INFLUENCE OF COUNTRY RATING ON NATIONAL ECONOMIC GROWTH, BEFORE AND AFTER EURO

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Abstract

The Economic and Monetary Union was formed in 1992 and the first 11 states that adopted euro on January 1, 1999 were rated with high quality ratings at that time. In the years that followed other countries have entered the euro area and their ratings were only grade "A" ratings at the time of the euro adoption. But things changed over the years. The financial crises had a very different impact over economic situation for countries of the European Union, inside and outside the euro area. This paper aims to analyze the impact of the country rating on the national economic situation before and after joining the euro area.

This article is motivated by the issues intensely debated lately. One of them is whether the rating agencies have anticipated certain events or they just acted accordingly; the evolution of ratings issued over a relevant period of time (1996-2018) is being analyzed here. Another issue is whether the change in ratings is likely to damage the economic recovery process; it is being analyzed here the impact of the rating change on the gross domestic product of the states for the time period 1996-2016. The results obtained are in a position to confirm some theories in the present literature, but also to lead to other ideas worth to be analyzed in future papers.

Keywords: rating, rating agencies, euro/non-euro area, financial crisis, gross domestic product

JEL Classification: E02, G01, G20.

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*The opinions expressed in this article belong entirely to the author and do not reflect the official position of the National Bank of Romania.

Introduction

The main idea of the Monetary Union was the integration of all EU economies in order to make a strong and competitive European Union.

The first 11 states that adopted euro on January 1, 1999 were: Austria, Ireland, Belgium, Finland, France, Germany, Italy, Luxembourg, Netherlands, Spain and Portugal. All these countries were rated with high quality ratings at that time. Two members of the European Union: Denmark and the United Kingdom (also having high quality ratings) have negotiated special right to renounce the adoption of euro when they signed the European Union Treaty, and the reports to the Council regarding them are prepared only at request. Greece was the next member state of the European Union that joined the euro-zone on January 1, 2001. It has been followed by Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009, Estonia in 2011, Latvia in 2014, and Lithuania on January 1, 2015. The latter became the 19th member stat that adopted the euro so far. Those countries that joined the euro area after 1999 had only grade "A" ratings at the time of the euro adoption.

Since when the euro has been introduced it persist a general opinion that having one currency for several countries has a large number of advantages. The cost of financial transactions is lower because currency risk is eliminated. The power of the euro on the international market is significant, euro stands alongside the US dollar for transactions at the global level and foreign investments are being attracted. Because the states have to meet the convergence criteria, the inflation rates are maintained bellow 2% and that can provide price stability. The economic growth is accelerated in a sustainable way by adopting strong measures which makes EU countries more efficient and more competitive on the international markets, making the EU economy overall stronger. Prices can be compared more easily and that can be used to increase transparency. The advantages are felt also by the European individuals searching for jobs or traveling within the economic and monetary union; they can benefit from trading in one single currency.

Countries that have joined the European Union have the right and the obligation to join the euro area when all the conditions imposed by the Maastricht Treaty are met. There is no specific timeframe for this to happen, states being allowed to develop their own strategies to accomplish this.

Monetary integration is an irregular process and the enlargement of the euro-zone is an ongoing action within the European Union. It has to be taken into consideration that, in order for a country to join the euro-zone, the convergence criteria must be reached, but also sustained in time (at least 2 years without significant deviations). The state must have the capacity to maintain an economic reality reflected in indicators within the levels recommended by the European Commission. This alignment with euro area standards can characterize a highly efficient and especially sustainable economy, which will certainly result in high ratings.

In order to obtain a fair economic position of the member states that have not yet joined the euro area, the statistic data provided has to be precise and complete. It is important to mention that "the examination of the economic convergence process is highly dependent on the quality and integrity of the underlying statistics (…) EU Member States have been invited to consider the quality and integrity of their statistics as a matter of high priority"[1].

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[1] Central European Bank, Convergence Report, June 2016.

The social impact is also important for the European Commission which often measures public perception of the euro. A report regarding this issue (Flash Eurobarometer 446 - The euro area) was published in December 2016 on the European Commission site. The study was made in all 19 member states by the TNS Political & Social network. They came to the conclusion that overall "the majority of the respondents think having the euro is a good thing for their country", that "the longer respondents remained in education, the more likely they are to say it is a good thing". But regarding the first impact short after adopting the euro, measured in Latvia and Lithuania (most recent countries entered in the euro-zone), the survey showed an increased number of people that think the prices rose during the changeover period. Therefore, it is important for governments to be prepared to manage a variety of comments from the social environment and to be strong enough to absorb any negative effects that may arise.

The financial indicators mentioned in convergence criteria are important in determination of the sovereign ratings. When an agency is making an analysis in order to form an opinion takes into consideration the economic and financial situation, but also the political and social elements of the national governments. Examples of important variables in assigning a sovereign rating are: GDP growth, inflation, external balance, fiscal aspects.

The most important rating agencies, also called "Big Three": Standard & Poor's, Moody's Investor Services and Fitch Ratings are among the oldest agencies, holding the most experience in issuing ratings. (Lăzărescu, 2003: pp. 14-15) recalls that in 1900 Jhon Moody founded Moody's Investors Services, which in 1909 issued financial ratings for the first time in Moody's Analysis of Railroad Investments. In 1860 Poor's Publishing Company was set up and began to provide ratings in 1916; In 1906 the Standard Statistical Bureau was founded, which began issuing ratings in 1922, and in 1941 the two merged and the Standard & Poor's Corporation was created. Fitch Publishing Company began issuing ratings in 1924. At present (Miricescu, 2011: pp. 28 and 2015: p. 2) reminds that over 2007-2008, seven new rating agencies were recognized in the US, and in Europe the European Securities and Markets Authority (ESMA) has authorized 39 rating agencies whose residence countries are mostly European.

The role of the rating agencies is to evaluate in an objective and independent way creditworthiness of the issuers (countries, companies, etc.). (Lăzărescu, 2003: p. 30) concludes that financial classification societies facilitate the access of creditors, i.e. those with risk exposures, to the knowledge base of collectivities regarding business partners, information being an essential element in a credit relationship, and rating agencies radically improved the circulation of information. The credit rating agencies use their own rating methodologies in forming and publishing their opinions at the request of governments, corporations or any other issuer, but also without request (unsolicited request). Taking into consideration that the credibility is the main asset of each rating agency (Raimbourg, 1990) the analysis is probably made very professionally and with the assumption of the impact on the financial market.

In order to correctly reflect new situations the agencies can change or upgrade/downgrade their previous rating to reflect a higher or lower level of creditworthiness. For example, the financial crisis had negative effects over the economic situation of most countries, inside and outside the euro area, and the data analysis presented in this paper reflects the fluctuations of ratings after the year 2009.

The analysis in this paper is based on the opinions of Standard & Poor's, Moody's Investor Services and Fitch Ratings. The ratings evolution includes the ratings of all three agencies and is related to the 1996-2018 time period for the EU countries divided into two categories: euro area countries and non-euro area countries. For the GDP~Rating regression the ratings issued by S&P are used and the level of GDP in those countries is collected from the Eurostat databases.

1. Literature review

In February 1992 the Maastricht Treaty was signed and it contained the convergence criteria that the countries are required to meet in order to adopt the euro currency. Regarding nominal convergence, clear variables are examined such as budget deficit, government debt, inflation, long-term interest rates and exchange rate stability. Other factors such as market integration, unit labor costs and other indicators are also important, nominal convergence being mandatory but not sufficient. Real convergence plays an important role in the country's state of development and targets its ability to align with the standards of the euro area countries. Real convergence also includes social issues.

The effects of the financial crisis on the evolution of indicators that measure the convergence criteria for the Member States were significant, but the degree of fulfillment of these criteria, either consistently or with oscillations, is not detailed in this paper. The analysis proposed in this article is an approach from the ratings point of view of countries before and after joining the euro area and their impact on GDP. In the unstable period of crisis, rating agencies have downgraded most countries, and the most affected state was Greece.

Rating agencies have been strongly criticized for not anticipating the financial crisis after 2007 (Bogdan, C., 2017), and have only highlighted the negative effects by lowering ratings, and in some cases these decreases have made it even much worse to redress the already difficult situation in that state. The theme of crisis forecasting by rating agencies was also studied by (Sy, A., 2004) who concluded in his paper that sovereign credit ratings fail to anticipate financial crises and they are only consequences of it.

(Host et al., 2012) studied the impact of the ratings on the spreading of the financial crisis in the euro area and confirmed by their research that the main task of rating agencies to predict the ability of borrowers to repay their public and private debt in a timely manner has not been met and even casts doubt on the functionality of the existence of these scoring entities. In their view, the agencies act late, ignoring many macroeconomic signals, and the moment they decide to act is more guided by panic, not by an element of calming the financial market.

(Iyengar, S., 2012) compared the ratings attributed by two of the leading international rating agencies - Moody's and Standard and Poor's, and one of the findings was that there are some differences caused by subjective evaluation of the noted countries. The conclusion of the paper was that it is necessary to increase the objectivity of rating agencies' decisions as well as greater transparency of the criteria used in the rating process, which would make sovereign ratings more credible.

2. Data analysis

2.1 Review of rating evolution before and after joining the euro area

2.1.1 Evolution of the euro area rating, the United Kingdom and Denmark

The rating evolution of euro area countries, as well as the two states that have negotiated their right to keep their local currency, before and after the adoption of the euro, is very interesting and can be seen in the table no. 1. The two countries are included in the analysis below even if they do not use the euro currency, but they are among the states that participated in the establishment of the EMU and are exceptions that cannot be included in the list of countries that have not adopted the euro currency but are in accession to the euro area. The chosen time period is generous (1996-2018) in order to highlight the impact of the adoption of the single currency on the rating agencies opinion, but also the effects of the financial crisis that affected most EU countries and not only. The table below contains the last rating issued in the reference year if several ratings were published in that year. The table highlights the fact that there are no significant fluctuations in country ratings before entering the euro area. None of the countries analyzed showed a major increase in the agencies' view, but no drastic decrease, the trend being generally an upward trend. After the adoption of the euro and until the outbreak of the crisis, ratings are stable or rising. After 2009, most states have been affected and the recovery process is still in progress.

Countries with a high-quality rating prior to the adoption of the euro and who have retained this level of scoring or have undergone minor changes after entering the euro area are Luxembourg, the Netherlands and Austria. The effects of the financial crisis on the ratings of these countries were also minor compared to imbalances produced in other countries in the post-2008 period.

After entering the euro area Finland, Ireland and Spain, which already had a high-quality rating, benefited from a slight increase and reached the highest rating. Of this countries Finland was the one that seemed to have the most stable economy because it has managed to maintain an "AA" rating even after the financial crises began. Ireland and Spain have encountered bigger problems that Ireland has surpassed faster and positioned itself on a rising trend that is still up to date.

In the euro area the effects of the crisis were initially felt in the ratings of countries like Ireland, Portugal, Spain and Greece. Then countries like Italy and Cyprus followed, but most countries have faced financial problems whose effects are still visible today.

Table no. 1: Evolution of the rating in the euro area, the United Kingdom and Denmark between 1996 and 2018

Group	Countries	Rating agency	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Euro countries	Austria	S&P	AAA																AA+						
		Moody's	Aaa																				Aa1		
		Fitch				AAA																AA+			
	Belgium	S&P	AA+															AA							
		Moody's	Aa1		Aaa			Aa1										Aa3							
		Fitch	AA+		AA-	AA-			AA				AA+					AA					AA-		
	Finland	S&P	AA		AA	AA+	AA+		AAA												AA+				
		Moody's	Aa2	Aa1	Aaa																		Aa1		
		Fitch	AA	AA+	AAA	AAA															AA+				
	France	S&P	AAA															AA+	AA						
		Moody's	Aaa															Aa1			Aa2				
		Fitch	AAA			AAA													AA+	AA					
	Germany	S&P	AAA																						AAA
		Moody's	Aaa																						Aaa
		Fitch	AAA			AAA																			AAA
	Ireland	S&P	AA		AA+	AA+	AAA									AA	A	BBB+			A	A+			
		Moody's			Aaa											Aa1	Baa1	Ba1			Baa1		A3	A2	
		Fitch		AA+	AAA	AAA										AA-	BBB+					A-	A	A	A+
	Italy	S&P	AA		AA				AA	AA-	AA-	A+						A	BBB+	BBB	BBB-				BBB
		Moody's	Aa3					Aa3	Aa2									A2	Baa2						
		Fitch	AA-		AA-	AA-			AA		AA	AA-						A+	A-	BBB+					BBB
	Luxembourg	S&P	AAA																						AAA
		Moody's	Aaa																						Aaa
		Fitch	AAA			AAA																			AAA
	Netherlands	S&P	AAA															AA+		AAA					
		Moody's	Aaa																					Aaa	
		Fitch	AAA			AAA																			AAA
	Portugal	S&P	AA-	AA-	AA							AA-				A+	A-	BBB-	BB			BB+		BBB-	
		Moody's		Aa3	Aa2				Aa2								A1	Ba2	Ba3		Ba1				
		Fitch	AA-		AA	AA					AA		AA	AA		AA	A+	BB+						BBB	
	Spain	S&P	AA		AA	AA+			AA+	AAA						AA+	AA	AA-	BBB-		BBB	BBB+			
		Moody's	Aa2		AA			Aaa								Aa1	A1	Baa3		Baa2					
		Fitch	AA		AA	AA+	AA+			AAA						AA+	AA-	BBB		BBB+					A-
	Greece	S&P	BBB-		BBB	A-		A		A+	A					BBB+	BB+	CC	B-		B	CCC+	B-		B
		Moody's	Baa1	Baa1		A2			A1							A2	Ba1	Ca	C	Caa3	Caa1	Caa3		Caa2	
		Fitch	BBB-	BBB		BBB+	A-	A		A+	A				A	A	BBB+	BBB-	CCC	CCC	B-	B	CCC		B-
	Slovenia	S&P	A		A			A+	AA-		AA							AA-	A	A-			A	A+	
		Moody's	A3			A2			Aa3			Aa2						A1	Baa2	Ba1		Baa3		Baa1	
		Fitch	A-			A	A		A	A+	AA-	AA						AA-	A	BBB+		A	A+		
	Cyprus	S&P	AA-		A+	A				A	A					A+		A	BBB	CCC+	B-	B+	BB-	BB	BB+
		Moody's	A2						A2						A1	Aa3			Baa3	B3	Caa3	B3	B1		Ba3
		Fitch							A+	A+					AA-				BBB	BB-	B-		B+	BB-	BB
	Malta	S&P	A+		A+	A	A			A		A				A2	A1		A-	BBB+		A-			
		Moody's			A3		A3								A2	A1		A2	A3						
		Fitch	A		A	A			A						A+					A					A+
	Slovakia	S&P	BBB-		BB+				BBB		A-		A			A+			A		A+				
		Moody's			Ba1			Baa3	A3			A2	A1					A2							
		Fitch	BBB-		BB+	BB+			BBB-	BBB	A-	A			A+										A+
	Estonia	S&P		BBB+	BBB+			A-		A-	A	A	A			A-	A	AA-							
		Moody's					Baa1		A1							A1									
		Fitch		BBB		BBB+	A-		A-	A		A			A-	BBB+	A	A+							
	Latvia	S&P		BBB					BBB	BBB+	BBB+	A-			BBB+	BBB-	BB	BB+		BBB	BBB+	A-			
		Moody's		Baa2	Baa2				A2						A3	Baa3			Baa2	Baa1	A3				
		Fitch			BBB		BBB	BBB		BBB+	A-			BBB+		BB+		BBB-	BBB	BBB+	A-				
	Lithuania	S&P		BBB-	BBB-				BBB	BBB+	A-	A			BBB+	BBB					A-			A-	
		Moody's	Ba2	Ba1			Baa1		A3		A2				Baa1					A3					
		Fitch		BB+		BB+	BBB-		BBB			A	A								A3				
Countries with an opt-out	Denmark	S&P	AA+			AAA																			
		Moody's	Aa1		Aaa																				
		Fitch	AA+		AA+		AAA																		
	United Kigdom	S&P	AAA																			AA			
		Moody's	Aaa																	Aa1				Aa2	
		Fitch	AAA			AAA														AA+		AA			

Source: Thomson Reuters, 2018

The most affected country by the crisis was Greece, which faced big liquidity problems after 2008. It has been said that downgrading Greece's rating accentuated the financial crisis in this state. Despite the fact that this country received financial assistance from the IMF

and the ECB, the economic recovery did not take place and the public debt increased considerably. Global Credit Review was published in 2013 and it contains the opinion of Michel Barnier (Member of the European Commission, Internal Market and Services) about the rating restrictions. He said that rules about rating restrictions was aimed at preventing rating agencies from changing sovereign rating during the negotiations of international aid programs. He claims that for Greece, during bailout discussions in July 2011, the changes made for the sovereign rating significantly increased market volatility. In 2011 all three agencies rated this country with a "C" rating, but the lowest ratings for Greece, in the analyzed period, were the following year, 2012, when the agencies have changed several times the mark granted to this state. As mentioned above, the table contains the last rating issued in the year to which reference is made but, by analyzing in more detail the situation of Greece, significant changes can be noted. In 2012, Greece received the lowest rating: SD from S&P, C from Moody's and RD from Fitch (Thomson Reuters, 2018). The decline in Greece's rating has only accentuated the financial crisis it has experienced. (Andreescu E., 2011: p. 3) gives the example of Greek bonds that have become unprofitable, and notes that a decreasing note translates into an increase in the interest rates. In the case of Greece (Host et al., 2012) believes that rating agencies are acting in an inopportune and unpredictable manner, aggravating the liquidity situation in the financial markets and causing interest rates to rise in government bonds.

The European Financial Stability Facility (EFSF) was created in June 2010 by euro area countries as a temporary crisis resolution mechanism. It seems that EFSF received the AAA rating from the world's tree most important rating agencies: Standard & Poor's Financial Services, Moody's Analytics and Fitch Ratings. EFSF has provided financial assistance to Greece, Ireland and Portugal. This tree states along with Italy, Spain and Cyprus have been downgraded after joining the euro area and an analysis about gross domestic product at market prices is important and is shown in table no. 2:

Table no. 2: The evolution of gross domestic product at market prices over the period 1996-2016 - euro area countries

Current prices, euro per capita

Gross domestic product at market prices

Country	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ireland	16,500	19,900	21,700	24,700	28,500	31,600	34,600	36,400	38,400	40,900	43,300	44,800	41,800	37,500	36,800	37,600	38,200	39,200	42,200	56,400	58,800
Greece	10,800	11,900	12,000	13,000	13,200	14,000	15,000	16,400	17,700	18,100	19,800	21,100	21,800	21,400	20,300	18,600	17,300	16,500	16,400	16,300	16,200
Spain	12,700	13,000	13,700	14,700	15,900	17,200	18,100	19,000	20,100	21,300	22,700	23,900	24,300	23,300	23,200	22,900	22,200	22,000	22,300	23,300	24,100
Italy	18,100	19,200	19,900	20,600	21,800	22,800	23,600	24,200	25,000	25,600	26,500	27,400	27,600	26,400	26,800	27,300	26,700	26,500	26,700	27,200	27,700
Cyprus	11,900	12,500	13,500	14,300	15,600	16,500	17,000	17,900	19,100	20,400	21,700	22,900	24,200	23,100	23,300	23,200	22,600	21,000	20,700	20,900	21,300
Portugal	9,600	10,200	10,900	11,700	12,500	13,100	13,700	14,000	14,500	15,100	15,800	16,600	16,900	16,600	17,000	16,700	16,000	16,300	16,600	17,400	17,900

Source: Eurostat, 2018

The graphical representation of the information in the previous table provides a better understanding of the evolution of GDP over time and a clearer view of the values of this important indicator for the euro area countries under review. This graphic representation is shown in figure no. 1.
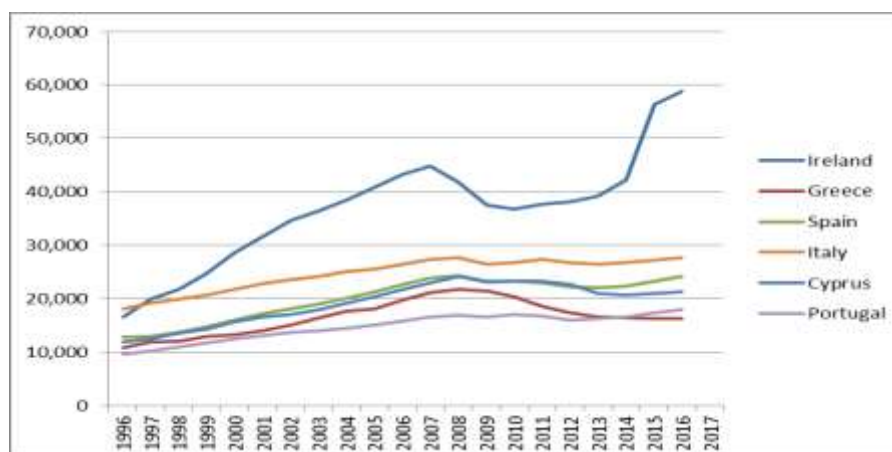
Figure no. 1: Graphical representation of GDP evolution at market prices over the period 1996-2016 - euro area countries
Source: personal processing in Excel

Ireland's recovery from the economic and financial crisis is better then that of Greece or Cyprus, while Portugal and Italy have shown a steady evolution without major oscillations.

2.1.2 Evolution of the non euro area rating

The evolution of non-euro area ratings for the same period of analysis (1996-2018) is also important and can be seen in table no. 3.

Table no. 3: Evolution of the non-euro area rating between 1996 and 2018

Countries	Rating agency	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Bulgaria	S&P			B		B+	BB-	BB	BB+	BBB-	BBB	BBB+		BBB							BB+		BBB-	
	Moody's		B3	B2			B1		Ba2	Ba1		Baa3				Baa2								
	Fitch			B+				BB	BB+	BBB-	BBB			BBB-									BBB	
Croatia	S&P		BBB-							BBB						BBB-		BB+		BB				
	Moody's		Baa3															Ba1			Ba2			
	Fitch		BBB-		BB+		BBB-					BBB-		BBB-				BB+	BB					BB+
Czech Republic	S&P			A-				A-		A-			A				AA-							
	Moody's				Baa1			A1																
	Fitch	A-	BBB+						A-		A		A+											
Hungary	S&P	BBB-		BBB		A-						BBB+		BBB	BBB-		BB+	BB		BB+	BBB-			
	Moody's	Baa3		Baa2	Baa1	A3	A1					A2		A3	Baa1	Baa3	Ba1				Baa3			
	Fitch	BBB-	BBB		BBB+	A-			A-		BBB+			BBB		BBB-		BB+			BBB-			
Poland	S&P	BBB-			BBB	BBB+							A-										BBB+	
	Moody's			Baa1	Baa1			A2																
	Fitch	BBB		BBB+					BBB+				A-											
Romania	S&P	BB-		B-				B	B+	BB	BB+	BBB-		BB+						BBB-				
	Moody's		Ba3	B1/B3				B2	B1	Ba3		Ba1	Baa3						Baa3		Baa3			
	Fitch	BB-		B	B-	B		B+	BB	BBB-		BBB		BB+				BBB-					BBB-	
Sweden	S&P		AA+			AA+				AAA														
	Moody's							Aaa																
	Fitch	AA-			AA			AA+		AAA														

Source: Thomson Reuters, 2018

Compared to the ratings oscillations of euro area countries, changes following the financial crisis, in this case rating decreases for non-euro area countries, are less drastic and generate smaller discrepancies from one period to the next.

The effects of the crisis were not found in the ratings of countries such as Sweden, Poland and the Czech Republic. Regarding the situation of Romania's rating after 2008, Moody's has kept unaffected the rating given in 2006, and S&P and Fitch agencies have downgraded the rating offered to Romania, but the differences were not major. In the S&P opinion, Romania has recovered by 2014 and the agency revised the rating by again giving the highest rating our country received from this rating agency.

The analysis of gross domestic product at market prices for some non-euro area countries is shown in table no. 4:

Table no. 4: The evolution of gross domestic product at market prices over the period 1996-2016 – non-euro area countries

Current prices, euro per capita

Gross domestic product at market prices

Country	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bulgaria	1,000	1,200	1,600	1,500	1,800	2,000	2,200	2,400	2,700	3,100	3,500	4,200	4,900	4,900	5,100	5,600	5,700	5,800	5,900	6,300	6,800
Czech Rep	5,100	5,300	5,800	5,900	6,500	7,400	8,500	8,700	9,400	10,700	12,100	13,400	15,500	14,200	14,900	15,600	15,400	15,000	14,900	16,000	16,700
Croatia	4,400	5,000	5,400	5,000	5,300	6,000	6,600	7,100	7,800	8,500	9,300	10,200	11,200	10,500	10,500	10,500	10,300	10,300	10,200	10,600	11,100
Hungary	3,600	4,100	4,200	4,500	5,000	5,900	7,100	7,400	8,300	9,000	9,100	10,200	10,800	9,400	9,900	10,000	10,000	10,300	10,700	11,300	11,600
Poland	3,300	3,700	4,000	4,200	4,900	5,600	5,500	5,000	5,400	6,500	7,200	8,200	9,600	8,300	9,400	9,900	10,100	10,300	10,700	11,200	11,100
Romania							2,300	2,500	2,900	3,800	4,600	6,200	7,100	6,100	6,200	6,600	6,700	7,200	7,500	8,100	8,600

Source: Eurostat, 2018

Also in the case of non-euro area countries, the graphical representation of the information in the previous table provides a better understanding of the evolution of GDP over time and a clearer view of the values of this important indicator for non-euro area countries. This graphic representation is shown in figure no. 2.
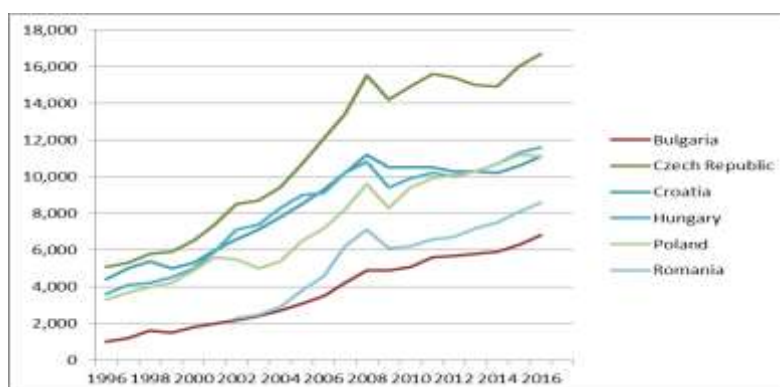
Figure no. 2: Graphical representation of gross GDP evolution at market prices over the period 1996-2016 – non-euro area countries
Source: personal processing in Excel

An upward trend is observed for all states shown in Figure no. 2, interesting is the increased (almost double) level of the GDP of the Czech Republic compared to that of Bulgaria.

2.2 Impact of the rating on GDP

The rating was collected from the S&P agency for 28 countries and for the period 1996 - 2016. For the same countries and the same period, the GDP was collected by consulting the Eurostat databases. In terms of forming rating series, whole numbers were assigned to the rating classes and subclasses according to the procedure recommended by the literature (Sy, A., 2004)[2], as follows:

- A positive natural number is assigned on a scale from 1 for CC, C / SD-D and up to 20 for AAA (the table below shows these numbers for a scale of 1 to 20 and for a scale from 1 to 58);

- An absolute (not a percentage) difference of the rating series is then calculated. For example, for the following series of ratings: 15, 15, 14, 14, 16, 16, the differences generated are: 0, -1, 0, +2, 0, the interpretation being simple (what influence on GDP has an increase or a decrease of a rating without any other data processing).

The above method is assumed to be the standard method, being suited to studying the impact of a GDP growth / decrease. How many conditions a state needs to meet in order to benefit from a rating increase, either between sub-classes or from a rating class to another, is a very interesting and complex subject, and information on growth / decrease of ratings can differ from one agency to another. This approach is a future research topic, however, we consider it appropriate to use the uniformly increasing rating scale in table no. 5, a scheme used in many specialized articles.

Table no. 5: Rating scales

Rating	20-point numerical credit rating scale (CR)	Rating	58-point numerical comprehensive credit	
Aaa/AAA	20	Aaa/AAA	58	
Aa1/AA+	19	Aa1/AA+	55	
Aa2/AA	18	Aa2/AA	52	
Aa3/AA-	17	Aa3/AA-	49	
A1/A+	16	A1/A+	46	add '+2' for positive watch, '+1' for positive outlook, '-1' for negative outlook, '-2' for negative watch, and '0' for stable outlook and no watch/outlook assignments
A2/A	15	A2/A	43	
A3/A-	14	A3/A-	40	
Baa1/BBB+	13	Baa1/BBB+	37	
Baa2/BBB	12	Baa2/BBB	34	
Baa3/BBB-	11	Baa3/BBB-	31	
Ba1/BB+	10	Ba1/BB+	28	
Ba2/BB	9	Ba2/BB	25	
Ba3/BB-	8	Ba3/BB-	22	
B1/B+	7	B1/B+	19	
B2/B	6	B2/B	16	
B3/B-	5	B3/B-	13	
Caa1/CCC+	4	Caa1/CCC+	10	
Caa2/CCC	3	Caa2/CCC	7	
Caa3/CCC-	2	Caa3/CCC-	4	
Ca/CC, C/SD-D	1	Ca/CC, C/SD-D	1	

Source: Sy, A., 2004, Rating the rating agencies: Anticipating currency crises or debt crises? Journal of Banking and Finance 28, 2845-2867.

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[2]„Rating the rating agencies: Anticipating currency crises or debt crises?", which was published in an international reputation journal (Journal of Banking and Finance 28, 2845-2867)

For GDP, the percentage growth of GDP ranges has been calculated, which can be interpreted as an impact on GDP as a result of the rating change. In the present article, calculations were based on nominal GDP[3].

To study the impact of the Rating on GDP, a panel regression of the following form was used:

$$\text{increase\%\_GDP} = c + \beta \times \text{differences\_Rating} + \varepsilon$$

In a valid regression model, one can find out how much the rating's increase/decrease contributes to GDP increase/decrease.
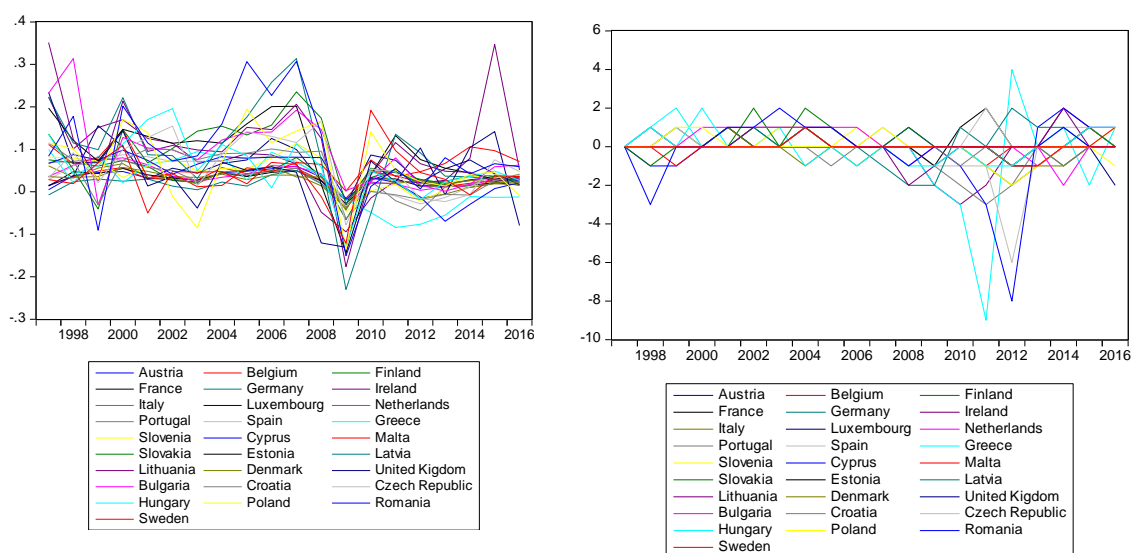
Figure no. 3: Regression GDP ~ Rating
Source: personal processing with EViews software 7.

The Rating and GDP series are stationary. The best results were obtained for panel regression with fixed effects on countries and the White cross-section covariance coefficient method (table no. 6).

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[3]In our research we also replicated the regression analysis of the real GDP growth evolution with the Rating, but the results obtained are inferior to those obtained from the nominal GDP rating regression (adjusted coefficient of R^2 is reduced by about 5 percentage points).

Table no. 6: Regression GDP ~ Rating (-1)

Dependent Variable: **GDP**
Method: Panel Least Squares
Date: 03/09/18   Time: 13:10
Sample (adjusted): 1998 2016
Periods included: 19
Cross-sections included: 28
Total panel (balanced) observations: 532
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.052559	0.008693	6.046264	0.0000
RATING(-1)	0.020956	0.005951	3.521505	**0.0005**

Effects Specification				

Cross-section fixed (dummy variables)

R-squared	0.206809	Mean dependent var		0.051850
Adjusted R-squared	0.162655	S.D. dependent var		0.065102
S.E. of regression	0.059573	Akaike info criterion		-2.750271
Sum squared resid	1.785097	Schwarz criterion		-2.517146
Log likelihood	760.5721	Hannan-Quinn criter.		-2.659037
F-statistic	4.683828	Durbin-Watson stat		1.625058
Prob(F-statistic)	0.000000			

Source: personal processing with EViews software 7.

The results of the regression with several rating lags (6) look interesting. It appears that the effect of a rating change has a persistent effect on GDP of up to 4 years (table no. 7).

Table no. 7: Regression GDP ~ Rating from 1 to 6 lags

Dependent Variable: **GDP**
Method: Panel Least Squares
Date: 03/09/18   Time: 13:23
Sample (adjusted): 2003 2016
Periods included: 14
Cross-sections included: 28
Total panel (balanced) observations: 392
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.048342	0.010059	4.806090	0.0000
RATING	0.014706	0.004518	3.255367	0.0012
RATING(-1)	0.016615	0.003775	4.401972	0.0000
RATING(-2)	0.008501	0.003113	2.730573	0.0066
RATING(-3)	0.010764	0.003636	2.960655	0.0033
RATING(-4)	0.007718	0.001898	4.066839	0.0001
RATING(-5)	0.002907	0.008202	0.354406	0.7232
RATING(-6)	0.001349	0.004478	0.301136	0.7635

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.281933	Mean dependent var	0.043840
Adjusted R-squared	0.213546	S.D. dependent var	0.066752
S.E. of regression	0.059197	Akaike info criterion	-2.730850
Sum squared resid	1.251025	Schwarz criterion	-2.376273
Log likelihood	570.2466	Hannan-Quinn criter.	-2.590322
F-statistic	4.122594	Durbin-Watson stat	1.607228
Prob(F-statistic)	0.000000		

Source: personal processing with EViews software 7.

On the other hand, analyzing the reverse (Rating = $c + \beta \times PIB + \varepsilon$) it seems that the effect is only contemporary (table no. 8).

Table no. 8: Regression GDP ~ Rating

Dependent Variable**: RATING**
Method: Panel Least Squares
Date: 03/09/18   Time: 13:29
Sample (adjusted): 1998 2016
Periods included: 19
Cross-sections included: 28
Total panel (balanced) observations: 532
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.178016	0.109023	-1.632825	0.1031
PIB	3.199470	0.880986	3.631690	0.0003
PIB(-1)	-0.322288	0.709783	-0.454066	0.6500

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.082639	Mean dependent var	-0.030075
Adjusted R-squared	0.029644	S.D. dependent var	0.911858
S.E. of regression	0.898241	Akaike info criterion	2.677982
Sum squared resid	405.0322	Schwarz criterion	2.919146
Log likelihood	-682.3432	Hannan-Quinn criter.	2.772362
F-statistic	1.559372	Durbin-Watson stat	1.749306
Prob(F-statistic)	0.033251		

Source: personal processing with EViews software 7.

Graphs show that GDP is influenced by the previous year's rating. The coefficient of determination, $R2 = 16\%$, indicates a significant GDP determination by modifying the country rating, but also that the GDP also has, quite plausibly, other fundamental determinants. As a future research topic, we propose a more detailed analysis using a quarterly frequency for these variables and not just an annual frequency. Also, in a future research, we will estimate the GDP-rating regression on different groups of countries, developed countries and emerging countries.

Conclusions

From the data and analyzes presented in this paper, it can be seen how ratings have been decreasing since 2009, although the economic crisis has started as early as the end of 2007. This confirms the theories in the literature that rating agencies highlighted the effects on countries emerging from unfavorable events and did not have the role of anticipating them.

The econometric study presented shows that the change of the country rating has a significant determination on the evolution of the national GDP. Our study takes into account the influence of the previous year's rating on the evolution of national GDP, and the effects of a rating change may be persistent. This may confirm the assertions in some specialized articles that rating agencies have damaged the economic situation of countries in financial crisis.

Corroborating these two issues, it is interesting to estimate the impact that a preventive decrease of the rating would have had on the economic situation of each country. Such a situation could have worsened the negative effects of the financial crisis, even more than it has now happened, or perhaps, could have alerted and mobilized the entities to take early effective prevention measures in the first place. This question mark is a future research topic.

The high-quality rating from the time of the adoption of the single currency may indicate that meeting the convergence criteria, which leads to the completion of the euro area accession process, generates a stable economic situation that determines an increased confidence in the opinion of the rating agencies.

Ratings issued by specialized agencies indicate a greater instability in the euro area after the financial crisis than in non-euro area countries. It seems that countries that have not yet adopted the single currency have had a higher degree of adaptation to post-crisis financial market conditions and have felt less of its negative effects. How much the favorable situation depended on the fact that the states coordinated their own monetary policy and therefore influencing possible exchange rate fluctuations that had positive effects on the economic situation is an interesting hypothesis and a more detailed analysis from this perspective could provide important information in this regard. This is also a future research theme.

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