CREDIT DEFAULT SWAPS AND MACROECONOMIC FORECASTS - HOW CAN THEY INFLUENCE EACH OTHER?

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Abstract: *Credit default swaps is an increasingly used tool for assessing access to external funding, although any increase in investors' risk aversion may influence their quotations. Vulnerabilities and tensions at the international and regional level may lead to increased volatility in financial markets, increase risk aversion to investors, influence macroeconomic forecasts and ratings of rating agencies, increase credit spreads volatility swaps, tighten exchange rates and inflation and may also affect access to sovereign foreign financing. Also, macroeconomic forecasts, whether favourable or unfavourable, influence the value of CDS quotations. Therefore, deviations from the reality of the forecasts may have clear negative effects on CDS, sovereign risk and macroeconomic realities that they should reflect. When forecasts are more unfavourable than in reality, the CDS may tend to grow, and this growth can lead to the deterioration of macroeconomic reality and implicitly forecasting, causing a negative snowball effect. Thus, this article aims to analyze the link between CDS, sovereign risk, macroeconomic developments and forecasts for Romania. The article aims to provide a number of solutions to alleviate these shortcomings.*

Key words: *CDS, Forecasts, Sovereign risk, Romania*.
JEL Classification: *G15, G23, H63*.

1. Introduction

According to the NBR definition (RSF, 2011, p.8), a Credit Default Swap (CDS) is a contract whereby a party (the protection buyer) pays a premium periodically to another party (the protection vendor) in return for receiving a compensation where a third party (referred to as a reference entity) does not pay. Therefore, a Credit Default Swap (CDS) is an important financial asset instrument for securing a financial entity against bankruptcy risk. The protection vendor is required to buy the benchmark at face value in the event of a credit event and to receive a premium (CDS premium or CDS spreads) from the buyer of the protection under the contract or when is produced a credit event. CDS therefore fairly reflect the credit risk of an entity, supporting both the debt instrument and credit, and on the other hand, signalling faster than the bond market, the possibility of a financial crisis in the future.

However, a possible negative influence of CDS in the economy can be noticed by the sometimes vicious behaviour of commercial banks, many with international equity, which often justify interest increases on traditional lending products by the deterioration in the perception of financial markets on risk of the country (evidenced by the increase in CDS quotations that have government bonds as support). Thus, in raising interest rates for commercial banks, it is invoked the stop of a cheaper financing from parent banks on the back of unfavourable exchange rate developments or financial products denominated in euro, pounds, Swiss francs or dollars, and the bigger risk of a country.

The motivation of such behaviour, though it has a kernel of truth, is not fully justified, especially as part of these macroeconomic developments are anticipated and implicitly "modelled" in a negative sense. For example, in the public space and in the literature are invoked mistakes, vices and errors in forecasting important macroeconomic indicators (such as inflation, economic growth, budget deficit and public debt of a country or a group of countries) by some international financial institutions (IMF, European Commission, European Bank for Reconstruction and Development, World Bank, rating agencies etc.). A rather pessimistic forecast or estimate directs future behaviour in the

economy: investors will be more reserved to invest, employment policies will be postponed, inflation and exchange rates will tend to grow on a global background of mistrust, and insecurity, taxes and interest rates will increase, implicitly interest rates on a country's loans etc. A rather optimistic estimate leads to a rather positive "direction" of an economy: borrowing costs will fall, investors will be stimulated to invest and hire, inflation and exchange rate are tempered against a favourable climate, budget revenues increase on the background of a blooming economy, interest rates remain satisfactory or reduced, etc. Incidentally or not, the forecasts of international financial institutions are often for certain groups of countries over which they have economic interests to be modelled rather negatively. The cost of such "errors" is not borne by the issuers of such forecasts, but only by the economy and economies evaluated. A solution would be that, as the ratings realised by rating agency as well as the forecasts of international financial institutions, governments whose assessments were in most cases negative, in a major discrepancy with reality, also to provide a classification or a rating for each such an institution, working only with those institutions that have correctly assessed and anticipated the future, proving their seriousness.

Therefore, the article, on the one hand, emits the inductive scenario above, and deductively, it seeks as far as it can prove empirically for Romania, whether the macroeconomic forecasts influence or not, and in what sense, the developments of CDS and ratings, either directly or indirectly, through developments in macroeconomic indicators.

2. Literature Review

Although they are relatively new instruments, introduced in the last two decades, CDSs are gaining increasing importance both in their use on the capital market and as the subject of study for a vast literature. When considering the literature, some of the studies focus on the implications of CDS in the economy and others analyze the impact of important macroeconomic and microeconomic variables on CDS development and trends.

In the first category could also be considered the study of Paskaleva (2017), which explores the link between informational value of credit default swaps and financial crisis, analysing the ability of credit default swaps to predict the crisis. She discovers that, especially in developed capital markets, CDS is a significant indicator explaining the periods proceeding financial crises. Thus, for emerging markets such as Bulgaria, Romania and Turkey she discovers that the CDS fluctuations are capable of predicting shocks and forthcoming crisis on capital markets and have significant information value (results identical to those of Coudert and Gex (2006) and Naziri (2009)). Thus, these authors and many others take into considerations the fact that economic fundamentals (e.g. GDP, inflation, unemployment) are the leading indicators for upcoming crisis together with investment expectations (often evaluated through the evolution of CDS) and political and social framework.

Also, looking at the link between Romanian banking lending activity and CDSs, in 2011, Mihai & Neagu study, the authors discover also a rather poor relation between CDSs and the cost of funding from abroad for most of the Romanian commercial banks (except the larger ones), conclusions sustaind also by the banks decalrations in an ad-hoc survey. According to the above authors, the result of the behavior of the Romanian commercial banks comes on the grounds of small and more and more concentrated CDS market and on the fact that the trading of bond issued internationally is rather a limited activity of the banking sector of Romania.

In the second category, for example in Kim& Park& Park (2015) paper, there is an investigation whether changes in CDS spreads depend on macroeconomic conditions

(analyzed by the prism of various proxies) and the authors hypothesize that an important factor in explaining the differences in CDS spreads is the business cycle. They found that the coefficient of the business cycle variable orthogonal to the risk-free rate, equity volatility and leverage ratio factors is strongly significant and robust. Also, they discover that the business cycle variables explain more of the CDS spreads changes for investment-grade firms and that their structural model variables, including the proxy of the business cycle, explain approximately 65% of the changes in CDS spread.

3. Methodology and data used

The article launches the hypothesis of the close link between the forecasts of the main macroeconomic indicators, the evolution of the macroeconomic indicators and CDS, implicitly sovereign risk ratings. At the same time, empirically, for Romania is trying to analyze the link between the CDS, the sovereign risk, the macroeconomic evolutions of some macroeconomic indicators and the forecasts on them. The empirical analysis carried out on Romania's case is mainly of a logical type and of an econometric type (correlation), but due to the extremely limited set of data it is necessary to give caution in interpreting the obtained results. In this article, we have appealed to the National Bank database, monthly bulletins for the period 2013-2017, including the January 2018 bulletin, to the data of the Ministry of Finance, and the reports on the European Commission's autumn and spring forecasts for the same period, therefore the frequency of the data is annual. For the actual evolutions of the indicators we used the data of the National Bank of Romania and for forecasts of the indicators from European Commission. The datas for forecasts are taken as the most recent for each year, without taking into account, for example, for the forecast for year t+1 the forecast made in the year t for year t+1, but the forecast of the current year. The number of observations is extremely limited, the data set being annual, but to the extent that the analysis would include a significant number of countries also the econometric analysis would be of considerable significance.

For the case study for Romania, we used CDS quotas on sovereign debt instruments, data being taken from the financial stability report of the NBR and the value of the annual series was made by compiling the monthly series as arithmetic mean. The rating classification is rather regular, using the ratings of the following rating agencies: Moody's, Fitch and S&P and the instrument underlying this rating is the state bonds for denominated contracts in foreign exchange on long term. Thus, the article seeks to point out, besides the importance of developments of macroeconomic indicators also the importance of forecasts in determining the evolution of CDSs and ratings for sovereign risks.

4. Results

As we have seen above, a multitude of studies aim to reveal the possible determinants of CDS quotations, but the link between the CDS and the macroeconomic forecasting is less addressed in the literature. Thus, the article tries to clarify the link between the CDS quotations, the evolution of some macroeconomic indicators and their forecasts, revealing the problem of the deviation from the reality of the forecasts. For empirical analysis on Romania we used annual sets for the period 2013-2017 (see Table no.1).

Table no. 1. The evolution of several macroeconomic indicators, their European Commission forecasts, the evolution of CDSs and ratings of the main rating agencies for the period 2013-2017

	2013	2014	2015	2016	2017
GDP (%)	3.50	3.10	4.00	4.80	7.00
GDP (%) aut.frcst.	2.20	2.00	3.50	5.20	5.70
GDP (%) spr.frcst.	1.60	2.50	2.80	5.20	4.30
CAB	-1.54	-1.01	-1.97	-3.50	-6.46
CAB aut.frcst	-1.70	-1.90	-1.20	-3.70	-5.50
CAB spr.frcst	-5.60	-1.70	-1.20	-3.70	-5.00
NLNB(%GDP)	-2.10	-1.40	-0.80	-3.00	-2.83
NLNB(%GDP)aut.frcst	-2.50	-2.10	-1.20	-2.80	-3.00
NLNB(%GDP)spr.frcst	-2.60	-2.20	-1.60	-2.80	-3.50
NBER	4.4190	4.4446	4.4450	4.4908	4.5681
NBER aut.frcst	4.4190	4.4379	4.4349	4.4887	4.5595
NBER spr.frcst	4.3865	4.4739	4.4214	4.4887	4.5214
HICP	3.20	1.40	-0.40	-1.10	1.10
HICP aut.frcst	3.30	1.50	-0.40	-1.00	1.00
HICP spr.frcst	4.30	2.50	0.20	-1.00	1.10
GDGG (%GDP)	37.80	39.40	37.90	37.60	38.70*
GDGG (%GDP) aut.frcst	38.50	39.40	39.40	38.90	37.90
GDGG (%GDP) spr.frcst	38.60	39.90	40.10	38.90	39.30
CDS	199.00	152.60	121.80	117.00	102.10
Ratings Moody's	Baa3 p.neg.	Baa3 p.st.	Baa3 p.st.	Baa3 p.poz.	Baa3 p.poz.
Ratings S&Ps	BB+ p.st.	BB+ p.poz.	BBB- p.st.	BBB- p.st.	BBB- p.st.
Ratings Fitch	BBB- p.st.	BBB- p.st.	BBB- p.st.	BBB- p.st.	BBB- p.st.

Source: NBR dates, monthly bulletins, including Jan 2018 bulletin, financial stability reports for 2013-2017; ratings are obtained from the Finance Ministry website. The date's fervency is annual. * For GDGG (%GDP) for the year 2017 the data are from Ministry of Public Finance of Romania from April 2017.
The notations are: GDP (%) - Gross domestic product, volume (percentage change on preceding year; GDP (%) aut.frcst. - Gross domestic product, volume (percentage change on preceding year) autumn forecast; GDP (%) spr.frcst. - Gross domestic product, volume (percentage change on preceding year) spring forecast; CAB - Current-account balance (in billions of euro); CAB aut.frcst - Current-account balance (in billions of euro) autumn forecast; CAB spr.frcst - Current-account balance (in billions of euro) spring forecast; NLNB(%GDP) - Net lending (+) or net borrowing (-), general government (as a percentage of GDP); NLNB(%GDP) aut.frcst - Net lending (+) or net borrowing (-), general government (as a percentage of GDP) autumn forecast; NLNB(%GDP)spr.frcst - Net lending (+) or net borrowing (-), general government (as a percentage of GDP) spring forecast; NBER- Nominal bilateral exchange rates against ECU/Euro; NBER aut.frcst - Nominal bilateral exchange rates against Ecu/euro autumn forecast; NBER spr.frcst - Nominal bilateral exchange rates against ECU/Euro spring forecast; HICP- Harmonised index of consumer prices (national index if not available), (percentage change on preceding year); HICP aut.frcst - Harmonised index of consumer prices (national index if not available), (percentage change on preceding year) autumn forecast; HICP spr.frcst - Harmonised index of consumer prices (national index if not available), (percentage change on preceding year) spring forecast; GDGG (%GDP) - Gross debt, general government (as a percentage of GDP); GDGG (%GDP) aut.frcst - Gross debt, general government (as a percentage of GDP) autumn forecast; GDGG (%GDP) spr.frcst - Gross debt, general government (as a percentage of GDP) spring forecast; CDS – credit default swap quotations related to sovereign debt instruments issued by Romania; Ratings Moody's -

sovereign risk from Moody's; Ratings S&Ps -sovereign risk from S&P; Ratings Fitch - sovereign risk from SR-Fitch.
Colour notations for forecasts: white - forecast identical to real value, very light grey - the forecast could have a rather positive impact in terms of reducing CDS and improving ratings, grey - the forecast could have a rather neutral impact in terms of reducing CDS and improving ratings, very dark grey - the forecast could have a rather negative impact in terms of reducing CDS and improving ratings.

From the above table, we can see that out of the 60 springs and autumn forecast data, only 18 records could have a positive impact on CDS and only 4 forecasts are overlapping perfectly on reality. However, CDS quotations have been declining year-on-year, and ratings for sovereign risk for Romania from major rating agencies also show a relatively positive and stable trend.

Although more significant correlations could be made with longer series of data, noting the lack of denseness of forecasts data, it is worthwhile presenting the correlations of CDS quotations and ratings with some macroeconomic indicators and their forecasts, however, to indicate possible links between CDS and macroeconomic forecasts for Romania (see Table no. 2).

Table no. 2. The correlations between CDS and ratings from Moody's, S&Ps and Fitch with several macroeconomic indicators and their European Commission forecasts for the period 2013-2017 for Romania

	CDS	*Ratings Moody's*	*Ratings S&Ps*	*Ratings Fitch*
CDS	1			
Ratings Moody's	0.94	1		
Ratings S&Ps	0.95	0.84	1	
Ratings Fitch	-0.67	-0.86	-0.45	1
GDP (%)	-0.71	-0.87	-0.48	0.98
GDP (%) aut.frcst.	-0.83	-0.87	-0.63	0.87
GDP (%) spr.frcst.	-0.82	-0.80	-0.70	0.72
CAB	0.70	0.87	0.46	-0.99
CAB aut.frcst	0.62	0.82	0.41	-0.98
CAB spr.frcst	-0.27	-0.02	-0.54	-0.49
NLNB (%GDP)	0.24	0.42	0.00	-0.74
NLNB (%GDP) aut.frcst	0.08	0.33	-0.14	-0.70
NLNB(%GDP)spr.frcst	0.24	0.51	0.00	-0.86
NBER	-0.78	-0.94	-0.60	0.98
NBER aut.frcst	-0.75	-0.91	-0.55	0.99
NBER spr.frcst	-0.78	-0.88	-0.72	0.80
HICP	0.79	0.56	0.83	-0.19
HICP aut.frcst	0.82	0.59	0.85	-0.22
HICP spr.frcst	0.86	0.68	0.85	-0.37
GDGG (%GDP)	-0.07	-0.20	-0.22	0.10
GDGG (%GDP) aut.frcst	0.11	0.39	-0.17	-0.79
GDGG (%GDP) spr.frcst	-0.39	-0.24	-0.62	-0.22

Source: NBR dates, monthly bulletins, including Jan. 2018, financial stability reports for 2013-2017; ratings are obtained from the Finance Ministry website. The data's fervency is annual;* for GDGG (%GDP) for the year 2017 the data are from Ministry of Public Finance of Romania from April 2017. The notations in Table

no.1 are maintained also here. The colour notations: white - correlations of and over 0.75, very light grey - correlations that can fall within the range [0.50-0.75), grey - correlations with values between [0.25.0.50), very dark grey - correlations below threshold 0.25.

For the table no. 2, note mentioning that we have not taken into account the entire correlation matrix, eliminating correlations between indicators and forecasts and between forecasts, between them. Also, we can see a very strong positive correlation (over 0.75) between CDS and Moody's and S&Ps ratings and between CDS and Harmonised index of consumer prices, including autumn and springs forecast. Strong negative correlations of CDS are with GDP (%) autumn and spring forecasts and with Nominal bilateral exchange rates against ECU/Euro (NBER), including forecasts. It can be seen that in some situations the correlation between CDS and macroeconomic forecasts is stronger than with the real indicator (e.g. in the case of GDP and NBER), thus sustaining our approach.

Moreover, in Table no. 3, we take into account only the deviation between the forecast and the real value of the macroeconomic indicator and the evolution of CDS quotations and its annual deviation for the period 2014-2017 (ΔCDS).

Table no. 3. The correlations between CDS and CDS annual deviation with gaps between the European Commission forecasts for macroeconomic indicators and the effective data for macroeconomic indicators

	CDS	Δ*CDS*
ΔGDP (%) aut.frcst.	-0.42	0.56
ΔGDP (%) spr.frcst.	-0.07	0.05
ΔCAB aut.frcst	-0.56	0.42
ΔCAB spr.frcst	-0.96	0.38
ΔNLNB(%GDP)aut.frcst	-0.50	0.98
ΔNLNB(%GDP)spr.frcst	-0.13	0.78
ΔNBER aut.frcst	0.65	0.49
ΔNBER spr.frcst	0.13	-0.55
ΔHICP aut.frcst	0.65	-0.23
ΔHICP spr.frcst	0.86	-0.95
ΔGDGG (%GDP) aut.frcst	0.13	0.13
ΔGDGG (%GDP) spr.frcst	-0.29	0.12

Source: NBR dates, monthly bulletins including for Jan. 2018, financial stability reports for 2013-2017; ratings are obtained from the Finance Ministry website. The data's fervency is annual;* for GDGG (%GDP) for the year 2017 the data are from Ministry of Public Finance of Romania from April 2017. The notations in Table no.1 are maintained also here. The gap notation for macroeconomic indicators reflects the difference between prognosis and indicator. The colour notations: white - correlations of and over 0.75, very light grey - correlations that can fall within the range [0.50-0.75), grey - correlations with values between [0.25.0.50), very dark grey - correlations below threshold 0.25.

It is noted that the deviation of the spring forecast from the reality of the current account balance and also the deviation of spring forecast for inflation from the real HICP has a strong impact on the CDS quotation. At the same time, with regard to the annual deviation of the CDS, it correlates strongly and positively with the autumn / spring forecasts of the Net lending (+) or net borrowing (-), general government and strong and negative correlation with the spring forecast for inflation (ΔHICP spr.frcst).

5. Conclusions

Although the literature abounds in CDS analyzes, a very few studies attempt to demonstrate the link between macroeconomic forecasts and the evolution of CDS, implicitly sovereign ratings.

Therefore, our hypothesis has invoked that the deviation of forecasts from real developments of macroeconomic indicators may negatively influence the evolution of CDS. If they are more optimistic than reality, they can help improve sovereign risk ratings and reduce CDS quotations, but they create a false picture of reality. If forecasts are more negative than reality, through a rolling effect, negative effects in the economy can be shown and can lead to rising CDS quotations and the degradation of international ratings. Thus, on the one hand, the article launches a challenge on the CDS theoretical framework, and on the other hand, it is doing a short deductive, empirical study of the relationship between CDS and the macroeconomic forecasts of the European Commission for Romania.

Romania's domestic macroeconomic developments, although having many aspects linked to their structural construction and to the economic cycle, are equally influenced by the public decision-making or by the international circumstances and assessments. Therefore, this article aims to reveal a possible link, not necessarily the one-way causal link, between CDS and macroeconomic forecasts and developments. Our results are in the area of the results presented by the literature but still retain the reserve of a very limited set of data.

From the analysis we can conclude that, despite some negative deviations on CDS, regarding the deviation of the forecasts from the macroeconomic indicators from their reality, the evolution of the CDS quotations for Romania was rather positive. This may be justified by the fact that during the analysis period deviations from exchange rate forecasts could be interpreted as having a rather positive impact on CDS.

Note mentioning that, macroeconomic developments need to be relatively predictable. Increasing the predictability of macroeconomic developments, legislation and public policy coherence, strengthening strategic areas for the Romanian economy (education, culture, health, infrastructure, defence, social security, etc.) and increasing the volume and impact of public investment in these areas; reducing regional disparities, are only a few aspects to be considered for a harmonious road map of the Romanian economy and improving macroeconomic forecasts.

Improvement of the forecasts of the main macroeconomic indicators can be reflected directly and indirectly, through the developments of the main macroeconomic indicators, on CDS and on the evaluation of country risk, guiding their evolution as accurately as possible.

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