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THE IMPACT OF BASEL III ADOPTION BY G20 MEMBERS ON THEIR CREDIT RATINGS*

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Abstract

This study aims to analyze the effect of Basel III standards adoption made by 27 countries included in Basel III adoption reports (including G20 group members) on their credit rating. In addition, the study tests the impact of some macroeconomic variables on sovereign credit rating. The data are obtained from BCBS semi-annual adoption reports, along with other macroeconomic indicators published by IMF and World Bank; however, the basic indicator for credit rating is Standard & Poor's credit rating. The period under the study is between 2011 and 2016. The results of the analysis show that there is a strong statistical significant positive effect of Basel III standards on 27 countries' credit rating.

Keywords: Basel III, Credit rating, Liquidity Coverage Ratio

JEL Classifications: C22, G21, G24

1. Introduction

Banking sector plays the major role in financial and economic development of the countries. In 2009 after the financial crisis, the G20 group recommended Basel committee to monitor and work on the financial sector of the G20 group. As a result, the committee has issued complementary standards of Basel II known as Basel III to maintain financial stability to help in assessing risks

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and avoid any expected financial crisis in the future. With the complementary standards of the previously issued Basel II accord, the new accord similarly contains three major pillars and it is built on the previous version of standards. Pillar-1 focuses on increasing the quality and quantity of capital in addition to increasing countercyclical buffers working as an absorption base for future losses. However, Pillar 2 is based on risk management and assessment against risk exposures of the banking sector. Pillar 3 contains disclosure requirements for individual banks. Indeed, Pillar 3 in Basel III consists of variety of requirements compared to the same pillar in Basel II, these requirements are designed to provide helpful information for supervisors of banking sector and help them to achieve maximum level of financial soundness (Bank for International Settlements, 2012). Variety of studies have been conducted to evaluate Basel III standards and indicate its impact on financial stability. For example, Slovik and Cournède (2011) employed GDP records to estimate the impacts of Basel III regulatory framework. As a result, they found that the new accord was helpful especially in smoothing economic fluctuations.

On the other hand, credit rating of the countries have been a critical issue for many countries as it enhances financial records and give signs of economic development. Cai and Kim (2016) studied the effect of credit rating on FDI for 103 countries for the period between 1985 and 2012. They found that credit rating has a strong effect on foreign direct investment (FDI). Moreover, they report that countries which have high credit ratings are attractive for FDI more than those which have lower rating. They also report that a country with high credit rating receives high volume of investments compared to others. Bayar and Kilic (2014) studied the impact of credit rating on FDI for Turkey for the period 1995-2013 and they report that credit rating agencies became a decisive factor for FDI and play major role in direct investments around the worlds. They also report that during that period, there is a positive relationship between FDI and credit rating.

Regarding the studies on Basel standards, Schlickemaier (2012) argue that Basel III standards are not enough to measure and accurately assess the risks and maintain financial stability because of geographic variations among the G20 group members. However, this issue is still debatable according to other scholars and there are many papers which support the idea of Basel III standards' efficiency. On the other hand, Hartlage (2012) assesses the liquidity coverage ratio¹ to consider the impact on financial stability and reports that liquidity coverage ratio requirements are found efficient tool to maintain financial stability in many countries. Schwerter (2011) shows that there are still adjustments. Although the development of Basel III is well advanced, some stabilizing incentives need to be provided. Samitas (2014) reports that neither economic crisis nor contagion is diminished under Basel III. At the same time, the authors' findings support that the stability goal is met, at least in part.

As an aftermath of the financial crisis in 2009, global financial consulting institutions started to study the reasons and impacts that stand behind the previous crisis. One of the most detailed study is done by Norgren (2010) to determine the main reasons of the past financial crisis. The study finds that lack of supervisory role is one of the main factors which cause the last crisis. In addition to this, higher risk taking by financial institutions is one of the reasons for financial instability in that period, combined with low level of international cooperation between supervisory authorities.

From the individual banking perspective, banking sector within that period failed to assess risks accurately and thus failed to make the proper reactions against occurred losses. Besides, credit rating agencies failed to report these financial weaknesses due to inadequate risk exposure reporting by banks. Arefjevs and Brasliņš (2013) examine the determinants of credit rating for Latvia for the period between 1997-2012 by including some macroeconomic variables such as GDP per capita, GDP growth, unemployment, inflation, external debt and other economic indicators. As a result, they report that inflation, GDP per capita, GDP growth and government debt are determinants of credit rating for Latvia during the period 1997-2012. Chee et al. (2015) examine the macroeconomic determinants of sovereign credit rating in 2014 for 53 countries for

¹Ercegovac (2017) reports that Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) are used for amortizing liquidity shocks.

the period 2000-2011. They find that GDP derivative variables have a statistical strong relationship with credit rating. Federal Reserve Bank of New York (2011) report about the long term impacts of Basel III on future financial fluctuations. The study found that the implementation has many benefits especially in decreasing financial volatility. After reviewing past studies conducted to assess the determinants of credit rating and the benefits of Basel III adoptions, the new accord is considered as an effective financial control tool which helps to enhance stability of banking sector and the economy as a whole since banking sector forms the basis for modern economies.

2.Data and Methodology

This study contains 27 countries including G20 countries in addition to other countries included in BCBS adoption report and covers the period between 2011 (the date of the first adoption report of Basel III) to 2016 depending on the availability of data. The data of Inflation, GDP and other macroeconomic factors are gathered from World Bank and International Monetary Fund Databases. Although the data on credit rating observations and adoption reports are taken in a semi-annual basis, some explanatory variables are available only in annual basis. To overcome this problem, the methodology suggested by Armesto *et al.* (2010) is used. To overcome this mismatching problem, they illustrate two main methods; namely, data aggregation and data interpolation. Although both methods follow the same concept, they are different in their result in that data aggregation converts frequent data to less frequent data by aggregating the most frequent until it matches with other variables, while data interpolation depends on the most frequent data to fill missed ones, e.g. taking the start and the end of the year's average to find the semi-annual observation. In this study, data interpolation process is used to match observations and keep observations as high as possible, instead of aggregating data and minimizing number of observations to the half.

In order to capture the maximum number of changes in credit rating among the group, it is decided to depend on S&P credit rating scale since it is the most frequent and up to date credit rating among the big three credit rating agencies according to past studies (Periklis, 2015; Karminsky *et al.* 2013).

In literature, there are different scales for converting credit rating, such as the 1-9 scale, 1-24 and 1-21 scales. The low scaled measure's main disadvantage is that it fails to capture all changes in values for the credit rating, so that by considering the scope and the time period of the data, it is found that a wide range scale can result in more reliable results. Therefore, the study considers a wide-scale of the 1-21 scale by dividing each one into three degrees in order to capture negative, stable and positive status of the rating.

In the study, in order to convert Basel III adoption reports into reliable values by considering the nature of the reports, it is decided to divide them into three eras. The first era starts in 2011 containing four semi-annual reports and each country has its own commitment evaluation out of four. The second era also contains four semi-annual reports and evaluates countries out of 16. The last era contains three semi-annual reports and evaluates commitment to the standards out of 68. In order to have logical results, it is decided to consider Switzerland and the European group as a base and ideal countries for the population. Switzerland and Europeans group base performance has been valued as 10 points. For example, if a country achieves less than 10 points, it means that its commitment is relatively lower than the base country, while if the score exceeds 10 points, it means that commitment is higher than the base country. In Table 1, the definition of the explanatory variables and expected signs are reported.

Table 1. Definition of Explanatory Variables and Expected Signs

Variable name	Definition	Source	Supporting literature	Sign
Basel III Adoption	Basel committee conducts its adoption reports in a regular semi-annual basis as described in BCBS adoption report, consists of four main adoption categories.	Basel Committee on Banking Supervision	Jul-Larsen (2014) Federal Reserve Bank of New York (2011) Mosko and Bozdo (2016)	+
Political Index	Political Risk Index ranked from low to high risk (highest is the most stable, Lowest is the least stable). The PRI is the overall measure of risk for a given country	Political Risk Service group-PRS	Standard and Poor's (2011)	+
GDP Growth	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.	World Bank	De Oliveira and Montes (2016) Reusens and Croux (2016) Afonso <i>et al.</i> (2011) Periklis (2015)	+
Inflation (CPI)	Consumer price indices (CPI) are presented in base years 2005 and, in addition, are measured in annual growth rate. The changes in CPI are normally used to assess price changes associated with the cost of living.	UNCTAD	Mellios and Paget-Blanc (2006) Periklis (2015) Rowland (2004) Afonso <i>et al.</i> (2011)	-
Current Account	Current account balance is the sum of net exports of goods and services, net primary income, and net secondary income. Data are in current U.S. dollars.	International Monetary Fund	Afonso <i>et al.</i> (2011) Rowland (2004)	+
Government Debt to GDP	Debt is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans.	International Monetary Fund	Reusens and Croux (2016) Periklis (2015) Rowland (2004)	-
Economic Freedom	Fundamental right of every human to control his or her own labor and property. In an economically free society, individuals are free to work, produce, consume, and invest in any way they please.	heritage.org- Economic Freedom Index	García <i>et al.</i> (2014) Afonso <i>et al.</i> (2011)	+
Corruption Control	Reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. High record represents higher transparency.	Transparency International	Periklis (2015) De Oliveira and Montes (2016)	+
Foreign reserves	Total reserves comprise holdings of monetary gold, special drawing rights, reserves of IMF members held by the IMF, and holdings of foreign exchange under the control of monetary authorities. The gold component of these reserves is valued at year-end (December 31) London prices. Data are in current U.S. dollars.	World Bank	Afonso <i>et al.</i> (2011) Periklis (2015) Rowland (2004)	+

In literature, many macroeconomic indicators such as GDP growth, government debt to GDP ratio and political stability are employed in previous studies to examine their effect on credit ratings. In this study, Basel III adoption is included in the model to examine its impact on the credit rating of 27 countries for the years between 2011 and 2016.

$$SP_{i,t} = \alpha_0 + \alpha_1 BSL_{i,t} + \alpha_2 ECO_FREE_{i,t-1} + \alpha_3 CACC_{i,t-1} + \alpha_4 CORR_{i,t-1} + \alpha_5 GDP_{i,t-1} + \alpha_6 DEBT_{i,t-1} + \alpha_7 INF_{i,t-1} + \alpha_8 POLST_{i,t-1} + \alpha_9 FRESERVES_{i,t-1} + \varepsilon_t \quad (1)$$

where;

SP is the Standard & Poor's CR, *BSL* is the Basel III adoption indicator obtained from BCBS semi-annual reports, *ECO_FREE* is the economic freedom index, *CACC* is the current account, *CORR* is the corruption control index, *GDP* is the GDP growth rate, *DEBT* is the government debt to GDP ratio, *INF* is the inflation rate, *POLST* is the political stability index, *FRESERVES* is the federal reserves and ε is the error term.

3. Empirical Findings

Before putting the variables into the regression model, it is important to assess the correlation between variables. The correlation matrix reported in Table 2 shows that there is a strong relationship between political stability, economic freedom and corruption control variables. Due to the nature of the population and due to high political stability, and economic freedom, these variables seem to be identical and have a very strong linear relationship between each other. Therefore, corruption control, economic freedom are excluded and political stability is kept as an indicator for the correlated variables. After exclusion, the proposed equation of the regression analysis becomes as follow:

$$SP_{i,t} = \alpha_0 + \alpha_1 BSL_{i,t} + \alpha_2 CACC_{i,t-1} + \alpha_3 GDP_{i,t-1} + \alpha_4 DEBT_{i,t-1} + \alpha_5 INF_{i,t-1} + \alpha_6 POLST_{i,t-1} + \alpha_7 FRESERVES + \varepsilon_t \quad (2)$$

Table 2. Correlation Matrix of the Variables

	BSL	ECO_FREE	CACC	CORR	FRESERVES	GDP	DEBT	INF	POLST
BSL	1.0000								
ECO_FREE	0.1202	1.0000							
CACC	0.1824	-0.1082	1.0000						
CORR	0.2097	0.8391	-0.0465	1.0000					
FRESERVES	0.1469	-0.2474	0.3811	-0.1926	1.0000				
GDP	0.0131	-0.1120	0.0965	-0.2217	0.3988	1.0000			
DEBT	0.0980	0.1325	-0.0623	0.3052	0.0755	-0.3107	1.0000		
INF	-0.1445	-0.5675	-0.0631	-0.5348	-0.1041	0.0014	-0.2230	1.0000	
POLST	0.1780	0.9212	-0.0411	0.8488	-0.1430	-0.0155	0.1851	-0.5662	1.0000

Next, Hausman test which is known as model misspecification test especially in panel data analysis is considered. The test helps to choose between fixed Effects model and Random effects model. Null hypothesis states that the preferred test is the random effects model, while the alternative hypothesis suggests the fixed effects model. If the p-value of the test is lower than 0.05, the null hypothesis (fixed effect is preferred) is rejected. On the other hand, if p-value is greater than 0.05 the null hypothesis (random effect is preferred) is accepted.

Table 3. Correlated Random Effects - Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. df.	Prob.
Period random	10.0899	7	0.1835

When the result of Hausman test reported in Table 3 is considered, it can be observed that the *p-value* is greater than 0.05. Thus, there is no sufficient evidence to reject the null

hypotheses, which stands for the random effect model. For that reason, in this study least squares-random period effect is considered as a regression model.

In the study, Levin-Lin-Chu unit root test is used and the results are shown in Table 4. A series is stationary if the mean and autocovariances of the series do not depend on time. Any series that is not stationary is said to be nonstationary. Standard inference procedures do not apply to regressions which contain an integrated dependent variable or integrated regressors. Therefore, it is important to check whether a series is stationary or not before using it in a regression.

Table 4. Unit Root Test Results

Variables	Test	Statistic	Conclusion
SP	Levin, Lin & Chu	-4.3754*** (0.0000)	1(1)
BSL	Levin, Lin & Chu	13.9108*** (0.0000)	1(0)
CACC	Levin, Lin & Chu	5.0072*** (0.0000)	1(0)
DEBT	Levin, Lin & Chu	17.2744*** (0.0000)	1(2)
FRSV	Levin, Lin & Chu	4.9449*** (0.0000)	1(0)
GDP	Levin, Lin & Chu	17.2744*** (0.0000)	1(0)
INF	Levin, Lin & Chu	8.4548*** (0.0000)	1(0)
POLST	Levin, Lin & Chu	8.5095*** (0.0000)	1(0)

Notes: 1(0): no unit root process at level; 1(1): no unit root process at 1st difference; 1(2): no unit root process at 2nd difference. *** denotes 1% significance level.

In order to get the most accurate results which assume low correlation between explanatory variables, a primary test has been performed to check the correlation between the explanatory variables. Basically, a high correlation is found between political stability, corruption control and economic freedom variables. Thus, two secondary variables are excluded from the model and political stability is kept in order to get a reliable result.

Levin-Lin-Chu unit root test is applied on the population's variables. The test results show that the population does not suffer from stationarity problems. Thus, the null hypotheses assuming a common unit root process is rejected. After performing the required tests of the analysis to measure the relationship between explanatory variables and credit rating factor, a restricted model is formed including all significant variables and ignoring insignificant variables. The Hausman specification test result is against the alternative hypothesis, in other words, it supports the null hypothesis for random effect as a preferred model for the analysis.

After applying regression analysis, least squares random effect model, the regression gives a strong statistical evidence for a relationship between credit rating and 6 variables out of 7 included in the model. These variables are: Basel III adoption, government to GDP, foreign reserves, inflation and political stability. On the other hand, no statistical relationship between current account and credit rating is reported between 2011 and 2016. The results of the analysis are reported in Table 5.

Table 5. The results of the regression analysis

Variable name	Coefficient
Constant (C)	-23.3151*** (4.3570)
Basel III Adoption (BSL)	0.4870*** (0.1517)
Current Account (CACC)	-0.0020 (0.0031)
Government Debt to GDP (DEBT)	-0.0466*** (0.0080)
Foreign Reserves (FRSV)	0.0037*** (0.0006)
GDP Growth (GDP)	-0.5870*** (0.1730)
Inflation (INF)	-0.0652*** (0.0062)
Political Stability (POL)	1.0045 (0.0472)
Observation	270
Adj. R²	0.8315

Notes: *** denotes 1% significance level. Standard errors are given in the parenthesis.

4. Conclusion

The results of the tests show that majority of the variables used in the study are determinants of credit rating of the G20 group members. Moreover, the analysis reports that there is a strong statistical evidence that commitment to Basel III standards have a positive effect on 27 countries credit rating in the period from 2011-2016.

Although current account is a decisive factor in determining credit rating in many past studies, it is not a determinant of credit rating for the 27 countries between 2011 and 2016. This could be attributed to the population being homogeneous. Also, GDP growth is a decisive determinant of credit rating in all past studies, it has a negative sign which contradicts with the literature, this bias can refer to the homogenous population of countries which has the highest GDP levels in the world and has a relatively low stable GDP growth which limits the ability to detect any relationship between dependent and independent variables.

Depending on the results of the analysis, it is suggested that policy makers implement the new accord requirements, as credit rating is expected to have positive movements along with time. According to Bayar and Kilic (2014), credit rating works as a buffer for the FDI which will have a general favorable effect on the whole economy. In addition, the adoption of the standards is found to be helpful for decision makers in order to enhance their economic position. To this end, they may include the first and second stage requirements of the accord which are; minimum capital requirements, capital conservation buffer, liquidity coverage ratio, leverage ratio disclosure requirements and D-SIB requirements.

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