Impact of sovereign credit rating and country risk on bond market of Pakistan

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ABSTRACT

This research investigates the impact of sovereign credit rating (SCR) and composite country risk on yield of Pakistan government bonds from period 1995 to 2015. Moderating variables added including Inflation rate, Current Account balance, GDP rate and Spot oil prices. Co-relation and Regression method used for analysis. From analysis of the first research question it's clear that bond yield has negative correlation with sovereign credit rating, inflation rate and current account balances. Which implies that when the value of all three variables including declined consequently value of bond yield jumped up. While Bond yield has positive correlation country risk. Which implies that if country is less risky, bond yield would be reduced. It must be noted that results are in line with many of researchers. While individual coefficients are concerned inflation rate has significant impact on bond yield of Pakistan. Country risk has also significant impact on bond yield of Pakistan. These results are in line with "Country Risk Report of Moody's" issued on 15 August 2106. There should be investigation about composite country risk (Pakistan placed at higher country risk ranking). What steps should be taken to improve the Sovereign credit rating of Pakistan? This topic would be interest of wider audience with respect to long term investments in bonds of Government of Pakistan. Because of higher risk of fraud in real estate market including scandals of DHA and poor industrial production, it's better for investor to invest in government bonds with minimum level of risk as compare to corporate bonds.

Keywords: Sovereign credit rating, Country risk, Bond yield

INTRODUCTION

According to Friedman (1999) commented "There are two superpowers in the today's world. There's the United States and there's Moody's Bond Rating Service. The United States can destroy any country by dropping bombs, and Moody's can destroy by downgrading your bonds. , it's not clear sometimes who is more powerful." This paper investigates role of sovereign credit rating and country risk in relation with Pakistan's government bond yield. Plenty of research carried out on sovereign credit rating and bond yield concerned with developed economies of European Union over the period of post financial crisis and debt crisis. Prime reason for selection of Pakistan on topic "impact of credit rating and country risk on bond yield", better credit rating could lead towards lower bond yield. Secondly dependence on the foreign lenders for example world bank and International Monetary Fund could be reduced. Thirdly it's better to sell government debt securities including treasury bills, notes and bonds instead of going for foreign loans form World Bank and IMF.

Composite country risk could be defined as country risk is composed of transfer and convertibility risk and cases of greater significant events (*e.g.* war, revolution, civil disturbance, floods, and earthquakes) Composite country classified into one of eight categories (0-7) through the application of a two-step methodology; The Country Risk Assessment Model (CRAM) produces a quantitative assessment of country risk based on three groups of risk indicators (the payment experience of the Participants, the financial situation and the economic situation). A qualitative assessment of the CRAM, considered country-by-country to integrate political risk and/or other risk factors not taken (fully) into account by the CRAM. Study tried to aanalyze correlation between sovereign credit rating, country risk, and bond yield of Pakistan from 1995 to 2015. Impact of sovereign credit rating and country risk on bond yield of Pakistan from 1995 to 2015.

This topic would be interest of wider audience with respect to long term investments in bonds of Government of Pakistan. Because of higher risk of fraud in real estate market including scandals of DHA and poor industrial production, it's better for investor to invest in government bonds with minimum level of risk as compare to corporate bonds. Secondly research could be useful for the Pakistani community living and working abroad in USA and Euro zone. Overseas Pakistani community must consider investment in Pakistan government bond because of minimum level of risk and higher return as compare to US, UK and other EU treasury bonds.

Moody's Sovereign risk report (2016) stated falling value of Pakistan's sovereign expected default frequency since June 2016, representing an increase in political stability and solid growth of economy of Pakistan. Report further emphasis that Pakistan's government reduced budget deficit to 4.2% in 2016 as compare to 5% in 2016.inflation rate of Pakistan also declined to 4.5% in 2016 as compare to 11.91% in 2011.Report

also claimed solid performance of Pakistan's economy because of better governance and political stability. As Moody's sovereign risk reports suggested the Pakistan risk reduced and sovereign credit rating improved; it would be a green signal for Pakistani Community to invest in bonds.

LITERATURE REVIEW

This part of research paper overlook the views of other researchers on similar topics. Vires and Haan (2016) investigated the relationship between sovereign credit rating and bond yield spread of Euro zone countries including Greece, Ireland, Italy, Portugal and Spain. They used the data from 1995 to 2014. They used data of average transformed credit ratings of Moody's, S&P's and Fitch. They found that earlier dynamics of credit rating and bond yield changed for the period from last quarter of 2009 to 2014. They suggested inverse relationship between average credit and yield spread of GIIPS for a particular period from 2009 to 2104 with the help of bar graphs. They used GDP growth, GDP per capita, investment as share of GDP, inflation, unemployment, the government budget balance as share of GDP, government debt as share of GDP and the current account balance as share of GDP are the explanatory variables for the determination of credit rating. They found that bond spreads could not be decided any more by credit rating agencies. They concluded that credit rating agencies showed conservative behavior in order to determine the sovereign credit risk after 2012.

Ozmen and yasar (2016) analyzed the relationship between credit rating and emerging market bond index of twenty three countries. They also investigate the impact of credit rating on bond spread during financial crisis of 2008.They used daily data of credit rating and emerging market bond spread from 1998 to 2012. They used panel data co integration and error correction model in order to judge the impact. They suggested that rating downgrades from investment to speculative status significantly increases spread of emerging market bonds. They also found impact of credit rating significantly decreases on spread of emerging market bonds after recent global financial crisis.

Bayar (2012) examined sovereign risk rating methodologies and used them as an early warning indicator for investors in relation Euro zone sovereign debt crisis. He found Eurozone member countries did not had enough saving in order to meet the repayment of investments during debt crisis. He suggested investors should not follow credit rating blindly, instead they should observe other indicators.

Dhawan and Yu (2105) examined the relevance of credit rating in corporate bond market of China. They used data of credit rating mainly from China Chengxin International Credit Rating Co for the period starting from first quarter of 2005 to third of quarter of 2013. They used the data of three types of bonds including commercial papers, medium term notes and long term corporate bonds. They used descriptive analysis in order to study the characteristics of all three types of bonds. They selected the regression analysis in order to find out the impact of credit rating on bond yield of all three types of bonds.

They used yield spread, guarantee, issuing amount, total assets and ratio of total debt to total asset as variables. They found that credit rating explained spread of bonds in Chinese bond market. They also discovered investors consider bond rating valuable with respect to risk of Chinese bonds. Jaramillo and Weber (2012) investigated determinants of bond yield of emerging economies including Pakistan. They selected twenty six emerging countries as case study. They used panel data method for analysis. They found that bond yield mainly effected by inflation and GDP growth projections.

Ory and Raimbourg (2015) investigated impact of rating announcements on European credit spread. They covered twelve euro zone countries and UK. They used the data of credit rating from world leading credit agencies from January 1999 to December 2005. They calculated spread of Euro bonds by using German government bond rates and for sterling bonds Data stream index of returns on UK government bond used. They used unit root test, multi correspondence analysis and cluster analysis. They found that insignificant reaction of investors to announcement of credit rating for the bond issues in Euro.

Afonso et al. (2011) analyzed the effects of sovereign credit rating announcements of both upgrades and downgrades on sovereign bond yield spreads in European countries. They conducted granger causality test on selected variables of ratings and yield spreads. They found that countries downgraded six months ago having higher yield, while countries have not been downgraded having persistence yield. They concluded bi-directional causality between sovereign credit rating and spreads in one to two weeks' time.

Baum et al (2013) explained the effect of credit rating agency announcement on Eurozone sovereign debt crises. They select the yield of long term bond of France, Italy, Germany and Spain over the period of 2011 and 2012.They used GARCH model .They showed that downgrade announcement from credit rating agencies (CRA) increase the yield of French, Spanish and Italian bonds; while CRA never touch German rating status. They suggested that no evidence of ganger causality from bond yields to rating announcements. Consequently investors shifted from financially ill EU states to financially stable EU states.

Contrasting evidence could be found as reported by Moore (2016) in Financial Times UK, in July 2016 UK lost it AAA credit rating, despite downgrading credit rating benchmark gilt yields decreased to a new record low. Many of studies discussed above suggested decrease in credit rating enhanced the bond yield respective country. But reverse happened in the case of UK. El-shagi and Schweinitz (2016) investigated joint relationship of sovereign credit rating and bond yield. They used data set forty six countries from 1980 to 2015 including advanced, transit countries and developing countries. They found if a rating shock derives a country below a B rating, risk premium can jump up. While impact of rating is ignorable for better rating countries. Down grade ratings have worst effect on developing countries and higher cost has to be paid for longer time.

Nassir, Fah and chee (2015) identified macroeconomic

determinants of sovereign credit ratings. They select fifty three countries and time period from 2000 to 2011.They use nine macro-economic variables and add three qualitative variables including history of default, economic development and economic freedom. They found that economic freedom indicator significantly determines country's credit rating. They also suggested that credit rating agencies are both backward looking and forward looking in order to determine the sovereign credit rating.

Yang and Zhang (2011) investigated impact of sovereign credit ratings on exchange rate of Euro zone countries as well as Sweden. They used the daily data of US dollar/Euro and US dollar /SEK from 1st January 2009 to March 31, 2010. They included seventy one sovereign rating announcement concerned with Euro zone. They used descriptive statistics and EGARCH model for analysis. They found that Sovereign rating announcement greatly affect the volatility of US dollar/Euro. They suggested that Euro zone sovereign rating news insignificantly effect the mean of UD dollar/SEK.

METHODOLOGY

Easterby-Smith *et al* (pp.57-59, 2008) described the implications of positivism. Firstly researcher should be independent from the research and human interests are totally irrelevant to research. Secondly explanation of research should be described the cause and effect relationship. Thirdly research moved forward by developing the hypotheses and applying the deduction approach. Fourthly the better analysis of problem can be performed by dividing the problem into many simple parts and large number of data required for analysis, this data should be selected randomly. Positivism research philosophy is used in this research. Robson (2002) gave five stages through which deduction research must be going through. At first stage derive a hypothesis from the theory. At second stage express the hypothesis in working terms, which proposes the relation of between two variables. Thirdly testing designed operational hypothesis. At fourth stage analysis the specific outcome of inquiry. Finally modify theory in the presence of findings if it's necessary. Theory and hypothesis are developed by the use of deduction approach and later hypothesis are tested by designing research strategy (Saunders *et al*, pp.117, 2007).

Research Classification

Research has asymmetrical relationship which means change in one variable is responsible for change in other variable. As bond yield depends on changes in sovereign ratings and composite country risk that means it has causal relationship. So this study classified in terms of explanatory research.

Secondary data is used for quantitative analyses to examine the impact of sovereign credit rating on bond market of Pakistan from 1995 to 2015. Data about all variables included in Appendix 1.

Data regarding rating news is taken from three leading credit rating companies (Moody's, S&P, and Fitch websites) of the world. Data regarding inflation rate, GDP growth and current account balances (% of GDP) adopted from World Economic Indicators. Data related to country risk borrowed from OECD country risk classification.

Annual data of selected variables taken from 1995 to 2015. Bond market yield is dependent variable. While sovereign credit rating is independent variable. It must be noted sovereign credit ratings give investors insight into the level of risk associated with investing in particular country. Moderating variables are those variables that increase the strength of relation between independent and dependent variables in the research. There are three moderating variables including inflation rate, GDP growth and current account to GDP.

Research Models

In order to find out correlation among the selected variables the method of Pearson correlation would be used for first question.

Regression Analysis with Explanation

In this research Linear Multiple Regression model. Regression analysis is that model which is used to check the impact of independent variables on the dependent variables. The Regression Equation is given below for bond market yield:

$$Y = \alpha + \beta 1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \varepsilon i \dots\dots\dots\dots (i)$$

Where, Y = Bond Yield, X_1 = credit rating, X_2 = inflation rate, X_3 = GDP growth, X4 = country risk, X_5= Current account to GDP, α = Constant, c = Regression Coefficient, and εi = Error arising due to other variables. R-squared is also known as coefficient of determination, or the coefficient of multiple determination for multiple regressions. In other sense, it is the percentage of response variable variation that is explained by a linear model.

DISCUSSIONS

Table 1
Pearson Correlation

		Bond yield	Inflation Rate	GDP %	Credit Rating	Country Risk	Current Account Balance % GDP
Bond Yield	Correlation	1	-.068	.011	-.076	.224	-.160
	Sig.		.765	.960	.738	.317	.478
	N	22	22	22	22	22	22

Bond yield has negative correlation with Sovereign Credit rating, Current Account balances. Which implies that value of these variables declined consequently bond yield increased. While GDP growth and country risk both has positive correlation with bond yield. Which means that when country risk increased bond yield also increased.

Table 2
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.459*	.211	.038	1.1026

From the Model summary it's clear that overall 21.1% changes in bond yield of Pakistan explained by independent variables including credit rating, country risk and other

moderating variables. While R represent 45.9% positive correlation of bond yield with all independent variables. It should be noted that there is insignificant impact of credit rating, country risk and other moderating variables on bond yield of Pakistan. It must be noted that value of r square is less because unavailability of daily data of yield of government bonds in the case of Pakistan.

It should be noted that full detail of coefficients could be found in appendix 2. Inflation rate has negative impact on bond yield of Pakistan. Credit rating only responsible of 23.3% changes in bond yield of Pakistan. While country risk has positive impact on bond yield of Pakistan. Finally current account balances are responsible -48.2% changes in bond yield.

CONCLUSIONS

From analysis of the first research question it's clear that bond yield has negative correlation with sovereign credit rating, inflation rate and current account balances. Which implies that when the value of all three variables including declined consequently value of bond yield jumped up. While Bond yield has positive correlation country risk. Which implies that if country is less risky, bond yield would be reduced. It must be noted that results are in line with many of researchers.

From analysis of second question, insignificant impact of SCR (sovereign credit rating), country risk and other moderating variables on bond yield of Pakistan. While individual coefficients are concerned inflation rate has significant impact on bond yield of Pakistan. Country risk has also significant impact on bond yield of Pakistan.

These results are in line with "Country Risk Report of Moody's" issued on 15 August 2106. Jaramillo and Weber (2012) found bond yield effected by inflation rate and GDP growth .Afonso et al. (2011) found that countries downgraded six months ago having higher yield, while countries have not been downgraded having persistence yield

The topic would be interest of wider audience because of following
- Long term investment in Pakistan government bonds is safe and mild level of returns
- Higher risk of fraud in real estate market(Scandal of DHA)
- Safe investment in Pakistan as compare to corporate bonds
- Overseas Pakistani community must consider investment in Pakistan government bond because of minimum level of risk and higher return as compare to US, UK and other EU treasury bonds.

RECOMMENDATIONS

Research should be conducted for emerging countries like Pakistan. Investors should not follow sovereign credit rating blindly but other economic indicators for example Exchange rate and inflation rate must be considered. There should be investigation about composite country risk; Why Pakistan placed at higher country risk ranking always? What steps should be taken to improve the Sovereign credit rating of bond spreads of the GIIPS, Applied Economics Letters, Pakistan.

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