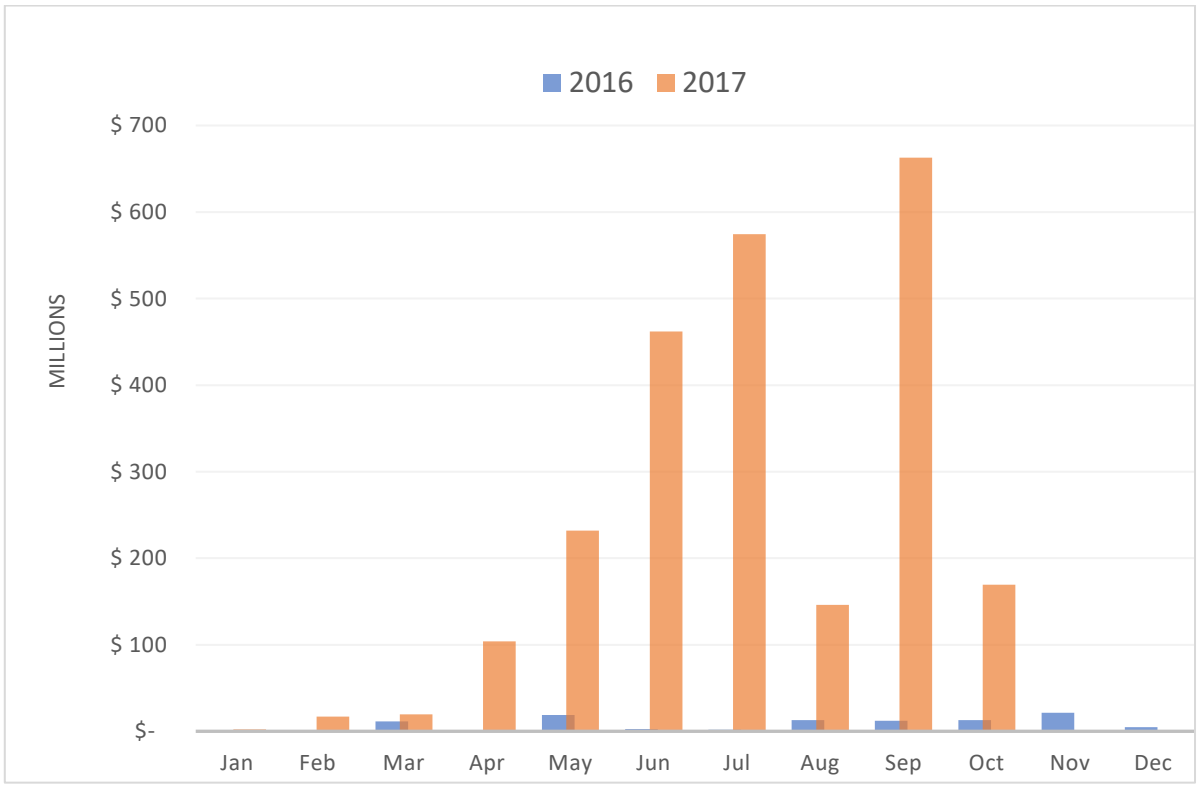
Another trend that are growing in 2017 is an interest of mainstream media outlets in these innovative assets. Broader news coverage has helped to spur a greater interest among people. Evidence of this fact is seen in Figure 1 shown below. At the start of the year 2017 there was around 17,5 billion dollars invested in cryptocurrencies. Today is the total market cap more than 176 billion dollars representing more than 880 % growth.

Figure 1 – Total market cap in 2017

Source: processed according to Coinmaketcap.com

Enthusiasm of investors are also shown in their interest in ICO. Figure 2 show new ICO funding in 2016 and 2017. It can be seen, that in 2017 there many times more money raised than in 2016. So far ICO has raised in 2017 more than 3 billion dollars which is more than 20 times as much money as they did during all of 2016.

Figure 2 – Monthly new ICO funding



Source: processed according to Coindesk.com/ico-tracker

Also, the amount of money raised by individual ICOs has greatly risen. Table 3 show the top 10 of ICOs of 2016 and 2017. In 2017 the ICO projects raised significantly more money that their competitors in 2016.

Table 3 – Top 10 ICOs of 2016 and 2017

2016		**2017**	
Project	**Total raised**	**Project**	**Total raised**
Waves	$ 16 436 096	Filecoin	$ 257 000 000
Iconimi	$ 10 576 227	Tezos	$ 232 319 985
Golem	$ 8 596 000	EOS Stage 1	$ 185 000 000
SingularDTV	$ 7 500 000	Bancor	$ 153 000 000
Lisk	$ 5 700 000	Kin	$ 97 041 936
Digix DAO	$ 5 500 000	Status	$ 90 000 000
FirstBlood	$ 5 500 000	TenX	$ 64 000 000
Synereo	$ 4 700 000	MobileGO	$ 53 069 235
Decent	$ 4 178 357	KyberNetwork	$ 48 000 000
Antshares/NEO	$ 3 608 378	MCAP	$ 45 192 400

Source: processed according to coinschedule.com/stats

When the world of cryptocurrency is expanding, usually on its head is the Bitcoin. This year is no exception. At the start of 2017 the value of 1 Bitcoin was around 950 EUR. At this moment one Bitcoin costs around 5 000 EUR. The development of its value is shown in Figure 3. One of the factors, that has helped push bitcoin to this value is the community's decision to implement Segregated Witness (SegWit). It is an upgrade of blockchain technology that will increase the size of a block, so it can contain more data (transaction information's). Also, the information gathered about transactions are altered so they can be smaller and this way even more of them will fit in a block leading to a smaller transaction fees. Activation of SegWit's first Phase has happened on 1 August 2017. With this soft fork a new cryptocurrency has been created – Bitcoin Cash. Every owner of Bitcoin received the same amount of Bitcoin Cash. Bitcoin Cash works on different blockchain with different rules. Second phase of SegWit should happen in following days, a so called hard fork. Many of relatively important mining groups does not support the second phase of SegWit, also known as SegWit2x. Even some of the partners signed in New York Agreement[4] cancels support of SegWit2x. The end of 2017 will tell what happens with bitcoin.

[4] An agreement made on 23 May 2017 in New York between 58 signatories, owning 80% of Bitcoin mining power, about future development of Bitcoin.

Figure 3 – Bitcoin value development in 2017

Source: own calculations based on data form cryptocompare.com

First phase of SegWit happened on 1. August 2017 and many people were afraid of the development of bitcoin after SegWit. But the offered free money (Bitcoin Cash) tipped the scales on the side of bitcoin and the prize of bitcoin has rapidly gone high. It went from 2.400 EUR to almost 4.000 EUR in the time of one month. We can see what public opinion can do in this sphere of investing.

Conclusion

The aim of this paper was to highlight the importance of cryptocurrency. Even though the media are trying to inform people about cryptocurrencies, many people still do not know about them, or find the too complicated. Many governments and heads of big financial institutions do not take the cryptocurrencies serious. According to the data collected, the cryptocurrencies are on the rise and the amount of money invested in these projects are breathtaking. These data speak for themselves and even if some of the major players in economy and financial world does not want to acknowledge the importance of cryptocurrency, soon will come time when there would be no other options.

If the trend will continue, Bitcoin will beat the 10.000 EUR limit sometimes at middle of the 2018. Rapid growth in ICO's projects and their raised funds indicates the interest of investors in this type of investment. In these projects it greatly surpasses any other kind of classical investment (venture capital, shares, and so on). Independence, low regulation and availability of cryptocurrency investment offer for many people a great opportunity for making a profit.

Research of this phenomena will continue in my dissertation work and information published in this paper are basic theoretical knowledge and statistical data. More detailed research will be published upon finishing my dissertation work.

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GDP DRIVER IN THE EUROPEAN UNION

Kitty Klacsánová, Mária Bohdalová

Abstract

The main objective of this paper was to investigate the co-movements and the heterogeneity in the changes in the nominal GDP across the countries of the European Union over the period of 49 and 21 years from 1967 – 2015 respectively from 1995 - 2015. To improve the understanding of GDP differences there were applied statistical methods. They also verified some of the big economic crises in the history. Nominal GDP developments yield similar results in both the shorter and longer term, suggesting that only two common principal components are needed to explain a significant variance in the data. Finally, the paper employed multiple linear regression models, where country specific dynamics in GDP were explained by the principal components from the previous analysis. In most cases the diagnostics plots indicate an adequate model and the R-square statistics are close to one, which means a good fit of the model.

Keywords: GDP, principal components analysis, EU

JEL Classification: E01, E37, C38.

Introduction

GDP as a comprehensive scorecard of a country's economic health is one of the most important and widely researched economic indicator. It represents the market value of all goods and services produced by an economy during a given period (Mankiw, 2004). Economists are interested in measuring the overall amount of goods and services produced in a country over a given period, which is not affected by the changes in prices. Real GDP considers the impact of inflation, allowing to compare the economic output of two countries or two different periods and to evaluate, whether a certain economy is expanding or contracting (Ray, Anderson, 2011).

In literature, many authors are interested in exploring or forecasting GDP growth. For example (Simionescu *et al.,* 2016) used panel data approach to explain the real GDP using the correlation with employment. (Taş *et al*. 2013) analysed the relationship between economic growth and macroeconomic indicators of the EU countries using panel data approach. They used 10 years data and they examined the effects of eleven macroeconomic indicators on GDP. The forecast of the German GDP is presented in (Schumacher, 2005; Schumacher, Breitung, 2008). These authors propose alternative methods for forecasting quarterly GDP with monthly factors. Another approach to predict French GDP used Bec and Mogliani in their paper (Bec, Mogliani, 2015). These authors investigate forecast combination and information pooling, in the context of French GDP prediction in real time with monthly survey opinions. (Rusnák, 2016) describes a Dynamic Factor Model to predict Czech GDP using multiple historical data over the period from 2005 to 2012. (Bjørnland, *et al*. 2017) examined the existence of a systematic influence in the co-movement across the countries to improve the forecast accuracy at the national level. They used dynamic factor model and their results showed that exploiting the informational content in a common global business cycle factor improves the forecast accuracy across a large panel of countries.

The main purpose of this paper was to analyse the nominal GDP and to point out the co-movements and the heterogeneity in its values. We researched the first member states as well

as all the countries of the EU together by employing statistical methods. The paper contains descriptive statistics and principal component analyses for both the longer and shorter period. The results indicate how many principal components are needed to keep the original variability of the data. They also reveal the problematic countries and years. Additionally, in the longer period (1967-2015) we employed linear regressions. The established regression models for France and Luxembourg enable to explain the relationship between these countries' nominal GDP and the principal components.

1. METHODOLOGY AND DATA

Principal Component Analysis (PCA) is a method known as dimensionality reduction technique to facile the complexity in multivariate data analyses. PCA is a technique to replace the original *n* data set by a smaller group of principal components (PCs), that explain the variance structure of a covariance matrix of the data through linear combinations of variables (principal components). We assume, that if the variance of most of the analysed data can be attributed to the first few components (principal components), then we can replace our original variables by a few components with minimal loss of information. The principal components (PC_1, PC_2, …, PC_k) are the uncorrelated linear combinations of the input data ranked by their variances in descending order. PCA identifies the eigen-structure of the covariance matrix. Eigenvectors correspond to principal components (Kardaun, 2005; Holmes, 2016).

We analysed the annual nominal GDP data denominated in USD, which were obtained from the World Bank's (2016) publicly available database. The statistical software SAS Enterprise Guide was used for the presented data analysis.

The EU countries were divided based on the changes that took place in their political system. The GDP development was examined in two time periods. The first analysed period was from 1967 to 2015. During this period, we analysed the first member countries (except Germany), i.e. countries, that were not affected by socialism and the countries that joined the EU before 1995 inclusive. This group was formed by the following 14 EU countries: Austria, Belgium, Denmark, Finland, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

The second period spans from 1995 to 2015, where we analysed the development of the nominal GDP in all the 28 countries of the EU.

2. RESULTS

a. Nominal GDP during the period from 1967 to 2015

Table 1 displays the mean and standard deviation of the time series for each country. We found that France had the highest average nominal GDP over the analysed period and the United Kingdom had the largest standard deviation from the founding countries as well as the countries which became a member of the EU before 1995. Furthermore, Luxembourg reported the lowest mean nominal GDP and the lowest standard deviation. However, we must take into account the fact that nominal GDP does not exclude the impact of price changes. High nominal GDP may occur for two reasons. The first reason is the production of a larger volume of goods and services. The second one is, that because of inflation current market prices increase. These are the reasons, why we cannot fully assume that Luxembourg lags behind the other countries. Conversely, the mean rate of inflation in Luxemburg reached 3.6%, which was among the lowest values in the surveyed countries. The country may have had lower nominal GDP due to

slower growth of goods and services prices compared to the other countries. We would be able to confirm this hypothesis, if we looked at real GDP that is not affected by inflation.

Table 1 – Descriptive Statistics

	AUT	**BEL**	**DNK**	**FIN**	**FRA**	**GRC**	**IRL**
Mean	1.82E+11	2.26E+11	1.50E+11	1.18E+11	1.28E+12	1.24E+11	9.06E+10
StD	1.39E+11	1.65E+11	1.10E+11	8.70E+10	9.00E+11	9.93E+10	9.39E+10
	ITA	**LUX**	**NLD**	**PRT**	**ESP**	**SWE**	**GBR**
Mean	1.03E+12	2.04E+10	3.77E+11	9.97E+10	5.86E+11	2.42E+11	1.25E+12
StD	7.36E+11	1.99E+10	2.88E+11	8.37E+10	5.01E+11	1.67E+11	9.70E+11

Source: own processing base on OECD data. Period from 1967 to 2015

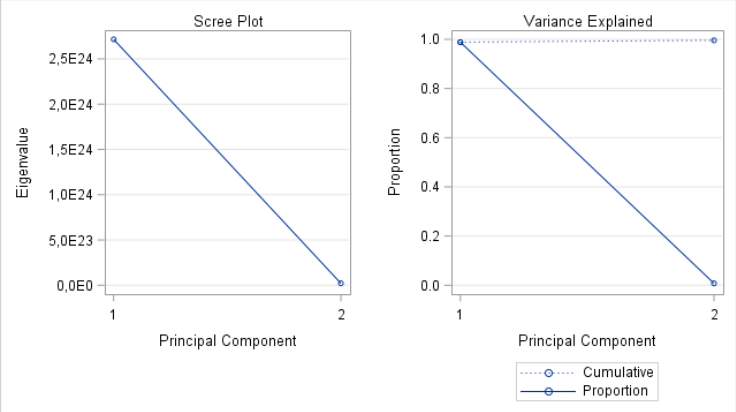
Now we have investigated the co-movements and the heterogeneity in the changes in the nominal GDP across the EU countries, we start with the principal component analysis (PCA). Based on the statistical information criteria, we determined two principal components that explained a significant amount of the total variability. Table 2 reports the eigenvalues of the covariance matrix of the nominal GDP in decreasing order, the proportion of variance explained by each component, and the cumulated explained variance for up to two principal components. The first factor explains about 98.84% of the variance in the whole nominal GDP data, whereas about 99.61% of the variance of all series is explained by the first two principal components.

Table 2 – Eigenvalues of the Covariance Matrix

Eigenvalues of the Covariance Matrix				
	Eigenvalue	**Difference**	**Proportion**	**Cumulative**
1	2.72E+24	2.69E+24	0.9884	0.9884
2	2.10E+22		0.0076	0.9961

Source: own processing base on OECD data. Period from 1967 to 2015

Figure 1 – Number of Principal Component vs. Eigenvalue



Source: own processing base on OECD data. Period from 1967 to 2015

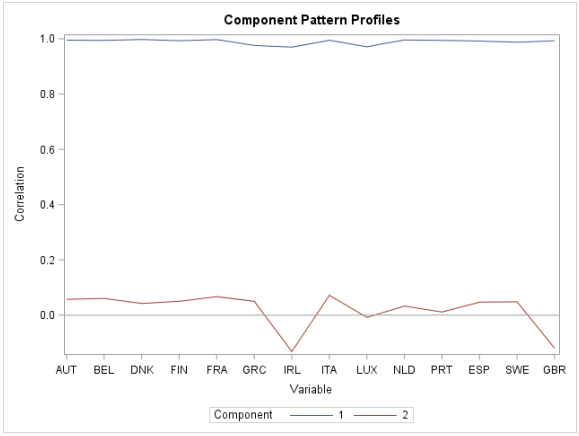
Based on the values of the covariance matrix's eigenvectors, the first principal component represents the nominal GDP development of the following countries: France, the United Kingdom, Italy and Spain. The second principal component reflects the variability of France's and Italy's nominal GDP as it has the highest positive loadings on these countries. Simultaneously, the second principal component has high negative loadings on the variables the United Kingdom (−0.8006), Ireland (−0.085) and Luxembourg (−0.001).

Table 3 – First two principal components

	AUT	**BEL**	**DNK**	**FIN**	**FRA**	**GRC**	**IRL**
PC1	0.084	0.099	0.066	0.0524	0.5447	0.0588	0.055
PC2	0.055	0.069	0.032	0.0302	0.4169	0.0343	-0.085
	ITA	**LUX**	**NLD**	**PRT**	**ESP**	**SWE**	**UK**
PC1	0.4442	0.0117	0.1740	0.0505	0.3014	0.1000	0.5845
PC2	0.3649	-0.001	0.0651	0.0065	0.1629	0.0554	-0.801

Source: own processing base on OECD data. Period from 1967 to 2015

Figure 2 – Component Pattern Profiles



Source: own processing base on OECD data. Period from 1967 to 2015

Figure 3 – Component Pattern

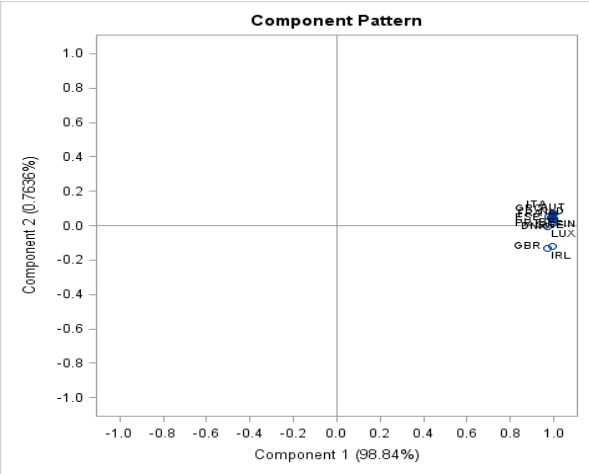
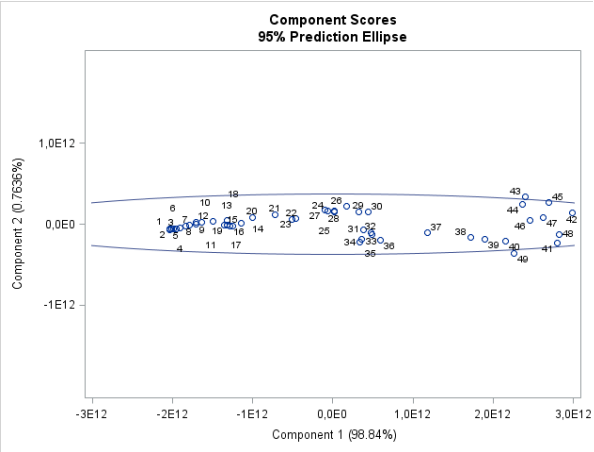


Figure 4 – Component Scores



Source: own processing base on OECD data. Period from 1967 to 2015

Figure 2 shows a component pattern profile. We can see a strong positive correlation effect of all countries with the first principal component. Its values are close to one. At the same time, there is a very weak (either negative or positive) correlation between individual countries and the second principal component. Figure 3 displays a pairwise component pattern plot also illustrating the correlations between the countries and the two principal components.

The isolated year 2009 (see Figure 4) highlights the global economic and financial crisis, which resulted in a gradual slowdown in the global economy, recession, lower economic growth and a higher rate of price growth. The start of the crisis dates back to 2007, the cause of which was linked to the crisis in the United States real estate market. Consequential impacts of the crisis in Europe took place in 2008. After the gradual slowdown in the global economy, lower economic growth and a higher growth rate of prices were expected. Our analysis confirmed this effect.

After obtaining two independent factors (first two principal components), we will discuss the estimation of France's and Luxembourg's nominal GDP. In the regression models, we use the principal components as independent variables. Regression results for France are reported in the Table 3 and for Luxembourg in the Table 4. According to the values of the Adj R-Square, the model for France seems to be better. Adj R-Square is equal to 0.9984 for France and 0.9404 for Luxembourg.

Table 3 – Linear regression results (France)

Analysis of Variance					
Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**	**Pr > F**
Model	2	3.89E+25	1.94E+25	15124	<.0001
Error	46	5.91E+22	1.28E+21		
Corrected Total	48	3.89E+25			

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	1.28E+12	5.12E+09	250.04	<.0001
PC1	1	8.98E+11	5.17E+09	173.53	<.0001
PC2	1	6.04E+10	5.17E+09	11.67	<.0001

Source: own processing base on OECD data. Period from 1967 to 2015

The estimated regression coefficients are positive, therefore between the GDP of France and both principal components exist a positive linear relationship. If the value of the first principal component increases by one unit, France's GDP will also increase by 8.98E+11 USD on average. In this case the values of the other principal components remain unchanged. At the significance level 0.05, both regression coefficients are statistically significant. This means that the principal components have a significant impact on France's GDP. The model meets the iid assumptions. With the estimated model, we can explain 99.85% of France's GDP, only 0.15% of the variability is caused by factors other than the development of the GDP in the EU countries that we did not include in the model.

Concerning the prediction of Luxembourg's GDP, from the regression model reported in Table 4 we have received an important information. If the nominal GDP of the countries represented by the second principal component increases by one unit, then the nominal GDP of Luxembourg will decrease on average by −2E+08 USD. Furthermore, only the first principal component has a statistically significant impact on Luxembourg's GDP. The model as a whole is statistically significant, but the residuals do not meet the assumptions of normal distribution. In addition, residuals show a systematic tendency. Durbin Watson's statistic equals to 0.079, it shows a positive autocorrelation.

Table 4 – Linear regression results (Luxembourg)

Analysis of Variance					
Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**	**Pr > F**
Model	2	1.80E+22	8.98E+21	379.43	<.0001
Error	46	1.09E+21	2.37E+19		
Corrected Total	48	1.90E+22			

Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	1	2.00E+10	6.9E+08	29.37	<.0001
PRIN1	1	1.9E+10	7.00E+08	27.55	<.0001
PRIN2	1	-2.00E+08	7.00E+08	-0.23	0.8193

Source: own processing base on OECD data. Period from 1967 to 2015

b. Nominal GDP during the period from 1995 to 2015

In this section, we analysed the nominal GDP data of the 28 EU member states over a period of 21 years, from 1995 to 2015. The lowest average GDP with the lowest standard deviation of the data had Malta. Germany had the highest average GDP and the highest standard deviation was also recorded in this country (see Table 5).

Table 5 – Descriptive Statistics

Simple Statistics								
	AUT	**BEL**	**BGR**	**HRV**	**CYP**	**CZE**	**DNK**	**EST**
Mean	3.15E+11	3.84E+11	3.30E+10	4.28E+10	1.79E+10	1.39E+11	2.56E+11	1.44E+10
StD	9.14E+10	1.13E+11	1.87E+10	1.70E+10	6.89E+09	6.72E+10	7.21E+10	8.18E+09
	FIN	**FRA**	**DEU**	**GRC**	**HUN**	**IRL**	**ITA**	**LVA**
Mean	1.99E+11	2.14E+12	2.92E+12	2.19E+11	9.72E+10	1.81E+11	1.73E+12	1.83E+10
StD	6.04E+10	5.83E+11	6.67E+11	7.30E+10	4.03E+10	7.53E+10	4.44E+11	1.04E+10
	LTU	**LUX**	**MLT**	**NLD**	**POL**	**PRT**	**ROM**	**SVK**
Mean	2.71E+10	3.91E+10	6.68E+09	6.57E+11	3.31E+11	1.83E+11	1.10E+11	6.27E+10
StD	1.51E+10	1.67E+10	2.53E+09	1.97E+11	1.56E+11	5.28E+10	6.82E+10	3.01E+10
	SVN	**ESP**	**SWE**	**GBR**				
Mean	3.58E+10	1.06E+12	3.96E+11	2.22E+12				
StD	1.28E+10	3.81E+11	1.23E+11	5.80E+11				

Source: own processing base on OECD data. Period from 1995 to 2015

The results of the PC analysis (Table 6) indicate, that only two principal components are needed to explain 98.63% of the original data variability. The first component contributes to the total variability by 95.41%, the second one only by 3.22%.

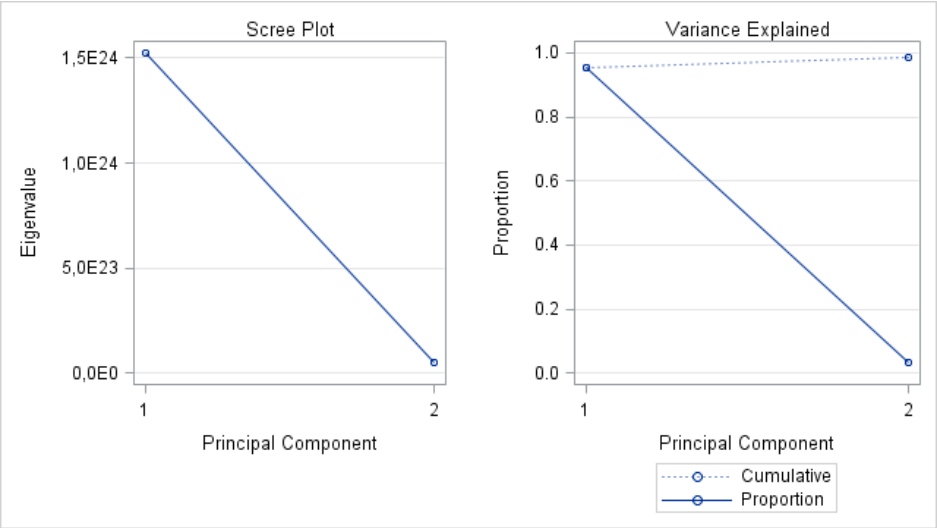
The first eigenvector (first principal component) of the covariance matrix acquires the highest loadings on the following variables: Germany, France, Italy, Spain and the United Kingdom. Given that the first and second eigenvector has high loadings in the case of United Kingdom, both principal components well reflect the country's GDP over the analysed period.

Table 6 – Eigenvalues of the Covariance Matrix

Eigenvalues of the Covariance Matrix				
	Eigenvalue	**Difference**	**Proportion**	**Cumulative**
1	1.52E+24	1.47E+24	0.9541	0.9541
2	5.15E+22		0.0322	0.9863

Source: own processing base on OECD data. Period from 1995 to 2015

Figure 5 – Number of Principal Component vs. Eigenvalue



Source: own processing base on OECD data. Period from 1995 to 2015

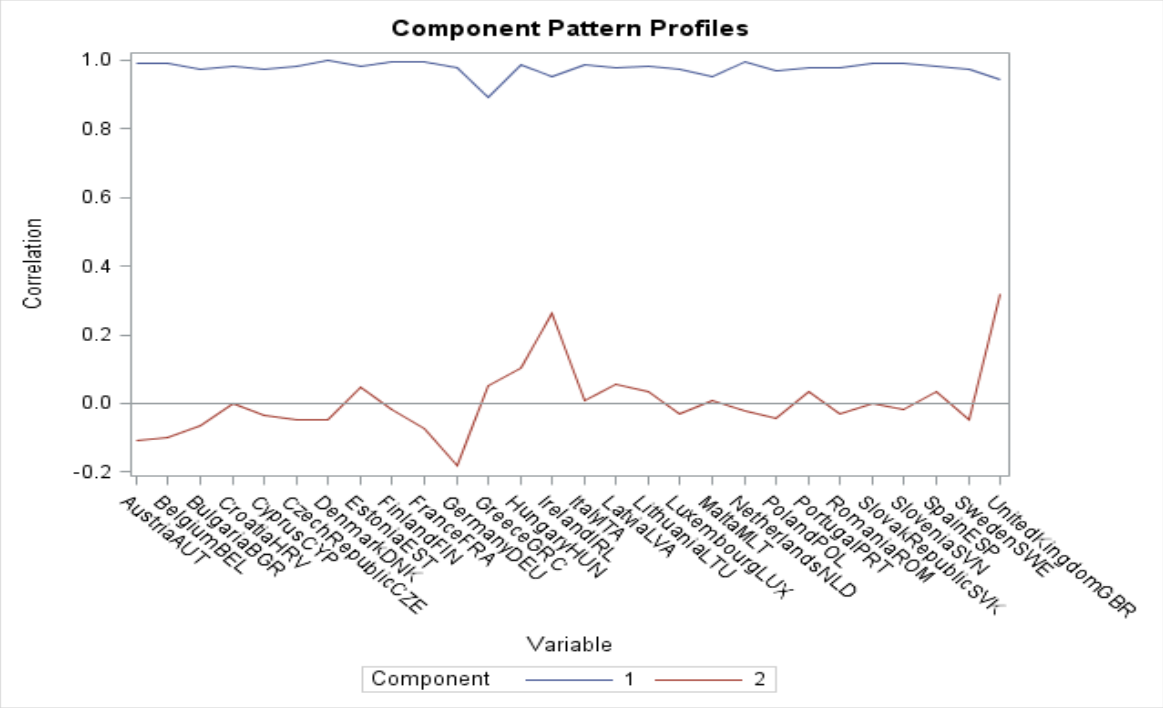
Table 7 – First two principal components

	AUT	**BEL**	**BGR**	**HRV**	**CYP**	**CZE**	**DNK**
PC1	0.0734	0.0908	0.0148	0.0136	0.0054	0.0535	0.0583
PC2	-0.0438	-0.0495	-0.0055	0.0000	-0.0010	-0.0141	-0.0157
	EST	**FIN**	**FRA**	**DEU**	**GRC**	**HUN**	**IRL**
PC1	0.0065	0.0488	0.4708	0.5282	0.0527	0.0322	0.0581
PC2	0.0017	-0.0046	-0.1899	-0.5304	0.0163	0.0183	0.0869
	ITA	**LVA**	**LTU**	**LUX**	**MLT**	**NLD**	**POL**
PC1	0.3544	0.0083	0.0120	0.0131	0.0020	0.1591	0.1220
PC2	0.0128	0.0026	0.0023	-0.0023	0.0001	-0.0197	-0.0305
	PRT	**ROM**	**SVK**	**SVN**	**ESP**	**SWE**	**GBR**
PC1	0.0420	0.0541	0.0241	0.0103	0.3030	0.0967	0.4435
PC2	0.0084	-0.0096	-0.0001	-0.0011	0.0541	-0.0264	0.8150

Source: own processing base on OECD data. Period from 1995 to 2015

Figure 6 shows the interdependence between the analysed countries and the principal components. We found that there is a very strong interdependence between all the countries and the first principal component. Additionally, there is a weak (either positive or negative) correlation between all the countries and the second principal component.

Figure 6 – Component Pattern Profiles



Source: own processing base on OECD data. Period from 1995 to 2015

Conclusion

Both analyses of nominal GDP required only one principal component to explain more than 95% of the overall variability of the GDP data. This implies that interdependence in the GDP development is high in the European Union. In both analyses, the first principal component maintained the greatest variability of the original data and reflected the GDP of France and the United Kingdom the most.

In the case of a regression analysis of Luxembourg GDP, not all assumptions about the random error component were met. The results suggested that the residuals didn't have a normal probability distribution and had a systematic tendency. Each of the regression models were shown to be statistically significant, as it was determined by scattering analyses for regression models. In addition, the estimates of the slope coefficients were statistically significant.

The regression models provide a number of opinions that can be taken into account when deciding on monetary policy, fiscal policy implementation and they also can be utilized to predict the GDP of France and Luxembourg with relatively high accuracy.

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THE ADVANTAGES AND DISADVANTAGES OF IMPLEMENTATION OF EURO FOR THE SLOVAK ENTPRENEURS

Lucia Kočišová, Peter Štarchoň

Abstract

The aim of this article is mainly to characterize in detail the whole process of euro adoption in Slovak republic. In introduction we present the current situation in context of whole European Union. Then, in the first chapter we focus on the assessment of the Maastricht criteria and presentation of National Euro Changeover Plan. The second chapter deals with business environment analysis and details the advantages and disadvantages of adopting the euro in our conditions. Finally, in conclusion after detailed analysis we offer our evaluation of how euro adoption affected Slovak entrepreneurs. The paper is based on literature and articles published by academic economists, publications of the European Central Bank and National Bank of Slovakia, articles in the Slovak and international press and webpages, and analyses produced by financial and banking houses as well as on opinion surveys of Slovak analysts and economists.

Keywords: euro adoption, advantages, disadvantage, entrepreneurs, enterprises, Slovakia

JEL Classification: E59, F33, G29

Introduction

Every national currency around the globe is subject to identical market laws and its value changes according to the same factors that influence all other currencies. Within the Eurozone, all countries share the same currency - the euro, and are less affected by changes in the euro exchange rate. There are many advantages of the euro adoption by the countries in the Eurozone, despite that disadvantages also exist, and the most well-known are the following: obliteration of the existing exchange rate fluctuations between a number of currencies and reduction of transaction costs (no other currency is necessary when conducting business or travelling in the Eurozone). The single European currency also stimulates trade activities and free movement of capital, goods and people but these effects should be subject to a profound academic research. Previously, the national economies of the European Union member states sometimes suffered from fluctuations of the local currencies within a common market. The euro exchange rate does not offer shelter from currency fluctuations in general but provides predictability and unifies the means of exchange in all countries in the Eurozone. Following the adoption of the euro, 12 countries in the EU witnessed their national currency disappear with more new member states entering the Eurozone gradually and other waiting at the door. Thus, all current members of the Eurozone take advantage of the single currency but they share the same disadvantages as well. When the U.S. Federal Reserve releases data showing increasing unemployment rate, falling number of new mortgages and growing number of businesses going bankrupt the most immediate consequence will be a falling exchange rate of the U.S. dollar. The same applies to the single European currency, but in addition to the data released by the European Central Bank, Forex traders around the globe take decisions whether to buy or not to buy euro depending on data about the national economies of the countries participating in the Eurozone. Hence, negative signals reported by the French or German economy could result in

depreciation of the euro exchange rate as a whole despite that the economies of all other Eurozone member states are running smoothly.

1. PROCEDURE FOR ENTRY TO THE EURO AREA NATIONAL PLAN OF EURO ADAPTION IN SLOVAKIA

In order to adopt the euro, EU countries have to meet specific economic conditions designed to ensure economic convergence with the countries of the euro area. Agreed in Maastricht by the EU Member States in 1991 as part of the preparations for introduction of the euro, the convergence criteria are formally defined as a set of macroeconomic indicators which measure:

- Price stability, to show inflation is controlled;
- Soundness and sustainability of public finances, through limits on government borrowing and national debt to avoid excessive deficit;
- Exchange-rate stability, through participation in the Exchange Rate Mechanism (ERM II) for at least two years without strong deviations from the ERM II central rate;
- Long-term interest rates, to assess the durability of the convergence achieved by fulfilling the other criteria

The exchange-rate stability criterion is chosen to demonstrate that a Member State can manage its economy without recourse to excessive currency fluctuations, which mimics the conditions when the Member State joins the euro area and its control of monetary policy passes to the European Central Bank (ECB). It also provides an indication of the appropriate conversion rate that should be applied when the Member State qualifies, and its currency is irrevocably fixed. According to the Treaty, at least once every two years, or at the request of a Member State with a derogation, the Commission and the European Central Bank assess the progress made by the euro-area candidate countries and publish their conclusions in respective convergence reports.

What is measured:	Price stability	Sound public finances	Sustainable public finances	Durability of convergence	Exchange rate stability
How it is measured:	Consumer price inflation rate	Government deficit as % of GDP	Government debt as % of GDP	Long-term interest rate	Deviation from a central rate
Convergence criteria:	Not more than 1.5 percentage points above the rate of the three best performing Member States	Reference value: not more than 3%	Reference value: not more than 60%	Not more than 2 percentage points above the rate of the three best performing Member States in terms of price stability	Participation in ERM II for at least 2 years without severe tensions

Maastricht criteria

The euro convergence criteria (also known as the Maastricht criteria) are the criteria which European Union member states are required to meet to enter the third stage of the Economic and Monetary Union (EMU) and adopt the euro as their currency. The four main criteria, which actually comprise five criteria as the "fiscal criterion" consist of both a "debt criterion" and a "deficit criterion", are based on Article 140 (ex article 121.1) of the Treaty on the Functioning of the European Union.

HICP inflation (12-months average of yearly rates): Shall not exceed the HICP reference value, which is calculated by the end of the last month with available data as the unweighted arithmetic average of the similar HICP inflation rates in the 3 EU member states with the lowest HICP inflation plus 1.5 percentage points. However, EU member states with a HICP rate significantly below the eurozone average (and pre 1999 below "comparable rates in other Member States"), do not qualify as a benchmark country for the reference value and will be ignored, if it can be established its price developments have been strongly affected by exceptional factors (i.e. severe enforced wage cuts, exceptional developments in energy/food/currency markets, or a strong recession). In example, at the April 2014 assessment: Greece, Bulgaria and Cyprus with HICP values respectively 2.2, 1.8 and 1.4 percentage points below the eurozone average, were all found to have suffered from exceptional factors, and hence concluded to be outliers, causing the reference limit instead to be calculated based on the HICP values from the three states with the 4th to 6th lowest HICP values in EU.

Government budget deficit: The ratio of the annual general government deficit relative to gross domestic product (GDP) at market prices, must not exceed 3% at the end of the preceding fiscal year (based on notified measured data) and neither for any of the two subsequent years (based on the European Commission's published forecast data). Deficits being "slightly above the limit" (previously outlined by the evaluation practice to mean deficits in the range from 3.0–3.5%), will as a standard rule not be accepted, unless it can be established that either: "1) The deficit ratio has declined substantially and continuously before reaching the level close to the 3% limit" or "2) The small deficit ratio excess above the 3% limit has been caused by exceptional circumstances and has a temporary nature (i.e. expenditure one-offs triggered by a significant economic downturn, or expenditure one-offs triggered by the implementation of economic reforms with a positive mid/long-term effect)". If a state is found by the Commission to have breached the deficit criteria, they will recommend the Council of the European Union to open up a deficit-breached EDP against the state in accordance with Article 126(6), which only will be abrogated again when the state simultaneously comply with both the deficit and debt criteria.

Government debt-to-GDP ratio: The ratio of gross government debt (measured at its nominal value outstanding at the end of the year and consolidated between and within the sectors of general government) relative to GDP at market prices, must not exceed 60% at the end of the preceding fiscal year. Or if the debt-to-GDP ratio exceeds the 60% limit, the ratio shall at least be found to have "sufficiently diminished and must be approaching the reference value at a satisfactory pace". This "satisfactory pace" was defined and operationalized by a specific calculation formula, with the entry into force of the new debt reduction benchmark rule in December 2011, requiring the states in breach of the 60% limit to deliver – either for the backward- or forward-looking 3-year period – an annual debt-to-GDP ratio reduction of at least 5% of the part of the benchmark value being in excess of the 60% limit. If both the 60% limit and "debt reduction benchmark rule" is breached, the Commission will finally check if the breach has been caused only by certain special exempted causes (i.e. capital payments to establishment of common financial stability mechanisms, like the ESM) – because if this is the

case they will then rule an "exempted compliance". If a state is found by the Commission to have breached the debt criteria (without this breach solely being due to "exempted causes"), they will recommend the Council of the European Union to open up a debt-breached EDP against the state in accordance with Article 126(6), which only will be abrogated again when the state simultaneously comply with both the deficit and debt criteria.

Exchange rate stability: Applicant countries should not have devalued the central rate of their euro pegged currency during the previous two years, and for the same period the currency stability shall be deemed to have been stable without "severe tensions". As a third requirement, participation in the exchange-rate mechanism (ERM / ERM II) under the European Monetary System (EMS) for two consecutive years is expected, though according to the Commission "exchange rate stability during a period of non-participation before entering ERM II can be taken into account." For example, Italy was deemed to have converged with only 15 months as an ERM-member, as measured on the last day in the review period of the convergence report. Meanwhile, the European Commission concluded that for Cyprus, Malta and Latvia, their 18 months of membership in the review period ending on 31 October 2006 was insufficient. As of 2014, all 29 times the subcriteria for ERM-membership length was found complied with by the Commission, these cases had the particular observation in common, that the state had surpassed minimum two full years of ERM-membership either ahead of the "final approval date (following approximately 1.5 month after the publication of the convergence report) where their currency exchange rate would be irrevocably fixed by the Council of the European Union" or by the "first possible euro adoption date following the publication of the convergence report".

Long-term interest rates (average yields for 10yr government bonds in the past year): Shall be no more than 2.0 percentage points higher, than the unweighted arithmetic average of the similar 10-year government bond yields in the 3 EU member states with the lowest HICP inflation (having qualified as benchmark countries for the calculation of the HICP reference value). If any of the 3 EU member states in concern are suffering from interest rates significantly higher than the "GDP-weighted eurozone average interest rate", and at the same time by the end of the assessment period have no complete funding access to the financial lending markets (which will be the case for as long as a country is unable to issue new government bonds with 10-year maturity – instead being dependent on disbursements from a sovereign state bailout programme), then such a country will not qualify as a benchmark country for the reference value; which then only will be calculated upon data from fewer than 3 EU member states. In example, Ireland was found to be an interest rate outlier not qualifying for the reference value calculation in the assessment month March 2012, when it was measured to have a long-term interest rate average being 4.71 percentage points above the eurozone average – while at the same time having no complete access to the financial lending markets. When Ireland was assessed again in April 2013, it was, however, deemed no longer to be an outlier, due to posting a long-term interest rate average only 1.59 percentage points above the eurozone average – while also having regained complete access to the financial lending markets for the last 1.5 month of the assessment period. A final relevant example appeared in April 2014, when Portugal likewise was found not to be an interest rate outlier, due to posting a long-term interest rate average being 2.89 percentage points above the eurozone average – while having regained complete access to the financial lending markets for the last 12 months of the assessment period.

NATIONAL PLAN OF EURO ADAPTION IN SLOVAKIA

In connection with the Slovak preparations for euro area entry the Government of the SR decided, in Resolution No. 862 of 8 September 2004, on the need to draw up a National Euro Changeover Plan for the SR. This document represented a plan of individual steps which needed

to be implemented for a trouble-free and successful introduction and use of the euro throughout the whole of the Slovak economy.

The National Euro Changeover Plan is a framework document which all entities in the Slovak economy could rely on. Basic principles, time schedule and institutional provision for the adoption of euro in Slovakia were defined in the introduction. The core of the Plan was the identification of tasks in individual sectors, including responsibilities, durations, control dates and completion dates.

The preparations for the euro changeover in Slovakia have begun even before the country's accession to the European Union. On 16 July 2003 the SR Government approved the Strategy for Adopting the Euro in the Slovak Republic, which was prepared up jointly by NBS and the Ministry of Finance of the SR. The Government and NBS, in their joint declaration, stated that the benefits of introducing euro in Slovakia clearly outweigh the disadvantages, and therefore Slovakia should enter the euro area as soon as possible – immediately after it will be able to meet in a sustainable manner the Maastricht Criteria, which are the conditions for euro area entry. In the Resolution No. 862 of 8 September 2004 the Government of the SR approved a further common document of NBS and the Ministry of Finance of the SR, the Specification of the Strategy for Adopting the Euro in the SR and adopted a decision to draw up a National Euro Changeover Plan for the SR. The fulfilment of the Maastricht Criteria was expected in 2007; therefore, the earliest possible date for the euro area entry was 1 January 2009, which was also set as the target date in accordance with the Strategy for Adopting the Euro in the SR. The Government appointed the Ministry of Finance of the SR as the National Coordinator for the process of introducing the euro in the SR. At the same time it entrusted the Minister of Finance of the SR and the NBS Governor with the negotiations with the bodies of the European Union regarding the entry into ERM II and on the setting of the central parity of the Slovak koruna against euro.

Prior to the euro changeover the SR was obliged to stay for at least two years in the exchange rate mechanism (ERM II). Following the agreement of the finance ministers of the euro area members, the President of the ECB and the finance ministers and central bank governors of Cyprus, Denmark, Estonia, Latvia, Lithuania, Malta, Slovenia and Slovakia of 25 November 2005, the Slovak koruna entered the ERM II on 28 November 2005. The central parity of the koruna to the euro was set at 1 euro = SKK 38.4550. At the request of Slovakia and following the agreement of the finance ministers of the euro area members, the President of the ECB and the finance ministers and central bank governors of Cyprus, Denmark, Estonia, Latvia, Lithuania, Malta and Slovakia, the central parity of the Slovak koruna in ERM II was revalued with effect of 19 March 2007. The new central parity of the Slovak koruna to the euro has been set at 1 euro = SKK 35.4424. Koruna uses a standard fluctuation band of ±15% around the central parity in ERM II.

In 2004, NBS announced a public anonymous tender for the designs of the national sides of the Slovak euro coins. NBS presented the best designs to the public in a nationwide opinion poll. The three motifs with the highest number of votes were subsequently chosen for the obverse side of the Slovak euro coins. In order to increase consumer confidence, particularly during price conversion from koruna to euro, the plenipotentiary of the Slovak Government in cooperation with the Business Alliance of Slovakia created the Ethical Code for the Euro Introduction. The signatories of the Ethical Code voluntary undertake not to misuse the euro changeover for unjustified price increases and they also assume further obligations that increase transparency, provision of information to customers and the smoothness of cash exchange. The Ethical Code is open to all shops and businesses, as well as to local authorities and non-profit organizations.

The NBS Bank Board and the Government of the SR (Resolution of the Government of the SR No. 892/2007 of 17 October 2007) have approved the „Communication Strategy on the Euro Introduction in the Slovak Republic“, which precisely defines the objectives, target groups, tools and the time table of the communication campaign. The Communication Strategy is based on the National Euro Changeover Plan for the Slovak Republic, but it is more detailed and more specific. Based on documents of the Working Committee for Communication, the Ministry of Finance of the Slovak Republic carried out public procurement for performing most of the information campaign and for creating a website concerning the introduction of the euro in the Slovak Republic. The selected entities implemented the first activities focused on the general public at the end of 2007, the website was launched at www.euromena.sk. On the basis of the approved communication strategy and supplier selection for a substantial part of the information campaign, the Ministry of Finance has asked the European Commission to enter into an Agreement of Partnership. The Agreement was concluded on 7 December 2007. Both parties undertake to coordinate and to mutually promote the information and communication activities regarding the euro. The Commission will participate in the financing of the individual projects within the information campaign on the euro introduction in the Slovak Republic by means of grants and in compliance with the approved Communication Strategy. The Commission will also carry out its own communication activities, for instance exhibitions, seminars or distribution of publications, in cooperation with the Ministry of Finance. The Act No. 659/2007 on the introduction of the euro and on amendments to certain acts (the umbrella law) was approved by the National Council of the Slovak Republic on 28 November 2007 with effect from 1 January 2008 with the exception of provisions that bacame valid on 1 January 2009.

The euro was introduced in Slovakia on 1 January 20091 simultaneously in cash and scriptural form without a transitional period, i.e. within a Big-Bang scenario. On this date, euro became the legal tender in the Slovak Republic. Slovak euro coins were valid in all euro area countries and also other euro area countries' euro coins were the legal tender in Slovakia. Banknotes were the same throughout the euro area. From 1 January 2009 scriptural payments were exclusively in euro. Euro was used in cash circulation from 1 January 2009. Koruna became only a euro denomination. For a short dual circulation period, until 16 January 2009, it was possible to pay also with koruna banknotes and coins in the Slovak territory. The Slovak currency was gradually withdrawn from circulation. By the end of the dual circulation, euro was the sole legal tender in the Slovak Republic.

2. ADVANTAGES AND DISADVANTAGES OF EURO ADOPTION IN SLOVAKIA

The adoption of European single currency in Slovakia had several favorable impacts which manifested immediately. Such positives permanently decreased the level of costs or increase GDP. The savings of enterprises and citizens on transaction costs are the most visible when charges and margins for koruna-euro exchanges are eliminated. Enterprises were also able to slightly reduce their administrative costs since they will not have to deal with management and accounting of euro exchange transactions. Full elimination of exchange risk against euro and slight decrease of such risk also against other currencies were felt by enterprises as a decrease of implicit costs, because before they have rarely hedged against them. In particular smaller enterprises, which have not had simple access to foreign financial markets, can after euro adoption enjoy a simpler and cheaper access to credits and stock capital.

So, at this point the most notable advantages of euro adoption can be named these few:

1. Elimination of transaction costs (by entrepreneurs in foreign trade and investment with euro area countries)

2. Higher certainty in the planning and calculations of future costs and revenues
3. Elimination of exchange rate volatility (hedging/ form of insurance that can be applied only on a short-term basis)
4. Increase of price transparency in the euro area
5. Growth of foreign trade (additional increase of GDP)
6. Increase of foreign direct investment (FDI) inflow
7. Specialization and concentration of businesses (comparative advantages in comparison with other euro area countries)

The main disadvantages of euro adoption for Slovak entrepreneur manifest manly in form of specific costs of the banking sector. Below you can see the list of 3 main negative effect that were strongly present during the transition period of enterprises:

1. Loss of independent monetary policy (impossibility to flexibly respond to potential economic shocks on the part of the central bank)
2. Technical and organizational costs of euro conversion (one-off costs of 0.3 % GDP)
3. Specific costs of the banking sector (in connection with the task of providing free conversion of the domestic currency to euro and reduction of the range of activities and revenues of banks)
4. The main negative phenomenon, which may manifest itself in the long-term horizon in corporate sector, is the loss of independent monetary policy, in particular the impossibility to flexibly respond to potential economic shocks on the part of the central bank. The value of the loss of independent monetary policy is estimated in points to 0.04 % GDP. The loss of independent monetary policy should not represent a serious problem for the Slovak economy.

Conclusion

In general we can state that the corporate sector benefited most from the euro adoption. The main contributions to its growth include the elimination of transaction costs and higher certainty in the planning and calculations of future costs and revenues. These should support the growth of foreign trade and attract new foreign investment which should consequently result in improved GDP and living standard growth.

In the long-term horizon the adoption of euro was reflected in faster economic growth of the Slovak economy, which the corporate sector will benefit to a considerable extent from. Despite the fact that for the corporate sector euro adoption is associated also with one-off costs, positives prevail over negatives, and we can conclude that euro adoption was undoubtedly beneficial for the corporate sector.

It is fair to mention, that if Slovakia postponed or dropped January 1, 2009 as the euro adoption date, its credibility in the eyes of international business and economic circles could be shaken and the costs of such a move would be too high also with respect to the membership in the ERM II. The extremely high potential losses of an economically unjustified retreat from the planned euro adoption date, the strong belief of the NBS in the success and the economic circles more inclined to believe in the success were more in favour of the sticking to the January 1, 2009 as

the euro adoption date in Slovakia than giving it uu. If the date would be postponed, it could have resulted in worsening situation for our enterprises in connected european market.

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ARE THE INVESTMENTS TO EUROBONDS ATTRACTIVE?

Daniela Majerčáková

Abstract

The aim of this paper is to specify more closely the features of Eurobonds and to outline on this theoretical basis the advantages and benefits of investing to Eurobonds. Discussion of how Eurobonds might work has occupied EU members since 1960s. A single currency for the six founding members was under the discussion in the 1950s and a collective way to borrow using Eurobonds was part of the plan. Where the idea of a shared currency was resurrected in the mid 1990s, borrowing for all countries was extremely cheap and the need for Eurobonds was unclear. They are not to be confused with the Eurobond market, which is a way for corporations, banks and other private entities to borrow money by issuing bonds. As London is the world´s biggest Eurobond marketplace, nowadays participants in this market are organized under the International Capital Market Association (ICMA) in London. A large number of Eurobond transactions involve elaborate swap deals in which two or more parties may exchange payments on parallel or opposing debt issues to take advantage of arbitrage conditions or complementary financial advantages. We have used the publicly available data that are compared.

Keywords: Eurobond, London, market, debts, advantages

JEL Classification: G14, G15

Introduction

The Eurobond market is generally restricted to large, single issues, and is limited to large companies, banks or governments. Maturities are usually around ten years or less. Bonds issued inside a country, and in its corresponding currency, and by foreigners, are separate from the Eurobond market. There are many distinct markets for issuing bonds, and the Eurobond is one of the oldest and largest. As Eurobonds offer a lower cost of financing for transnational companies and governments that require other currencies to conduct international business or to finance project, for multinational corporations can not rely on just a panel of banks to meet all of their funding needs, especially when those banks decide to cut on lending to this corporations or sector. Eurobond market is an alternative and significant source of debt finance for these corporations. International Capital market Association in London has currently more than 530 members located in over 60 countries worldwide.

The emergence of the Eurobond market was partially the result of the Interest Equalization Tax (IET) imposed by the US government in 1963 to discourage US investors from investing into foreign securities. Thus, non-US borrowers that historically sold foreign securities to US investors began to look elsewhere for funds. In recent years, governments and corporations from emerging markets such as Croatia, Ukraine, Romania and Hungary have frequently utilized the Eurobond market. New corporations that have been established in emerging markets rely on the Eurobond market to finance their growth. They have to pay a risk premium of at least 3 percentage points annually above the US Treasury bond rate on dollar-denominated Eurobonds. (Madura & Fox, 2016)

1. EUROBONDS

Firstly it must be clear, that Eurobonds and not euro bonds. Euro bonds are bonds denominated in euro and sold in the Eurozone. Eurobonds are bonds denominated in the currency different from the currency of the countries in which they are issued and sold. The name Eurobond has nothing to do with euro or even with Europe. Eurobonds are issued to be sold in an expanded market or to avoid the laws and regulations of the country in which the currency is based. Many of these bonds have special names, for instead samurai bonds, which are in yen denominated bonds issued outside of Japan or Eurodollar bonds pay in USD but issued outside of the United States. Eurobonds area bonds that are underwritten by an International syndicate, issued simultaneously to investors in a number of countries, and issued outside the jurisdiction of any single country. As they are bearer bonds and are not regulated like domestically issued bonds, Eurobond holders are anonymous, whereas most domestically issued bonds are registered, allowing authorities to identify the holders. International Capital Market Association is a self-regulated body that imposes some restrictions and regulations, and standardizes procedures on the issuance of Eurobonds.

Syndicated loans can be denominated in a variety of currencies. The interest rate depends on the currency denominating the loan, the maturity of the loan, and the creditworthiness of the borrower. Interest rate of syndicated loans is commonly adjustable according to movements in an interbank lending rate, and the adjustment may occur every six months or every year. Syndicated loans not only reduce the default risk of a large loan to the degree of participation for each individual bank, but they can also add an extra incentive for the borrower to repay the loan. From the perspective of banks, syndicated loans increase the probability of prompt repayment.

When the Eurobond market began, European countries had different currencies, so traders were organized by currency. With the advent of euro, traders started specializing by sector. Transactions were done by telephone. Eurobonds can have diverse characteristics, some of which are tailored for specific investors, such as pension funds. The most common types include the following: (1) straight fixed-rate bonds pay an annual coupon at a rate that is fixed for the term of the bond; (2) equity bonds have either attached warrants, which give the holder the right to buy another assets, usually shares of the issuing corporation at a specified price or they are convertibles; (3) floating rate notes have a variable coupon that is reset regularly, usually every three or six months as a spread above a reference rate, usually LIBOR (which is the rate commonly charged for loans between banks); (4) Zero coupon bonds pay no interest but are issued at a discount.

Many Eurobonds are issued by corporations. Transactions have been usually governed by UK law, since London is the centre of most Eurobond activity. In recent history, some of the largest American companies have raised financing abroad to tap into lower interest rates around the world. For instead, Apple issued a Eurobond in 2014 raising 2.8 billion euro with two eight- and twelve-years bond issues. Importantly, this bond would still be called a Eurobond if were issued in British pounds, Swiss francs or Japanese Yen. Multinational companies that generate profits globally can service a Eurobond without much added difficulty or currency risk. Apple generates a profit in euro in Europe, so paying interest on a bond denominate in euro is not particularly challenging. We also have to consider the needs of the investors. A London fund manager who oversees a pound-denominated portfolio might the risk-reward ratio of Apple debt, but only if he or she can invest without exchange-rate risk. A pound-denominated Apple Eurobond would allow the fund manager to invest in Apple debt without worrying about exchange rates between the U.S. dollar and British pound. Eurobonds are the most commonly issued when the issuer doesn't have a particularly deep local debt market, or when the issuer´s

home currency is less attractive to investors. Due to external currency characteristics, the Eurobonds are also known as external bonds. The external bond market, also called the international bond market, includes bonds with the following four features:

(1) underwritten by an international syndicate;

(2) at issuance they are offered simultaneously to investors in a number of countries;

(3) issued outside the jurisdiction of any single country;

(4) they are in unregistered form;

Eurobonds also have a secondary market. The market makers are in many cases the same underwriters who sell the primary issues. A technological advance called Euro-clear and Clearstream helps to inform all traders about outstanding issues for sale, thus allowing a more active secondary market. The intermediaries in the secondary market are based in ten different countries, with those in the UK dominating the action. They can act not only as brokers but also as dealers that hold inventories of Eurobonds. Many of these intermediaries, such as Bank of America International, Salomon Barney and Citicorp International, are subsidiaries of US corporations. (Madura & Fox, 2016). Although Eurobonds are typically registered on a national stock Exchange, the most common being the Luxembourg, London, or Zurich exchanges, the bulk of all trading is in the over-the-counter-market. The majority of Eurobonds are now owned in electronic rather than physical form.

1.1 Advantages and disadvantages of Eurobond financing

In the Eurobond market, there is a debate regarding the relatively weak protection afforded by covenants. The chief reason for this is that investors in corporate Eurobonds are geographically diverse. As a result, it makes it difficult for potential bond investors to agree on what form on covenants offer true protection.

Firstly, we can modify two single ways how to look at Eurobonds. From the positive point of view we can say, that Eurobonds can prevent repeated financial crisis that is creating a destabilizing economic and political environment. Investors will have greater security in buying the bond because overall Eurozone debt is manageable. In this case interest rate costs would fall for several countries, this would give them much greater ability to repay outstanding debt rather than just keeping up with interest payments. It would mean secure countries wouldn't need to get involved in bailout packages. From this point of view the logical conclusion is to have a single currency. A common monetary policy and common currency needs a single fiscal policy to ensure economic harmonization.

Advantages of Eurobond financing are for instead the possibility to take advantage of favorable regulatory and lending conditions in other countries. Eurobonds are not usually subject to taxes or regulations of any one government, which can make it cheaper to borrow in the Eurobond market as compared to other debt markets. Obtaining financing by issuing Eurobonds is often cheaper than obtaining a foreign currency bank loan. Since Eurobonds are normally aimed at institutional investors and not the public, there are no advertisement costs involved and this means lower cost for the issuing company. Domestic financing reduces the debt costs when the local currency depreciates. The advantage of financing domestic bond in comparison of financing of Eurobonds, are investors normally hopeful to the company, hence increase the source of capital and smooth operation. The lack of investor´s interest in the domestic bonds is a poor liquidity in the secondary market. Domestic bonds operate within a national system of regulation and might be subject to more regulation than the Eurobond market. The main advantage of Eurobonds are increased liquidity of European bond market, protection from large

market shocks and erratic market discipline, guaranteed funding for all Economic and Monetary Union countries and an improvement in the international position of the Euro.

The most attractive benefit of a Eurobond compared to a foreign bond is the reduced regulatory requirements and greater flexibility. Eurobond disclosures are governed by market practices rather than an official agency, which enables issuers to avoid regulatory paperwork, reduce costs, and ultimately issue the bonds ore quickly.

From "negative" point of view we can conclude, that is unfair to countries, which have avoided debt crisis through fiscal responsibility. From the perspective of national horizon Eurobonds can be a moral hazard. If countries can benefit from overall Eurozone average, there may be less incentive to reduce wasteful spending and borrowing. As debt will be secure, it may encourage countries to borrow more than prudent because they don't have the same incentive to reduce borrowing. If there is a lack of fiscal discipline, overall Eurozone debt could continue to grow possibly making even Eurobonds lose credit worthiness over time. (Pettinger, 2011)

One of the disadvantages of Eurobond financing is the restrictive clause. Company can be restricted to issue bonds, to pay dividend and to make Manger and Acquisition. From the overall perspective, for instead currency swaps are beneficial, from the hedging motive as well as from the financing motive (value maximization). The hedging motive differentiates the currency swap alternative from the domestic debt financing currency of the domestic debts. As alternative also suggests that a long term or a short term exposure to the exchange rate changes is best addressed by use of currency swap and other alternatives such as a cross-listing. Eurobond and domestic financing cannot achieve the dual objectives of long term or short term hedging and financing for companies. Therefore, currency swap alternative is profitable way for companies for raising funds. One of the main disadvantages are possible free-riding problems, tensions with the no-bailout clause, credibility and political viability.

The potential negative risk of Eurobonds is that it is not regulated by regulators and investors must also factor in any foreign exchange risks associated with the issues, which can be volatile when dealing with emerging on frontier markets.

1.2 Issuers and Investors

Issuers have the freedom to issue bonds in a country or region of their choice. They also have the choice of currency in floating the Eurobond. Other benefit for issuer can be interest rate variety from one country to the other. The issuer can choose the country with favorable rates and using Eurobond the company mitigates the forex risk. For instead Sub-Saharan countries or South Asian countries has a huge investment possibilities in Eurobonds in foreign currencies. One of the biggest benefits for issuer is a wide variety of maturity duration, which can be selected. Although Eurobonds are issued in particular country, they are traded on the global stock exchange, which helps in attracting large investor base.

As the majority of Eurobonds have lower face value, benefits for Investors are their denominating in foreign currencies and launching them in nations with stronger currencies keeps them highly liquid for local investors. Due to local availability of foreign currency bonds, resident investors can get exposure to foreign investments. This allows another level of diversification to their portfolios.

Conclusion

Eurobonds can accelerate economic growth, poverty reduction and can be helpful for the country's economy if the borrowed funds are spent on infrastructure projects that offer a greater scope for augmenting revenue earnings and creating employment opportunities. Eurobond can also help establish a benchmark-bond for domestic companies planning to finance business activities from international sources.

Common bonds could ease the ECB´s withdrawal from the market. They would provide a way around the limits on which countries' debts the ECB is able to buy, which is already proving problematic as it runs out of eligible German and Portuguese bonds. Many countries issued Eurobonds after the last financial crisis, which resulted in falling commodity prices. For instead, in this year's ability of African countries to raise money was limited. Eurobonds in Sub-Sahara regions help governments reprioritize the countries' finances and is better than other loans that often have conditions attached to them. Eurobond issuance by Sub-Saharan Africa peaked in 2014 amounting to 8 billion USD. The growth in this market provided benefits to the region from of increased diversification in funders and sources of funding.

Eurobonds could offer a unique advantage to large and reputed multinational companies to raise low-interest debt from global markets. The benefit of investors is from the diversification through addition of other currency debt.

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THE IMPACT OF FISCAL POLICY ON THE EFFECTIVENESS OF TAX COLLECTION IN THE SLOVAK REPUBLIC

Alexandra Mittelman

Abstract

The aim if this paper is to analyze the collection of taxes, the possible key parameters and the evaluation of its effectiveness in the Slovak Republic. By the analysis of the results acquired by the use of the chosen indicators, the paper points out to the possibilities of the evaluation of development of success of the collection of taxes in the Slovak Republic during the last years. Moreover, the paper points to the reasons why the Slovak Republic belongs to the states of EU where the effectiveness of the collection of taxes is one of the worst ones. It can be seen from the experience of the countries with developed economy that tax system maturates from three to five years. The Slovak Republic was in that period of maturity at the end of 90ties of the 20th century. Therefore it was necessary to come to the steps leading to improvement, eventually to the changes of tax system – to tax reform. The keystone of so-called tax reform in the Slovak Republic was to decrease tax burden, decentralization of tax system and finally stimulation of entrepreneurial sphere. For the processing of theoretical part, the method of research of professional literature and other relevant information to this topic was used. We have used the publicly available data that are processed by means of comparative analysis for the evaluation of the impact of fiscal policy and effectiveness of collection of taxes in the Slovak Republic.

Keywords: the Slovak Republic, taxes, effectiveness, tax evasion

JEL Classification: E62

Introduction

Fiscal policy, its aims and tools are one of the most important part of economic policy, economic stability and economic growth of every country where the principles of market economy are applied.

The instability of market economy and the necessity of the use of fiscal policy (interefernces of the government) to the stability of macroeconomy were already emphasized by Keynesian theory. The cyclic fluctuation of economy leads to unemployment, instability of economic development and to other issues. For this reason, the state has to interfere and direct economic processes.

The condition of the national economy in every country is the result of the impacts of various tools of economic policies that mutually dissolve and complement. Fiscal policy belongs into the most significant in the field of macroeconomy. It has the big relevance mainly for the countries that are the members of Economic and Monetary Union. The membership in Monetary Union means for country the loss of the independent monetary policy so the member country cannot use the tools of monetary policy for the establishment of the balance in economy and by this it loses one of the very important macroeconomic policies. However, the basic starting point is always state budget and its effort to balance total revenues and costs. The main source of state revenues are revenues from taxes and therefore it is very important to dedicate the significant attention to the field of setting tax system and to the effort of determination of the optimal burden what has ultimately influence on the majority of macroeconomic processes and indicators.

The revenue effort of state budget is significantly influenced by tax collection because it represents the biggest sources of revenues for the state. The increase of tax revenues can be reached either by implementing new types of taxes or by increasing current rates or by improving the effectiveness of tax collection. This paper focuses on the last possibility: the effectiveness of its collection.

1. FISCAL POLICY

Economic theory distinguishes between two types of policies that are closely related to each other. Fiscal policy, on the contrary to budget policy was established as the expression later, in connection with Keynesian understanding of economic policy whose basis is the state interference to economy. Fiscal policy is the use of the tools that are state budget costs, taxes, duties, etc that influence economic processes. It is the performance of state focused on the stabilization and support of the economic growth and it is realized by the government.

The original objective of fiscal policy was obtaining and allocating funds for the state costs coverage. Till 1930s of 20th century state budgets did not play any important active role, as in practical policy where the doctrine laissez faire was applied, according to which the system of free competition was able to secure the full employment and balance between the offer and demand. In 1930s of 20th century the significant quantitative change was made in the status of state budgets. Fiscal policy became an active economic factor.

We distinguish between microeconomic and macroeconomic functions of fiscal policy. In microeconomic standpoint, there is the allocating and redistributional function. Allocating function focuses on concentrating and allocating financial resources on payment of the production of public goods.

1.1 Fiscal policy in EU

Fiscal policy is in EU remained in the competence of its member states. However, there were manadatory rules on performance of national fiscal policies adopted in the contract of European Monetary Union signed in Maastricht and valid since november 1992. In 1997 The Stability an Growth Pact was concluded and it strengthened the conditions of convergent criterion for the deficit of public finances and it innovated the procedures securing the correction of its fulfilling. In coordination of national fiscal policies, authorities and institutions of EU clearly and consistently promote the requirement to remediate public finances mostly on the basis of decreasing the rate of its costs from GDP and at the same time to increase the effectiveness of its implementation. It is recomended there to decrease also public costs in the parralel performance of structutral reforms. However, the basic rule here is the requirement that any change in public finance or in fiscal policy would improve and in no way deteriorate the result from public finance, as the priority structural reform is specially remediation, resp. maitenance of healthy public finance that The Stability an Growth Pact expects from member countries. The EU authorities influence and coordinate fiscal policy and public finance as the field of common interest of the whole Union that is supposed to contribute to fulfilling of its aims.

The European Commission so far unsuccessfully tries to harmonize indirect taxes in EU, however it mostly has led only to aproximation of taxes. Except of harmonization of taxes, tax competition belongs to the issues of EU, that the countries try to use for attracting the foreign capital. Lower taxes relatively increase the atractiveness of the country towards the neighbour countries, in consequence of that workforce nad capital could be heading to that country with the negative consequences for the economy of partners. Disadvantaged partner could, of course

react the same by decreasing taxes and the ole process of tax competition would decrease taxes under the level necessary for normal functioning of economies of particular countries, mainly its public finance.
In 2015, tax revenue (including social contributions) in the EU-28 stood at 40.0 % of GDP, and accounted for around 89 % of total government revenue. The ratio of tax revenue to GDP in the euro area (EA-19) was higher than in the EU-28, at 41.4 %. As figure 2 shows, the ratio of 2015 tax revenue to GDP was highest in France (47.9 % of GDP), Denmark (47.6 % of GDP) and Belgium (47.5 % of GDP); the lowest shares were recorded in Ireland (24.4 % of GDP), Romania (28.0 % of GDP), Bulgaria (29.0 %), Lithuania (29.4 %) and Latvia (29.5 %) as well as Switzerland (28.1 %).

Between 2014 and 2015 decreases in the tax-to-GDP ratio were observed in seven Member States (Ireland, Denmark, Belgium, Malta, Luxembourg, Cyprus and Portugal) as well as Norway and Iceland. The largest decreases in the tax-to-GDP ratio were observed in Ireland (-5.5 p.p, due to denominator effects), Denmark (-2.7 pp., coupled with a decrease in absolute terms), Belgium (-0.5 pp.), Malta and Luxembourg (both -0.3 pp.). For Iceland (-1.9 pp. of GDP), Norway (-0.1 pp. of GDP, coupled with a decrease in absolute terms) and Serbia (-0.5 pp. of GDP), decreases were also noted. For Italy, between 2014 and 2015, no change in the tax-to-GDP ratio was observed.

Increases in the tax-to-GDP ratios were observed in twenty Member States as well as Switzerland. In percentage points, the highest increases in % of GDP from 2014 to 2015 were recorded by Lithuania (1.5 pp.), Estonia (1.3 pp.), Slovakia (1.1 pp.) as well as Switzerland (1.1 pp.). All four countries report comparatively low tax-to-GDP ratios.

Amongst the countries that joined the EU in 2004, Hungary and Slovenia had the highest tax revenue-to-GDP ratios in 2015, at 39.2 % and 37.1 % of GDP respectively. Even so, tax revenue in both countries remains lower than the EU average.

It is interesting to note that the arithmetical average of the 28 EU countries is somewhat lower (at 37.1 %) than the GDP-weighted EU average (40.0 %), due to the relatively low levels of GDP (and therefore low weight) for some of the countries that have low tax revenue.

(Source:
http://ec.europa.eu/eurostat/statisticsexplained/index.php/File:Total_tax_revenue_by_country,_1995-2015_(%25_of_GDP).png)

1.2 Fiscal policy in the Slovak Republic

The state budget balance has been published monthly since 1993. However, since january 1998 the height of deficit without the principal instalments of debt has been published. There existed the wide scale of state funds beyond state budget to improve the state budget deficit in many cases, e.g. the costs of Government Fund of Road Economy should not have been included fully into state budget. National Property Fund, National Labour Office or Social Security are not the part of it. If we then take into an account the above, we will find out that almost a half of the fiscal deficit arises beyond the state budget. It means that it does matter if the deficit arises within the state budget or within extra-budgetary chapters. As the Ministry of Finance of the Slovak Republic was not able to provide to the public the data about the fiscal deficit in the past, the National Bank of Slovakia used, is own monetary survey for the quantification of the approximate estimate of the height of deficit. NBS defines the fiscal deficit on the basis of the flow of financial resources as the change of net loan to the Government and National Property Fund. However, it is only the approximation of fiscal deficit, because these data do not include

the foreign and nonbank creditors of the Government. The data published by NBS usually underestimate the height of the fiscal deficit.

The Ministry of Finance is the coordinator of the budget process. The Government in accordance with the policy statement and on the basis of the financial possibilities of the state states the priorities of the particular sectors and at the same time it directs and coordinates the realization of the sector policies. The Parliament approves the limits for costs and the height of deficit in the Act on state budget. Citizens, company and non-governmental organizations are on one side the beneficiaries of resources of state budget, services or goods that they buy for it but on the other hand they realize the important controlling function by means of members of parliament. Every year, Supreme Audit Office of the Slovak Republic checks how effectively and rationally did the state economize with the money of taxpayers and it presents the report about it to the Parliament. The Treasury has been providing the current information of the performance of revenues and costs of state budget since 2004.

The common factor of all parts of public finance is, that it works with the money from all of us. This money gets to them by means of paid taxes, levies to insurances and from the various fees for acts (e.g. in the form of seals) or by transfer from the state budget. Taxes that represent the nonrepayable and aimless payment of citizens and state companies have the biggest share on the public finance revenues. The fiscal decentralization passed 1. 1. 2005 in the Slovak Republic, and original competencies that were till then financed from transfers from the state budget are financed now from own resources, own revenues of local authorities. It is up to local authorities how will they withdraw their own revenues or what amount of local taxes will they state.

Table 1 - The latest tax reforms

Description of measure	Change	Date
Personal income tax: Earned income		
Taxation of dividends - Introduction of 7 % withholding tax on dividends.	New tax	Legislation: 21-09-2016 In force from: 01-01-2017
Personal income tax: Unincorporated businesses/Self employment income		
Lump-sum expenditures will increase up to 60 % of business income, with maximum threshold of EUR 20 000 annually.	Base decrease	Legislation: 21-09-2016 In force from: 01-01-2017
Social security contributions: Employee		
Increase of maximum assessment base (maximum threshold for contributions to apply) from 5 times average wage (t-2) to 7 times average wage (t-2). Applicable to both SSC of employees and employers.	Base increase	Legislation: 11-10-2016 In force from: 01-01-2017
Abolition of maximum assessment base (maximum threshold for contributions to apply). Applicable to both SSC of employees and employers.	Base increase	Legislation: 14-12-2016 In force from: 01-01-2017
Social security contributions: Employer		
Taxation of dividends - Abolition of heath contribution from dividends. Health contribution from dividends has been replaced by withholding tax on dividends.	Neutral	Legislation: 21-09-2016 In force from: 01-01-2017
Corporate income tax		
Decrease in CIT rate from 22 % to 21 %.	Rate decrease	Legislation: 17-10-2015 In force from: 01-01-2017
Abolition of tax licence (minimum tax for enterprises).	Base decrease	Legislation: 14-12-2016 In force from: 01-01-2018
Other corporate taxes		
Increase and prolongation of special levy on enterprises in regulated sector - 100 % increase of monthly rate (current level - 0.363 %).	Rate increase; base increase	Legislation: 21-09-2016 In force from: 01-01-2017
Prolongation of special levy on selected financial institutions - Monthly rate 0.2 %, abolition after 2020.	Neutral	Legislation: 17-08-2016 In force from: 01-01-2017
Other excise duties		
New tobacco taxation - Increase in minimum and special rate and gradual increase of excise duty from cigarettes based on a calendar.	Rate increase	Legislation: 17-08-2016 In force from: 01-01-2017

Source:
https://ec.europa.eu/taxation_customs/sites/taxation/files/taxation_trends_2017_country_chapter_slovakia.pdf

To ensure costs, the state needs revenues that it gains from households and companies mainly in the form of taxes but also by means of various fees. Revenues and costs that state carries out in the stated period (generally annually), create the centre of state budget. The state budget is the balance of revenues and costs during one budget year that is in the Slovak Republic the same as the calendar year, however, this is not valid in all countries. For example in USA the budget year begins in October and in many islamic countries it begins in March.

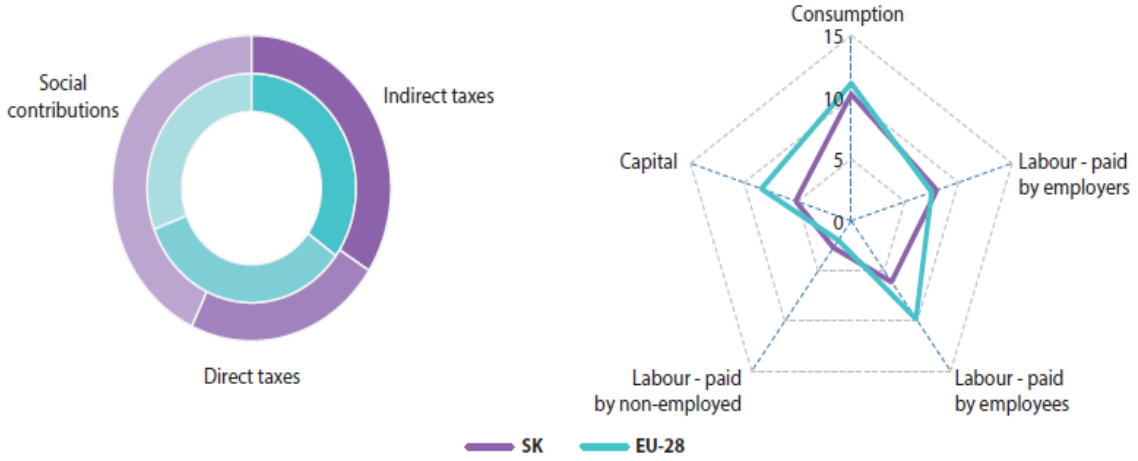
Tax laws valid and effective in the Slovak Republic till the end of became the part of the tax system reform that meant the significant change in the development of tax system and it was connected to the social and economic changes in teh country. Since 1993, these laws have been amended for various reasons, either from legislative reasons, political reasons or by promoting benefits into provisions of the particular tax laws from the side of interest groups. Tax laws therefore contained many non-systemic measures, different types of benefits, exceptions and exemptions. Many provisions of laws were ambiguous and required other explanations and guidances. From the reasons stated, the previous tax system was very complicated. The implementation of different tax rates and different treatment with the various types of taxpayers contributed to complexity that led to the situation that taxpayers were transferring its revenues to other types of groups, they eventually transferred it to other more advantageously taxed taxpayers in an effort to „optimalize“ tax duty.

1.3 State budget of the Slovak Republic

State budget is the most important tool of fiscal policy and it is the significant part of every economy. The creation of sufficient resources on the revenue side of the budget and its effective use in the area of public finance is one of the main aims of budgetary policy. The height of deficit of public finance as well as state debt is influenced by various factors as for example interest rate in national economy, inflation rate and also a inclination of particular governments to debt. Public debt and deficit is becoming the current phenomenon in economies.

In the Slovak Republic, VAT is the most important tax from the point of view of the amount of revenues into state budget. There are studies that try to evaluate the effectiveness of VAT collection in particular states. The Organization for Economic Cooperation and Development compares for example effectiveness of VAT collection on the basis of various indicators. According to the available statistics, the Slovak Republic is one of the worst performing countries regarding the effectiveness of VAT collection. If the Slovak Republic was succesful in raising the effectiveness of VAT collection to the average level of other countries, the revenues from this tax would rise substantially.

Figure 1 - SK: Tax revenues by main taxes, compared to EU-28, 2015 (in % of total taxation (left graph) and in % of GDP (right graph))



Source: DG Taxation and Customs Union, based on Eurostat data.

Source: https://ec.europa.eu/taxation_customs/sites/taxation/files/taxation_trends_2017_country_chapter_slovakia.pdf

As it can be seen from the graphs, the Slovak Republic has in comparison with the EU states (EU-28) almost the same amount of collection of indirect taxes, direct taxes are by the third lower and the biggest share has social contribution, what represents almost the half of the slovak „tax pie“.

One of the reasons of this inequality can be the division of taxes which is in the Slovak Republic grouped to 9 basic types. For the needs of this paper, we focused on the taxes divided according to tax technique, direct and indirect taxes.

The total tax burden in the Slovak Republic in teh last year increased up to 61,86 % from the average reward belonged to employee. Employee with the average salary then worked almost 226 days in a year to pay all the taxes and from the 227th day they started to earn for themselves and for their families as the Conservative Institute of M. R. Štefánik has informed about it. 484 Eur for one month lasted to employee last year with the average brutto salary 912 Eur monthly after paying all the taxes. It represents 38,14 % of all labour costs that represent approximately 1 269 eur monthly. In 2016, tax burden increased by 0.8 the percentual point in comparison with 2015 and by 1.5 pecentual point in comparison with 2014.

“Although the state has decreased some consumption taxes, for example by implementing 10% VAT for the particular articles of food, by higher taxation of companies, the total tax burden of citizens has been increased,” Institute states. The symbolic day of the tax unburden has then been moved from the 12th of August from the last year to the 15th of August according to the updated calculation.

Last year, revenues of taxpayers were taxed the most, what created 71,2 % of total taxes. Then it was the comsuption with the share of 25,1 %, assets created 2 % and entrepreneurship 1,7 %. From the recipients of these enforced payments, the state gained the most, including the funds of social security, it was 81,1 % from taxes.

Tax-levy burden is growing also according to the Slovak Chamber of Tax Advisors (SCHTA). As Miroslav Marcinčin – the member of the bureau of SCHTA added, the high tax-levy burden

of labour in the Slovak Republic is caused mainly by very high levy burden that is according to him one of the highest ones from the member states of OECD. “This burden is still growing because of removing the maximum basis of assessments for health insurance since 2017 and also because of the rising of the maximum monthly basis of assessment on the social insurance from the amount of 4 290 eur to the amount of 6 181 eur since 2017".

Another reason of the current situation are the low tax-free amount and deductible items stated in returns. After some years stagnation, tax-free part of the basisi of assessment is going to grow by less than 30 eur to the amount of 3 830,02 eur for year 2017. As the amount of tax-free revenue does not grow as fast as nominal salaries, tax burden is growing.

According to the chamber, the amonut of tax bonus for children has the influence on the height of tax burden, too. In the Slovak Republic, the tax bonus for child is in the amount of 256,92 Eur annually. In Czech Republic the tax-free amount is between 510 to 650 Eur annualy. In Germany, the tax bonus is in the amount of 2 304 to 2 676 Eur annually on one child, depending on the number of children. The interesting thing is that in other countries you can deduct in return also those items as costs for commuting to work, costs for the care or education of children, higher cots for living, etc. (Source:http://www.epi.sk/clanok-z-titulky/celkove-danove-bremeno-na-slovensku-rastie-spravodajstvo-8-2017.htm)

1.4 Offshores and Slovak taxes

Together with the question of taxes and its collection, it is necessary to look at the fact that how many Slovak companies have the registered office, resp. use the advantages of the system of offshores.

Offshores are places in world’s economy that offer entrepreneurs for its performance much more favourable conditions for entrepreneurship than their mother countries. Its advantages are low or none taxes, the high level of bank and trade and bank secret, no control of foreign deposits in foreign currencies, modern communication devices. Thanks to these advantages, entrepreneurs from all over the world transfer some of their transactions to these offshores. Decreasing revenues of other countries and measures directed right against offshores could be a problem.

At the beginning of 2017 the number of companies owned by Slovaks and established in offshores increased. However, since February there is a law in force according to which, companies have to publish its real owners if they want to make business with state. Despite of the fact that the Government has decreased the corporate tax from 23% to 22%, it is still the highest in the V4 countries.

According to the information of data company Bisnode Slovakia, there were 4777 countries in offshores last year, its number has increased year on year by 76 and quarter-on-quarter by 147. The record jumper of last year is Cyprus. There are 1066 companies on the island that is approximately the fifth off all the Slovak companies that are directly registrated in some of offshores. In USA, there are currently 1028 Slovak companies, which is the decrease by 36 companies in comparison with the year 2015.

Cyprus was not according to the analysis the only one where the new registrations significantly increased. Slovaks trust more and more to UAE. Emirates were after Cyprus the second biggest jumper in last year. Last year, 47 companies increased in UAE, thus more than the third from the total number of companies currently based in this country. Its advantage is mainly the fact that they are able to secure the absolute anonymity of ownership and companie are not burdened by any local taxes. The newest record numbers of companies from the Slovak Republic in

offshores confirm the predictions of Bisnode that companies have not been frightened by the new law against offshores. The Netherlands is the number one in offshores among Slovaks. In 2016, 1142 companies had its registered office there. However, despite the still great interest, the number of companies beginds to stagnate in the country.

The cases Panama Papers or the newer Paradise Papers, change of tax information among countries or the EU pressure can have the influence on stagnation or companies leaving offshores.

Table 2 - The number of Slovak companies in offshores

13	Bahamas	10
107	Belize	99
0	Bermudas	1
103	British Virgin Islands	139
14	Gibraltar	14
9	Goemsey (GB)	7
36	Hongkong	40
10	Jersey (GB)	10
5	Cayman islands	5
740	Cyprus	872
36	Liechtenstein	81
63	Latvia	86
392	Luxembourg	410
92	Malta	92
5	Marshall islands	43
21	Monaco	17
3	Netherlands Antiles	5
1137	The netherlands	1150
5	Island Man (GB)	5
169	Panama	157
190	Seychells	225
71	United Arab Emirates	97
1029	USA	1036
4250	Total	4601
2. quarter 2015		2. quarter 2016

1.5 The problems connected to tax collection

Economic theory predicts the rational behaviour of individuals in society where every economic subject tries to maximize its utility either from the monetary or non-monetary character. Regarding the topic of taxes, there is a prediction of the classical economic theory about the rational behaviour probably kept, when everyone tries o maxinize their utility. The economic border of the tax duty is stated by law and it is relatively clear but it is very difficult to state the so-called psychological border of taxation and it is influenced by many factors. Generally, the anti-taxation mood, unwillingness to pay taxes occurs in the society. The reasons can be economic – unwillingness to give up the part of their assets, social- the amount of taxes that leads directly to the dislike of taxpayer, psychological- the desire to avoid law.

The amount of tax frauds and tax evasion represents annually 1 billion EUR according to the estimates of EU. The topic of tax evasions has become more and more popular in recent years. Tax frauds represent the huge issue and influence ever individual.

2. THE INDICAORS OF EVALUATION OF EFFECTIVENESS OF TAX COLLECTION

Economists understand the expression effectiveness the fact that taxes should not cause the big changes in prices and utility from the different types of performances. The changes lead taxpayers to substitution of taxed goods or services by goods or service taxed less. This leads to the damage of the effective allocation of resources in economy. Moreover, taxes should not restrict labour effort of taxpayers, willingness to save and undergoing entrepreneurial risks.

In the Slovak Republic, one of the substantial influence on the effectiveness of tax collection, resp. tax administration is the speed of processing, whwre it is possible to select taxes in the currect saving of the rights of taxpayers. It is possible to divide the evaluation of the effectiveness of tax collection into the evaluation on the level of :

1. Public sector – direct costs
2. Taxpayers – secondary costs

The World Bank suggests to set the following types of evaluation for the evaluation purposes :

- Performance resp. effectiveness
- Efficiency
- Tax system structure
- Organization and management
- Resources

It is possible to follow tens or hundreds of different indicators withing the framework of such a defined structure of measuring indicators and comparison of performance of tax administrations.

Conclusion

The enforced selective tax policy based on favoritism of certain fields or types of entrepreneurial subjects should be substituted by the flat tax policy that would create generally favourable conditions for entrepreneurship and investments. The number of tax frauds and tax evasions represents annually according to EU estimates 1 billion Eur. The topic of tax evasions

has been recently more and more popular. Tax frauds represent the huge problem and influence every individual. The issue of tax evasions does not recognize limits and it can be often solved only by the common effort of states. The tendency not to pay taxes occurs in the society among many taxpayers. In principle, it is possible to distinguish between tax evasion (the conscious law infringement with the aim to minimize its tax duty) and tax optimalization (the evasion of tax duty within the law).

Every country measures the effectiveness of tax collection by means of various tools. The key results of productivity of personal pension taxes and VAT are key results for the results of effectiveness in the international understanding. According to the World Bank, the total effectiveness is influenced also on the level of personal pension taxing and the number of taxpayers on the one tax administrator.

It results from the survey of OECD, that if tax administrations publish the ratio of administrative costs to netto collection of taxes, it is almost always the data for all institution (i. e. for all administrated agendas) and not for the single taxes. The reason for the lack of data to the distribution of administrative costs or even the practical impossibilities of that observation. If there is the same methodology of measurement used, under the same conditions the change of this coefficient in time means the change of effectiveness of tax collection. One of the proposals for posssible solutions is the possibility to decrease administrative costs on tax collection. This fact from the point of view of costs to netto collection of taxes would brought the biggest contribution to the effectiveness of tax collection from the point of view of the Slovak Republic.

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THE EURO CRISES AND ITS IMPORTANCE FOR EUROPE

David Novak

Abstract

The Euro is the new currency in many countries of the European Union (EU). It has a crucial impact on persons, companies and public households as well as on debts, real and felt inflation, interest rates, the political unity based on assumed liability of the tax payers etc. There is a significant amount of public literature about various effects of the Euro currency. The importance of the warranty act for the EU is discussed as the crises or trap the Euro has brought obviously for many market participants in various countries. Due to the fact that there does not exist only one correct view, as this depends on the country this view is taken from, any final statements which are valid ever and for all cannot be done. Obviously it is a serious challenge for all attending countries including their inhabitants and companies. The fact that many single effects cannot be derived to one single or main reason proves the challenges regarding this matter. There are still several countries which didn't implement the Euro as currency and obviously they have reasons for that.

It can be stated that the Euro as currency didn't convince as necessity for the unity of the European Union each head of state and is a research gap so far. This paper is therefore a basis for further research regarding all mentioned reasons.

Keywords: Euro, monetary policy, price history, Euro trap

JEL Classification: G00, G38, E40, E50

Introduction

This paper gives a brief overview about the effects of the Euro currency in many European countries. As the effects includes as well advantages as disadvantages it is obvious that not one or final effect as crucial point can be emphasized. The felt price development is investigated including the interest rates which have an impact on all market participants. And the fact that experts in science see the Euro currency only on probation, describes the uncertainty how the new currency is seen yet.

1. THE EURO: ADVANTAGES AND DISADVANTAGES IN THEORY AND PRACTICE

1.1 The perceived price development in the Euro zone

The Euro cash changeover in 2002 gave a great deal of public attention to price changes. A considerable part of the population was, and still is, of the view that the Euro is the cause of enormous price increases. In the course of the discussion, this feeling came to light particularly by the fact that the term "TEuro" was a synonym for the Euro (a word play in German between teuer=expensive and Euro).

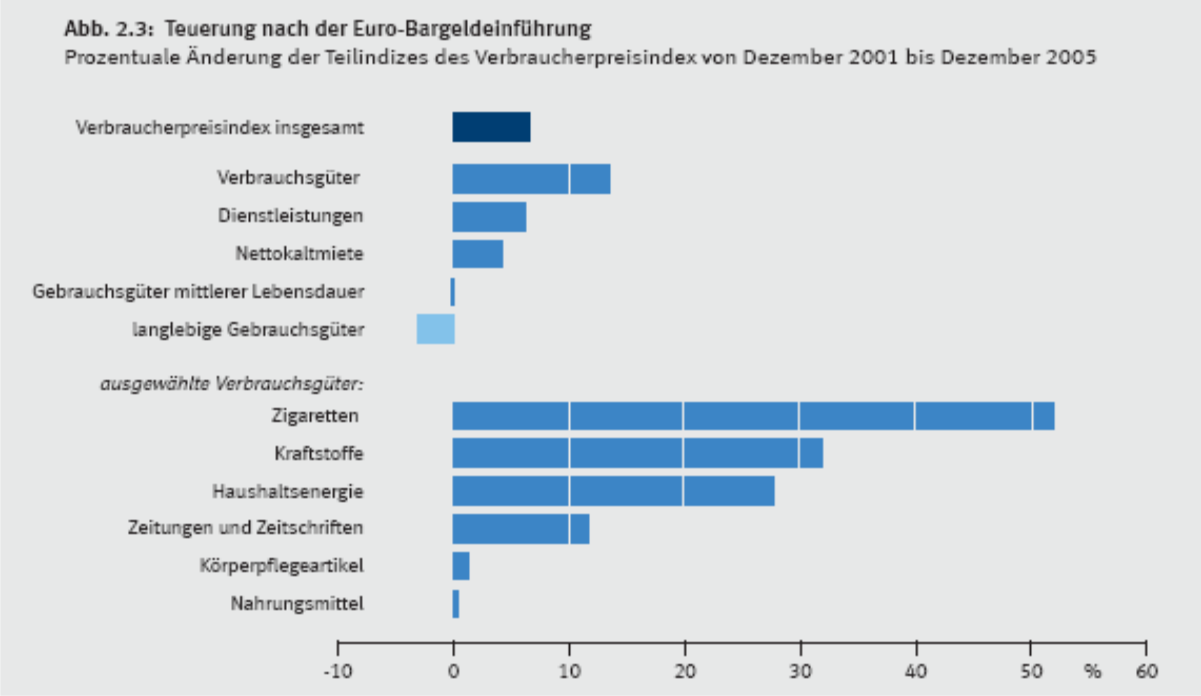
Official statistics have already paid attention to this phenomenon at an early stage and have initiated regular investigations into the position of the population against the Euro. A survey commissioned by the EU Commission, the so-called Eurobarometer, shows that in November 2002, 80 per cent of respondents felt that prices had risen as a result of the changeover. By

means of further interviews, it was found that this phenomenon is not only confined to the phase directly after the introduction of the Euro, but also continues in the following years. However, the results of the official statistics contradict this general view. According to the calculations of the consumer price index and the resulting official measured inflation rate, the Euro cash advance did not lead to the extreme price increases, as suggested (Eife, Coombs, p.2f).

According to this, the annual inflation rate at the beginning of 2002, i.e. at the time of Euro cash, was between 1.1 and 2.0 percent. Overall, inflation in 2002 was only 1.4 per cent compared to the previous year, which was lower than in 2001. The average annual price increase since the introduction of Euro cash until 2006 was 1.5 per cent, slightly above the average annual inflation rate in the five years of the Euro cash inflow of 1.4 per cent (Beuerlein, p. 208).

According to the results of official statistics, the Euro is thus not a "TEuro" and has not led to a price increase. The results of EU consumer surveys and official statistics seem to be contradicting, obviously there is a clear discrepancy between real and perceived inflation in the context of the introduction of Euro cash changeover. There are different explanatory approaches that may be the reasons for this discrepancy. Both, the Federal Statistical Office, the ECB and various experts have dealt extensively with this phenomenon. According to the Federal Statistical Office, one of the reasons for the obvious gap between the actual measured inflation and the perceived inflation in different special developments is to be seen. There were numerous factors that were decisive for price developments in the Euro area, but could not be directly linked to the Euro. (Beuerlein, p. 209)

Figure 1 – Inflation after Euro cash changeover



Source: Statistisches Bundesamt (Germany)

An important aspect that has had an effect on price development is administrative measures by the state. For example, the penultimate stage of the ecological tax reform came into force and the tobacco tax was increased. A further special impact is, which also coincides with the

introduction of the Euro cash market and has nothing to do with the introduction, the development of food prices. At the end of 2001 and at the beginning of 2002, there were considerable price increases. The main reason, however, was the cold winter in southern Europe, which had led to higher fruit and vegetable prices, as well as the effects of foot-and-mouth disease and the BSE crisis. In addition, a strong price competition in the retail sector ended in 2001, which meant that the grocers were again able to push higher prices after a longer period of low prices. The overlap of such developments with the introduction of Euro cash can be an explanation for the discrepancy between real and perceived inflation. A further attempt at explaining the discrepancy between real and perceived inflation is based on the composition of the commodity basket for the calculation of the consumer price index (Statistisches Bundesamt, pp.15f.).

Figure 2 - Chart €-US$ historic.

Source: Finanzen.net

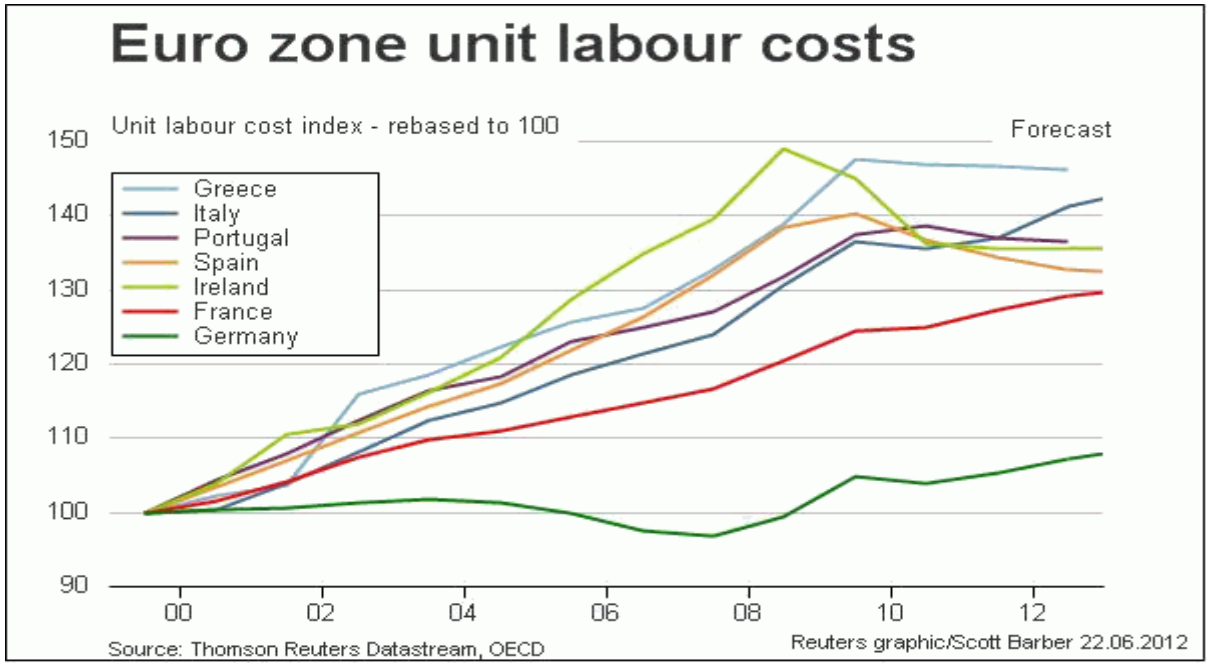
From the above course, it is clear that the Euro, with the exception of the very first time, was permanently more expensive than the US $. This fact of price stability must also be taken into account when allocating possible inflation rates, whether felt or real.

1.2 The advantages and disadvantages of the Euro for Germany

Of the numerous advantages and disadvantages mentioned in the scientific literature, and even more in the public newspapers, it's following only a few are mentioned, without claiming to be complete:

A disadvantage for Germany in particular was that there was a great stability with low interest rates, but in many other EU countries this was the reverse. This alignment lasted for many years and led to massive disadvantages, particularly in Germany, against other countries such as Ireland and Spain, where a large number of investments were suddenly worthwhile due to falling interest rates and substantial inflation. Solution: At the political level, Agenda 2010 was launched. Only the long-term stability of unit labor costs in Germany (see chart below) led to a considerable improvement in the competitive position of German manufacturers over time, while these unit costs rose significantly in other Euro area countries (Busch, p. 28-30).

Figure 3 - Euro zone unit labour costs.



Source: Dorgan, G. An *Upcoming Italian Success Story*, Retrieved https://snbchf.com/italy-euro-exit/upcoming-italian-success-story/. Original Source: Thomson Reuter Datastream, OECD

The common currency, which had had rather negative effects for Germany in the previous years, now began to yield significant advantages. This was mainly done in two ways: on the one hand, the single currency made it impossible for the other countries in the Euro zone to restore the reduced international competitiveness through a depreciation (which reduces the price of their own export goods abroad), as is often the case in the Euro area past had happened. A correction was now only to be achieved by adjusting the pay height downwards or by significantly increasing productivity. The comparative advantages of the Federal Republic in the stability of unit labor costs could no longer be compensated by a unilateral decision to devalue. And in a different way the common currency has proved itself in the past years as a clear advantage for the Federal Republic and thus brought an improvement over the D-Mark era. The existence of the Euro meant that the economic uncertainty caused by the financial market and economic crisis that began in the summer of 2007 could not lead to an escape into the most stable national European currency and would not lead to an appreciation (and thus a rise in the price of German exports) against the European trading partners (Busch, p. 31).

1.3 The constitutional complaint against the ESM

As a result of the financial market and economic crisis referred to in 1.2, the European Stability Mechanism was launched. Germany and the German taxpayer are the main debtors. As a result, there was a legal constitutional complaint:

In the spring of 2011, Eurozone heads of state and government agreed on the introduction of a permanent crisis fund. The European Stability Mechanism (ESM) should not enter into force until mid-2013. At the beginning of December 2011, the EU leaders decided to move the ESM

by one year at a crisis summit in Brussels. The credit volume of the ESM is expected to amount to 500 billion Euros. The ESM is to have a capital base of EUR 700 billion consisting of guarantees of EUR 620 billion and a cash contribution of EUR 80 billion. The German taxpayer's liability potential is calculated on the basis of the German capital at the European Central Bank (ECB). This corresponds to 27.1 percent. For the cash contribution, Germany is therefore liable with around 22 billion Euros and for the guarantees with around 168 billion Euros. This results in a total liability potential for the ESM of € 190 billion (Herrmann, p. 2).

In the constitutional complaint, therefore, the Federal Republic is rightly criticized for the fact that the Federal Republic is subject to additional liability risks within the framework of the ESM "on a scale which exceeds the extent of the constitutionally permissible". In the event of a partial realization, the budgetary autonomy of the Bundestag would be permanently restricted. The ESM Treaty also provides for an amendment to European primary law10. With the implementation of Article 136 III TFEU, the "Bail-Out of the State Community" is to be legally legitimized. This leads to a change of direction in the EU (Herrmann, p. 6).

On the other hand, however, constitutional complaints and a dispute between the members of the Bundestag, which led to the following court decision at the German Constitutional Court in Karlsruhe: "The constitutional complaints and the dispute against the establishment of the European Stability Mechanism, the fiscal Pact as well as the national consent and accompanying laws, the consent law to Art Para. 3 TFEU, the TARGET2 system and the so-called “six-pack” are partly inadmissible and are otherwise unfounded. This has been decided by the Second Senate of the Federal Constitutional Court with today's announced verdict. Despite the commitments made, the budgetary autonomy of the German Bundestag is adequately preserved. It is, however, to be ensured under budgetary law that any call for capital under the ESM Treaty can be completed within the agreed ceilings and can be fully fulfilled and thus a suspension of Germany's voting rights in the ESM committees is reliably excluded" (Bundesverfassungsgericht). The fact that the German Constitutional Court is being sued against the Euro or the related mutual payment obligation can be seen as evidence of the lack of confidence in the Euro as a whole. This also explains why the title of this paper involves the term “Euro crisis”.

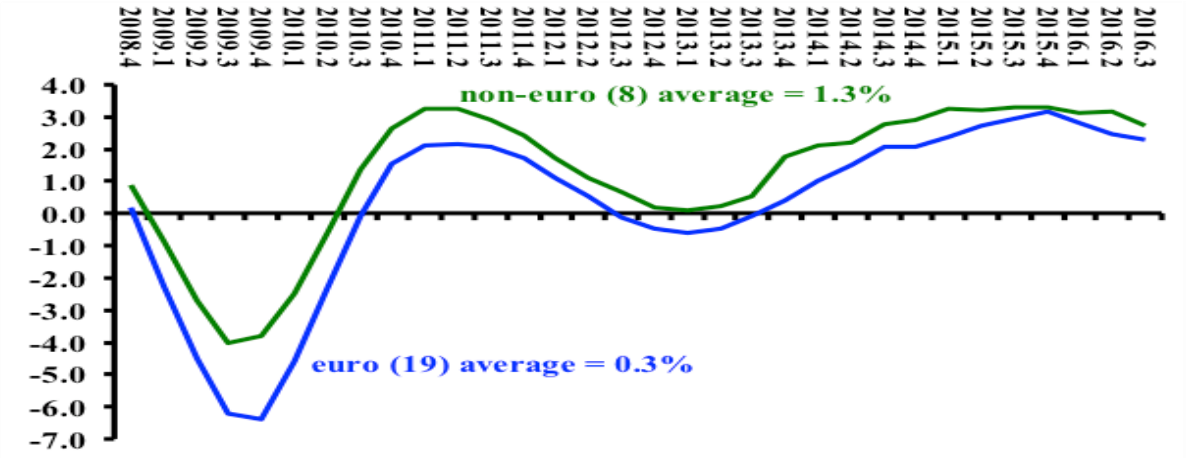
1.4 The Euro on probation

As a result of these various advantages and disadvantages, the currency of the Euro must still be viewed as a sort of "on par with", since the following challenges remain, each of which is worth its own paper value (Heinrich, pp. 161-166):

A withdrawal from the monetary union or the creation of a North or South Euro
A debt cut for the completely overthrown Greece
A further increase in ESFS capacity (expansion of the rescue screen)
An introduction of Eurobonds (the international communitization of debts)
Further borrowing by the European Central Bank
The establishment of a European rating agency and thus to achieve a European ranking

The introduction of a single financial transaction tax within the EU
So what is the concrete impact of the Euro an economics, e.g. the inflation rate? The chart below shows growth rates across countries from the outset of the economic collapse of 2008 through the third quarter of 2016, using a moving average to eliminate purely seasonal effects. Over those eight years, the average rate of growth in the 19 was consistently lower than for countries with national currencies.

Figure 4 - EU Countries, Euro Zone (19) and Non-Euro Zone (8), GDP Growth Rate, 2008-2016.



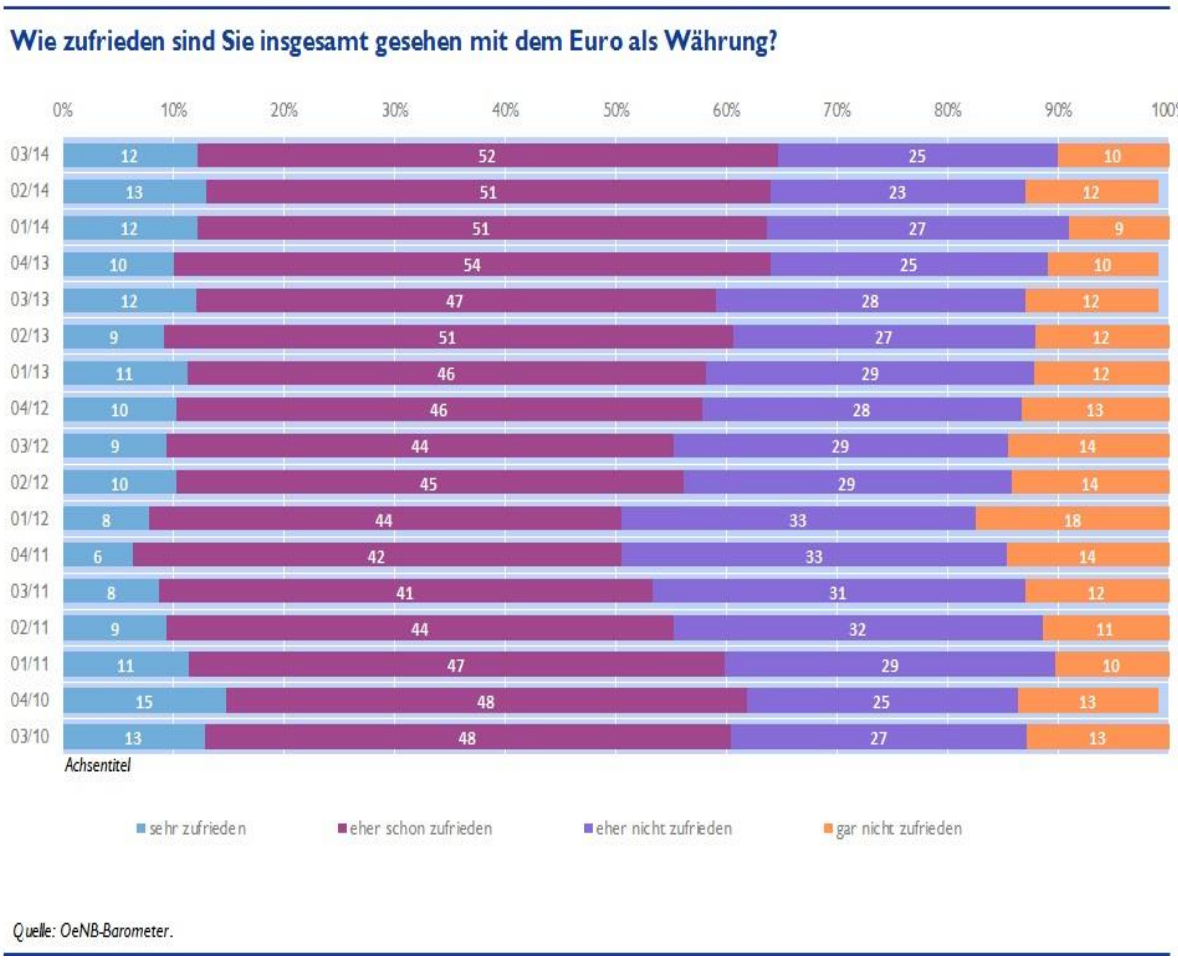
Source: Weeks, J. (2017). In *Social Europe*, original source: *Eurostat*. Note: Annualized Four Quarter Moving Average (Each Quarter Compared To Same Quarter Previus Year)

Conclusion Pros and Cons: All instruments of crisis management and all combinations thereof as described above are lengthy, expensive and without success guarantee. It is not a decision between short-term or long-term, corrective or preventative measures, saving or growth, but many things must be advanced in parallel in a high-spirited policy and market environment. The experiment of putting a monetary bell over a politically, economically and culturally divergent state bond can be considered a failure. This attempt has brought Europe closer to the brink of division than to its unification (Heinrich, pp. 166-168).

1.5 Satisfaction with the Euro

Really reliable and particularly up-to-date figures are apparently not available or cannot be found in the scientific literature about satisfaction with the Euro currency in Germany and / or the EU. Various investigations are carried out either by TV stations or by opponents of the currency, so that a neutral assessment by the author does not seem possible. The most recent study found was in Austria (Fluch, Schlögl, 2012) in 2011, in which about 60% of all respondents expressed rather positive about the Euro, if the currency were to remain in the future.

Figure 5 - Satisfaction with the Euro as currency



Source: Österreichische Nationalbank Online

The results of the "Eurobarometer" show that the attitude of the Austrian population to the Euro is mostly positive. 64% of respondents are satisfied with the Euro. In addition, the Euro is estimated to be stable by a large majority: 86% of respondents expect that the Euro will continue to exist in five years, and 77% consider this desirable. The results show that uncertainty about the continuation of the single currency has declined significantly over the past three years. At the end of 2011, about one-third of the population still supported their own national currency, but today it is only one-fifth (Österreichische National Bank Online, press release, 2014.12.18).

2. EURO CRISIS

2.1 The importance of the guarantee law for Europe and its impact on the future

The starting point for the Guarantee Act was as follows: Germany had insisted on the approval of the Euro under the Maastricht Treaty that the fund provided for in the Delors-Plan was not set up for the free-trade of afflicted states. They wanted to go the American way and therefore, with Article 125 of the consolidated EU Treaty, excluded a reciprocal liability of the EU countries. But this rule is no longer relevant. It was leveled with the law of guarantee in a legal,

probably admissible, factual but problematic form. Probable consequence of the guarantee law: Just as it is formulated, it is for Germany an incalculable adventure and a secure growth brake. It will further inflate the European debt bubble and subsequently induce transfer payments to the debtor countries because this is the only way to prevent the bursting of the bubble. The path to the Transfer Union is pre-programmed (Sinn, pp. 1-9).

2.2 The Euro as a bone of contention

Due to the numerous and above all, one must assessively evaluate negative developments in the 2010s, there are various critical scientific-based articles and books on the Euro currency. The following can be used as a criterion: the book "The Eurotrap" written by renowned economist Hans-Werner Sinn, which appeared in English (Oxford University Press), as well as with a one-year delay in German. These include numerous assumptions, or half-demonstrable developments, such as possible links between the Euro and peace, the development of the European Community, German reunification, or the development of the EU towards a transfer and debt union. In this context, attention is drawn to developments which are certainly linked to the Euro, such as the construction boom (rising housing prices by 0 interest rate policy), dying industries, or the financing of the balance of payments deficit. All measures are followed by measures such as support and rescue loans, or the violation of the initially banned bail-out procedure whereby taxpayers of one country are liable for the debts of another country. A single final royal path to the solution cannot be shown by sense (Sinn, pp. 453-501).

Conclusion

According to a number of scientific sources, one can conclude that there is no definite or definite assessment of the Euro currency. The reasons for this seem manifold and they seem difficult to answer. The actuality of the literature is, at best, vacillating and clear algorithms (cause: this - consequence: that) seem often difficult or impossible. At the same time, surveys on the Euro are neither current in German literature, nor do they appear to be scientifically based, which makes an assessment much more difficult. To what extent political interests (Euro seems to be responsible for the unity and cohesion of Europe) on the part of the respective governments, or the European politicians in Brussels, can at best be assumed but not proven. What is striking is that there are hardly any "Contra-Euro" publications. In any case, this issue must be questioned and scientifically investigated.

In any case, however, it must be noted that there are still numerous research gaps. And "correct" or "solutions valid for all states" does not seem to exist, since the respective national interests, represented by the respective heads of state, seem to be opposed to this. Nor can the current literature clarify whether the Euro is more economic science, or rather political-social issues or problems. This is also a major research field for the future. And since it is not possible to assess objectively how individual states and / or the EU as a whole would have developed without the Euro, a final conclusion is not possible according to today's research.
The only chance to arrive at truly valid results is the fact that individual facts can only be broken down into a single state and possibly only to a single industry or income group. But even then hardly a statement according to the motto "what would happen if without the Euro" would hardly be possible.

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NEW PERSPECTIVE AND CHALLENGES OF EUROPEAN ONLINE ADVERTISING

Ludmila Navrátilová

Abstract

The paper brings new data about European online advertising that is getting its power and importance in advertisers‘ portfolio of paid way of promotion. Digital advertising market is very fast changing and growing market, as different in online advertising formats as countries in European Union are. Research uses the newest data gained from current situation in the European markets especially from studies made by IAB Europe, IHS Technology and European Audiovisual Observatory. Paper explains meaning and position of programmatic display advertising.

Keywords: European Union, Online Advertising Formats, IAB Europe, Key Drivers of Display Advertising Growth, Programmatic Display Advertising

JEL Classification: M31, M37, O35

Introduction

Online advertising market in Europe has brought many changes in growing expenditures into internet as one of the main media type. In nine EU countries we can already find that online ad has surpassed TV ad spend: UK, Germany, France, Netherlands, Sweden, Denmark, Czech Republic, Ireland and Finland (Grece, 2016). IAB Europe (2016) in their research found out amount of total European online advertising market more than EUR 36 billion in 2015 (27 IAB countries), it means a growth by +13% year-on-year comparing with 2014. As statistics show in many countries as UK, France, Netherlands, Germany, Nordics use digital space for very naturally and advertisers are becoming confident because of increasing consumers‘online consumption of important and interesting content (Grece, 2016; Baines, Fill, Page, 2013).

1. METHODOLOGY OF RESEARCH

Data for this paper were generated through secondary research of online sources especially from *Interactive Advertising Bureau Europe (IAB Europe)* who is leading European-level association for online advertising ecosystem and main voice of digital businesses. IAB Europe works on promotion of the development of the digital highly innovative environment through shaping the regulatory environment, investing in research, providing thought-leadership, establishing business standards across Europe, delivering education and training and much more (IAB Europe, 2017).

Many used data for this research were also taken from *AdEx Benchmark report* monitoring European online advertising market and *IHS Technology*, a leader in global information and providing research by various markets (IAB Europe, 2016; IHS Markit, 2017). Used report refers to facts, figures and current trends across Europe’s diverse and rich digital markets.

The following survey according to *AdEx Benchmark report* and report of *The online advertising market in the EU* made by European Audiovisual Observatory, should also reinforce the importance of getting the framework of online advertising right for the EU economy because if

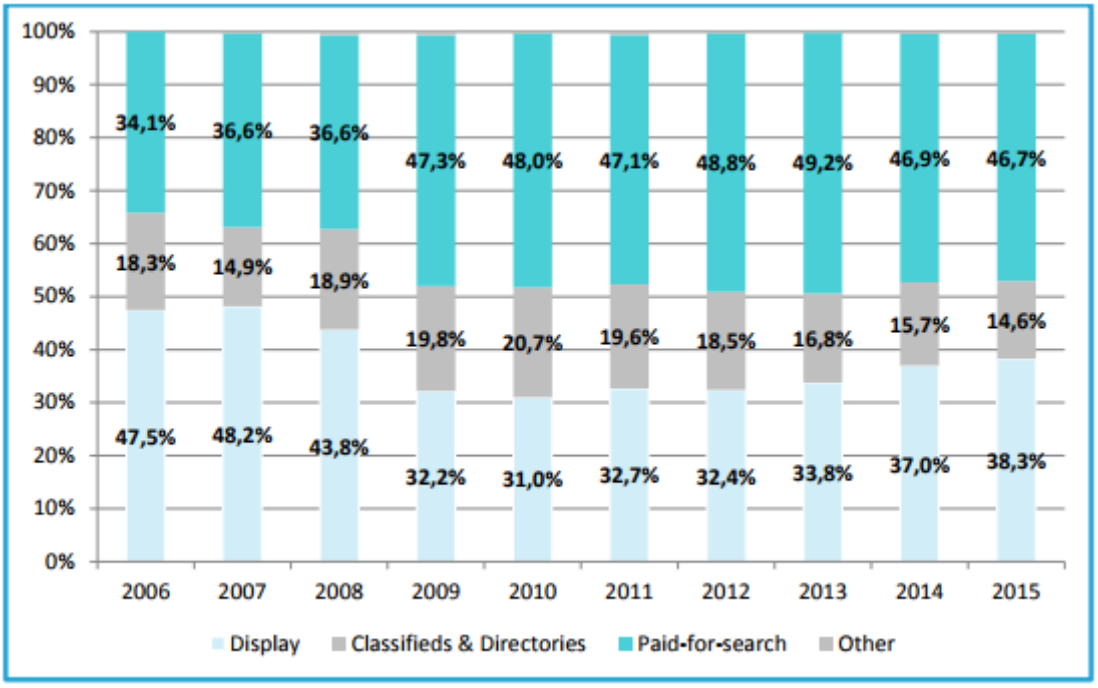
the law does not match regulatory scrutiny can be actual risk for users and companies with data protection. In the close future, European authorities more over should understand the implications of the recently-adopted General Data Protection Regulation, and IAB Europe and national IABs will play a key role in contributing to that interpretative exercise.

IAB Europe and IHS Technology establish figures on online advertising expenditures in Europe are based on data received from 27 European countries. 21 of them are members of the European Union. EU countries missing are Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta and Portugal. Non-EU countries included in IAB Europe and IHS Technology are Belarus, Norway, Russia, Serbia, Switzerland and Turkey. Consequently, when referred to "European online advertising" the figures are not representative of the European Union but the "Europe" of the 27 countries participating in the IAB long-term research.

2. CURRENT SUCCESSFUL ONLINE ADVERTISING FORMATS

Advertising on the Internet is represented by many advertising formats. According to expenditures: display ads, classifieds & directories and paid-for-search (Figure 1) are the largest advertising formats.

Figure 1 - Europe (27 IAB countries) Format shares of online ad spend in %, 2006-2015



Source: IAB Europe, 2016

Main formats of online advertising: display, classified & directories and paid-for-search advertising can be explained as (IAB Europe, 2017a; IAB USA, 2017):

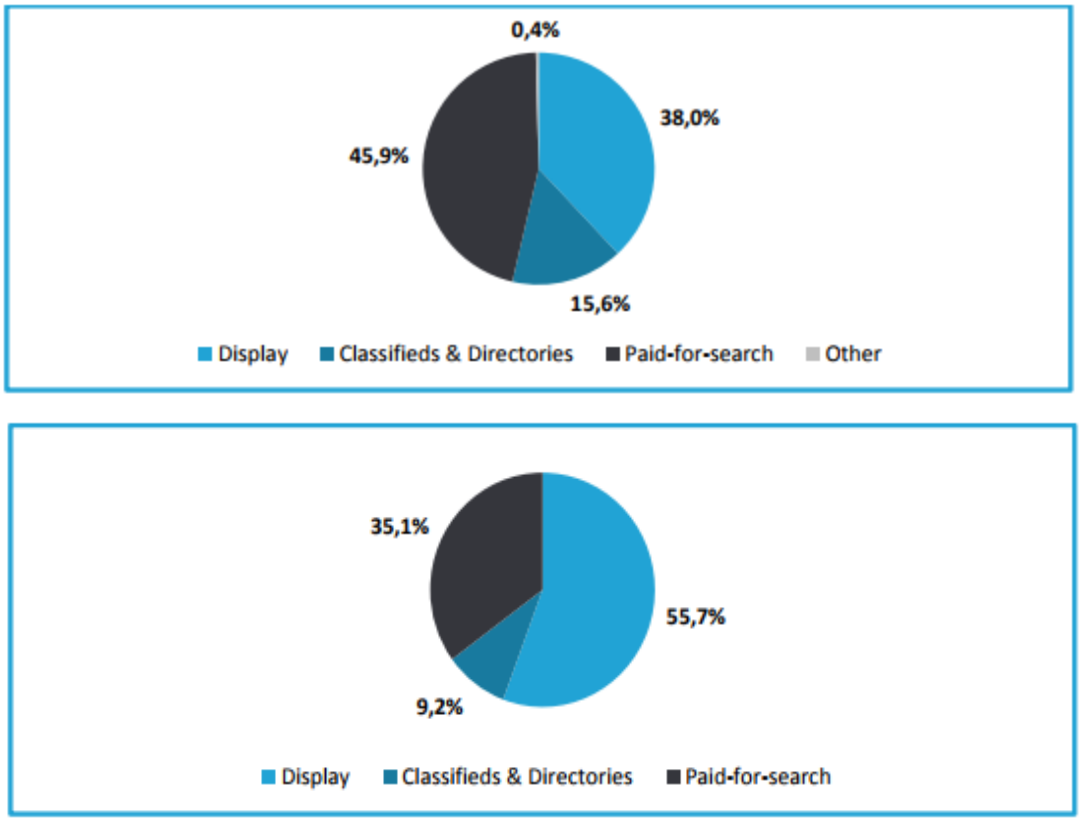
- *Display advertising* means kind of online ads where message of advertiser appears on destination website generally in a box (top, bottom, side) of the content of the page, e. g. banner ad, online video ad, pop-up, etc.

- *Classified advertising and directories* represent ads grouped under headings classifying the product/service being offered (e.g. headings such as restaurants, universities, fitness…) and is grouped in a section.

- *Paid-for-Search advertising* defines ads displaying company's name/site, domain name in search by specific word(s) or phrase(s), e.g. online users searching for an accommodation, plane ticket, product, etc.

Total online advertising spends within Europe show different attitudes in ad formats, especially between Western European countries and countries from Central/Eastern Europe (excludes Russia). Paid-for-search represents main advertising format in Western countries on the other hand display advertising format is the most common in Central and Eastern countries in Europe.

Figure 2 - Western vs. Central and Eastern European countries: share of online ad formats in 2015



Source: IAB Europe, 2015

3. KEY DRIVERS OF DISPLAY ADVERTISING GROWTH

Display advertising nowadays consists of also mobile display ads, online video advertising, ads on social networks that significantly year-on-year have been growing due to changing consumer habits.

Mobile display advertising

Mobile display ads grew by more than 60% in Europe in 2015. It demonstrates increasing importance of smartphones in huge advertising ecosystem (Greece, 2016). The top tree European countries (UK, Italy, France) accounted for 75% of mobile display ad spend with the UK alone taking 53% of EU mobile display ad expenditures in 2015 (IAB Europe, 2016). Use of smartphones also has shown new tactics of optimalization of shopping by these devices through just one click, directly using consumer personal and credit card data (Meeker, 2015; PWC, 2015).

Video advertising

Advertising by video on the Internet increased by more than 35 % in 2015 (IAB Europe, 2016). The reasons of this growth are mainly innovation in ad technology permitting better targeting of consumers reaching fragmented audiences, more efficient ways of transactions and new trends in monetization for content producers as well as online video consumption.

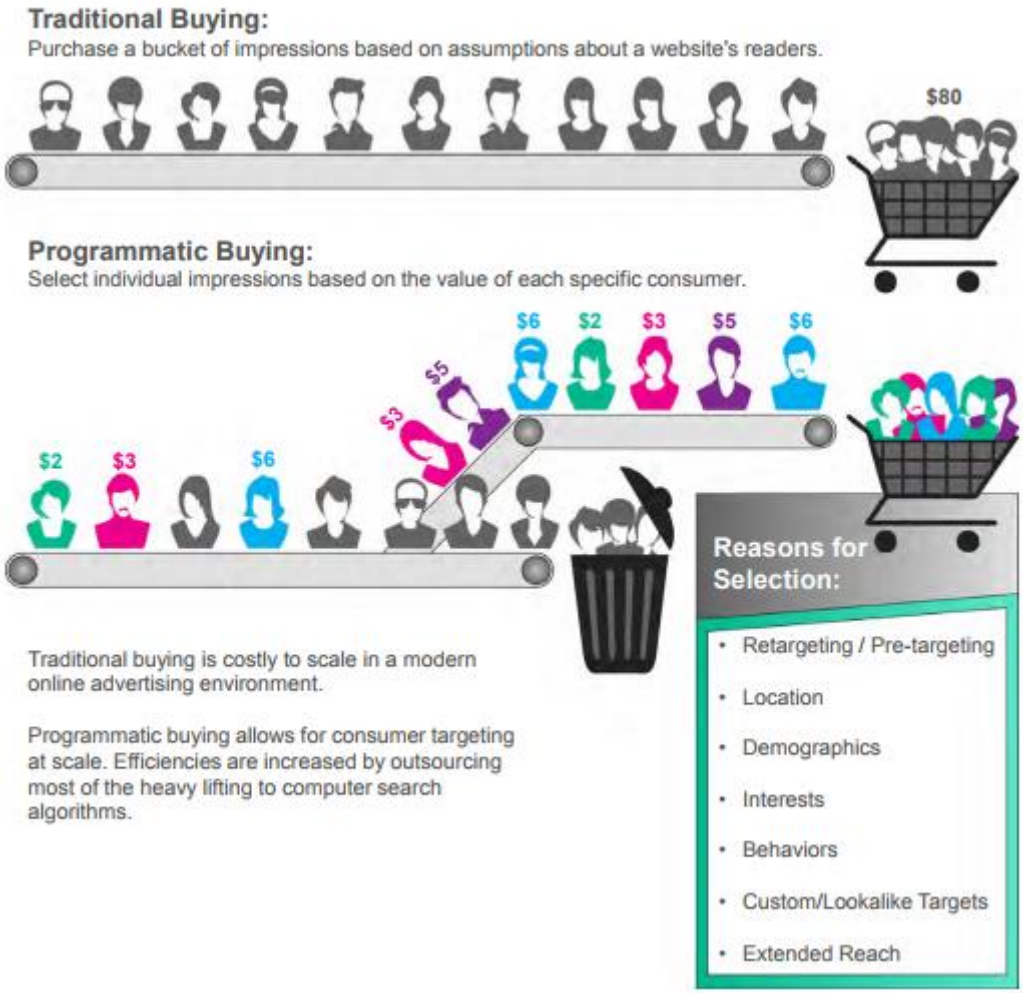
Advertising on social networks

Due to high penetration of social networks to internet users in Western Europe (more than 63%) comparing with total population (47%) (eMarketer, 2017), ads are getting important on social networks as Facebook, Snapchat, LinkedIn, Twitter, YouTube. These social networks grow their user base that mean the reason of advertising expenditures and also increasing consumption of videos/video ads has been continuing as a growth driver (Greece, 2016).

4. PROGRAMMATIC DISPLAY ADVERTISING

Meaning of programmatic advertising is in buying and selling of digital advertising space by display advertising (static and rich media banners, online video ads or mobile web) with aim of displaying/showing advertising in the right advertising message in front of the right target audience at the right time automatically (e. g. real-time bidding) (H1, 2015; Greece, 2016). Therefore, advertisements are served on an individual lever rather than on a common and broad basis created according to interest of the internet user, his preferences etc. (Picture 1).

Picture 1 - Differences between traditional and programmatic buying of online advertising



Source: Stillman & Letang, 2015

Programmatic advertising brings many advantages in technology-driven process passes through a machine-to-machine automation that uses algorithms and computers. Human input in the transaction is needed to set the rules for buyer and seller and define the profiles of potential interested online user, it is necessary to set price limits in auctions of the digital space (Tiwary, 2016). All process of buying and selling for online display programmatic advertising lasts less than 200 milliseconds that is why can be used quickly and efficiently.

Two main and different categories of programmatic advertising can be found depending on whether the selling process is auction-based (*Real-Time Bidding* purchase of advertising) where the price is not fixed or non-auction-based (*Programmatic Direct*) where prices are fixed and known in advance. Real-time bidding (RTB) can be based on *Open Exchange/Open Auction* available only to selected advertisers called as *Private Marketplace/Invitation-Only Auction*. In Programmatic Direct, publisher and advertiser cooperate in direct contact and can be on reserved inventory, called as *Automated Guaranteed* or on unreserved inventor, called as *Unreserved Fixed Rate* (IAB, 2016).

5. EUROPEAN MARKETS GROWTH

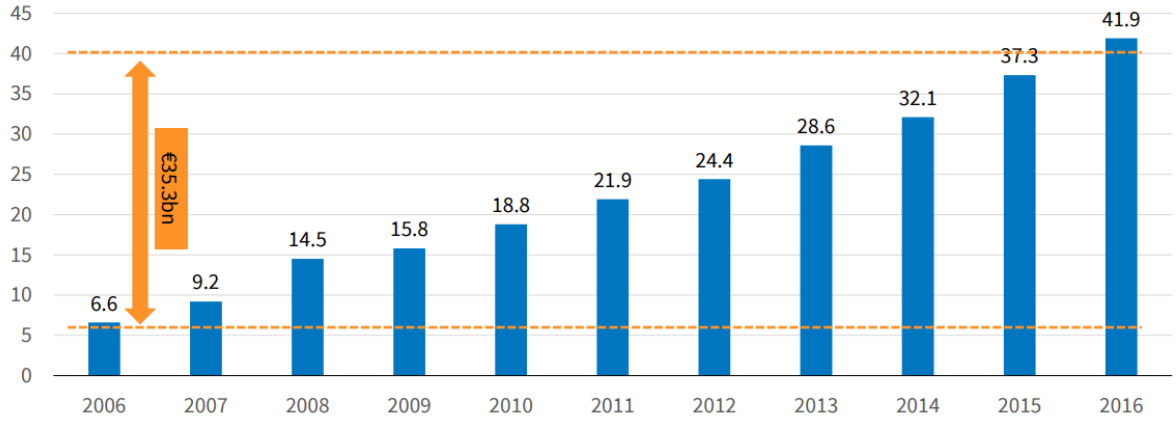
The most visible changes in year-on-year growth can be find in European markets in Ireland by 29,0%, in Bulgaria by 22,3% and Poland by 21,8%. European online advertising grew by 13,1% in 2015 to a market value of 36,4 billion euros in 2015 surpassing European TV advertising market in size 33.3 billion euros.

Year 2016 meant again strong growth of online advertising in Europe by 12,2% to 41,9 billion euros. Individual main growth markets were Romania by 36,9%, Slovenia by 32,2% and again Ireland by 31.4%.

Current top 10 European markets, according to its amount of expenditures for online advertising in 2016, are represented by: UK - €14.2bn, Germany – €5.9bn, France – €4.2bn, Russia – €2.6bn, Italy - €2.3bn, Netherlands – €1.7bn, Spain – € 1.6bn, Sweden – €1.6bn, Belgium – €0.9bn and Switzerland – €0.9bn.

Following figure (Figure 3) presents constant growth of expenditures for European online advertising.

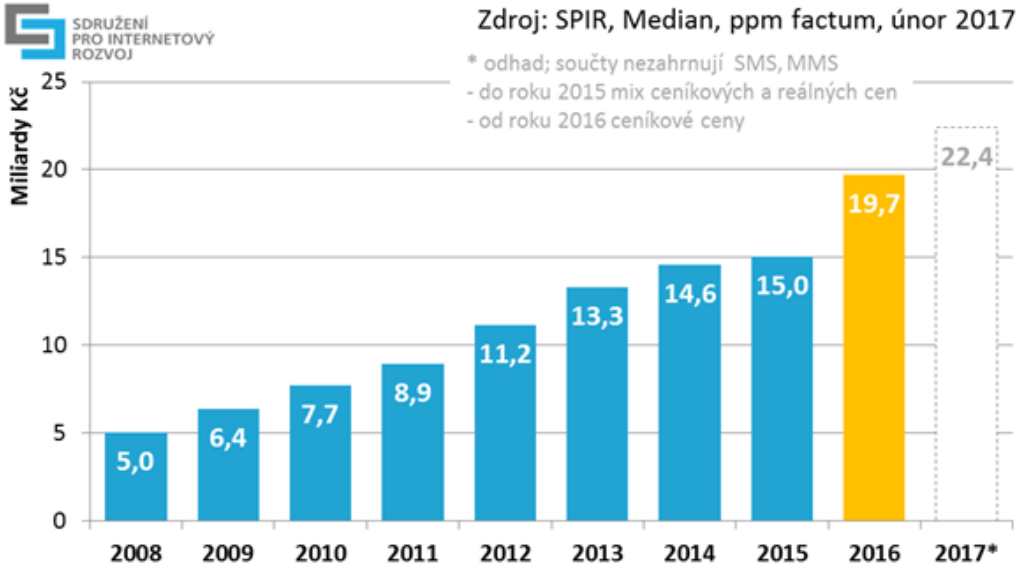
Figure 3 - Total online advertising expenditures in Europe



Source: IAB Europe, 2017b

Czech Republic comparing with other European countries and their investment into online advertising seems to be important player too. Advertisers used internet advertising in the amount of CZK 19,7 billion in 2016, which is 31% more than in the previous year as following figure shows (Figure 4).

Figure 4 - Total online advertising expenditures in Czech Republic



Source: SPIR, 2017

Conclusion

Changing consumer habits has brought many new formats of online advertising and many attitudes of advertisers in different countries in European Union. The research demonstrates that expenditures into online advertising continues to surpass TV advertising and all European markets participating in the study of IAB Europe and IHS Technology recorded positive growth. Twenty European markets grew double-digit for the third year running, three markets even recording 30% growth. Mobile advertising continues to drive the growth with both mobile display and mobile search seeing 50% growth in 2016. Mobile dominates across all markets with a 100%+ growth rate in some markets.

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TWO-PARENT FAMILY HOUSEHOLDS WITH CHILDREN IN THE CZECH REPUBLIC

Ondřej Nývlt

Abstract

Significant changes in demographic behaviour affecting household structure characterised in the Czech Republic the period after 1989. Postponing entry into partner households combined with a decline in fertility resulted in a decline in the number of women living in partner households with children. The study shows the basic trends in the household structure focusing on two-parent family arrangements with children. The decrease of the number of the parent family households with children can significantly affect the demographic development in the Czech Republic. Labour Force Survey has become an essential framework for this part of study and the population projection was used as the source for projection of women in two-parent family household. The headship rate according to age groups and the relative share of individual types of households will be used as a basic methodological approach for this study.

Keywords: single-parents families, headship rate method, Labour Force Survey

JEL Classification: J10, J11, J13

Introduction

The number and structure of private households is implicitly influenced by demographic and non-demographic factors of population development; for instance changing attitudes towards marriage, divorce and birth. In the case of the projection of the private household, further non-demographic factors (trends toward consensual union, an early departure from the parental home) may also be important. The demographic and non-demographic factors, which, in a population projection, are considered to be related to the individual person, together influence the entire process of household formation, extension, reduction, and dissolution (Linke, 1989).

Basic changes emerged in the sixties with an increase in secularization, individual rights and freedoms of the individual in Europe, which brought about an increase in the share of other forms of cohabitation at the expense of marriage (Lesthaeghe, 1983). In the case of the Czech Republic, the non-demographic factors as an increase in individual rights and freedoms after 1989 play a specific role. In the period after 1989 there were major changes in the society, which had a significant influence on the formation of households. Before 1989 the financial benefits associated with entry into marriage in the socialist Czechoslovakia caused a high proportion of two-parent family households with extremely low proportion of extramarital fertility (Kučera, 1994). After 1989, the expansion of various alternative behaviours in family history led to an unprecedented increase in extramarital fertility (eg. Lesthaeghe – Surkyn, 2002, Rychtaříková, 2003, Kennedy - Bumpass, 2008, Dominguez-Folgueras, 2013). Delay of entry to the partner household and postponing of birth of the first child has become another basic aspect of second demographic transition (Nývlt – Bartoňová, 2011).

The number of households may be projected by using either the microsimulation or macrosimulation approach. The first approach requests access to individual data on one hand, and a relatively large number of assumption about individual transition probabilities on the other (Linke, 1989). The macrosimulation model does not require access to individual data. The

headship rate method in modelling households is one of the best-known applications of the macroanalytical approach.

The period after 1989 can still be characterized by an increase in the divorce rate and rise in the number of women living alone with a child under 15 years of age. While in 1995 the number amounted to 100.3 thousand women, in 2015 it was already 151.3 thousand women, the increase of approximately 33% (Nývlt, 2016). All these changes could extremely influence the number of two-parent household families in the Czech Republic after 1989.

1. METHODOLOGY

An analysis of households is therefore available in two different views. The first is based on the traditional concept of types of households, where the household is the main unit.

a) partner family households (married couple or cohabitation partners)

b) single-parent family household (single parent with at least one child)

c) a household of individuals

d) non-family households (two or more persons related or unrelated, household together, that does not constitute a family household).

In addition, analysis by different types of households is also a possible approach if we focus on the individual itself and its position in the household. In this approach, people are divided according to their relationship to the head of the household and type of household into these basic categories:

a) living alone (individual)

b) partner living in a household (spouse, partner, sibling)

c) living alone with a child (mother, father, in an incomplete family)

d) living with one or two parents (the relationship to the head of the household - son, daughter)

e) living in non-family households (including other persons not falling into previous categories)

Household projections are rarely used in demographic literature in the Czech Republic. In all articles model projection of households is based on the calculation headship rate (Linke, 1988) according to age groups and the relative share of individual types of households. The individual aspect and position in the household is a methodological basis of this projection. Women living in partner households with a child to 15 years of age represent the main goal of the analysis.

This model projection of households is based on the calculation headship rate according to age groups and a relative share of individual types of households. For the purpose of the projection, the headship rate is calculated for each five-year age of mothers in two-parent families with a child to 15 years age:

$$K_{x,t} = \frac{H_{x,t}}{P_{x,t}} \qquad (1)$$

where $H_{x,t}$ *is the number of the mothers in two- parent families with child do 15 years age, age group x, in year t*

and $P_{x,t}$ *average population in age group x, in year t*

In this projection, we assume unchanging headship rate for the whole period until 2050. For this reason we can calculate the total number of mothers in two-parent families with a child to 15 years age according to the formula:

$$H^{p}_{x,t} = v_{x,t} * P^{p}_{x,t} \qquad (2)$$

where $H^{p}_{x,t}$ *is the projected number of mother in two-parent families with child to 15 years age, the age group x, in year t,*

$v_{x,t}$ *is projected headship rate in the age group x in year t,*

and $P^{p}_{x,t}$ *is projected population in the age group x, in year t*

By summing up the five-year age groups we obtain the projected numbers mothers in two-parent families with a child up to 15 years age in year according to the formula:

$$H^{p}_{x,t} = \sum_{i=1}^{n} H^{p,j}_{x,t} \qquad (3)$$

2. DATA SOURCE

Labour Force Survey is the main data source for this study. For the study of family households used data from Labour Force Survey (LFS) are used as well. LFS is a household sample survey, the largest in the Czech Republic. This is a continuous survey methodology and comparable data can be obtained in the time series since 1993. The sample includes approximately 25,000 households, representing approximately 63,000 people. The survey covers all persons usually living in surveyed private households dwellings. The usual residence is based on the intension to remain on the territory of the Czech Republic at least one year.

The second part of the study is focused on the future development of women in two-parent family households. For this purpose the projection of the population from the Czech Statistical Office is used (Projekce obyvatelstva ČSÚ do roku 2010, 2016).

3. ANALYSIS

The study is focused on the development of women in two-parent family households. Only the data from the Labour Force Survey are used and with the advantage that it can work with continuous time series from 1998 to 2016. It is clear that the development was similar to trends in levels of total fertility rate in the Czech Republic, of course with some delay. Changes in level of fertility (for example expressed by indicator TFR) are often the result of the current population situation, either favorable or unfavorable. On the other hand, the development as expressed by the increase or decrease in the number of women living in the household with children gives a more stable view of the population situation.

In the first case, the study is focused on the development of the number of women in two-parent family households. We used the time series from 1998 to 2016. On the whole, there is a steady decline and a consequent increase in overall values. The decrease to very low TFR (Total fertility rate) at the beginning of this millenium caused the declining proportion of women aged 20-49 living with a child under 15 year in a partner household. The indicator decreased to the

historical minimum in 2008 (35.7 %). In the following years the share rose again up to the proportion 41.2 % in 2016. It is the same value as in the initial year 1998.

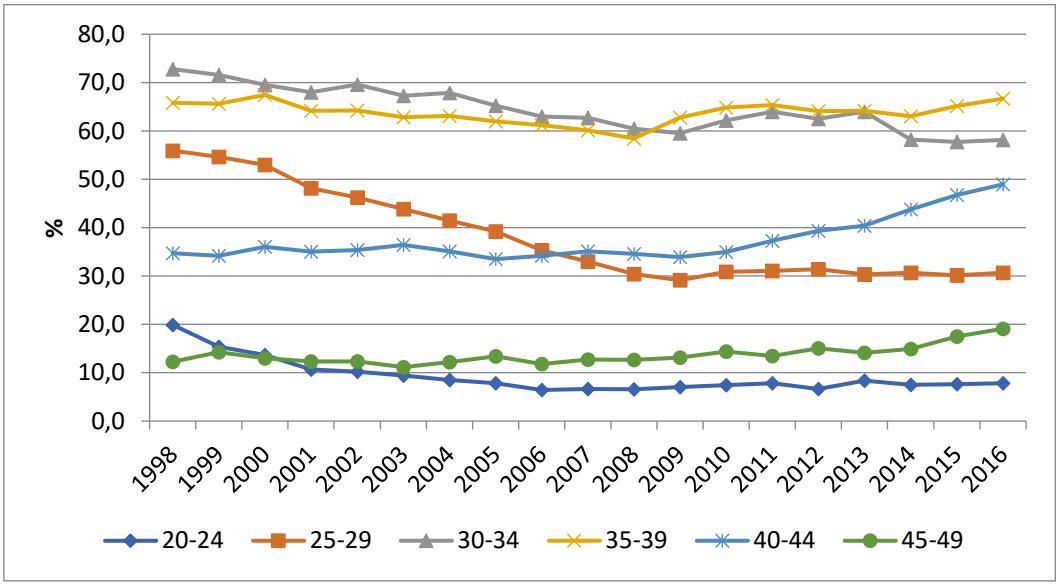
Table 1 - Women in two-parent household families in age 20-49 years with child up to 15 year in the Czech Republic (1998-2016)

Year	Women, total 20-49 years (in thousand)	Women (20-49 years) in two-parent family households with child up to 15 years (in thousand)	% of women in two parent families to total number of women (20-49 years)
1998	2257.6	931.0	41.2
1999	2260.9	914.5	40.4
2000	2259.6	913.2	40.4
2001	2237.4	860.6	38.5
2002	2222.9	864.4	38.9
2003	2212.0	845.5	38.2
2004	2205.7	845.7	38.3
2005	2198.5	828.9	37.7
2006	2198.2	803.7	36.6
2007	2202.1	808.3	36.7
2008	2221.1	793.6	35.7
2009	2235.8	811.6	36.3
2010	2246.5	854.3	38.0
2011	2227.8	865.3	38.8
2012	2230.7	864.1	38.7
2013	2225.9	870.5	39.1
2014	2209.4	851.9	38.6
2015	2193.6	873.9	39.8
2016	2166.9	892.0	41.2

Source: Labour Force Survey 1998-2016

In the next part of the analysis, we can define age groups that contribute the most or the least. There was a significant decrease of women in age 20-24 year in two-parent family households with a child up to 15 years of age by the end of the last century. Then there was no further decline in the following years. The decrease was more significant in the age group 25-29 years which lasted until the year 2009. Due to the shift in the birth age of the first child, it increased the proportion of women in age 40 year and more in two-parent family households with child up to 15 years of age.

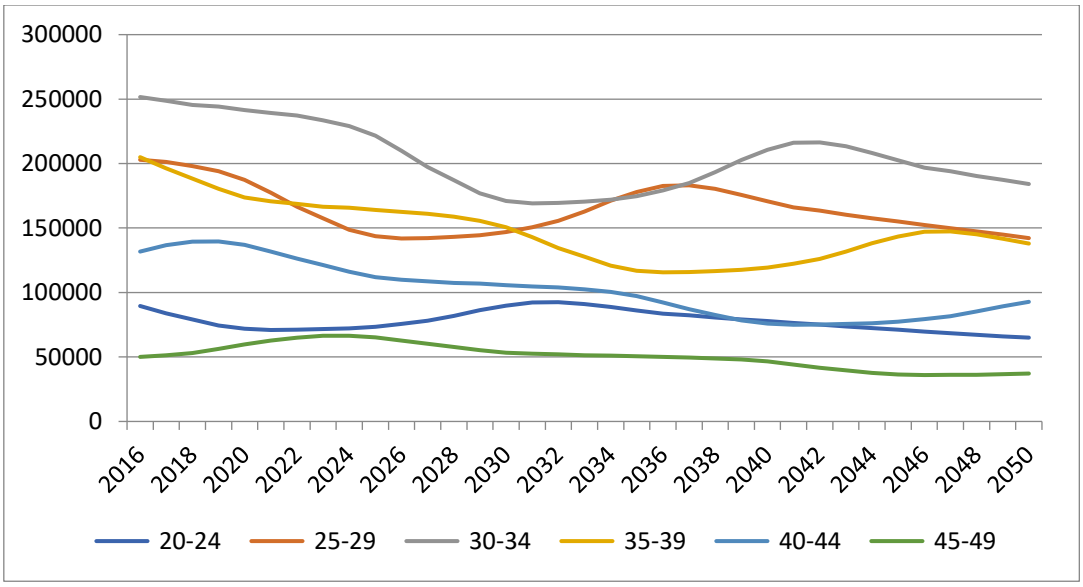
Figure 1 - Women in two-parent household families with child up to 15 years according to age group in the Czech Republic (1998-2016)



Source: Labour Force Survey 1998-2016

The basic premise of the model projection is a stable rate headship rate, so we do not expect the whole period the changes in intensity of creating of particular type of households. The resulting figures for 2050 are due to changes in the population. The impact of population aging is also reflected in the outcome of the household model projection. The total number and proportion of women in age 20-49 years in two-parent family households are decreasing over the whole period precisely because of the aging population.

Figure 2 - Projection of women in two-parent family households, Czech Republic, 2016–2050



Source: Labour Force Survey 1998-2016, ČSÚ. Projekce obyvatelstva 2100

Conclusion

The study is focused on the development of women in two-parent family households in age 20-49 years. The trend of total number of women in this type of household was not unambiguous. Firstly, the proportion of women aged 20-49 living with a child up to 15 years of age in a partner household decreased and in 2008 this indicator was on the historical minimum (35.7 %). In the following years the share rose again up to the proportion 41.2 % in 2016. It is the same value as in the initial year 1998. Postponing the birth of the first child, especially in the nineties of the last century led to a decline of women in two-parent family households in the age group 20-24 years and 25-29 years.

The headship rate method was used as the application of the macroanalytical approach. The advantage of this method is the possibility of linking to the population projection. For purpose of the development of women in a two-parent family household the population projection from the Czech Statistical Office was used. Future developments have shown that the number of women in two-parent household will continually fall from reason of population aging.

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DEEPENING THE EMU: SEARCHING FOR A PLAN B

Petr Procházka, Eva Zamrazilová[1]

Abstract

This paper is focused on the future of the Euro Area by exploring uncharted waters of possible alternatives. First, the main bottlenecks of the monetary union are discussed, primarily common monetary policy. One of the main drivers of imbalances was the fact that ECB interest rates have been too low for the periphery which together with strong euro exchange rate has led to the debt crisis on the periphery, and some other serious problems which have been waiting for sensible solution. Further, different options how to proceed in European integration outlined so far by European authorities, and potential alternative solutions are analysed. Finally, the possibility of scaling down the Euro Area membership to the "hard core" is discussed, assessing the feasibility of measures and steps towards shifting the Euro Area closer to optimal currency area.

Keywords: Monetary union, interest rates, financial stability, public debt, real convergence,

JEL classification: E44, E52, E58, G01

1. EC REFLECTION PAPER ON EMU DEEPENING: ONE WAY TO GO?

At the beginning of March 2017 – at the eve of celebration of the 50th anniversary of signature of the Treaty of Rome – the European Commission (EC) published the "White Paper on the Future of Europe" that reflects not only the latest developments influencing the integration project including the reaction on financial and migration crises, but presented five scenarios of possible future. The description of the Economic and Monetary Union (as well as the other policy areas) within these scenarios was rather schematic, and the Commission signalled that specific Reflection Papers for the key areas (social, globalisation, defence, EMU, and EU finance) will be gradually published during the second quarter of the year. This promise was accurately kept. In all but one, the published papers EC work with different options and scenarios that broadly reflects the "first five". The one was the "Reflection paper on the deepening of the EMU". Five scenarios presented in the "White Paper" briefly outlined the developments if:

a) The things go the same way as up to recently, so the EU will be "**carrying on**" gradually further its current reform agenda (in the academic literature about the Euro Area [Roubini 2016] uses the phrase "muddling through")

b) The EU focuses narrowly on (the deepening of) "**nothing but the Single Market"**

c) Multispeed EU will become increasingly the reality, intentionally and openly "**those who want more do more"**

d) The EU will (at last) focus on key priorities only, so as the result is **"doing less more efficiently**", and finally

e) In a full harmony with the thesis of ever closer integration the EU will be "**doing much more together**"

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In a stark contrast to that the Reflection Paper on deepening the EMU [EC 31 May 2017] "set out possible ways forward for deepening and completing the Economic and Monetary Union up until 2025" as the only strategic option. It builds fully on the Five Presidents Report, goes in line with only the fifth scenario "doing much more together", and admits no alternative solutions.

But the heterogeneity of actual Euro Area where its members have one currency, one interest rate and one exchange rate, but only broadly coordinate economic and above all fiscal policy, has moved it far away from the textbook definition of an Optimal Currency Area, and within the period of last 18 years led to its deep division – as it is generally described – between creditor North, and heavily indebted South. This is broadly valid despite all the progress achieved so far in the reaction to the global financial crisis that has led to the establishment of the Banking Union with the single banking supervision (SSM) within the ECB responsibility, and creation of badly needed Single Resolution Mechanism with the nascent Single Resolution Fund (so far without the fiscal backstop that is one of the most sensitive issues in current discussions).

The Commission proposal for further Euro Area integration was put on the table in the situation where the major dividing line represents the question how to sequence the risk reduction and the risk sharing measures in the banking sector, being it mounting non-performing loans in balance sheets of some banks in some Member Countries on the one hand, and the European Deposit Insurance Scheme (EDIS) on the other. The disparity of North – South interests and thus positions gives – despite all the effort to show a good will and some concessions on both sides – only a little hope that – in the current Euro Area composition – the progress towards even more sharing of sovereign debt burden (through a European Safe Asset) or creating Euro Area fiscal capacity, and finally a Treasury headed by the Minister could be achieved any time soon, if ever. As a reaction to the pressure towards "ever closer Union" one can even observe growing centrifugal forces that in extreme case could not only stall but revert the integration to the damage of us all.

Thus, the question of alternative scenarios and their feasibility seems to be more acute than before. In order to find at least a proxy of the answer, the article is organised as follows: after analysing the substance of a long time growing Euro Area cross-country imbalances, the authors will characterise the basic features of alternative scenarios of Euro Area future, and finally will try to assess the feasibility of broadly defined rules and incentives (positive or negative) for achieving the optimal size and composition of the Euro Area.

2. GROWING EURO AREA CROSS-COUNTRY IMBALANCES: 1999–2016

The Euro Area was the political project from the very beginning, and during the first ten years worked relatively well [EC 2008]. But the growing imbalances between its Member States as well as one-way flow of funds, that were hidden under the surface, started to matter as soon as the global financial crises provoked by US problem with sub-prime mortgages and subsequent fall of Lehman Brothers hit Europe.

Original expectations tied to common currency were high - end of currency turbulences, deeper integration, convergence of member states, acceleration of growth, improving competitiveness on world markets – to name but a few.

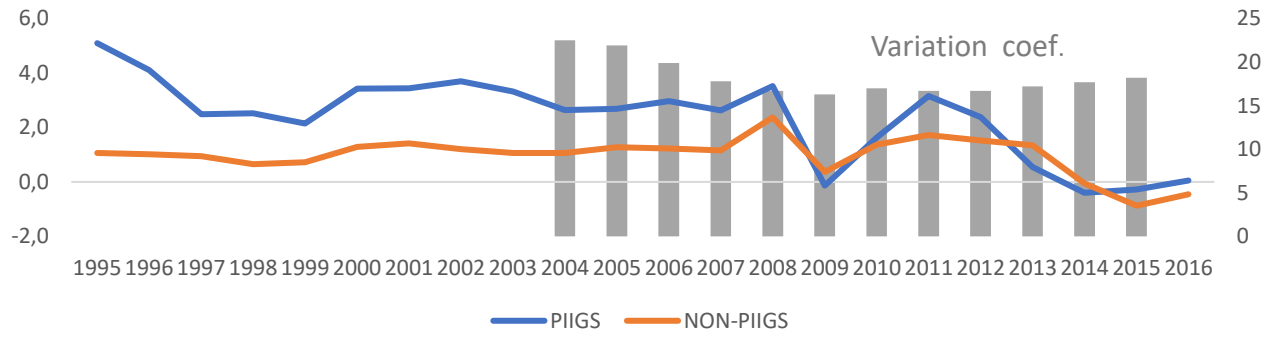
However, opinions on proper initial macroeconomic conditions were under question, with two different basic economic viewpoints. The first one represented mostly by German economists called for high degree of real convergence and homogenous economic policies before introduction of common currency while the opposite one considered common currency as the sufficient condition leading automatically to convergence and similar economic policies. This

institutional position was mostly supported by French, Italian and Belgian economists and politicians. Actually, Maastricht criteria represented a sort of compromise between these two attitudes.

With the advantage of hindsight, it may be concluded that economic reality has justified rather the first attitude – common currency is suitable and helpful for countries at similar economic development and relative price levels, with similar attitudes to public finance and last but not least with flexible labour markets. Currency turbulences have been replaced by different kinds of imbalances, diversity between EMU countries has deepened, economic growth weakened even under favourable global environment. The financial and economic crisis brought a crucial test for EMU in many respects. Rescuing steps and mechanisms to prevent the Euro Area from collapsing have been necessary to adopt, without clear solution being adopted up to now. Moreover, the legacy of the imbalances accumulated before the crisis are still on the table.

The first signs of disparities in Euro Area have been **different developments of inflation**. Since 2000 there was a visible tendency in Southern EMU member states[2] to higher than average inflation in the Euro Area. The different development in inflation is illustrated by Figure 1, which also shows the heterogeneity in inflation measured by simple coefficient of variation. Harmonized index of consumer prices in Spain and Greece exceeded 3 % annually during 2002 – 2008. Italy followed suit with inflation amounting to approximately 2.5 % since the beginning of the century till 2008. On the other hand, inflation in the rest of Euro Area stood at approximately 1 % in the years preceding the crisis. Under quite low basic interest rates of ECB there were negative real interest rates in the South supporting the demand for loans. During the pre-crisis period, loans boomed in particular in Spain and Ireland (increasing by more than 30 % annually) and Greece (more than 20 %, y/y). In Italy and Portugal, the growth of loans approximately by 10 % annually exceeded the growth in nominal GDP.

Figure 1 - EMU heterogeneity: Inflation (HICP, y/y, in %)



Source: Eurostat (2017)

The legacy of pre-crisis boom in loans has been embodied in volumes of **non-performing loans** (NPLs) in some countries. Table 1 presents volumes of non-performing loans in EUR bn., volumes of non-performing loans per capita in EUR mil. and shares of non-performing loans in total loans for individual Euro Area countries at the end of 2016. The share of NPLs differs considerably across the Euro Area and the improvements have also been very uneven across

[2] In this paper, the division between Southern and Northern parts of EMU are labelled in various ways. Southern part of EMU – Portugal, Italy, Greece, Spain and Ireland (even though it is not a part of southern block) is labelled as PIIGS or periphery. Core countries, northern part of EMU or Non-PIIGS countries represent the rest of EMU.

various countries. Therefore, in many countries high shares of NPLs in balance sheets restrain lending activities of the banks as well as hurt their profitability. Obviously, there are no "one size fits all" solutions. Past experience shows that authorities can help improve banks' incentives via changes to the tax code, by lowering obstacles to collateral sales, as well as addressing obstacles to debt restructuring.

Table 1 - Non-performing loans in Euro Area countries

	NPLs (in % of total loans)	NPLs (in EUR bn.)	NPLs per capita (in EUR mil.)
Luxembourg	1.1	2	3.5
Estonia	1.3	n.a.	n.a.
Finland	1.6	4	0.7
Germany	2.5	68	0.8
Netherlands	2.5	45	2.7
Belgium	3.2	21	1.9
Lithuania	3.2	n.a	n.a.
France	3.7	148	2.2
Latvia	3.8	1	0.5
Slovakia	4.2	2	0.4
Malta	4.4	1	2.3
Austria	5.3	25	2.9
Spain	5.7	141	3.0
Ireland	13.6	33	7.0
Slovenia	14.4	3	1.5
Italy	15.3	276	4.5
Portugal	19.5	41	4.0
Cyprus	44.8	21	24.8
Greece	45.9	115	10.7

Source: EBA (2017)

At the end of 2016, Italy was the leader in the volume of NPLs which amounted to EUR 276 bn. The share of NPLs in the total loan portfolio (15 %) was significantly lower than in Greece (46%) or Cyprus (45 %), however for the financial stability of Euro Area as a whole, the volumes are more important than relative indicators. The second highest volume of NPLs belonged to Spain – even after strong improvements in quality in banking portfolio to only 5.7 % of NPLs, their volume still represented a very high EUR 141 bn., at the end of 2016. Very

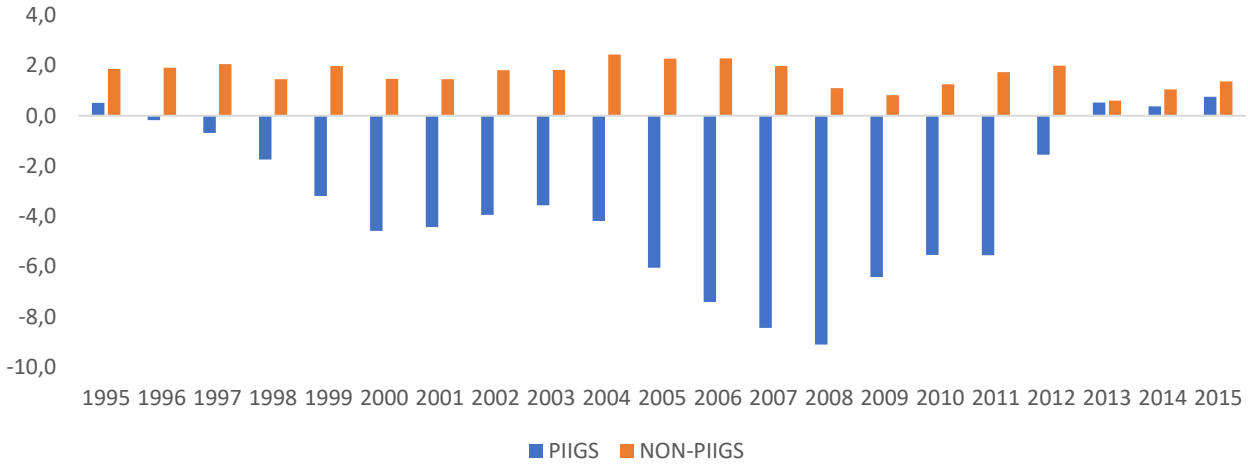
high NPLs ratios close to Italy were registered in Portugal (19 %) and Ireland (14 %) however, the volumes of EUR 41 bn. and EUR 33 bn. do not represent a substantial threat to Euro Area financial stability.

Another sign of the imbalanced macroeconomic developments in Euro Area before the financial crisis has been the **divergence of the current account balances**. The current account balance was not included in the Maastricht criteria. Even for some time the diversity of current account balances between individual EMU members were disregarded as having no economic meaning within the monetary union. However, the current account (representing the difference between domestic savings and investments) belongs to key macroeconomic indicators and the long-term experience has been showing quite clearly that the deficit of the current account above 5 or 6 % of GDP is unsustainable in the long term. The current account of the whole Euro Area has been more or less balanced, however very soon after the onset of the euro introduction diverging current account balances between Southern and Northern parts of EMU have started to signal problems later reflected in the debt crisis of Euro Area – see Figure 2.

Spanish current account deficit has been exceeding tolerable limits since 2004 increasing to 9.5 % of GDP in 2006-2008. In Portugal, the deficit of current account amounted to about 10 % in the whole decade 2000-2010. The highest current account deficit belonged to Greece with approximately 11.5 % of GDP in 2005-2011. On the whole, since 2005 the external imbalance of PIIGS has been over the acceptable risk levels. This sign of imbalance in individual countries was covered by "euro umbrella" as the whole current account of Euro Area was balanced due to surpluses produced by Germany, Benelux, the Netherlands and France. It may be argued that if PIIGS countries had not been under the „euro umbrella", attacks on their currencies would have threatened.

Peripheral countries have been rapidly losing competitiveness soon after 2000. Measured by real exchange rate, competitiveness of PIIGS declined by almost 20 % on average during 5 years preceding the crisis (2002- 2007). The exchange rate of EUR was too strong for the periphery and undermined the export efficiency of these countries. Adversely, imports were supported by both low interest rates and strong exchange rates which led to increasing current account deficits. Peripheral countries were not able to react by standard measures – devaluation of the currency or rate hikes as had been the case in the past. One size monetary policy represented a sort of asymmetric shock for Southern and Northern parts of the Euro Area prohibiting standard adapting mechanisms of monetary policy, i.e. exchange rate and/or interest rate adjustment. Under these circumstances, the increasing price for servicing public debts have been inevitable.

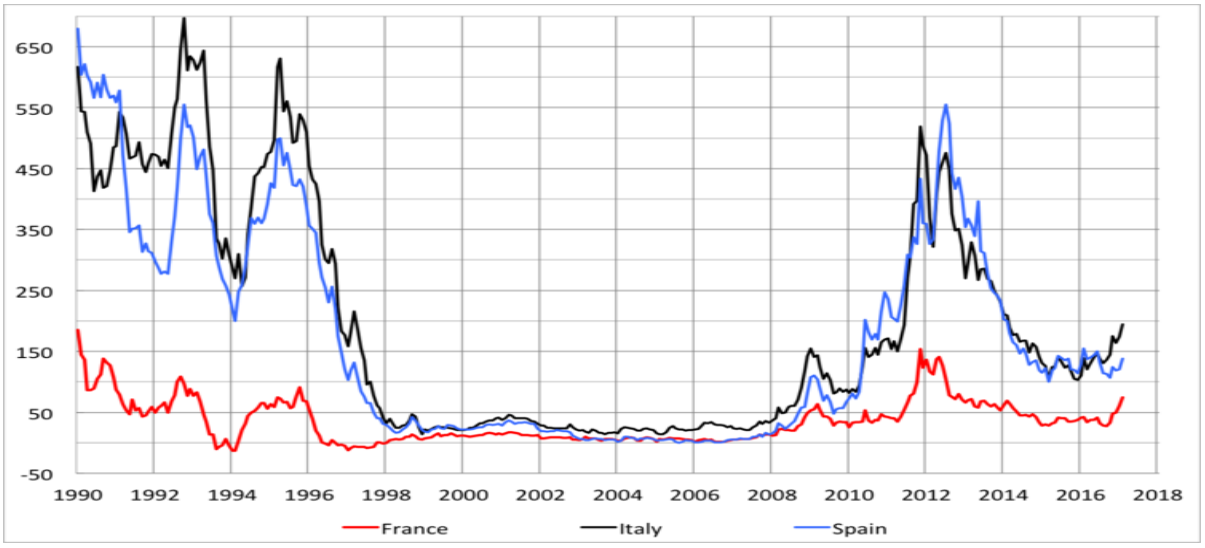
Figure 2 - Current account balances (in % of GDP)



Source: Eurostat (2017)

The virtual illusion of the same risk for the whole Euro Area had been living for ten years. Very soon after the onset of financial crisis financial markets have started to differentiate between individual EMU countries as for the quality of government debts. Figure 3 shows spreads of Italian, French and Spanish 10-year bonds against German ones. To analyse the reasons and outcomes of the Euro Area debt crisis (especially the impact of different fiscal policies) goes beyond the main focus of this article. Nevertheless, one of the conclusions is that the debt crisis in Euro Area may be labelled as a „masked currency crisis "of some Sothern members, in particular Greece, Italy, Portugal and Spain. The imbalances leading to the debt crisis were similar to those leading to currency turbulences in the past. These imbalances were covered under the surface of quite favourable global economic developments in the first decade of 21st century.

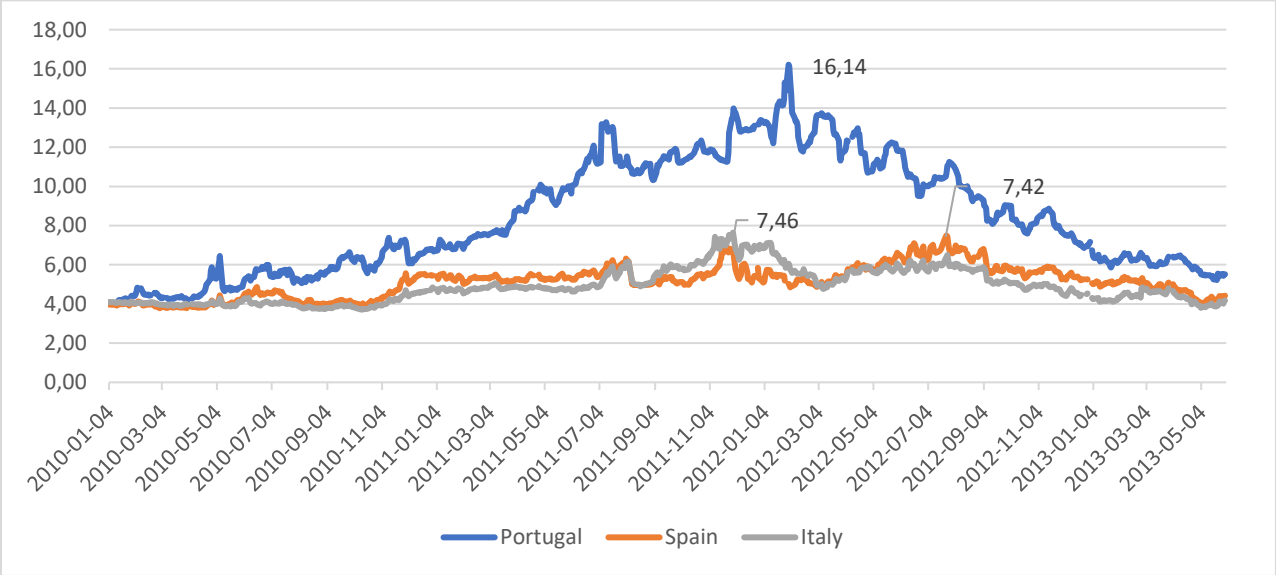
Figure 3 - Spreads of 10year bonds to Germany (in basis points)



Source: Bloomberg

During the Euro Area debt crisis, it has become more and more obvious that fiscal policies in the above-mentioned countries have hit their limits. The responsibility thus burdened the ECB as the central bank to save Euro Area from collapsing. The crucial July 2012 decision of ECB to start the programme of outright monetary transactions (quantitative easing) was helpful enough to stop further rising yields of 10year bonds for Italy, Spain and Portugal – see Figure 4. However, after this calm down the spreads between German bonds and bonds of Italy, Spain and France have started to rise again, in 2017.

Figure 4 -Government bond yields (in %)



Source: BIS (2013)

Moreover, another imbalance calling for attention has emerged since the beginning of global financial crisis. The **Target 2 balances** (Trans-European Automated Real-time Gross settlement Express Transfer) administered within the network of Eurosystem[3] are not easy to interpret exactly [see eg. Cecchetti et al, 2012]. Interpreters of TARGET 2 balances fall into two camps: the first one pointing out to current account financing (flow interpretation) the second interpreting TARGET 2 as a "capital account reversal" (stock interpretation). Anyway, the countries reporting liabilities have weaknesses in their balance of payments. Some authors [Marsh, 2017] label the claims as involuntary loans to insolvent central banks. As indicated by Figure 5 the major creditor of TARGET 2 has always been Germany with TARGET 2 claims increasing from EUR 5 bn. at the end of 2006 to EUR 320 bn. at the end of 2010 to probably not less than EUR 1 trillion by early 2018.

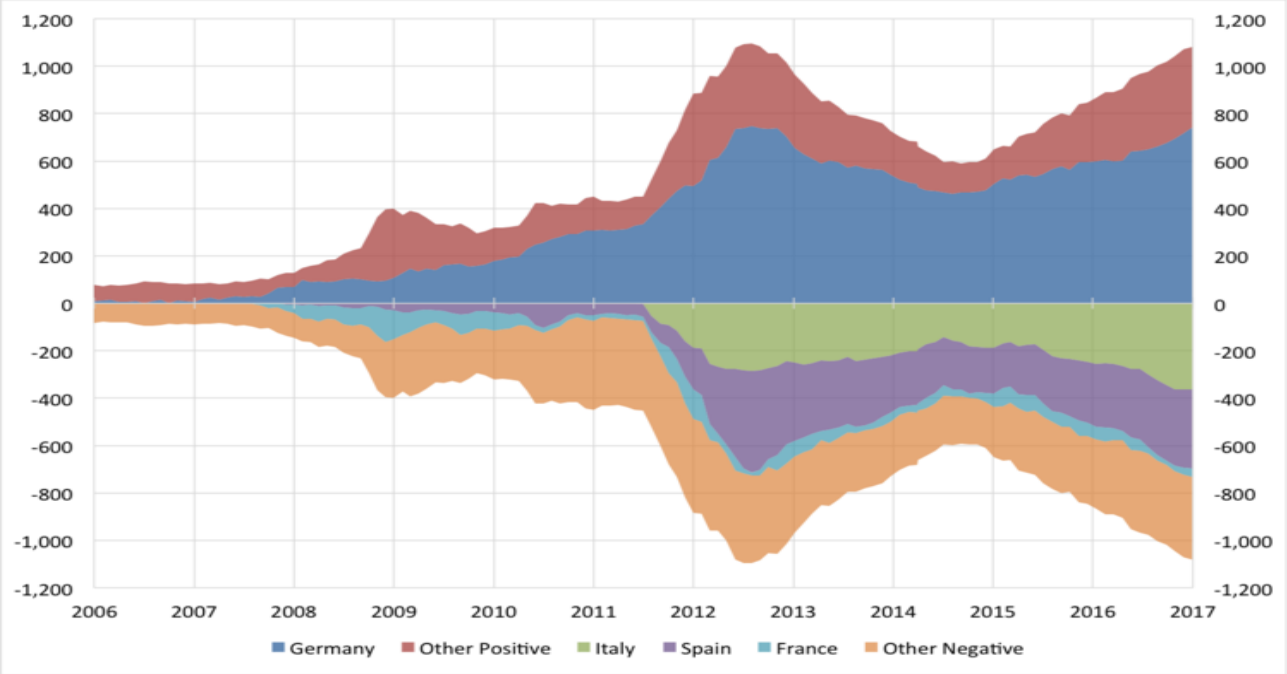
After some attenuation of deepening TARGET 2 imbalances observed since autumn 2012 to 2014, another expanding of TARGET 2 balances up to the same levels like in summer 2012 has been observed recently. It is obvious that the ECB monetary policy has been under the spell of main Euro Area periphery debtors.

Due to unresolved problems of the periphery, monetary policy is too loose for core countries. One of additional reasons of concern is that the boom on real estate markets in some countries which has been strongly contrasting with low inflation and concerns on inflation below the

[3] Eurosystem = ECB plus Euro Area central banks

target (or even deflationary threats in some cases as pronounced by policy makers not long ago). The research about overheating of the housing market in individual eurozone countries under common monetary policy should not be overlooked, as macroprudential policy itself does not seem strong enough to prevent too strong demand in this market in the countries that would urgently need stricter monetary policy. In particular in countries where population is traditionally conservative and prone to savings (typically Northern part of EMU), the consumers feel their savings to be devalued under low interest rate environment. With zero interest on deposits their search for yield has been often focused to real estate market, especially under eroding pension schemes. Relatively cheap mortgages have been supporting the demand for housing with obvious result of rising housing prices even though in most EU countries macroprudential measures concerning mortgages already were introduced. And the fact that housing price increase in some countries has not been calmed down by adopting macroprudential measures is a subject of concern for policymakers.

Figure 5 - TARGET 2 balances



Source: ECB, 2017

Not only the evidence of imbalances that have been built since 2008 but their persistence and even more so their growing nature thus send the clear signal of the urgent need to make the decisive steps towards a sustainable solution.

3. IS THE FEDERALIZATION THE ONLY WAY FORWARD?

The Commission in the White Paper [EC 1 March 2017] in part 3 declares, that the presented scenarios are "illustrative in nature to provoke thinking" in order to avoid "misleading and simplistic" approach of a "binary choice between more or less Europe". Indeed, albeit the line of "deepening EMU" proposed in the [EC 2015] and further in the [EC 31 May 2017] Reflection paper on deepening the EMU is the only official scenario on the Euro Area way forward, in the academic literature one can find at least three additional options. What is remarkable, all of

them were born after the financial crisis, in the middle of bursting Euro Area sovereign debt crisis, and were meant as the alternative solutions of it (with the exception of the first one below that bears the biggest risk of crash into its own limits any time sooner or later). Here is the full list:

- The first option represents the **current status quo**. While in the White Paper [EC 2017] such a scenario of further gradual compromises based progress in some least controversial issues bears the label "carrying on", it is rather known as "muddling through", see i.a. in [Roubini 2016]

- The second approach was outlined by the Commission most recently in [EC 31 May 2017] Reflection paper, and is in line with "**ever closer Union**" approach

- The third proposal [European Solidarity Manifesto 2013] is trying to show that "a **controlled exit of the most competitive countries** such as Germany, Netherlands, Finland at al. lies in the best interest of the South, and that such solution offers the best chance to save the European Union and the Common European Market". In short, such an option could be called "strong that will leave the Euro Area", and finally

- The fourth suggestion makes the opposite solution – **to scale down the Euro Area to the hard core only** – one could describe it as "strong that will stay" strategy. This approach is proposed i.a. at [Sinn 2013], which concludes that "… Europe cannot have a common currency without a common state. Realistically, however, I do not see a United States of Europe taking shape in my lifetime. In its absence, the eurozone needs a flexible system that gives its members the possibility to exit and re-enter the monetary union if necessary."

Opinions of the bulk of observers, and most importantly the EU policy makers show that fears of the impact of an exit of a country from the Euro Area onto the future of the Single Currency, and thus the cohesion of the EU as a whole, are so paramount, that the only conceivable development seems to be the way towards "**ever closer Union**" through step by step introduction of fiscal and, as the consequence, even political union. Such a process is often described as the EU federalization, even though its resulting features could be much closer to the confederation a la Swiss.

The worries mentioned above are concentrated towards damaging financial market reaction in case, that the exit of a Member Country from the Euro Area is taking place within the context of current Treaties (the EU Primary law does not address such a case at all, Article 50 introduced into the Treaty of the EU lately in Lisbon, and first used for Brexit, frames only the situation of a country decision to leave the EU as a whole), and thus in a disordered fashion. Potential causes, variants and consequences of such a decision of a Member State analyses i.a. [Belke 2012]. The quoted article uses the country classification of potential scenarios based on analysing what consequences will it have, if the decision to leave is made by "weak" or "strong" country[4]. Although according to its conclusions the impact of the exit of a weak country on the economy would be higher, the impact of strong country departure on the Euro Area credibility would be fatal. "It cannot be excluded a priori that the economic costs of a doomsday scenario – a breakup of the euro area – would be high and extremely damaging, especially in the case of a weak country's departure. It seems at first glance as if the costs of breakup would be lower if a strong country were to secede. However, in this case, the euro area would lose its pillar of stability, and the probability of a collapse of the whole EMU project would be even greater."

[4] Under its working definition, "weak" countries are those experiencing financial distress, while "strong" countries are those EMU members that have retained their AAA credit ratings [Belke 2012].

From that perspective the most probable future development seems to be the "**muddling through"**, going on with the partial and compromises based steps towards the eventual achievement of "genuine EMU" or towards the crash with a political reality in some of the weak (because of social unrest stemming from international loans conditioned by painful expenditure cuts and reforms) or strong (voters will ultimately lose the patience with increasing one-direction budget transfers) countries with potentially catastrophic consequences. The immediate consensus on the full application of Commission proposals from the EMU Reflection Paper [EC 2017] seems to be – taking into account current state of discussion of EDIS like issues, i.e. going further ahead with risk and debt mutualisation – least probable, but not fully excluded[5]. The transition to the "Genuine EMU" within full recent Euro Area membership introduces the danger of long term massive one direction North – South fiscal transfers, that would further weaken the incentives to introduce badly needed but painful structural and in some cases further institutional reforms in the South. Both the public, and politicians of strong countries are very well aware of it.

As shown by the [Belke 2012] analysis, the **departure of a strong country from the Euro Area** would be fatal not only for the single currency as such, but most probably for the EU as a whole. That – at least in our case, where we are searching for solution that would endanger neither EU nor the Single Market – disqualifies the solution proposed by the [European Solidarity Manifesto 2013] of a controlled exit of the most competitive countries. The special case examined in [Buiter and Rahbari 2011] refers to the situation where Germany exits the Euro Area together with a group of other strong countries that would immediately create a brand new common currency. Even without referring to the details one can conclude with authors that "…there would be nothing to keep the periphery euro area together", so as even for the EU in its current composition would be difficult to survive.

Therefore, let us turn the attention to the fourth alternative scenario of **scaling down the Euro Area membership to the "hard core" countries** (for the sake of simplicity to countries that are economically most converged with Germany, among which some of them in the pre-euro past successfully linked their currencies to the Deutsche Mark). Should even in such a case the reduction of the Euro Area provokes "the mother of all financial crises" [Eichengreen 2010], if the process goes orderly based on rules enshrined in EU Primary Law (amended Treaties), and though following ex ante defined path? Could such an orderly approach be feasible, at all, what rules would it be necessary to have, and how the process should look like?

4. RULES AND INCENTIVES FOR ACHIEVING THE OPTIMAL SIZE AND COMPOSITION OF THE EURO AREA

The trouble is that even before one starts to think about it, instead of answers gets the whole series of additional queries that not only help better structure the problem but introduce a lot of difficult problems on their own:

- Could one think about such a strengthening of EU safety net that could allow remaining Euro Area members to intervene on behalf and along the departing one in order to help defeating the market overshooting of the exchange rate of a new successor currency before it stabilises around its natural equilibrium?

[5] The latest EC compromise proposals in [EC 11 October 2017] „Completing the Banking Union" package in case of EDIS condition the step behind reinsurance to a co-insurance phase by foregoing risk reduction, but the substance remains unchanged. Similarly allowing the ESM to play the role of SRF backstop makes the risk for public budgets compared to their full involvement only indirect, as the Governments hold ESM capital shares, and thus guarantee its operations.

- How to fine-tune incentives for a voluntary decision of a weak country to leave the Euro Area (voluntary exit)? And could there be any?

The first-in hand answer that refers to the ECB unorthodox monetary policy measures (among others long lasting OTP program, QE, provision of Emergency Liquidity Assistance (ELA) through Eurosystem National Central Banks, that is in case of insolvent state de facto guaranteed by the ESCB) would be: "There is no need for incentives: simply stop financing them." Nevertheless, such an answer is in contrast with composition of the ECB Governing Council, where the strong countries lack the needed majority to outvote those who have the vital interest at prolonging current non-standard monetary policy measures.

But indeed – to get and consequently hold ECB out of quasi fiscal operations that have flooded its balance sheet for example by re-establishing the minimal benchmark for securities held by ECB/ Eurosystem (without joint and irrevocable guarantee of Member States) at least at the lowest investment grade level as proposed e.g. by [Buiter and Rahbari 2011], would be the step in a very desirable direction.

- Based on what criteria and conditions, would it be reasonable to allow for a re-entry of already departed country that would desire not to abandon euro for ever?
- Should one introduce – nowadays non-existent – possibility of ruling out the member that does not respect the rules and/ or seriously violates mutually agreed obligations (non-voluntary exit)?
- How to fine tune the rules for and the process of managing a state bankruptcy within Euro Area (and EU more broadly) in order to make the process of debt restructuring predictable and transparent, and to allow investors to ex ante built it in their decisions?

Even more difficult issue follows immediately, as the major purpose for abandoning euro and re-introducing a national currency in a weak country would be help to solve the country competitiveness and debt problems through its sharp depreciation against euro. This should be particularly tempting after having the experience with the process of internal devaluation (sharp decline of wages and prices as the only way of re-gaining competitiveness in the environment of externally fixed exchange rate). One of the key findings in [Eichengreen 2007] while discussing economic, political, technical and legal barriers to exit is that "… the difference between the transition to the euro and the transition back to national currencies is that in the first instance there was little reason to expect subsequent changes in exchange rates and thus little incentive for currency speculation, while in the second case such changes would be viewed as virtually inevitable. "

Indeed, ex ante signalled departure of a weak country from a single currency would lead investors to partly legally required effort to sell instruments in a departing currency, as certain institutions (typically insurance houses) are not allowed to hold other than the top-rated papers (usually above A rating), and to partly profit driven speculation that is usually even reinforced by herding behaviour. As the current debt denomination may not be unilaterally changed[6], and the new currency could be used for the new debt issuance only, this will open the issue of the future country ability to service its debt. Even more difficult seems to be the case of depositors that in the event of expected depreciation of the new currency start voting by their feet; the transfer of deposits to (Euro Area) banks abroad not only further undermine the value of successor national currency, but through the run on domestic banks has the potential to damage

[6] Nevertheless, a possibility to change a debt denomination differs case by case, country by country. [Buiter and Rahbari 2011] mention Greece, where more than 90 % of public debt in 2011 was issued under the national law. In such a case, the introduction of a new currency if accompanied by redenomination of public debt would almost inevitably lead to the sovereign default.

not only individual institutions but national financial stability. At least partial solution could be seen in allowing depositors to hold the stock of their savings on euro-denominated accounts in domestic banks for transition period long enough, and leave the moment of the individual account changeover to their individual decision.

What could that mean in reality? You will end up with the government that is liable to investors in euro (hard currency) but having most of the assets (tax receipts) in the new national currency, and with domestic banking sector owing (their euro deposits) to households but selling them loans (and getting receipts) in the national currency they earn. Partial euroization of the country thus in such a case will be the reality, but will it really matter?

The answer is – it depends. In the scenario which feasibility we are trying to explore, the chief purpose of return of a group (much more than a one) of weak Euro Area countries to a national currency is not primarily to solve their individual competitiveness problem. The first question is to find a way how to avoid the collapse of the Euro Area / single currency in a case that its further centralisation proposed by the European Commission is rejected due to (unfavourable) political reality, and at the same time to solve this conundrum in a way that will not damage the Single Market. Only then come the second, but not less important priority of restoring the individual competitiveness of weak countries that could allow them after achieving this goal on a sustainable basis to individually opt either for returning to the club or staying out of it with their national currencies but otherwise as fully fledge EU member.

One of possible solutions of how to **stabilize the exchange rates** of newly born national currencies of departing states that are interested not to leave Euro Area forever but just for the period needed to solve the most pressing problems would be to use already existing mechanism of ERM II with a full range of ± 15%[7], and common ESM intervention bazooka at the margin. So that the temporarily departing members can be certain that they will not be left alone, the remaining strong camp would be assured that their loss of competitiveness will not be unlimited in principle, and thus there is no need to introduce tariffs and quotas that would create the life threat or even destroy the Single Market for a very long time.

On the other hand, the ESM involvement should be strictly limited in time

- to the period needed for achieving market-equilibrium exchange rates of individual new currencies,
- and putting credibly into motion the process of structural (mainly labour market) and institutional reforms,

but no longer than few weeks to a month in order to encourage national politician´s activity and avoid the reluctance stemming from the persuasion that the financial channels would be endlessly available as they were used to.

Finally, despite a wide spread popular belief that a sharp depreciation is necessary and sometimes even sufficient to restore the competitiveness of an economy, we cannot take it for certain. While using the case of Greece, [Buiter and Rahbari 2011] admit that "the examples of Germany during the first decade of this century and of Latvia since 2008 demonstrate at the very least that nominal exchange rate depreciation is not necessary for achieving a significant and lasting improvement in relative productivity and efficiency, that is, in real competitiveness". There are rather deep structural and even institutional reforms in need, without which – as the cited analysis of the Greek case argues – following nominal exchange rate depreciation and "a sharp bout of inflation, the same uncompetitive equilibrium would be restored".

[7] Or even beyond based on the estimated equilibrium exchange rate of a new successor currency.

Of course, the return to the club should be made possible only after the fulfilment of **amended entry conditions** that should capture not only nominal (adjusted Maastricht) criteria but the criteria of real convergence, as well. Their strict assessment (not as back in 1998 with fiscal and especially debt criteria or 2000 with improper statistical data from Greece) should be underpinned by the threat of leaving the Euro Area definitely in case that the "second chance" was either misused or failed. Such an ultimate exit will not be accompanied by "luxury" of access to any kind of common Euro Area safety net, be it re-designed ESM, ECB operations or anything else.

One of the most sensitive areas felt as an un-crossable Rubicon by creditor countries, and often taken into the account in the rulings of the German Constitutional Court, is **the mutualisation of the debt**. It is not an accident that [Sinn 2013] warned against repetition of the same mistake that was made by Americans at the time the USA was founded: in 1791 Alexander Hamilton decided on mutualisation of state debts (second round happened 1812-13) arguing that "this would act as cement for the new US state". After the race in the discipline of (individually taken by states, but mutually guaranteed by federation) public investment, the major credit bubble burst 1837, and till 1842 nine Member States went bankrupt. From this experience according to [Sinn 2013] EU must learn because "since we do not have a legal resolution mechanism at a state level, debt socialization would ... lead to endless quarrels in Europe".

Indeed, although so called "**no bail-out clause**" i.e. the Article 125 of the Treaty on the EU states that "*...the Union shall not be liable for or assume the commitments of central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of any Member State, without prejudice to mutual financial guarantees for the joint execution of a specific project. A Member State shall not be liable for or assume the commitments of central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of another Member State, without prejudice to mutual financial guarantees for the joint execution of a specific project...*", the EU reality is somewhat more varied. On one hand it allowed for the European Stability Mechanism (ESM) establishment as the prominent example of fund mutually owned and guaranteed by Member States on the intergovernmental basis, on the other hand the state bankruptcy rules do not exist since today. One of the early birds of the step in the right direction was the introduction of "Collective Action Clauses" (CAC)[8] into all new euro denominated debt issues back in 2013. According to the ESM Treaty (§3 of Article 13) "...the model CAC became mandatory in all new euro area government securities with maturity above one year issued on or after 1 January 2013". But all the Euro Area member countries sovereign debt issued earlier holds the same statute as before.

The argument for introducing the **Sovereign Debt Restructuring Mechanism** (SDRM) for the Euro Area (even despite unsuccessful attempts to do so under the IMF auspices at the global level during the last decade of 20th Century) made e.g. [Mody 2013]. According to him, in order "...to compensate for the inflexibility of fixed exchange rates, the euro area needs flexibility through a system of orderly debt restructuring." In the environment of common monetary policy "... fiscal austerity has been the main instrument for achieving reductions in public debt levels; but because austerity also weakens growth, public debt ratios have barely budged. Austerity has also implied continued high private debt ratios."

It is rather difficult to find a detailed evidence for recent Troika negotiations with Greece, not only for the sensitive nature of the process and bargaining on demanded conditionality that included query for lasting primary budgetary surpluses in the country that lack the growth, but

[8] According to Wikipedia CAC allows a supermajority of bondholders to agree to a debt restructuring that is legally binding on all holders of the bond, including those who vote against the restructuring.

does not lack the mounting unemployment, painful labour market, tax system reshuffling and institutional reforms, to name but a few. The fact that they involved some haircut and subsequent debt restructuring could rather be found ex post from the extended repayment schedule that currently goes to 2060. The ex ante clear rules of the game could through higher transparency very much help to avoid endless bargaining and episodes of market turbulences that only add costs and pain to all participating parties, especially to the most vulnerable.

But in the cases similar to the Greek one, at stages so advanced as today, the SDRM will not make immediate change anyway. As noted by [Sinn 2015] "Greece should have the option of re-introducing the euro after a recovery and after achieving an exchange rate that is in line with its competitiveness. It is conceivable that after a waiting period of perhaps a decade the country could return to the Eurozone, assuming that it will by then have implemented the corresponding structural reforms. In any case, the door to the euro should be kept open for Greece."

All the steps sketched above will require quite a different approach to the Union-level financing. The [EC 28 June 2017] Reflection paper on future of EU finances offers different options in broad terms compatible with different White Paper scenarios. Generally, even without creating a special Euro Area budget as proposed by the [EC 31 May 2017] Reflection paper on deepening the EMU, one could reshuffle what is nowadays called EU budget in the way that reflects its current trends as well as the evolving needs. Common Agriculture Policy reform is overdue for a very long time, although blocked by its sensitivity, it could spare part of the funds for redesigned priorities. The need of public funds for the EU Cohesion Policy would be much smaller in case that the ongoing shift from subsidy based system to the use of private capital leveraged public funds together with simplification of its use will succeed. Resulting level of credit and investment at the national economy level could be even bigger than today. The spared balance could be redirected to the new budgetary priorities from migration, through common defence to guarantees for ESM strengthening.

Maybe the most difficult question come at the end **– why would weak countries want to leave the Euro Area, albeit temporarily?** To find positive incentives is difficult. One can rather imagine a situation in which such a step could come as a reaction to a threat that a strong country could leave on a solo basis or as a group in order to avoid the danger of being manoeuvred to fall into the trap of a transfer union. Even in such a case it must not necessarily mean the dissolution of the Union. As [Buiter and Rahbari 2011] conclude, "…if enough of the core EA members were to leave together, they could re-establish the EU in all but name for themselves and for those EU members always outside the EA that might prefer to be in a de-facto EU with the core EA member states to being in the de jure EU with the periphery EA member states."

Even though such an approach described above is an extreme one, and in contradiction with the traditional perception of EU solidarity, to have the plan B seems to be reasonable. If nothing else, the contingency planning addresses the situations we would like to avoid but have to be prepared to just for the case what if they materialise.

Conclusion

The approach described above represents quite substantial change of the post-Maastricht integration paradigm that (in a way) according to its critics led to the blind alley. But the transition back to the realistic path will not be easy, as it requires to change and streamlining the rules enshrined in the Treaties along the following principles:

- Single market will remain the base for EU, the point of no return (which should lead to its full completion, not least in the area of services)

- The concept of ever closer Union will be left, the adoption of euro will not be obligatory but voluntary
- Newly defined Euro Area entry conditions should be valid both for new entrants, and those who will be returning after their temporary departure in order to avoid repeating the old mistakes with a pre-mature, politically driven entries, and to assure the equal treatment
- Voluntary Euro Area entry requires allowing for voluntary exit, but in principle for only one chance to return, as the credibility of single currency would be otherwise in question
- Those members who left the Euro Area with the intent to re-enter should remain the Banking Union members on the basis of current rules (no voice in the ECB Governing Council, no use of ESM money or ELA) in order to be better equipped to cope with potential banking sector / financial stability problems
- In case of serious breach of rules or dishonouring of obligations the respective Euro Area member should be ruled-out and loses the right to re-enter again

If one things about the sequencing of "Plan B" measures, it would be useful to re-group them into three broad categories. Measures that are needed anyway will consist of design a state bankruptcy rules including draft Sovereign Debt Restructuring Mechanism, and proposal for new EU budgetary priorities to be applied in the programming period 2021 – 2027. Transitory measures for achieving optimal Euro Area membership would begin with the draft Treaty amendments in parallel to creating for Member States sufficient time space for necessary structural and institutional reforms as defined in Country Specific Recommendations (max. 5 to 7 years), and strengthening safety net for backing orderly exit and re-entry to the Euro Area. Finally, dynamic measures as to the full applicability, fair and uneven enforcement of the new rules.

The approach described above does not mean giving up the aims of achieving further stages of integration including full economic and monetary union, and eventually a form of political union. Right the opposite is true: economically more aligned users of common currency will have much better chance and incentives to reach more integrated stages earlier[9], and if this proves to be economically appealing, then the outliers will step up their efforts to join later. Very important part that would really "cement" both parts (non-euro-area and Euro Area) of the Union together will be effort to complete the Single Market in a way that would remove all the barriers to the four freedoms (including technical and non-tariff ones), minimize the regulation and bureaucracy to the reasonable level, and allow market forces to pull innovation for the good of people.

Of course, that part of it should be strengthening the role of democratic institutions including the proliferation of national and European parliamentary processes. But this is another part of the story that despite the close connection goes beyond the subject matter of this article. Only the full integration process will last longer (as it was the case with the USA): maybe it would be more realistic to describe the future as "Uniting Nations of Europe".

However, the issue that remains open is the one of the driving force of such a paradigm change that albeit looking appealing and desirable, would be extremely difficult to achieve.

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[9] Each integration stage requires the Treaty adjustment to the new conditions, so as the principles above.

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CALIBRATION OF COUNTERCYCLICAL CAPITAL BUFFER RATE. CASE OF SLOVAKIA

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Abstract

Countercyclical capital buffer belongs to the most prominent macroprudential tools. Despite its wide implementation in EU members states' legislation and existing official proposals for analytical and policy framework, decisions on countercyclical capital buffer are still very challenging. In our work we find the methodology proposed by the Basel Committee on Banking Supervision as not appropriate for Slovakia, mostly due to short time series of underlying data and emerging character of the local lending market. In our paper, we suggest a more tailored calculation of the credit-to-GDP gap using a different approach to GDP in the denominator as well as a targeted calibration of the countercyclical capital buffer rate based on the historical losses. In our work we do not apply any advanced modelling approach due to data constrains and policy orientation of the results.

Keywords: Countercyclical capital buffer

JEL Classification: E44, E61, G21

Introduction

Financial stability can be threatened by systemic risk of both structural and cyclical nature. Therefore macroprudential policy toolkit usually comprises different types of instruments to address these risks. As far as cyclical risks are concerned, different national authorities around the globe typically use either borrower-based measures, such as limits on loan-to-value ratios and limits on debt service-to-income ratios or capital-based measures, i.e. higher capital buffers or modifications of risk weights.

Importantly, objectives of national macroprudential authorities in the area of cyclical systemic risks can be defined differently. Most of the countries so far, activated macroprudential policy instruments with the primary objective of increasing resilience of the local banking sector. This essentially means that macroprudential tools should increase the capacity of banks to absorb extraordinary losses incurred during financial stress. However, a broader understanding of macroprudential policy objective would aim not only on banking sector resilience, but also on prevention of asset price bubbles formation, such as the one on property markets. Even if both objectives are often closely related it is important to make a transparent definition of macroprudential policy objective to make the policy moves foreseeable by market participants. Our understanding of macroprudential policy objective is more oriented on banking sector resilience, while positive effects on e.g. property market is considered as an important side effect not guiding the decision. Consequently, the work on countercyclical capital buffer, including methodology of indicators and calibration of the buffer rate, discussed in this article is driven by this concept of banking sector resilience.

So far only few national macroprudential authorities have activated countercyclical capital buffer. Furthermore, most of these decisions were not primarily guided by the officially proposed credit-to-GDP gap methodology, but rather by some alternative variables. Consequently the research work connecting credit-to-GDP gap with real decisions on countercyclical capital buffer remains modest. Nevertheless, the concept of credit-to-GDP gap

remains very important and macroprudential authorities should find its role in their decisions on countercyclical capital buffer rate.

1. COUNTER-CYCLICAL CAPITAL BUFFER

Currently countercyclical capital buffer is the most important cyclical tool at the disposal of macroprudential policy authorities. It was introduced by Basel Committee on Banking Supervision (BIS, 2010) and soon after became a part of European legislation (EC, 2013). Its concept is very simple and intuitive. The capital buffer should be build in good times when banks are profitable and loans are provided on a background of higher risk appetite or lower risk perception. Consequently, in bad times, capital buffer is released and used to absorb losses associated with the excessive lending activity that took place prior to the crises.

Initial introduction of the countercyclical capital buffer as tool for macroprudential policy proposed the credit-to-GDP gap (gap_t) as the leading indicator (Drehmann et al, 2010). It is calculated as a deviation of the ratio of credit to GDP (r_t) from its long term trend (t_t).

$$gap_t = r_t - t_t \tag{1}$$

The long term trend was suggested to be calculated by one-sided Hodrick–Prescott filter with a smoothing parameter of 400,000 (Drehmann et al. 2011). This calibration was also confirmed by the work of ESRB (Detken et al., 2014) and published as a recommendation of the European Systemic Risk Board (ESRB, 2014).

After the gap is figured out, it is transformed into the countercyclical capital buffer rate (buffer guide), which is already an implied value of the countercyclical capital buffer rate in the form of Tier 1 capital, expressed in percent of risk-weighted assets. According to this official calibration, value of gap_t lower than 2 implies a countercyclical capital buffer rate of 0 % while gap_t above 10 implies a countercyclical capital buffer rate of 2.5 %. Countercyclical capital buffer rate ($rate_t$) is than calculated according to the formula:

$$rate_t = (0.3125\ x\ gap_t - 0.625) \tag{2}$$

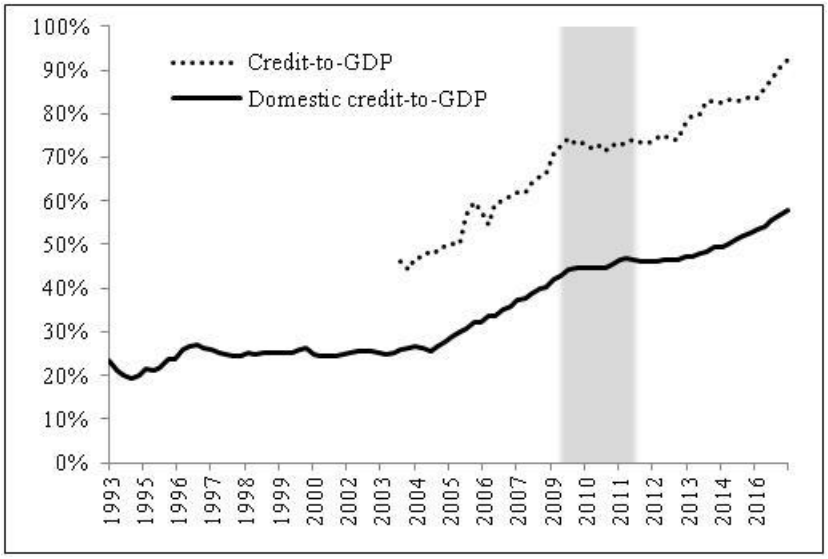
However, the calculation of the credit-to-GDP gap and calibration of the buffer guide was done on a sample of selected countries not covering Central and Eastern Europe (Drehman, 2011). Logically, it does not necessarily reflect specific situation in all the countries, which is also the case of Slovakia. This concept was already criticised by several authors (Geršl – Seidler, 2012), (Repullo – Saurina, 2011), (Rychtárik, 2014), (Castro et al., 2016). Practical problem with results of official methodology led to development of alternative indicators (Plašil et al., 2015). Nevertheless, after an extensive work done by the ESRB, member states were recommended to consider an introduction of additional credit gap metrics (ESRB, 2014), as the standardized Basel measure may not always reflect character of their respective countries.

For the purpose of this paper we will focus on three important issues to be answered when introducing additional credit-to-GDP gap as an indicator to guide decisions on the countercyclical capital buffer in Slovakia: (i) definition of credit, (ii) problem of GDP in the credit-to-GDP metrics and (iii) calibration of the buffer guide based on this additional credit-to-GDP gap. Similar these questions need to be answered by national authorities to reflect the character of the lending market and the economy in respective jurisdiction.

1.1 Definition of credit

Basel proposal defines the nominator of the credit-to-GDP gap as total private debt. This includes all forms of debt of households and enterprises. As for households, the figure is relatively straightforward. Household debt is usually concentrated in housing loans and consumer loans provided by the domestic banking sector. This means that in most of the countries, bank reporting can be very well used to approximate the total household debt. However, the debt of enterprises can have different forms and interpretations. It is not only the volume of loans provided by local banks, but also loans provided by foreign banks on a cross-border basis or bonds issued on domestic or foreign markets. Moreover, there are some additional items where the interpretation of debt is rather ambiguous, such as corporate intra-group funding provided on domestic or cross-border basis or short-term trade balances with other enterprises. From a methodological point of view, the definition of credit should be as broad as possible. But from a policy viewpoint, decisions should be taken in a timely manner relying on data with appropriate quality. Thus the use of bank reporting with high quality data, limited time lags and longer time series outweighs the broad credit definition figured out from different sources, often dependent on estimations and always with important time lags. For Slovakia we recommend a narrow definition of domestic credit, i.e. loans provided to households and enterprises by local bank.

Figure 1 – Credit-to-GDP: Total debt versus domestic credit



Source: National bank of Slovakia

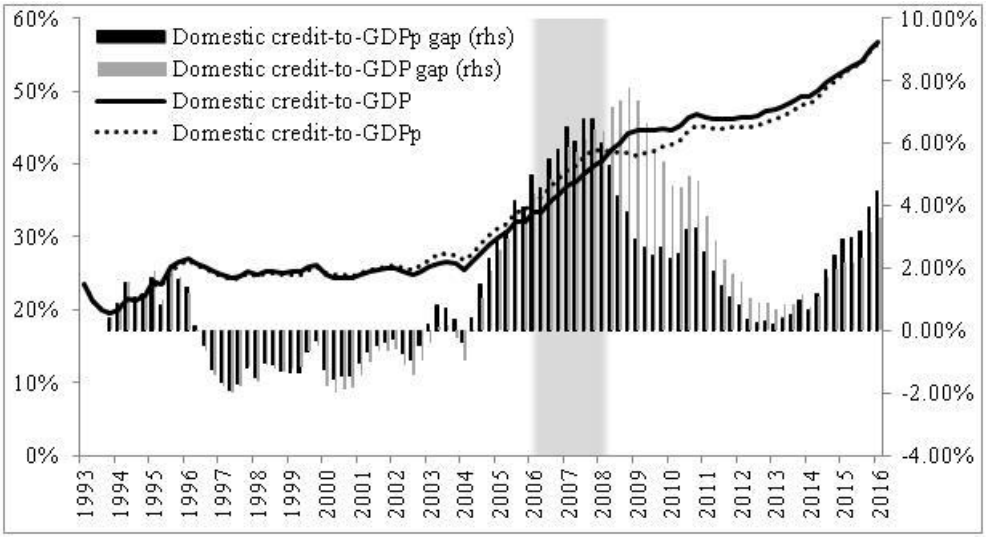
The level shift between credit-to-GDP ratio using total debt and domestic credit-to-GDP ratio does not influence the final gap, as this is a trend indicator. Importantly, longer time series with less volatile evolution returns more reliable results.

1.2 Problem of GDP in the denominator

Some authors (Repullo – Saurina, 2011) already described an important weakness of credit-to-GDP gap measure of comparing a stock variable in the nominator (credit) with a flow variable in the denominator (GDP). If GDP slides down during the crises when the volume of loans remains rather sticky, credit-to-GDP deviates from its long-term trend in a positive way. Such

development (positive gap) is a sign of excessive credit growth and implies an increase in the countercyclical capital buffer rate. This particular case is of course a false signal, as the positive gap occurs due to GDP drop in denominator and not due to an excessive credit growth in nominator. Moreover, Slovak experience from the period 2004 – 2008 revealed an additional problem. Excessive credit developments in this period did not lead to an appropriate increase of the credit-to-GDP gap, because it was accompanied by unsustainably high GDP growth. In other words, excessive credit growth was masked by excessive GDP growth (Rychtárik, 2014). To address this error type, we suggest using potential GDP (GDP_p), which is lower in booming phase and does not suddenly drop in bad times.

Figure 2 – Domestic credit-to-GDP gap and domestic credit-to-GDP_p gap



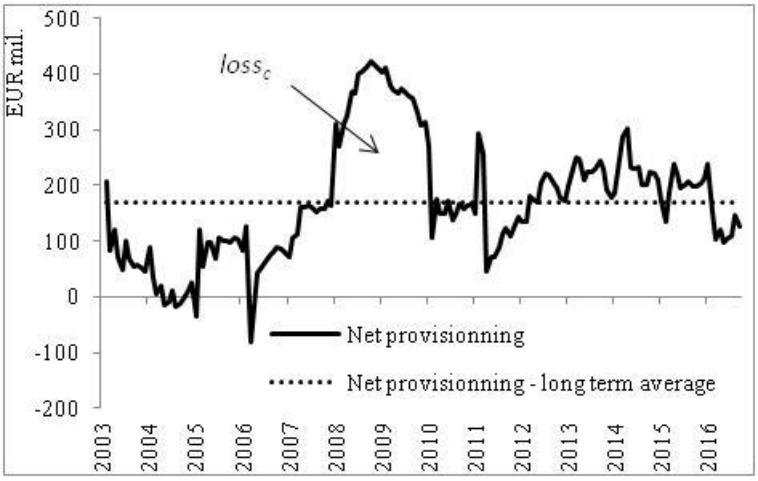
Source: National bank of Slovakia

The metrics using current GDP in market prices peaked only after the crisis outbreak and remain elevated even after. Calculation with the potential GDP indicated a higher degree of imbalances in 2008 before the crisis and fell afterwards.

1.3 Calibration of the buffer guide

Calibration of the buffer guide suggested by Basel documents and further analysed by the ESRB should be tested in every respective jurisdiction. This is not only because every jurisdiction can have different character financial cycle, but also due to the fact that calibration of the buffer rate should be related to the concept of unexpected losses. Thus the mechanism of incurring losses in banks´ books is very country-specific. It is related to many details, such as bankruptcy low, character of property market, banks´ access to collateral, provisioning rules, etc…

Figure 3 – Loan loss provisioning in Slovak banks



Source: National bank of Slovakia

Calibration of the buffer rate based on the experience of the past financial crisis comprises several steps. First, we have calculated the domestic credit-to-GDP_p gap according the methodology described above. We found its peak in September of 2008 with the value of gap at 6.77. Second, we have figured out all credit losses incurred by the Slovak banking sector in normal times (2003 – 2008 and 2011 – 2016) to determine the average annual credit loss, denoted as $loss_a$. We have excluded period of 2009 – 2010 as these losses resulted from excessive credit growth reaching its maximum in June 2008. This amount of credit loss should be considered as long-term, through-the-cycle element. Such loses are typically absorbed by earnings from the current year and does not require a special capital add-on. Then we have figured the credit losses related to the excessive credit growth before the crises and incurred in 2009 and 2010 ($loss_c$). The difference between the loss incurred in time of crisis ($loss_c$) and the long-term average loss ($loss_a$) indicates the part of losses that should be covered by the counter-cyclical capital buffer. This volume of credit losses is expressed in terms of risk-weighted assets to obtain the countercyclical capital buffer rate.

$$rate_{2008} = \frac{loss_c - loss_a}{RWA_{2008}} \quad (3)$$

Finally, once we have calculated the domestic credit-to-GDPp gap for 2008 and the extraordinary losses of 2009 and 2010, we can establish a relationship between them, based on the Basel formula:

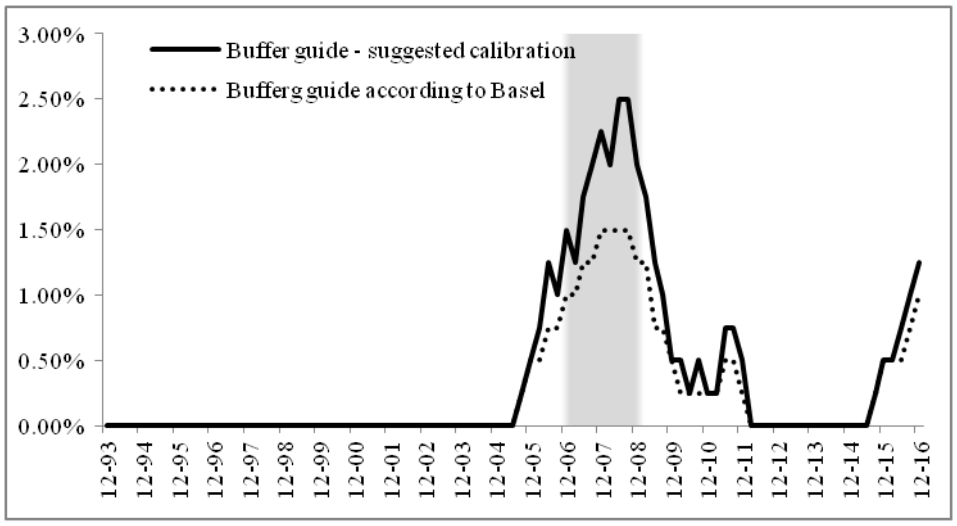
$$rate_t = (K\ x\ gap_t - 2xK) \quad (4)$$

Knowing the $rate_t$ and the gap_t, of 2008 we can figure out the parameter K. The suggested calibration of countercyclical capital buffer for Slovakia would be:

$$rate_t = (0.475\ x\ gap_t - 0.95) \quad (5)$$

The proposed calibration of the countercyclical capital buffer for Slovakia is more conservative than the standard Basel methodology. Empirical evidence showed that in 2008 Slovakia would need a countercyclical capital buffer of 2,50 % to fully absorb losses during 2009 and 2010, while the Basel calibration would build a capital buffer of 1,50 % only. As seen on the Figure 4, suggested calibration implies a higher countercyclical capital buffer rate also in 2015 and 2016.

Figure 4 – Basel calibration and suggested calibration of buffer rate for Slovakia



Source: National bank of Slovakia

2 ADDITIONAL CONSIDERATIONS FOR CALIBRAITON

But decisions on counter-cyclical capital buffer rate must not rely on the past data and experience only. This is even more important for countries like Slovakia, where there is only one crisis observation and the lending market has an emerging character. Therefore, policymakers should take into account additional nuances of actual market developments and regulatory environment.

2.1 Level of indebtedness

Size of the credit losses is generally related to the level of vulnerabilities in households and enterprises and to the magnitude of accumulated imbalances, such as excessiveness of credit market. While excessive credit growth can be measured by credit-to-GDP gap, it contains no information about vulnerability of households and enterprises. Actual indebtedness of households and enterprises is currently much higher (Figure 1), which should increase the calibration of the countercyclical capital buffer rate compared to the same credit-to-GDP gap levels of 2008.

2.2 Lending standards

However, differences in lending standards would speak for a less conservative approach. As National bank of Slovakia has introduced borrower-based measures in 2014, lending standards appear to be tighter than they were in 2005 – 2008. Current limits on loan-to-value, debt service-to-income ratio, maturity caps, interest rate shocks and other measures implicitly mitigate the size of the future losses from these loans.

2.3 Accounting standards

Very soon, banks will adopt new accounting principles IFRS 9. Following these changes, the size of credit losses itself should not be affected, while the time in which the provisioning will need to be built up is expected to be shorter. This speaks for higher countercyclical capital buffer rates.

2.4 Average risk weights

The countercyclical capital buffer is always expressed in percent of total risk-weighted assets. But in many countries, including Slovakia, the main driver of excessive credit growth is related to housing loans. However over the last years, housing loans have been subject to extensive work under Internal Rating Based Models to decrease their risk weights in individual banks. Also in Slovakia, the average risk weight has decreased between 2008 and 2017. This means that absorption of the amount of loss from 2009 – 2010 would need a higher countercyclical capital buffer rate in 2017 than it was the case in 2008.

2.5 Applicable rate time lag

Decision to increase a countercyclical capital buffer has an important time lag. First lag is related to common statistical data collection issues. For example, the GDP of December 2015 is available only at beginning of the second quarter of 2016. Second lag comes with the phase-in of the countercyclical capital buffer, usually 12 months from the date of decision. In other words, the times shift between the date of the underlying data (date of the value of credit-to-GDP gap) and the date when the countercyclical capital buffer rate becomes effective is not less than 6 quarters. In practice, when the credit gap is picking up, the countercyclical capital buffer always lags some 6 quarters behind. This means a more conservative calibration should be in place.

2.6 Banking sector profitability outlook

As mentioned above, the role of the countercyclical capital buffer is to absorb losses related to excessive credit growth. Long term average "typical" losses should be absorbed by day-to-day banking activities and it is normally covered by the risk margin. Thus it is important to regularly do a simulation of banking sector profitability. Potentially weak outlook about profits over the next year would contribute to a more conservative calibration of the countercyclical capital buffer.

2.7 Monetary policy environment

Estimation of losses is closely related to the interest rate environment. The losses recorded in 2009 – 2010 were heavily mitigated by the abrupt reduction of interest rates by the European Central Bank. Falling rates led to a reduction of debt service-to-income ratios. Current extremely low rates environment limits possibility of further reduction of the debt burden. Consequently, calibration of the countercyclical capital buffer in a low interest rate environment should be more conservative.

Conclusion

Calculation of the credit-to-GDP gap and its transformation into countercyclical capital buffer rate proposed by Basel documents provides and important input for countries around the world in their approach to this macroprudential policy tool. However for certain countries, where the economy and financial markets are rather young the calculation of the credit-to-GDP gap should be modified. In our work we found that potential GDP returns more reliable results than actual GDP in market prices. Also to calculation of the buffer guide should reflect local conditions. Based on the experience from the crisis of 2009, we propose a calibration of the countercyclical capital buffer guide that is more reflecting Slovak conditions and actually leads to a slightly more conservative approach. Also we propose a number of factors that need to be considered when building the guided judgment decision anchored on the buffer guide. Most of them imply a more conservative approach.

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THE INFLUENCE OF THE COMMON CURRENCY ON THE PROCESS OF CONVERGENCE

Ilona Švihlíková, Michael Kroh

Abstract

The paper investigates the problem of adopting the euro from the position of a country facing the challenge of moving closer to the advanced EU members in terms of economic performance and the standard of living of citizens. This problem resonates in political debates and is associated with the declining popularity of the Union in the Czech Republic. Based on the results of economic theory, especially the OCA, and the evaluation of the basic indicators of the economic level of the EU states, the authors concluded that the Czech Republic should not be in a hurry with the entry into the ERM II exchange mechanism and subsequently to the euro-zone. The key reason is the potentially negative impact of the common currency on the convergence process (mainly the loss of ability to move closer to the more advanced countries through the strengthening of the crown in its current high underestimation of purchasing power parity).

Keywords: *euro, euro-zone, optimal currency area (OCA), economic convergence, Greek crisis, Maastricht criteria, bail out, fiscal compact*

JEL Classification: E42

Introduction

Recently, the intensity of discussions on the possible entry of the Czech Republic into the euro area and the adoption of the common currency have increased. Political arguments prevail in the debate, especially among the euro's followers. In our paper, we will try to clarify the economic aspect of the process, which does not appear to be as favorable as it is presented by some politicians and government-bound economic experts as part of a thorough objective analysis.

Before we move on to the economic analysis of the issue, we will mention some political arguments in favor of the rapid adoption of the euro. They have been recently formulated by the Prime Minister[1], his advisers and close associates. They are based, in particular, on the fear that closer co-operation between the euro-zone countries will gradually "disqualify us", pushing us to the periphery of the EU, and turning into mere passive recipients of directives agreed at the closest nucleus of integration. Some commentators added "sugar" in the form of a plan to increase intra-euro area solidarity, based on the ideas of the French president and other French politicians, particularly European Commissioner Pierre Moskovici, seemingly intending to accelerate the process of convergence of the economic level of the countries of the Common European currency.

Informal agreements on a common approach to negotiations within the EU are already a common practice and cannot be expected to change in this sense. However, the euro-zone is not as homogeneous as to promote easily a common position. This is rather the result of the pressure of big countries (Germany, France, Italy). In this direction, the entry into the euro-zone would not bring us much because we would not be able to enforce anything against the coalition of the strong members. France's plans to reform the euro-zone hardly overcome the resistance of Germany or the Netherlands and moreover would require a change in the current

basic treaties, which would have to be ratified by all states, including the Czech Republic. The likely cosmetic changes that will be the result of the complex negotiations on this initiative will not change the substance of the current euro-zone, and therefore we will not take into account our analysis.

Another strike on the geopolitical justification of joining the euro-zone was inadvertently put forward by European Commission President J. C. Juncker in a report on the state of the EU in the European Parliament, calling on states that have committed to adopt the euro to do so as quickly as possible under a technical support from Commission. This clearly discourages the idea of a hard core and a periphery of the EU based on membership of the euro area. The hard core would so paradoxically involve Bulgaria and Romania, and not Sweden or Denmark. The absurdity of such a situation is pervading, and it is clear that only the formal technical and organizational act of accepting the common currency does not involve us in any hard core. The Euro does not play an important role therein. The EU is not just the area of cooperation and solidarity only, as the propaganda declares but an arena of hard competition, too. We will have to fight our hard core position and it is a question whether the adoption of a common currency would help us somehow.

1. THE THEORETICAL BASIS FOR EXAMINING THE PROCESS OF CONVERGENCE IN RELATION TO THE COMMON CURRENCY

The concepts of the 1960s remain the basis for theoretical exploration of currency zones, defining the conditions of the so-called optimal currency zone (Mundell, Kennen, McKinnon, later Mongelli)[2]. In these approaches, the individual conditions appear to be external (exogenous) and the participants should meet them before the currency block is created. With a little simplification, it can be said that the conditions of the optimum currency zone created in this way can only be a federal or association state (it is little known that the German mark was formally a monetary union until its dissolution) and not a community like the EU. Plans to create a common EU currency were in fact counter to economic theory, which the politicians as well as part of the Euro-optimistically tuned experts did not like. The authors Frankel and Rose therefore came with an endogenous hypothesis in 1998, claiming that changes leading to an optimal currency zone will represent the automatic consequence of introduction of the common currency itself[3].

The adoption of this hypothesis by the political elite led to the adoption of the countries that differed from the "hard core" (Spain, Portugal, Greece, etc.) to the economic level and structure of the economy. It has, however, been forgotten that, in particular, the political criteria for an optimal currency zone do not take place automatically, and that the necessary change may collide with interests of key countries. Mainly the criterion of joint overcoming of asymmetric shocks by means of international transfers (bail out), which are prohibited by the Maastricht Treaty and by later versions of the basic treaties, should be mentioned in this context. Germany is the bigger opponent of the transfers. The shocks are therefore settled by the classic means of the Washington Consensus - spending cuts, bridging loans, repayments, privatizations, etc., which often aggravate problems of borrowing countries without expected long-term results.

The endogeneity hypothesis was contradicted by Paul Krugman's view that a greater openness of the economy (McKinnon's OCA criterion) leads to a higher degree of specialization and consequently to a higher likelihood of asymmetric shocks, resulting in increased costs for the functioning of the common currency[4]. Kalemli-Ozcan, Sorensen, and Yosha (2003) find that a high degree of financial integration (even outside the monetary union) can have a similar effect due to a functioning risk sharing[5]. Agenor and Aizenman (2011) find that the benefits of joining

the currency zone depend on the efficiency of the domestic financial sector, especially on its ability to expand to other currency zone countries[6].

As a result of the resistance of most of the euro-zone members who did not want to pay off to "dishonorable and unruly" partners, although they themselves sometimes contradicted the Maastricht criteria, there was no automatic shift towards fulfilling the conditions of the optimum currency zone and no necessary change of basic contracts. Development, especially in light of the impact of the financial and economic crisis since 2008, has justified standpoints of Krugman and the other mentioned critics as true. Therefore, the professional public has had to say that the theory of currency zone endogeneity has not been confirmed, particularly in the EMU case. On the contrary, it was observed that less competitive economies diverge from the core of the euro area[7]. **The authors of this paper are of the opinion that critical evaluation of the euro-zone can be related to the entire EU economy, and therefore a reform of the common currency without a major reform of full integration has no hope of success. The violent attempt to create the legal status of the two-speed EU would probably lead to its subsequent split and de facto decay.**

Regarding the process of convergence, it is usually examined using statistical calculations to bring the Czech economy closer to the euro area. In this respect, some approximation can be traced in the form of alignment of the business cycle and other indicators. However, we want to focus on bringing the Czech Republic closer to the more advanced EU states in terms of economic performance and living standards of the population. Recently, a more attention has been given to this topic in the context of growing dissatisfaction with the results of the EU membership and subsequent Eurosceptic moods. Political elites are beginning to realize that the naive optimism of the accession negotiations and the first years of membership have gradually faded and that the expectation of a faster convergence of the level of life with more advanced states has not been fulfilled. It is to be welcome that this issue is now being politically discussed and motivated by the fact that the wage bill is also being considered as a big problem within the Union. Germany and France have taken the initiative in this respect, because they do not want to accept low salaries of workers from the new Member States operating in these countries, particularly in the field of transport.

The pessimism prevails in the opinions of experts on this subject, some of them even claim about the impossibility of catching up developed countries or a very long time of convergence - over several generations. Looking at the graph of GDP development in the EU countries, then the prevailing skepticism cannot be a surprise. After a slight acceleration of the approximation process just after accession, the turnaround resulted after the crisis after 2008, and only in recent years the situation has stabilized so that no further opening notional scissors is observed. However, a pronounced quicker convergence, despite relatively rapid growth, cannot be expected. Those who promised the convergence benefits of European development and social funds probably did not realize that their purpose was different. In the 1980s, the EEC bodies had to admit that integration under the Single European Act (1986) would suit more advanced and industrialized countries or regions and that the new policy was designed to "*offset the burden on the southern states and disadvantaged regions from the common market*.[8]" It was not a gift for a quicker development, no the supermarket, as Emannuel Macron often talks about, but the compensation of the unfavorable consequences of integration for economically weaker countries!

The essence of the convergence problem is implicitly contained in the classical and neoclassical schemes of comparative advantages. Their original purpose was to prove the advantage of international exchange and manufacturing specialization against isolation. This, of course, is true, but when addressing the issue of convergence, we must examine the international division

of labor as a reproduction process. And there is a tendency to increase cumulatively the comparative advantages of states with technologically advanced industrial base and larger capital. The gap between developed and less developed countries is therefore rapidly increasing in terms of free trade, without customs protection. Neoclassical Swedish theoreticians Heckscher and Ohlin have even declared the rule (assuming perfect competition) that less developed countries should permanently specialize in products more demanding for labor force. This would, however, mean to abandon efforts to converge, and endure reconciliation with the inferior position in the world economy.

The theoretical conclusion of Balassa and Samuelson, which theoretically proved the previously empirically established fact of permanent undervaluation of the less developed countries' currency, is also important for an analysis of the ability to converge in economic performance and living standards[9]. This, on the one hand, improves their competitiveness (but not to the point of convergence) but optically further deepens the difference in wealth.

2. THE GREEK CASE

Greece is a specific and alarming example not only of the functioning of the euro-zone (membership, choice of convergence criteria), but also of a demonstration of how the euro area was not prepared for a crisis that affected many other countries, too - Spain, Portugal, Ireland, Cyprus. Problems due to asymmetric shocks affected Finland, Italy was in a difficult economic situation because of its banking sector problems.

The idealization of the functioning of the monetary union, illuminated in the previous section, has led to the situation, in which salvage mechanisms of the debt crisis or asymmetric shocks have been devised and implemented with a delay (so called on the march). The results of their application are not encouraging, because one of the dominant results of the euro area is the divergence of the member states, not the convergence. That is why a critical examination without today´s clichés and predominating stereotypes is necessary.

Greece was the only country eligible for membership in the euro area (in the first wave of twelve countries, excluding Great Britain, Denmark and Sweden) to be assessed as country that does not meet the convergence criteria. Nevertheless, it was accepted after "creative adjustments" somewhat later. As other countries, however, had also considerable problems with fulfilling the criteria, the debt criterion has been "softened" through an amended interpretation. Thus countries that have been far from the 60% of the public debt to GDP have been admitted to the monetary union. It was accepted if this ratio had steadily declined and countries such as Belgium and Italy also joined the monetary union. Already at the beginning of the functioning of the Monetary Union, the Stability and Growth Pact, which was the subject of continuous compliance with the convergence criteria, was violated by Germany and France without sanctioning them[10].

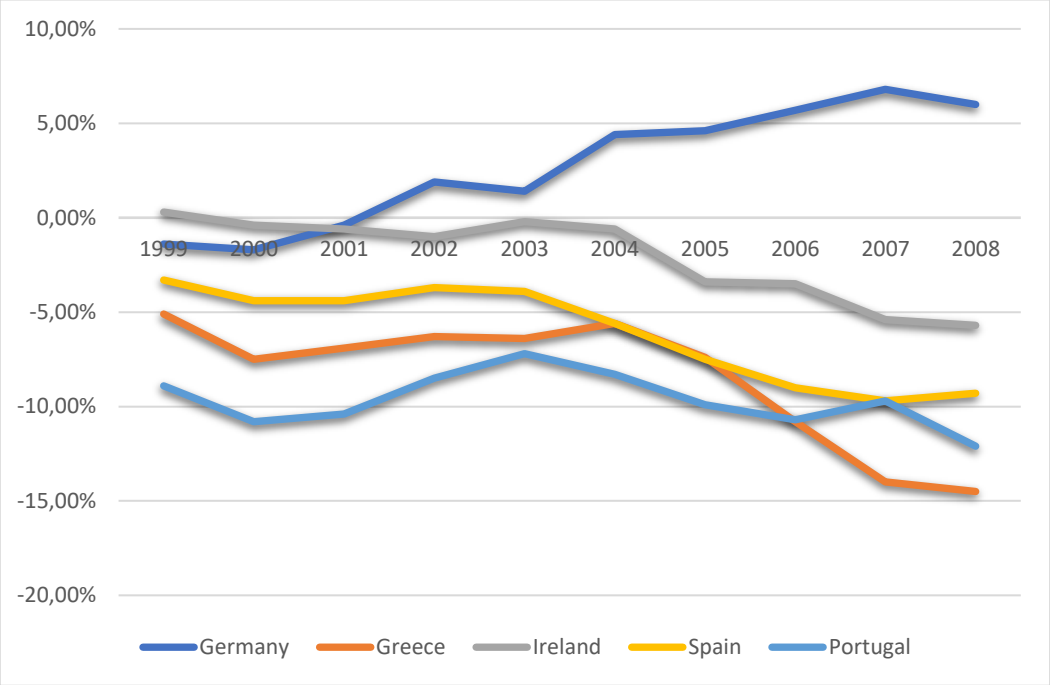
Divergence under the new Monetary Union was very strong in the current accounts of member countries. The following factors contributed to this. It was not "just" that the countries were structurally very different and they had a different resistance to shocks, etc. This key failure had been set in the architecture of monetary union before, from the beginning, as mentioned in the previous section.

Among other key factors it was the ECB's policy which had to confront to the different economic developments in the country and a lack of synchronous economic cycle from very beginning of its operation. The ECB set interest rates according to the needs of Germany, which at the time of the 21st century faced economic stagnation and high unemployment. However,

low interest rates contributed to bubble formation in southern countries and Ireland, which were in a different phase of the cycle.

A significant change in German social policy was also debatable, as expressed by the Hartz IV law, which fundamentally changed the functioning of the German labor market towards greater flexibility. Some analysts[11] believe that Germany has supported a wage deflation policy that has highlighted its cost benefits. This has had an impact on the German competitiveness, which has strengthened export-led growth, which is, however, typical for developing countries. On the other hand, the wage deflation policy has limited the consumption component of the German economy, which led to the accumulation of surpluses in the current account of Germany. These surpluses in Germany are still up to date and are higher than Chinese in relation to GDP. This is, therefore, a serious imbalance problem, which is, however, "hidden" within the euro area.

Figure 1 - Current account balance in % to GDP



Source: The Eurostat

The graph above shows well how the different countries "suffered" the common currency at a time when there was a relative boom in Europe. It is clear that, in the case of Germany, since the introduction of the euro, the surplus of the current account was growing. On the other hand, there were countries that could have a current account deficit before the introduction of the euro[12], but the situation further deteriorated after its introduction. German current account surpluses were subsequently "recycled" in such a way that German banks invested in countries with current account deficits, whether in the form of government bonds or in the private sector.

It is not the purpose of this article to thoroughly analyze the Greek crisis, which resulted in a decline of the economy by a quarter what is comparable to the war situation. However, it is important, in the context of the future introduction of the euro by The Czech Republic, to state briefly what solutions have been chosen. Without taking a deep look at the functioning of the European stabilization mechanism or the role of the European Central Bank (especially in the summer of 2015), it is clear that the maintenance of the common currency is still based on

incomplete monetary union, which has been supplemented by restrictive mechanisms under a German pressure. These include predominantly the application of austerity policy, which is also embedded in key documents, such as the so-called Fiscal Compact. However, these measures, supplemented by the monetary policy of quantitative release in recent years, i. e. a quantitative easing program as well as negative interest rates, namely a deposit facility of -0.4%, have led to an adjustment to the stagnation path having an asymmetric character. As the following table shows, financially strong countries have increasing surpluses, countries with deep cuts at the cost of long recessions move to a balanced current account. However, the imbalances did not disappear from the euro-zone, but they are very noticeable in the Target2 system.

Table 1 - Current account in % of GDP

	2008	2009	2010	2011	2012	2013	2014	2015
Portugal	-12,10%	-10,40%	-10,20%	-6,00%	-1,90%	1,50%	0,10%	0,50%
Ireland	-5,70%	-3,00%	0,60%	0,80%	-1,50%	3,10%	3,60%	4,50%
Greece	**-14,40%**	**-12,40%**	**-11,40%**	**-10,00%**	**-3,80%**	**-2,00%**	**-2,10%**	**0,00%**
Spain	-9,30%	-4,30%	-3,90%	-3,20%	-0,20%	1,50%	0,90%	1,40%
Cyprus	-15,60%	-7,70%	-10,70%	-3,90%	-5,60%	-4,50%	-4,60%	-5,10%
Italy	-2,90%	-1,90%	-3,50%	-3,10%	-0,40%	0,90%	1,90%	2,10%
Finland	2,20%	1,90%	1,20%	-1,80%	-1,90%	-1,70%	-0,90%	0,10%
Germany	**5,60%**	**5,70%**	**5,60%**	**6,10%**	**7,00%**	**6,80%**	**7,30%**	**8,50%**
Netherlands	**4,10%**	**5,80%**	**7,40%**	**9,00%**	**10,80%**	**10,90%**	**10,60%**	**10,90%**
Sweden	8,50%	5,90%	6,00%	6,10%	5,90%	6,00%	5%	5,90%
France	-0,90%	-0,80%	-0,80%	-0,90%	-1,20%	-0,80%	-0,90%	-0,10%
Slovakia	**-6,5%**	**-3,4%**	**-4,7%**	**-5,0%**	**0,9%**	**1,9%**	**1,1%**	**0,2%**
Czech rep.	**-1,9%**	**-2,3%**	**-3,6%**	**-2,1%**	**-1,6%**	**-0,5%**	**0,2%**	**0,2%**

Source: The Eurostat

The divergence, which is the result of both the monetary union and the economic policy, is well visible in GDP per head[13]. However, the data for Ireland, which has in its territory a number of foreign companies that statistically report operations that have little influence on domestic the economy, are misleading.

Table 2 - GDP per capita in selected countries, EU average = 100

	2008	2009	2010	2011	2012	2013	2014	2015
Portugal	79	81	81	78	77	77	78	77
Spain	101	101	97	94	92	91	91	92
Ireland	132	129	130	132	131	131	134	145
Greece	**94**	**94**	**87**	**77**	**74**	**74**	**73**	**71**
Italy	105	104	103	102	101	98	96	95
Finland	120	116	115	116	115	113	110	108
Cyprus	105	105	102	96	91	84	82	81
France	106	107	108	108	107	108	107	106
Germany	**118**	**116**	**121**	**124**	**124**	**124**	**126**	**125**
Netherlands	139	137	134	134	132	132	131	129
Sweden	126	122	125	126	127	124	123	123
Slovakia	71	71	74	75	76	77	77	77
Czech Rep.	84	85	83	83	83	84	86	87

Source: The Eurostat

3. SLOVAKIA: CASE TO FOLLOW?

The entry of the Slovak Republic into the euro area has been associated with great expectations[14]. However, neither predicted high GDP growth rates nor an inflow of foreign direct investments occurred. In a study by the Economic Institute of the Slovak Academy of Sciences from 2014, it is stated that "together with the disadvantages of euro adoption, consisting mainly in the loss of sovereignty in monetary policy (and the possibility of influencing domestic economy development through standard instruments such as interest rates and the exchange rate), further disadvantages accrued.[15]" These includes, for example, a € 16bn risk – loan - guarantees for highly indebted countries[16]. On the other hand, the convergence process has slowed down considerably after joining the euro area (see the preceding table). The sober analysis of Slovak economists contrasts with admirable tirades of Czech politicians about the example of a good story of Slovakia.

4. THE SITUATION IN THE CZECH REPUBLIC

The Czech Republic, like the other countries that acceded in 2004, has no exception as for the adoption of the euro. It is therefore expected that the euro will be accepted, although there is no clear time horizon when it should happen. Even within the EU, there is debate about how the EU and the monetary union should evolve further. It is to be expected that the debate on reforms will be led mainly among the main actors, Germany and France. Especially French President Macron presents deep reforms of the euro-zone as one of the key points of his program. The impact of the domestic debate on the adoption of the euro has also been affected by general statements such as the aforementioned speech by the President of the European Commission, Jean-Claude Juncker. He stressed in his speech on the state of the EU that the euro was intended as a currency for all members (with the exception of Denmark and Sweden) and therefore it

should be accepted even by those countries that are more reserved for it. This category includes Poland, Hungary, and the Czech Republic, in which about 70% of citizens refuse to accept the euro. It is undoubtedly a strong signal to political representation to take in account such a strong disagreement.

We can read in the official material of the Ministry of Finance and the CNB from the year 2016[17] that the Czech Republic fulfills the convergence criteria, except for its participation in the ERM II system as it has not yet entered into it. The other criteria, i.e. public finances, price stability and convergence of interest rates, are met by the Czech Republic.

It is stated that the Czech Republic has restored convergence to developed countries within EU[18]. The adoption of the euro is reflected in the high degree of openness of the Czech economy and the ownership relations towards the euro-zone[19]. Nevertheless, according to this report, the scope for convergence continues to be considerable, and the structural difference between the Czech economy and the considerable impact of the industry on both GDP and employment are also highlighted. Critical is also the view of the stability of the entire euro area, including considerable uncertainty about its future shape and functioning.

The question of convergence is linked to the exchange rate and exchange rate channel. The exchange rate was artificially distorted and depreciated from November 2013 to the spring of this year at the level of CZK 27 per euro. Since leaving the so-called exchange rate commitment, the Czech crown has strengthened, but is still well below the purchasing power parity. The Eurostat places it at 18-19 crowns for the euro. If the euro were introduced at a rate deviating too much from the purchasing power parity[20], devaluation of wages, pensions, savings, overall wealth of Czech citizens would occur. The exchange channel, which is one of the major channels of convergence but also adjustment, would be closed.

Although a look at convergence criteria encourages optimism, the Czech economy suffers from a number of problems. From a structural point of view a moderate lower value added exists in the economy, what represents a significant brake on raising the standard of living and on convergence itself. A high share of foreign ownership leads to strong outflows in the economy, which since 2006 have exceeded reinvested earnings. It is evident that the model based on the inflow of foreign direct investment has already become antiquated and that it is necessary to come up with another, more advantageous national economy concept for Czech citizens.

It should be added that the combination of a number of factors also leads to a lower GDP value in the Czech Republic (due to economic outflows) or a considerable discrepancy between the level of salary and the level of performance. In terms of the differences between these categories, the Czech Republic occupies one of the leading positions in Europe[21]. A premature fixation to the euro at a disadvantageous rate (i.e. a rate that strongly deviates from purchasing power parity) would further strengthen this problem.

The conservation of the lower average added value anchors the Czech Republic in a disadvantaged position within the international division of labor. The process of convergence is therefore necessarily linked to fundamental and difficult structural changes. We suppose that we need to make the most of all to achieve a room for maneuver in economic policy towards these changes. It is inappropriate to restrict it at this stage by accepting any restrictions - whether it is a Fiscal Compact or the introduction of the euro.

Conclusions and recommendations

The territories of national economies and integration groups are heterogeneous. It is due to natural conditions, historical development and other factors. It is unrealistic to assume that this should change in the foreseeable future and this even would not be desirable because of the environment and landscape sustainability, regional specialization or cultural differences. The average level of wages and standard of living will not be as high on peripherals as in industrial centers. This is also valid for the integration group. However, there are automatic balancing transfers in national states that mitigate differences and, above all, ensure a universally accepted level of social policy, health care, education and other basic functions of the modern state. In the EU, however, these transfers are, as has been said, prohibited. This favors economically stronger countries and makes a convergence more difficult. However, in the long run, growing differences will cease an advantage even for more advanced participants in integration. Paul Krugman has shown that economic centers attract job seekers from peripheral areas due to wage differences and higher intensity of the economic activity. But the resulting migration, as we can now see, has not only positive but also negative impacts (political, cultural and economic) and can severely damage not only the recipient states but also integration as a whole.

As for the euro area itself, "hard" statistical data do not confirm the contribution of the common currency to the convergence process. On the contrary, stronger attachment of less efficient states to those more efficient tends to hamper the convergence and deepen existing differences in the degree of comparative advantages of integration. European grant programs have weakened this negative impact, these "integration costs" for the weaker, but this only compensates for the notional scissors to go too far. However, statistical data also show that the current integration process that has been created on the basis of the interests and conditions of the most advanced European countries does not help the convergence process, and the access procedures do not respect the economic differences and the historical experience of the candidate countries. The enlargement process is dictated primarily by the geopolitical interests of European powers, and the convergence is in particular reduced to legal adaptation. And it is not certain whether the steps to further transferring competences to a pan-European level and deepening political integration can somehow contribute to convergence towards the economic performance of the core of Europe's most advanced countries.

The Czech Republic should therefore be more active in its efforts to reform the Union and should present its own ideas, whether they will be welcome or not. It is clear that individual states and groups of states have different, often very contradictory interests within the Union. It is therefore very difficult to find a generally acceptable compromise. Increased solidarity and asymmetry in trade relations are not achievable and it would therefore be worthwhile to stimulate deepening of CEEC cooperation with the V4 core, especially in the area of technology associated with the Fourth Industrial Revolution. It can bring a higher value added and reduce subcontracting for firms from the core of the EU to the GDP of the countries concerned. Furthermore, today's too high export orientation to the EU is to be reduced from today's 82% with help of strengthening cooperation in the 16 + 1 or 'Belt and Path' initiatives. Despite of a positive impact on some groups of export-oriented firms the euro should not be accepted by the Czech Republic before a major reform of the euro-zone that would introduce solidary transfers or similar compensatory measures in favor of current economically less efficient members.

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ECONOMIC ALIGNMENT AND EURO ADOPTION IN THE CZECH REPUBLIC: WHAT IS NEW?

Vladimír Tomšík, Dana Viktorová

Abstract

In 1998, the Czech Republic adopted the monetary policy regime of the inflation targeting which has been successful since that. Floating exchange rate serves as a moderator of shocks, even though there had been a period of exchange rate commitment during November 2013 and April 2017. The Czech Republic has been performing without any serious macroeconomic imbalances, including sound financial situation as well. Good performance of the Czech monetary policy has led to low and stable inflation, low interest rates, appreciating koruna exchange rate, and consequently to low public desire for euro adoption. Major issues while considering the euro adoption in the Czech Republic remain in the level of achieved economic convergence, labour market flexibility and long-term ability of the fiscal policy to serve as macro stabilizer. The article discusses in detail current basic questions regarding euro adoption in the Czech Republic: First, does the Czech Republic fulfil the Maastricht criteria? Second, is the fulfilment of the Maastricht criteria enough to adopt the euro? And finally, has the recent macroeconomic development altered the alignment with the euro area?. In conclusion, the authors deliver the recommendations for the Czech economy.

Keywords: Maastricht Criterion, Nominal and Real Convergence, Structural and Cyclical Alignment, Euro Adoption

JEL Classification: E52, E32, E65

BASIC FACTS

The Czech Republic adopted in 1998 monetary policy regime of the inflation targeting which has been successful since that. Floating exchange rate serves as a moderator of shocks, even though there had been a period of exchange rate commitment during November 2013 and April 2017. However, the exchange rate flexibility has been always a tool for economic adaptation during possible crisis. The Czech Republic has been performing without any serious macroeconomic imbalances, including sound financial situation as well. What is also important considering the euro adoption in the Czech Republic, it is the fact, that public demand for euro adoption remains rather low (around 30 % of population is supporting the euro adoption in the Czech Republic).

Only nineteen out of twenty-eight EU Member States share a common currency. However, the euro is the second largest reserve currency and one of the most traded currencies in the world financial markets. It is correct to mention, that building up the euro area has been a political decision ever since, but it should be based on economic analysis, especially considering further euro area enlargement.

Good performance of the Czech monetary policy has led to low and stable inflation, low interest rates, appreciating koruna exchange rate, and consequently to low public desire for euro adoption. Major issues while considering the euro adoption in the Czech Republic remains in the level of economic convergence achieved, labour market flexibility and long-term ability of the fiscal policy to serve as macro stabilizer (especially after Czech Republic would lose flexible exchange rate and its own monetary policy).

What are the issues in the euro area that should be considered before approaching the euro adoption processes?

1) Does the Czech Republic fulfil the Maastricht criteria?

2) Is the fulfilment of the Maastricht criteria enough to adopt the euro?

3) Has the recent macroeconomic development altered the alignment with the euro area?

EVALUATION OF THE MAASTRICHT CRITERIA

Fulfilment of the Maastricht Convergence Criteria has been evaluated in the Czech Republic each year since 2004[1] by a joint material of the Ministry of Finance and the Czech National Bank approved by the Czech Government "Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area", the latest evaluation was published in December 2016.

The Convergence Programme of the Czech Republic has been prepared yearly by Ministry of Finance since 2004. The latest programme was published in April 2017. The new evaluation will be released in December 2017. The Czech National Bank has been publishing each year "Analyses of the Czech Republic's current economic alignment with the euro area" since 2005, the latest analysis in December 2016. A Convergence Report is published every second year by the European Central Bank, the latest in June 2016. It focuses on countries under examinations: Bulgaria, Czech Republic, Croatia, Hungary, Poland, Romania and Sweden. It excludes the United Kingdom and Denmark as countries with opt-out clause or under the EU exit procedures.

The Maastricht convergence criteria refer to a nominal convergence process including price stability, level of the long-term interest rates, exchange rate stability and sustainability of the public finance. Following, we would examine the criteria in detail.

PRICE STABILITY CRITERION AND THE LONG-TERM INTEREST RATES

The price stability is measured by HICP remaining under the reference value calculated by summation of the average in the three EU Member States with the lowest HICP and 1.5 percentage points.

Chart 1 - Harmonized Index of Consumer Prices

	2013	2014	2015	2016	2017	2018	2019
Average for 3 EU countries with lowest inflation*	0.3	-0.2	-0.9	-0.4	0.8	1.3	1.5
Reference value	1.8	1.3	0.6	1.1	2.3	2.8	3.0
Czech Republic	1.4	0.4	0.3	0.6	1.5	1.8	1.9

Note: Average for last 12 months vs. average for previous 12 months as of end of period, growth in %.

Source: Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area, 2016.

Except for periods of administrative price increases (simultaneously accompanied by decrease in reference value due to exceptionally low inflation within the EU Member States), the Czech

[1] First assessment (2004) had been approved by the Government in 2005.

Republic is compliant with the price stability criterion. Inflation forecast for this year is at the edge of the criterion value (reference value of the inflation rate is close to the CNB's target). We also assume that the reference value would not deviate far from actual inflation rates of the best performing Member States.

The level of the long-term interest rates is measured as average yields for ten-year government bonds in the past year under the level of summation of the average in the three EU Member States with the lowest HICP and 2.0 percentage points.

Chart 2 - Long-Term Interest Rates for Convergence Purposes

	2013	2014	2015	2016	2017	2018	2019
Average for 3 EU countries with lowest inflation*	**4.4**	**1.8**	**1.8**	**1.9**	**4.1**	**2.3**	**1.8**
Reference value	6.4	3.8	3.8	3.9	6.1	4.3	3.8
Czech Republic	2.1	1.6	0.6	0.7	1.2	1.5	1.8

Note: 12-month average, in %.

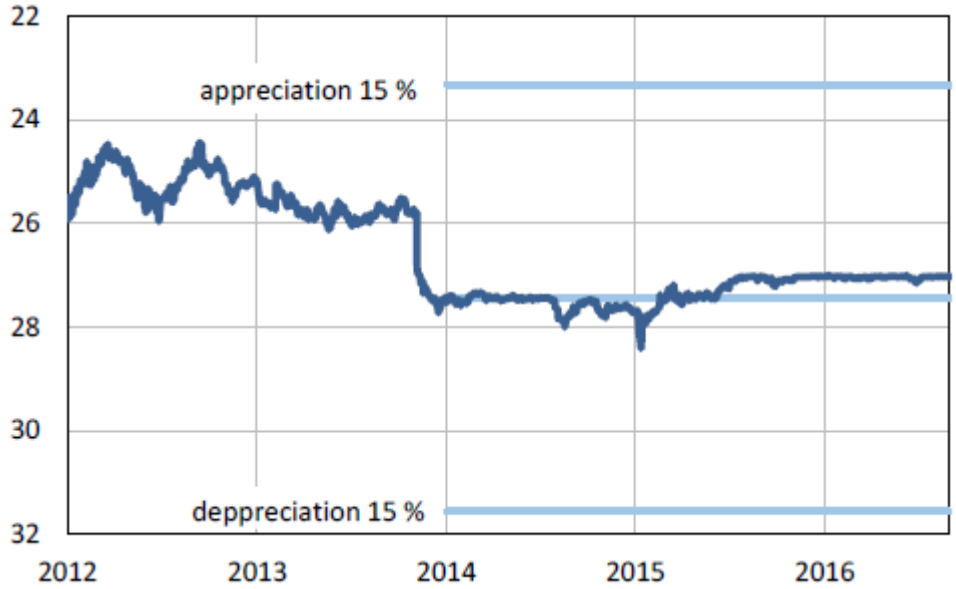
Source: Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area, 2016.

The Czech Republic has constantly fulfilled the interest rate criterion by a considerable margin in the period under review. The fiscal stability and credibility are reflected in the Czech Republic's constantly high sovereign rating and in smooth subscription of government bonds. It can be assumed that the Czech Republic should stay compliant with this criterion in the period ahead. The Czech Republic has been performing sound macroeconomic development and the long-term interest rate convergence is safely compliant.

THE EXCHANGE RATE STABILITY

The exchange rate stability criterion is defined by at least biennial participation in the European Exchange Rate Mechanism - ERM II - with possible fluctuation of the current countries exchange rate against the euro around the central parity that has been agreed, within the range of ± 15%. Nevertheless, the exchange rate criterion cannot be evaluated unless ERM II adopted. However, we might use a simulation elaborated by the Czech National Bank and Ministry of Finance in 2016.

Figure 1 - Nominal Exchange Rate of the Czech Koruna against the Euro



Note: The hypothetical central parity is simulated by the average exchange rate for first quarter 2014.

Source: Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area, 2016.

FISCAL SUSTAINABILITY

Sustainability of the public finance defined by the ratio of the annual government deficit relative to the GDP at the market prices that shall not exceed 3 % at the end of the preceding fiscal year. For all the EU Member States, failure of this criterion is accompanied by an excessive deficit procedure (EDP).

Chart 3 - General Government Balance

	2013	2014	2015	2016	2017	2018	2019
Reference value	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
Czech Republic	-1.2	-1.9	-0.6	-0.2	-0.2	0.1	0.5

Note: in % of GDP.

Source: Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area, 2016.

The ratio of gross government debt relative to GDP at the market prices shall not exceed 60 % at the end of the preceding fiscal year.

Chart 4 - General Government Debt

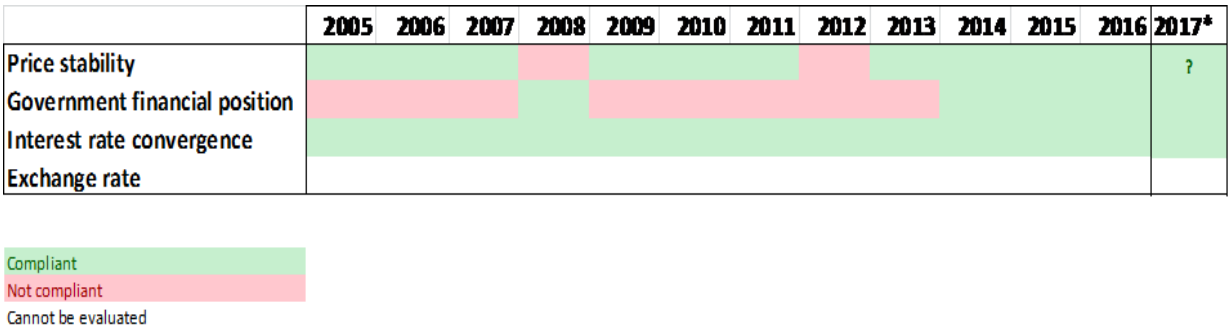
	2013	2014	2015	2016	2017	2018	2019
Reference value	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Czech Republic	44.9	42.2	40.3	38.6	38.5	38.0	37.1

Note: in % of GDP.

Source: Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area, 2016.

We can observe improvement in the government financial position starting 2014, and the sustainability of public finance in the Czech Republic is safely compliant nowadays.

Chart 5 - Assessment of the Fulfilment of the Maastricht Convergence Criteria, Czech Republic



Source: Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area, 2016.

It is important to highlight that it is not the Czech National Bank who can and will decide about the euro adoption. It is within the competence of the Czech government. It is important to mention that the euro adoption would lead in giving up independent monetary policy and flexible exchange rate as effective macroeconomic policy instruments. However, those instruments must be accompanied by flexible labour and product markets, stable financial system and sound fiscal policy while diverting economic downturns and turmoil efficiently.

ALIGNMENT WITH THE EURO AREA

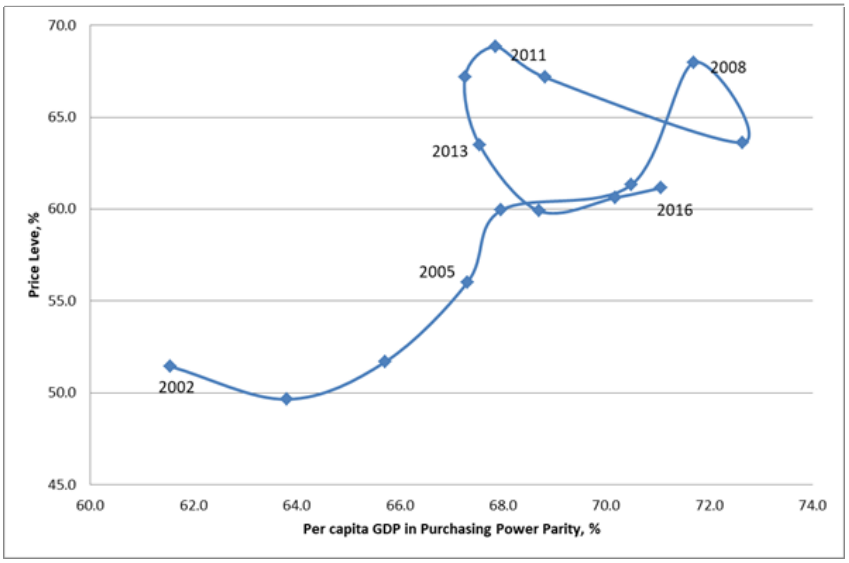
Is the Czech Republic able to adjust to possible asymmetric shocks without independent monetary policy and flexible exchange rate? To answer this question we shall evaluate the economic convergence processes and the defragment the structure of the Czech economy and its competitiveness as well as the economic cycle.

NOMINAL AND REAL CONVERGENCE

Figure below displays a convergence process within the period 2002 and 2016. After the increase of the GDP per capita in purchasing power parity relative to the EU5 until 2008, followed a period of decline in real convergence during the world financial crisis. The real convergence process has renewed starting in 2013 but the price converge has been falling

behind. We can state that the real and nominal convergence processes towards the EU are still unfinished.

Figure 2 - Convergence of the Czech Republic with Respect to EU15 (100)

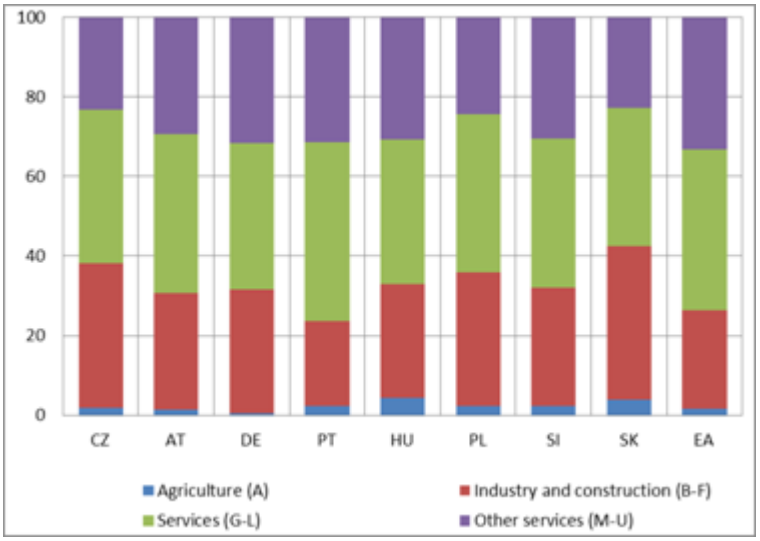


Source: Eurostat

STRUCTURAL ALIGNMENT

The structural similarities among the euro area Member States and the Czech Republic reduce risks of asymmetric effects of economic shocks. The higher share of industry in the Czech economy and the lower share of services comparing the selected EU Member States are both relatively stable in time.

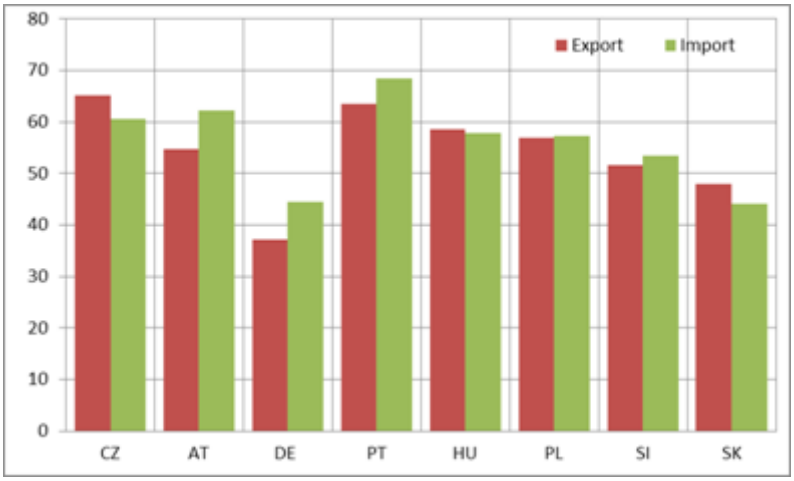
Figure 3 - Shares of economic sectors in 2016 (%)



Source: Ministry of Finance, Czech National Bank: Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area, 2016

The Czech economy displays a high degree of openness (above 80 % of exports to the GDP ratio). The strong foreign trade and ownership links with the euro area increase the benefits of eliminating potential exchange rate fluctuations. The foreign trade and ownership structure are the main arguments for the euro adoption. The strong trade links foster the alignment of the economic cycles between the Czech Republic and euro area.

Figure 4 - Shares of exports and imports to the euro area in 2016 (% of total)

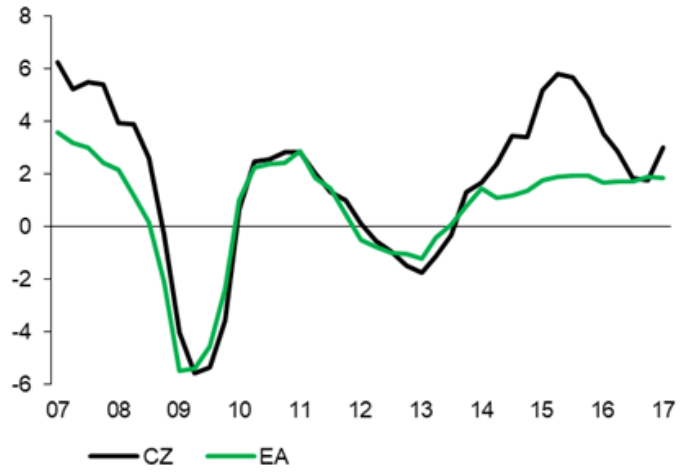


Source: Ministry of Finance, Czech National Bank: Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area, 2016

CYCLICAL ALIGNMENT

The cyclical alignment – an alignment of economic activity would be a premise for the ECB's single monetary policy well configured for the Czech economy. According to the optimum currency area theory, the loss of an independent monetary policy is less costly for a country with a more correlated business cycle. Analyses indicate a high degree of cyclical alignment; the Czech Republic shows a high level of correlation even when adjusted for crisis period.

Figure 6 - Real GDP growth in the Czech Republic and the euro area (% YoY)



Source: Eurostat, CNB and authors' calculations

Figure 6 - Growth rate of industrial production index in the Czech Republic and the euro area (% YoY)

Source: Eurostat, CNB and authors' calculations

ADJUSTMENT MECHANISMS

The Fiscal policy shall ideally be countercyclical. The lower structural deficits and the lower debt bring more space to cope with economic downturns and recessions. The Czech Republic has displayed improvement of the structural balance since 2014, moreover the structural surplus in 2016.

Government debt is low but facing a population ageing problem in the future (i.e. pension and health expenditures). There has been a sufficient fiscal space nowadays, but might be the fiscal policy able to fulfil its stabilizing role in the future?

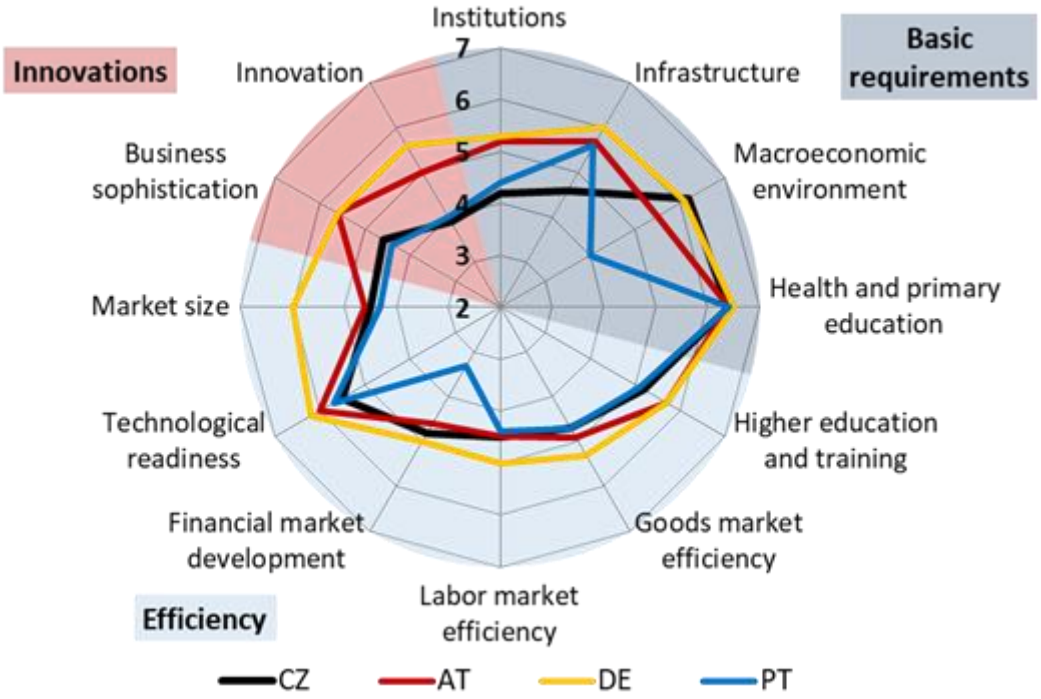
Chart 6 - General government balance (European Commission estimate) (% of GDP)

	Total balance						Structural balance					
	2007	2014	2015	2016	2017	2018	2007	2014	2015	2016	2017	2018
CZ	-0.7	-1.9	-0.6	0.6	0.3	0.1	-3.1	-1.0	-0.6	0.5	0.0	-0.2
AT	-1.4	-2.7	-1.1	-1.6	-1.3	-1.0	-2.7	-2.3	-0.6	-1.1	-1.1	-0.9
DE	0.2	0.3	0.7	0.8	0.5	0.3	-0.8	0.5	0.8	0.8	0.6	0.3
PT	-3.0	-7.2	-4.4	-2.0	-1.8	-1.9	-3.7	-5.6	-3.5	-1.7	-2.0	-2.4
HU	-5.1	-2.1	-1.6	-1.8	-2.3	-2.4	-6.5	-1.6	-1.6	-2.0	-3.0	-3.7
PL	-1.9	-3.5	-2.6	-2.4	-2.9	-2.9	-3.3	-2.9	-2.4	-2.3	-3.1	-3.1
SI	-0.1	-5.4	-2.9	-1.8	-1.4	-1.2	-3.3	-3.8	-2.1	-1.7	-2.0	-2.4
SK	-1.9	-2.7	-2.7	-1.7	-1.3	-0.6	-4.8	-1.8	-2.3	-1.5	-1.4	-0.9
EA	-0.6	-2.6	-2.1	-1.5	-1.4	-1.3	-2.2	-1.3	-1.2	-1.0	-1.1	-1.3

Source: European Commission

The Czech business environment is still more burdened by administrative and regulatory barriers than those in the other countries under comparison. There is still space to improve and catch up with advanced countries.

Figure 7 - Barriers to growth and competitiveness (GCI)



Source: Ministry of Finance, Czech National Bank: Assessment of the Fulfilment of the Maastricht Convergence Criteria and the Degree of Economic Alignment of the Czech Republic with the Euro Area, 2016

OBLIGATIONS RESULTING FROM THE EURO ADOPTION

Is the fulfilment of the Maastricht criteria sufficient to adopt the euro? Definitely not. In response to the debt crisis, surveillance and prudential mechanisms the euro area Member States

have deepened the integration processes which resulted into the creation of new institutions, frameworks and funds. Those imply new institutional participations and financial obligations while entering into to the euro area, including the payments.

What are the financial payments (costs) of the euro area accession? We can estimate direct costs including the capital repayments up to CZK 49.6 billion payable within four years in the European Stability Mechanism; the rest in the share in subscribed capital of the ECB (CZK 4.4 billion); transfer of CZK 25.6 billion to the Single Resolution Mechanism (banking union has to be joined not later than euro adoption); payments of annual fees (CZK 57.4 million) paid by Czech commercial banks to the ECB for the conduct of supervision within the Single Supervisory Mechanism. And there are possible additional payments related to the euro adoption estimated up to about CZK 80 billion.

The European Stability Mechanism is an intergovernmental organization to safeguard and provide instant access to financial assistance programs in financial difficulty for the euro area Member States with capacity of EUR 500 billion. Our membership is not linked to the adoption of the euro but might be required. The Czech Republic should seek to mitigate the impact of potential losses resulting from ESM loans granted before the accession whose provisions could have not affected (for example Greece program repaid in 2034—2058).

In 2016, the Czech Ministry of Finance and the Czech National Bank recommended that the Czech government shall not set a target date for euro area entry for the time being.

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THE PROBLEM OF FISCAL ILLUSION AND ITS CAUSES. THE CASE OF THE EU-28 COUTRIES

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Abstract

This article discusses the issue of fiscal illusion in the EU-28 countries on the basis of recent literature review. The special focus is concentrated on its causes and consequences. The research hypothesis states that fiscal illusion is mainly determined by institutional factors and leads to deterioration of public finance. In relation to the formulated hypothesis, the article aims to assess the size of fiscal illusion in the EU-28 countries in years 2004 and 2015. For this purpose, the index of fiscal illusion was used. The principal component analysis (PCA) allowed the indication of four factors which were included in the formula of index. These four factors embrace different measures and indicators that can be assigned to different dimensions of fiscal illusion. The highest value of the index in 2015 was achieved in Greece (0,991), Italy (0,973) and Hungary (0,955) whereas the lowest in Ireland (0,047). The results of the study revealed the importance of institutional determinants, which both influence the quality of public finance and the size of fiscal illusion.

Keywords: fiscal illusion, index of fiscal illusion, public finance, EU-28 countries

JEL Classification: H30, H60, H62, H63, H87.

Introduction

Fiscal illusion is often identified with the misperception of fiscal burden or the amount of tax paid. It happens when taxpayers regard their tax burden smaller or heavier than it actually is in fact. The phenomenon of fiscal illusion concerns almost all economies, including the EU-28 countries and is a research problem undertaken in theoretical and empirical studies. In the literature, at least five sources of fiscal illusion can be found, e.g.: the complexity of the tax structure; income elasticity of the tax structure; flypaper effect, renter illusion and debt illusion. The first hypothesis assumes that countries with relatively high complexity of tax systems are generally more vulnerable to fiscal illusion. The second hypothesis says that high income elasticities of tax revenue leads to high levels of government expenditure. The third hypothesis, known as flypaper effect, is related to taxpayers who underestimate the tax price of local spending. Similarly, the rent illusion appears at the local level when local taxes are levied on the owners of the property and not on their tenants who do not understand the link between the amount of local spending and the amount of rent they pay. Finally, the debt illusion is caused by politicians who conduct the irresponsible fiscal policy relying on increasing public spending, what contributes to the increase in public debt. It has to be underlined that, in the long perspective, every kind of fiscal illusion negatively affects budgetary outcomes and economic performance.

The purpose of this study is to both explore the size of fiscal illusion in the EU-28 countries and identify the main causes of this phenomenon in a selected time period. The empirical research covered the European Union countries in years 2002 and 2015 because in case of many European economies the deterioration of public finance quality is distinctively observed, which, as a result may have a negative impact on their long-term performance.

This study offers several contributions to current literature devoted to fiscal illusion, particularly through deepening the knowledge on factors which intensify this phenomenon. The intension is to disclose the institutional variables that are likely to influence the level of fiscal illusion. In opinion of authors future research should further examine the extent to which institutional factors, mainly fiscal policy, contribute to fiscal illusion.

The discussion is organized as follows. Section 1 characterizes the fiscal illusion problem and its sources in the light of theoretical and empirical studies. Section 2 describes the methodology for the measurement of fiscal illusion while Section 3 presents the results of empirical study regarding fiscal illusion in the EU-28 countries**.**

1. A THEORETICAL APPROACH TO FISCAL ILLUSION

Fiscal illusion means the systematic underestimation of the costs of government decisions, when full compensation does not have to be paid. According to researchers of this phenomenon, voters underestimate fiscal costs, because of the existence of information asymmetry. For example, the costs of public services are underestimated, which means that if voters had full information, their support for public services would fall. It is worth noticing that, as Downs (1957) suggested, the incentives to gather information on the benefits and costs of government programs are much smaller than for private activities. The voter (having one vote) has little reason to invest substantial resources in learning about the relative costs and benefits of the various alternatives in the public sector (Oates 1988, p. 66).

In the literature there is a negative and positive definition of this phenomenon. *The notion of fiscal illusion is associated with the misperception of the fiscal burden or the amount of tax paid.* (…) *Taxpayers regard their tax burden as smaller than it actually is* (positive version – more often). In negative version *taxpayers perceive their tax burden in fact to be heavier* (Määttä, 2006, p. 6).

The pioneering research on fiscal illusion was conducted by A. Puviani at the turn of the XIX and XX century (1897/1903), while the development of such research is owed to such economists as J. Buchanan and R. Wagner (60. and 70. of XX century).[1] Puviani defines the fiscal illusion as a case of political illusion. It means that politicians distort reality using lies, manipulating statistics, etc (Mourão, 2010, p. 234). Buchanan, analyzing modern tax systems, noted that less painful for a taxpayer is to reduce part of his income for tax purposes when the employer plays the role of a tax collector. Therefore, the employee does not directly receive the total amount of wages/salary which is taxable. In case of social taxes (social security contributions) – the taxpayer is more likely to accept regular tax increases when it assumes that the money collected in this way will be spent on his future retirement. If the taxpayer knew that the tax increases stemmed from the need to pay current pensions – his resistance would have been greater (Buchanan, 1967).

Wagner's paper titled: "Revenue structure, fiscal illusion and budgetary choice" (1976) is undoubtedly a very important analysis of fiscal illusion from conceptual and empirical point of view. The author claimed that the institutional manner in which citizens are required to pay for government can affect taxpayer's perception of the price of government, and, hence, the size of the public sector. (Wagner, 1976, p. 46-47).

[1] Roberto Dell'Anno and Brian E. Dollery (2014) noticed that *Treatise on the practical influence of taxation and the funding system* written by McCulloch (1845) is the intellectual source of the traditional approach to the fiscal illusion phenomenon.

Currently, in many theoretical and empirical studies, five sources (forms) of fiscal illusion can be identified which are sometimes regarded as hypotheses of fiscal illusion. (Oates, 1988).

Taking it into consideration, we have the following sources of fiscal illusion:

- complexity of the tax system (revenue complexity hypothesis) where the misperception of tax system complexity stems from fragmentation of the revenue system. In this approach it is assumed that, the more complicated the tax structure, the more difficult it is to assess the real tax burden (Mueller 2003, p. 527)
- income elasticity of the tax structure (revenue-elasticity hypothesis) where growth in revenue is associated with income elastic forms of taxation,
- the flypaper effect – where lump-sum intergovernmental grants have a stimulatory effect on public expenditure,
- renter illusion with respect to the property taxation which depends on the extent of property ownership in a given jurisdiction,
- debt illusion where public awareness of the extent public expenditure depends more on current taxation than debt financing,

The revenue-complexity hypothesis is studied the most often (e.g. Dollery and Worthington, 1996; Dell'Anno and Dollery, 2014), and was especially developed in the public choice tradition of public economics (Rakov 2016). According to the revenue-complexity hypothesis, initially defined by Puviani (1903) and Buchanan (1967), the more complicated the tax (revenue) system, the more difficult it is for the taxpayer to estimate the tax-price of public outputs – and the more likely it is that the taxpayer will underestimate the tax burden associated with public programs. It means that the more complex the revenue system, the larger will be the public budget (Oates 1988, p. 69). The next author, Wagner (1976) undertook the first test of the revenue-complexity hypothesis. The author implemented the Herfindahl index, that is commonly used in the industrial-organization literature to measure the degree of concentration within an industry.

Secondly, the revenue-elasticity hypothesis, tested for the first time by Oates (1975), assumes that high income-elasticities of tax revenue are likely to increase fiscal illusion. Buchanan (1967) argues that: "*In a period of rapidly increasing national product, that tax institution characterized by the highest (income) elasticity will tend, other things equal, to generate the largest volume of public spending".* In the light of this approach, a relatively high income elasticity of revenue system leads to larger increments in general income, and this increase will be "automatically" funneled into increased expenditure (Dollery and Worthington, 1996). The other authors who tested this hypothesis, Craig and Heins (1980, p. 267) also reported a positive relationship between high income elasticities of tax revenue and high levels of government expenditure. They supported*"... the idea that elasticity drives spending*". Research conducted by Greene and Hawley (1991), Heyndels and Smolders (1994), Ellen Schwartz (2004), Oates (2011), Döring (2015) gave similar results. However, there are some studies which did not prove these results, e.g.: Di Lorenzo (1982) and Feenburg and Rosen (1987) did not find a significant relationship between higher income elasticities of tax revenue and higher levels of public sector spending.

Thirdly, "the flypaper effects" hypothesis was identified by Gramlich and Galper (1973) but many other studies have also reported its existence, e.g. Hines and Thaler (1995) or Bailey and Connolly (1998). This source of fiscal illusion appears at the local level when taxpayers do not directly see, hence misperceive, the flows of grants from higher levels of government to their local governments, which, in turn, leads them to systematically underestimate the tax price of local spending. This misperception causes two widely recognized effects. The first, the overspending effect, suggests that public spending is greater under fiscal illusion than under

perfect information. The second, the flypaper effect, is the prediction that increases in intergovernmental aid receipts tend to stimulate more local public spending than do comparable increases in voter - taxpayer income (Turnbull, 1998). The issue of the flypaper effect have been empirically tested by many researchers. Many of them have incorporated grant distortions into studies directed at other forms of fiscal illusion, such as the revenue-complexity hypothesis or the elasticity hypothesis. These include Oates (1975),Wagner (1976), Munley and Greene (1978), Craig and Heines (1980), DiLorenzo (1982), Dollery and Worthington (1995), Dollery, Wallis (2001), Leyden (2006), Boadway, Anwar and Shah (2007), Cullis and Jones (2009), Kalb (2010), Lee, Johnson and Joyce (2013), Nicholson-Crotty (2015).The results of their research proved that intergovernmental grants are the important determinant of the level of public expenditure.

The next hypothesis – renter illusion – occurs when local taxes are levied on the owners of the property and not on their tenants. In this case illusion refers to tenants who do not understand the link between the level of local spending and the level of rent they pay. Renters believe that the costs of government expenditure are low (even if taxes are shifted forward in rent charges). It seems that so long as the actual tax-price is underestimated, rental voters will support higher levels of public expenditure and would therefore bias expenditures upwards. The results of empirical studies devoted to this hypothesis are mixed. Several studies supported the hypothesis of rent illusion (Heyndels and Smolders, 1994; Worthington, 1994). However, most studies have also given either implicit or explicit consideration of alternative hypothesis of "renter rationality" (Barr and Davis, 1966; Hanushek, 1975; Beck, 1984) or criticised the main assumption of rent illusion hypothesis (Martinez-Vazquez, 1983; 1988; Dollery and Wallis, 2001; Dell'Anno, Martinez-Vazques, 2013; Berger, 2016).

The last potential source of fiscal illusion is known as debt illusion hypothesis. Vickrey (1961) refers to *"a public debt illusion" ... (when) individuals pay no attention to their share in the liability represented by the public debt* ... (Abbott and Jones, 2016). The argument here is that individuals are more likely to perceive the costs of public goods provision if they pay for them through current taxation than if tax liabilities are deferred through public-sector borrowing. Voters usually ignore future tax liabilities and are more tend to accept government borrowing that appears to reduce the costs of taxation. It has to be simultaneously underlined that the debt illusion hypothesis is contrary to the Ricardian Equivalence Theorem, which holds that individual consumers recognize the government's intertemporal budget constraint and are thus aware that any change in current taxes must be offset by a change in future taxes. The phenomenon of fiscal illusion in the context of public debt became a subject of many empirical studies: Oates (1969), Epple and Schipper (1981) or Dalamagas (1992, 1993), Haug (2009), Buehn, Dell'Anno, Schneider (2015), Gérard & Ngangnué (2015).

2. THE METHODOLOGY OF RESEARCH ON FISCAL ILLUSION

Many scientists and public finance practitioners undertake issues related to public finance management in the context of institutional analysis. Many of these studies are devoted to fiscal illusion. On the basis of the literature review it can be said that fiscal illusion as a multidimensional phenomenon causes a number of methodological implications. Irrespective of the complexity of this phenomenon, the construction of the fiscal illusion index, which includes identified theoretical as well as empirical dimensions, seems to be an extremely interesting research initiative. Especially valuable from the point of view of the necessity to measure the fiscal illusion for the purpose of international comparisons are, in particular, empirical studies by Alesina and Perotti (1996), Kaufmann, Kraay and Zoido-Lobatón (1999), Nard (2005), Mourão (2005), Hameed (2005), Alt and Lassen (2006), Bernoth and Wolff

(2006), Dell'Anno and Dollery (2012), etc. In general, following the approach von Hagen (1992), a growing body of empirical and theoretical studies has mainly dealt with issues related to the quality of institutions (Gleich, 2003; Hallenberg at all, 2007; Deroose, Moulin and Wierts, 2005; Debrun et al, 2008; Afonso and Hauptmeier, 2009; Schaechter et al. 2012; Giosi et al., 2014). The majority of authors who concentrate on the quality of institutions in public finance sphere simultaneously conclude that formal institutional setup supports fiscal discipline and is particularly desired in the situation of the recent public finance crisis. Taking into consideration that fiscal illusion is the main subject of interest in this article, the methodology proposed by Mourão (2008) was used. The author has built the Index of Fiscal Illusion in 68 countries since 1960. The results of Fiscal Illusion Index can provide benchmarks for evaluating the comparative performance of different democratic countries, discerning long-term trends, and uncovering good governance practices in minimizing fiscal illusion.

The analysis for EU-28 countries was conducted on the basis of data coming from two periods: the years 2004 and 2015. In the study "*Taxation trends in European Union. Data for the EU Member States, Island and Norway*", Eurostat Statistics and International Country Risk Guide databases were used. If data scarcity of some variables appeared, the authors according with the suggestions of Nardo et al. (2005), substituted missing values with national average values of the variables. On the basis of the literature review different dimensions of fiscal illusion, along with their indicators (observed variables) were indicated. The occurrence of different dimensions of fiscal illusion and indicators which characterized this phenomenon required to implement one of the normalization methods – percentile rank. It was also assumed that if the expected effect of the variable on fiscal illusion was negative, then the rank was reordered, considering the difference between 1 and the percentile rank.

To measure the phenomenon of fiscal illusion, the Multiway Principal Components Analysis (MPCA) was conducted using program IBM SPSS Statistics 23. The implementation of PCA allows both to indicate the number of principal components which explain the variation of the observed variables and obtain the matrix with the rotated factor loadings for fiscal illusion variables. It must also be stressed that PCA as a nonparametric method widely used in a wide spectrum of sciences, does not require the additional assumption regarding the normal distribution of variables. Its purpose is simply to replace the input set of correlated variables by a small number of unrelated main components that explain almost the whole variability of data. Main components are the vectors of the correlation matrix. For this study, where more than two dimensions of X variables observed in N countries in two different T periods are encountered, there is a triple data matrix M (X * T * N).

A principal component is defined as a linear combination of optimally weighted observed variables. It is assumed that there are Q variables in a dataset which variance can be explained by a smaller number of variables – principal components Z_1 $Z_{2...}Z_Q$

$$Z_1 = a_{11}x_1 + a_{12}x_{12} + \cdots + a_{1Q}x_Q$$

$$Z_2 = a_{21}x_1 + a_{22}x_{22} + \cdots + a_{2Q}x_Q$$

……..……

$$Z_Q = a_{Q1}x_1 + a_{Q2}x_2 + \cdots + a_{QQ}x_Q$$

The lack of correlation among principal components means that they measure different "statistical dimension" in the data. The weights a_{ij} (factor loadings) applied to the variables x_j

in the system of equations, and the principal components Z_{ij} should satisfy the following conditions:

– they are uncorrelated (orthogonal),
– the first principal component accounts for the maximum possible proportion of the variance of the set of x's, the second principal component shows the maximum of the remaining variance and so on until the last of the principal component which absorbs all the remaining variance no accounted for by the preceding components.

PCA involves finding the eigenvalues λ_j, j=1,…, Q of the sample covariance matrix,

$$CM = \begin{bmatrix} cm_{11} & cm_{12} \dots cm_{1Q} \\ cm_{21} & cm_{22} \quad cm_{2Q} \\ \dots & \\ cm_{Q1} & cm_{Q2} \quad cm_{QQ} \end{bmatrix}$$

where the diagonal element cm_{ii} is the variance of x_i and cm_{ij} is the covariance of variables x_i and x_j. The eigenvalues of the above matrix are the variances of the principal components and can be found by solving the equation CM $-\lambda I = 0$, while I is the identity matrix with the same order as CM, and λ is the vector of eigenvalues.

Before starting the PCA procedures, both through the Alfa Cronbach and the KMO statistics the reliability and accuracy of the proposed set of indicators was checked. The achieved results are satisfactory and statistically significant. Alpha Cronbach obtained 0.742 (above the recommended value of 0.7), while the measure of KMO adequacy was 0.609 (exceeded the acceptable value of 0.5). Bartlett's spatial index (α <0.05) also confirmed the significance of Pearson's correlation coefficients between the analyzed pairs of variables. These results allow to apply the principal components analysis.

Next in the construction of Fiscal Illusion Index, the methodology introduced by Nicoletti et al. (2000) and implemented by Mourão (2008) was adopted. According to the selected approach the sub-indicators with highest factor loadings were grouped in intermediate composite indicators, which number is equal to the number of factors. It was assumed that each intermediate composite indicators with a significant factor loading above 0,7 has a weight equal to the square of the factor loading divided by the explained variation by the factor. Additionally, to calculate Fiscal illusion Index, each intermediate composite indicator has a weight equal to its proportion of the variance explained by all the factors. The aggregation of them gives the overall Index of Fiscal Illusion. The final value for each country-year observation was rescaled, using the percentile rank but considering now all weighted values (Mourão, 2007, p.15).

3. THE EMPIRICAL ANALYSIS OF THE PHENOMENON OF FISCAL ILLUSION IN EU-28 COUNTRIES

Under the process of PCA four components (according to the Kaiser's criterion factors with eigenvalues above 1) from twelve variables describing fiscal illusion were retained. These factors account for 79,3% of the total variation. The first component accounted for 39.45% of the total variation, the second – 15,88 %, the third – 12.3% and the fourth – 11.67%.

Table 1 – Components loadings for fiscal illusion variables

Component	Initial eigenvalues			Extraction sums of Squared Loadings			Rotation sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	4,734	39,454	39,454	4,734	39,454	39,454	3,508	29,229	29,229
2	1,906	15,882	55,336	1,906	15,882	55,336	2,416	20,132	49,361
3	1,476	12,303	67,639	1,476	12,303	67,639	2,062	17,180	66,541
4	1,401	11,677	79,316	1,401	11,677	79,316	1,533	12,775	79,316

Source: own calculations: Extraction Method – Principal Component Analysis done in SPSS.

The varimax rotation with Kaiser normalization was implemented in order to simplify the interpretation of the factors. It is worth mentioning that varimax is an orthogonal rotation method that minimizes the number of variables that have high loadings on each factor.

Table 2 – Rotated component matrix for fiscal illusion variables

	Components			
	1	2	3	4
TotalTaxR	**0,841**	0,393	-0,228	-0,049
Ctax	0,194	0,072	0,337	**0,825**
Ltax	**0,891**	0,086	-0,108	-0,260
CapitalTax	0,093	**0,507**	-0,627	-0,182
SSCt	0,461	0,105	0,323	-0,720
Loc/Ctax	**0,682**	-0,091	-0,032	0,318
TGovExpe	**0,791**	0,547	-0,056	0,065
GPService	0,287	**0,854**	0,044	0,279
Spexpen	**0,680**	0,257	-0,485	-0,074
RQ	-0,012	0,120	**0,772**	0,060
Debt	0,086	**0,929**	0,019	-0,188
RoL	-0,322	-0,003	**0,740**	-0,057

Source: own calculations: Extraction Method – Principal Component Analysis done in SPSS.

The presented in Table 2 results allow to characterize the phenomenon of fiscal illusion through the prism of four extracted principal components. The first principal component is built by the following variables: total tax revenues (TotalTaxR – 0,841), labour taxation (Ltax – 0,891), ratio of local taxes to state taxes (Loc/Ctax – 0,682), total public expenditures (TGovExpe – 0,791) and public social expenditures (Spexpen – 0,680). It means that the size of fiscal illusion can be explained by both the exceeding public tax revenues and public spending, including public social expenditures, the increasing labour tax burdens and the degree of decentralization of public finance. The second factor has high positive coefficients (loadings above 0,7) with

variables such as: GPService (0,854) and Debt (0,929). It proves that fiscal illusion is not only characterized by the exceeding general public services but also the level of debt in a given country. The third factor is mainly determined by institutional variables, such as the regulatory quality (RQ – 0,772) and rules of law (RoL – 0,740), whereas the fourth factor builds one of the idirect taxes – consumption tax (Ctax – 0,825).

The next step was to calculate the intermediate indicators for factors from F1 to F4 according to the chosen procedure (using data from table 1 and Table 2). Each intermediate indicator is a weighted average of the normalized variables with a significant factor loading (greater than 0,7). For example, the first intermediate indicator is calculated as follows:

$$\mathrm{F1_{it}} = \frac{0{,}841^2}{0{,}395} TotalTaxR_{\mathrm{it}} + \frac{0{,}891^2}{0{,}395}\mathrm{LTax_{it}} + \frac{0{,}791^2}{0{,}395}\mathrm{TGovExpex_{it}},$$

and so on until F4.

To measure the Fiscal Illusion Index, the Fiscal Illusion Indicators were weighted in accordance with the formula:

$$\mathrm{FII_{it}} = \frac{0{,}395}{0{,}793}\mathrm{F1_{it}} + \cdots + \frac{0{,}117}{0{,}793}\mathrm{F4_{it}}$$

The Fiscal Illusion Index, as a percentile ranking, shows how a country-year observation performs compared to the other country-year observations at its position. Following the assumptions, higher values of the index indicate higher level of fiscal illusion. The results of the calculation are presented in Table 3.

Table 3 – Fiscal Illusion Index for EU-28 countries

Countries:	**Fiscal Illusion Index FII**		
	year 2004	**year 2015**	**2015/2004**
Belgium	0,813	0,848	+0,35
Bulgaria	0,277	0,295	+0,02
Czech Republic	0,116	0,455	+0,34
Denmark	0,777	0,759	+0,02
Germany	0,527	0,598	+0,08
Estonia	0,223	0,402	+0,18
Ireland	0,02	0,047	+0,02
Greece	0,652	0,991	+0,34
Spain	0,152	0,563	+0,42
France	0,670	0,777	+0,11
Croatia	0,637	0,902	+0,27
Italy	0,705	0,973	+0,27
Cyprus	0,348	0,620	+0,28
Latvia	0,027	0,170	+0,15
Lithuania	0,098	0,205	+0,11
Luxemburg	0,134	0,188	+0,06
Hungary	0,760	0,955	+0,20
Malta	0,438	0,509	+0,08
Netherlands	0,313	0,473	+0,16
Austria	0,705	0,830	+0,13

Poland	0,420	0,375	-0,05
Portugal	0,375	0,795	+0,42
Romania	0,063	0,259	+0,20
Slovenia	0,545	0,920	+0,38
Slovakia	0,241	0,491	+0,25
Finland	0,580	0,866	+0,29
Sweden	0,741	0,688	-0,06
United Kingdom	0,08	0,33	+0,25

Source: own calculations

On the basis of the calculated data the increase in the value of fiscal illusion index in case of the majority of the EU-28 countries, excluding Sweden (- 0,06) and Poland (- 0,05), was observed. The biggest changes in the value of the index in year 2015 compared to year 2004 were noticed in countries such as: Spain (+ 0,42), Portugal (+ 0,42), Slovenia (+ 0,38), Belgium (+ 0,35) and Greece (+ 0,34), while the smallest changes occurred in Denmark (+ 0,02), Bulgaria (+ 0,02), Germany (+ 0,08), Poland (-0,05), Sweden (-0,06) or Luxemburg (+ 0,06).

Table 4 contains additional information on the size of fiscal illusion in the EU-28 countries. They were classified into four groups, taking into account the obtained values of the index in two analyzed years. It is clearly evident that in year 2004 the lowest values of IIF were observed in old union countries 15-UE, i.e. in Ireland, Luxemburg, United Kingdom and Spain, and also in countries of Central and Eastern Europe (CEE). It particularly concerns the Baltic States – Lithuania, Latvia, Estonia and Balkan States – Romania. In turn, countries such as: Belgium, Denmark and Hungary were characterized by the highest values of IIF. In general, in year 2015 the evident growth of fiscal illusion in the majority of the EU-28 countries occurred. As a result, the group of countries with the lowest size of fiscal illusion was represented by only four countries: Ireland, Luxemburg, Latvia and Lithuania.

Table 4 – The size of fiscal illusion in UE-28

Year	**2004**				**2015**			
IIF	**0-0,25**	**0,25-050**	**0,50-0,75**	**0,75-1,00**	**0-0,25**	**0,25-0,5**	**0,5-0,75**	**0,75-1,00**
Country	Czech Rep.	Bulgaria	Germany	Belgium	Ireland	Bulgaria	Germany	Belgium
	Estonia	Cyprus	Greece	Denmark	Latvia	Czech.Rep.	Spain	Denmark
	Ireland	Malta	France	Hungary	Lithuenia	Estonia	Cyprus	Greece
	Spain	Netherlands	Croatia		Luxemburg	Netherlands	Malta	France
	Latvia	Poland	Italy			Poland	Sweden	Croatia
	Lithuania	Portugal	Austria			Romania		Italy
	Luxemburg		Slovenia			Slovakia		Austria
	Romania		Finland			United Kingdom		Portugal
	Slovakia		Sweden					Slovenia
	United Kingdom							Hungary
								Finland

Source: own calculations

At the same time, in year 2015 the increase in the number of countries belonging to fourth group characterized by the highest values of IIF, which included both the 15-EU countries, i.e. Belgium, Denmark, France, Greece, Italy, Austria, Portugal, Finland and the new EU-28, such as Hungary or Slovenia occurred.

Conclusions

Fiscal illusion due to its multidimensional nature seems to be an interesting subject of numerous theoretical and empirical studies. The results of component analysis confirmed that main sources of fiscal illusion in the EU-28 countries are in accordance with the hypotheses which have been described in the literature of public finance. The misperception of individuals refers to the real amounts of government revenue and expenditure, and these is caused by the lack of transparency in fiscal policy discussed in the first hypothesis on the complexity of tax system. Moreover, it turns out that fiscal illusion increases along with the decentralization of public finance and this kind of illusion in known as flypaper effect. Finally, fiscal illusion can be characterized by increased debt that in the light of debt illusion hypothesis taxpayers are not fully conscious.

On the basis of methodology of measurement proposed by Mourão (2007), the authors counted the index of fiscal illusion (FII) in order to estimate the size of fiscal illusion in the EU-28 countries in years 2004 and 2015. After the identification of the theoretical framework, twelve variables have been chosen. Thanks to the implemented Multiway Principal Component Analysis the number of variables describing the phenomenon of fiscal illusion was reduced to four factors which explained 79,3% of the total variation. It has to be emphasized that high positive loadings (above 0,7) also appeared in case of the variables identified with formal institutions (regulatory quality and rules of law). The results of the empirical analysis proved the importance of institutions (both formal and informal) and their impact on the size of fiscal illusion.

The analysis of fiscal illusion indicators in years 2004 and 2015 confirmed that the problem of fiscal illusion has intensified. As a result, the number of countries belonging to the group characterized by the highest values of IIF significantly increased. It was noticed that the highest value of the index occurred in Greece, Hungary and Italy where debt illusion appeared as a consequence of poor public finance discipline. The countries associated with less complicated tax system such as Ireland or United Kingdom were in turn characterized by the lowest index of fiscal illusion. Similarly, in countries that made their tax system less complicated through introducing straight line income tax e.g. Lithuania, Latvia, Estonia and Romania, the size of fiscal illusion is considerably lower. On the contrary, fiscal illusion is relatively high in case of economies with the progressive income taxes. This concerns in particular Belgium or Denmark, including the Nordic countries – so called the welfare states – in which the growth of indirect taxes has simultaneously been observed. The case of the Czech Republic and Poland, additionally proved that the aspiring euro countries, which joined the EU in year 2004, have lower public debt, as they were more focus on fiscal disciple.

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