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POLICY STRATEGY TOWARDS ACHIEVING INVESTMENT GRADE STATUS FOR EMERGING ECONOMIES

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Abstract

The paper discusses a possible policy strategy towards achieving an investment grade status for emerging economies. Through the use of an econometric model, it determines which among the macroeconomic variables considered by Credit Rating Agencies (CRAs) impacts speculative and investment grade economies. More importantly, it ranks these macroeconomic determinants according to its largest effect on the probability of achieving an investment grade status. This vital information will aid policymakers in identifying target areas where government efforts and resources should be focused.

Key Words: Credit Ratings, Credit Rating Agencies, Governance, Political Stability Indicators, Investment Grade, Econometric Model with Panel Data

JEL Classification: E44, F34, C33

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1. Introduction

Recent events in economic history have raised public policy concerns regarding shortcomings of Credit Rating Agencies (CRAs) arising from conflicts of interest, transparency and accountability. The 1990s witnessed the pronounced boom-bust cycles in emerging markets lending, culminating in the Asian financial and currency crises. During this period, CRAs earned a conspicuous reputation for failing to forewarn the Mexican and Asian crises. These crises have also demonstrated the vulnerability of emerging markets associated with the reversal of private capital inflows. Moreover, the endogenous effects of capital flows on macroeconomic variables seem to remain underemphasized in rating assessments. The recent global financial crisis appears to produce the same sentiments regarding rating agencies.

Despite these criticisms, CRAs still play a critical role in financial markets by reducing information asymmetry between borrowers and investors. By serving as information intermediaries, CRAs increase the pool of potential borrowers and promote liquid markets. These functions increase supply of capital in the market and support economic growth.

A sovereign investment grade status eases government's financing cost and cascades this benefit to other borrowers of the same nationality. This also significantly contributes towards depicting a picture of relative financial stability. Moreover, it helps in attenuating boom-bust cycles. During the boom, early rating downgrades would help dampen euphoric expectations and reduce private short-term capital flows which have repeatedly fuelled credit booms and financial vulnerability in capital importing economies. Through time, their role has also expanded with financial globalization and gained more prominence from international regulatory bodies recommending ratings

from CRAs to be incorporated into the rules for setting weights of credit risks.

From the perspective of sovereign debt issuer and policymaker, a particular interest would be on the variables used by CRAs in determining sovereign credit ratings. Possible policy questions that would arise from credit rating determinants are: (i) Do CRAs differentiate between emerging and advanced economies?; (ii) What kind of variables differentiate investment grade economies from speculative grade?; and (iii) If indeed, there are variables distinctively separating between rating categories, which variable has the greatest probability of credit rating upgrade? This study attempts to find answers to these questions and offer strategic areas of policy improvement for emerging economies.

2. Review of Related Literature

A number of economists have estimated econometrically the determinants of credit ratings for both advanced and emerging markets (Cantor and Packer, 1996; Bhatia, 2002). In these studies, a number of explanatory variables explain ninety (90) percent of the variation in ratings:

- GDP per capita;
- GDP growth rate;
- Inflation rate;
- The ratio of non-gold foreign exchange reserves to imports;
- The ratio of current account balance to GDP; and
- Default history and the level of economic development.

Borenszstein and Panizza (2006) found a single variable GDP per capita explaining about eighty (80) percent of the variation in credit ratings. It is worthy to note that the fiscal position as measured by government budget/deficit ratio to GDP was found to be statistically insignificant while including political events can improve the explanatory power of the regressions as observed by Haque et al. (1998) while creditworthiness appears to be determined primarily by economic

variables. In addition, two other variables adversely affect ratings for emerging market economies namely:

- Increases in international interest rates; and
- Structure of its exports and its concentration.

Juttner and McCarthy (2000) found a structural break in ratings assessments in 1997 in the wake of Asian financial crisis. The authors added that this means that in a global financial crisis, models might become completely obsolete since a stable relationship between rating and determinants might not be robustly identified. In their analysis of the determinants of credit ratings during the Asian crisis, they found the following variables were significant:

- The CPI rate;
- Ratio of external debt to exports;
- A dummy variable for default history;
- Interest rate differential; and
- Real exchange rate.

Variables denoting financial strength were not found to be significant determinants of sovereign ratings even one year after the Asian crisis. However, these variables were subsequently included in ratings assessments by the major CRAs following their unsatisfactory performance during the Asian crisis.

3. Empirical Model of Sovereign Rating Determinants

3.1 Model

Ratings are qualitative measures of relative likelihood a sovereign economy will default on its obligations. Considering that the relationship between rating notches is not linear, using traditional Ordinary Least Square (OLS) method could be inappropriate as it assumes that the difference between ratings AAA vs. AA+ is the same as the difference between ratings BBB vs. BB+. For this reason, we choose an ordered probit context, where the cut-off points that divide each category are

estimated by the model. We also use a panel data technique as the main advantage is that it allows for more sample variability including both temporal and spatial dimensions.

Each CRA makes an evaluation of a country's creditworthiness based on a set of variables (Eq. 1), where R_{it} is the evaluation of the CRA on the creditworthiness of a sovereign economy (i) in period t. X_{it} is a set of independent variables that explain the behavior of R_{it}. The term a_{it} is the unobserved effect for each economy which could be thought as a variable that CRAs consider when assigning a rating that cannot be measured directly. Lastly, the term u_{it} represents statistical error that is assumed independent across time and economies.

$$R_{it} = X'_{it}\beta + a_{it} + u_{it} \qquad \text{Eq. 1}$$

There are two approaches to estimate the model's parameters:

1. Fixed effects, where a_{it} is treated as parameters to be estimated along with β without specifying any assumption about their relationship.

2. Random effects, where a_{it} and β are considered as random variable with the density function specified by the modeler.

In the first case, a joint estimation of a_{it} and β results in incidental parameter problems as the number of groups tends to approach infinity, the number of parameters to be estimated increases as well which have the propensity to make estimators inconsistent. The second approach assumes that the correlation effect between the observed and unobserved variables is zero. Given the limitations of a fixed effects model, the random effects estimation seems to be a better alternative.[2] The random effects model supposes the following:

- $Cor\,(X_{it}, a_{it}) = 0$
- $a_{it} / X_{it} \approx N(0, \partial_a^2)$

2. During the econometric exercise, the authors run the fixed effects model on the panel data as well. The model converges and the results are comparably robust with random effects model.

Both assumptions imply that a_{it} and X_{it} are independent and a_{it} is normally distributed. Under both assumptions, X_{it}, a_{it}, u_{it} are estimated by the conditional maximum likelihood. Because a_{it} is not observed, it does not appear in the likelihood function. Instead we find a_{it} in the joint distribution of (R_{1t} R_{2t} ... R_{it}) conditional on X_{it}, a step that requires the integration of a_{it}. Since a_{it} is normally distributed $(0, \partial_a^2)$, the vector of the parameters θ include β, ∂_a^2 and u_{it}. The likelihood function can be maximized with respect to β, ∂_a^2 and u_{it}, to obtain $\sqrt{n}$ consistent asymptotically normalized estimators.[3]

If one cannot assume that the correlation between the unobserved variable and the regressors is zero, the relationship between them can be modeled. Drukker (1998) allowed for correlation between a_{it} and X_{it} assuming a conditional normal distribution with non-linear expectation and constant variance, $a_{it} / X_{it} \approx N(\theta + \bar{X}_i, \partial_a^2)$. This assumption transforms Eq. 1 into the following:

$$R_{it} = X_{it}'\beta + \bar{X}_i + \varepsilon_{it} + u_{it} \qquad \text{Eq. 2}$$

From Eq. 2, we can identify short-run effects which include the effect of cyclical deviations to historical averages (trend). Most importantly, it identifies the ranking of the variables that determine which among them will have the most significant effect for a rating upgrade.

3. In this regard, the magnitude of coefficients of explanatory variables can be compared with each other directly.

3.2 Data

This study uses data for eighty nine (89) economies for the period 2011 and 2012. The time period coverage is based on the extent to which data are available for most SEACEN economies. The economies included in the study are listed in the table below. Those indicated in bold font are the fifteen (15) SEACEN economies included in the econometric model.

Table 1: Economies Included

Argentina	Denmark	Jordan	Paraguay	Trinidad & Tobago
Australia	Dominican Republic	Kazakhstan	Peru	Tunisia
Austria	Ecuador	Kenya	**Philippines**	Turkey
Bahrain	Egypt	Kuwait	Poland	Ukraine
Bangladesh	El Salvador	Latvia	Portugal	United Kingdom
Belgium	Estonia	Lebanon	Qatar	United States
Belize	**Fiji**	Lithuania	Romania	Uruguay
Bolivia	Finland	Luxembourg	Russia	Venezuela
Botswana	France	**Malaysia**	Saudi Arabia	**Vietnam**
Brazil	Germany	Malta	**Singapore**	
Bulgaria	Greece	Mexico	Slovakia	
Cambodia	Hong Kong	**Mongolia**	Slovenia	
Canada	Hungary	Morocco	South Africa	
Chile	Iceland	Netherlands	**South Korea**	
China	**India**	New Zealand	Spain	
Colombia	**Indonesia**	Nigeria	**Sri Lanka**	
Costa Rica	Ireland	Norway	Sweden	
Croatia	Israel	Oman	Switzerland	
Cyprus	Italy	Pakistan	**Chinese Taipei**	
Czech Republic	Japan	**Papua New Guinea**	**Thailand**	

Ratings by Standard and Poor's, Moody's and Fitch are the dependent variables while macroeconomic and governance indicators are used as explanatory variables. The macroeconomic indicators considered in the model as determinants of sovereign ratings are listed in Table 2. Data for most of the explanatory variables are from the World Bank's World Development Indicators and the International Monetary Fund's World Economic Outlook which are publicly available.

Table 2: Explanatory Variables

Macroeconomic Indicators:

- Government budget balance as a percent of GDP;
- Capital account balance as a percent of GDP;
- External debt as a percent of exports of goods and services;
- Per capita GDP (in US dollars)
- Real GDP growth rate
- Real per capita GDP (in US dollars)
- Gross government debt as a percent of GDP;
- Inflation rate
- Unemployment rate; and
- Foreign exchange reserves in months of imports.

Governance indicators used in the analysis are:

- World Bank indicator of government effectiveness; and
- World Bank indicator of political instability

In addition, dummy variables were included for the following: membership in the European Union (1 if EU member); prior history of default on sovereign obligations (1 if defaulted); and level of economic development (1 if developing economy).

3.3 Estimation Results

The first step in the empirical analysis is to convert the letter grade from the three major agencies to a numerical equivalent. In the scale used for the empirical exercise (see Table 3), one (1) denotes the lowest rating and seventeen (17) denotes the highest rating. According to the literature (Hong Kong Monetary Authority 2010, for example), the logistic scale is more indicative of reality than the linear scale since the credit rating adjustment does not follow a standardized interval. Therefore we utilized logistic transformation of credit ratings in the econometric exercise.

Table 3: Sovereign Ratings Conversion from Letter Grade to Numeric Scale

	Standard & Poor's	Fitch	Moody's	Numeric Grade Transformation	
Investment Grade				Linear	Logistic
Highest credit quality	AAA	AAA	Aaa	17	3.50
Very high credit quality	AA+	AA+	Aa1	16	2.34
	AA	AA	Aa2	15	1.76
	AA-	AA-	Aa3	14	1.35
High credit quality	A+	A+	A1	13	1.02
	A	A	A2	12	0.74
	A-	A-	A3	11	0.48
Good credit quality	BBB+	BBB+	Baa1	10	0.24
	BBB	BBB	Baa2	9	0.00
	BBB-	BBB-	Baa3	8	-0.20
Speculative Grade					
Speculative	BB+	BB+	Ba1	7	-0.50
	BB	BB	Ba2	6	-0.70
	BB-	BB-	Ba3	5	-1.00
Highly speculative	B+	B+	B1	4	-1.40
	B	B	B2	3	-1.80
	B-	B-	B3	2	-2.30
High default risk	CCC+ and below	CCC+ and below	Caa1 and below	1	-3.50

Source: Sovereign Credit Rating: Hong Kong's Experience", Hong Kong Monetary Authority (2010).

Table 4 shows the results estimating Eq. 1 with three different techniques: pooled, random effects and fixed effects which reports the unrestricted model incorporating all variables listed in Table 2. With the unrestricted random effects model[4], we found that almost eighty percent (80%) of variation in credit ratings can be explained by a handful of statistically significant variables similar to the study of Cantor and Packer (1996) and Bhaita (2002) except for per capita GDP, real GDP growth rate and real per capita GDP that were estimated to be insignificant in our model. However, we found variables of financial strength (i.e. external debt as percent of exports of goods and services, foreign exchange reserves in monthly imports) statistically significant unlike in the study of Juttner and McCarthy (2000). Among the three

4. The Hausman specification tests did not reject the null hypothesis suggesting that the random effect model is consistent and efficient than the fixed effect model.

dummy variables, only default history turned out to be significant at the 10% significance level. In addition, we found fiscal position to be statistically significant unlike Borensztein and Panizza (2006). In contrast with Haque et al. (1998), we found governance and political events to be critical in credit worthiness assessment. The relative importance of governance and political indicators would be further highlighted in our marginal effect analysis as shown in Table 6.

Table 4: Unrestricted Regression Results

Variable	Pooled Regression	Random Effects	Fixed Effects
Government Budget Balance to GDP	0.05**	0.03**	0.02**
Capital Account Balance to GDP	0.06**	0.01**	0.00**
External Debt as Percent of Exports of Goods and Services	-0.09***	-0.38***	-0.45***
Per Capita GDP	0.00	0.00	0.00
Real GDP Growth Rate	0.12	-0.34	-0.59
Real Per Capita GDP	0.20	-0.40	-0.60
Gross Government Debt to GDP	-0.05***	-0.18***	-0.24***
Inflation Rate	-0.05***	-0.02**	-0.05**
Unemployment Rate	0.06	0.19	-0.03
Foreign Exchange Reserves in Months of Imports	0.00***	0.16***	0.29**
World Bank Indicator of Government Effectiveness	3.40**	3.12**	2.64
World Bank Indicator of Political Stability	2.07**	1.63**	1.70
European Union Dummy Variable	2.33	1.01	1.57
Default History Dummy Variable	-1.24*	-0.35*	-0.36*
Economic Development Dummy Variable	-0.12	-0.11	-0.14
Constant	9.09**	8.02**	8.54
R-Squared	0.69	0.78	0.73

Table 5 reports the restricted model by excluding variables which are not statistically significant and whose sign is different from expectations. The Wald tests were used to exclude variables that did not reveal any explanatory power. After the process of alternative exclusions, a handful of regressors narrow down the number of credit rating determinants into nine (9) from the original twelve (12) explanatory variables. The variables found to be significant in the unrestricted model generally remain significant with the same expected sign direction as in the restricted model. Furthermore, real per capita GDP that was insignificant in the unrestricted model turned to be significant. Although the exclusion process moderate the explanatory power of the model, it still accounts for more than sixty percent (60%) of ratings variation.

Table 5: Restricted Regression Results

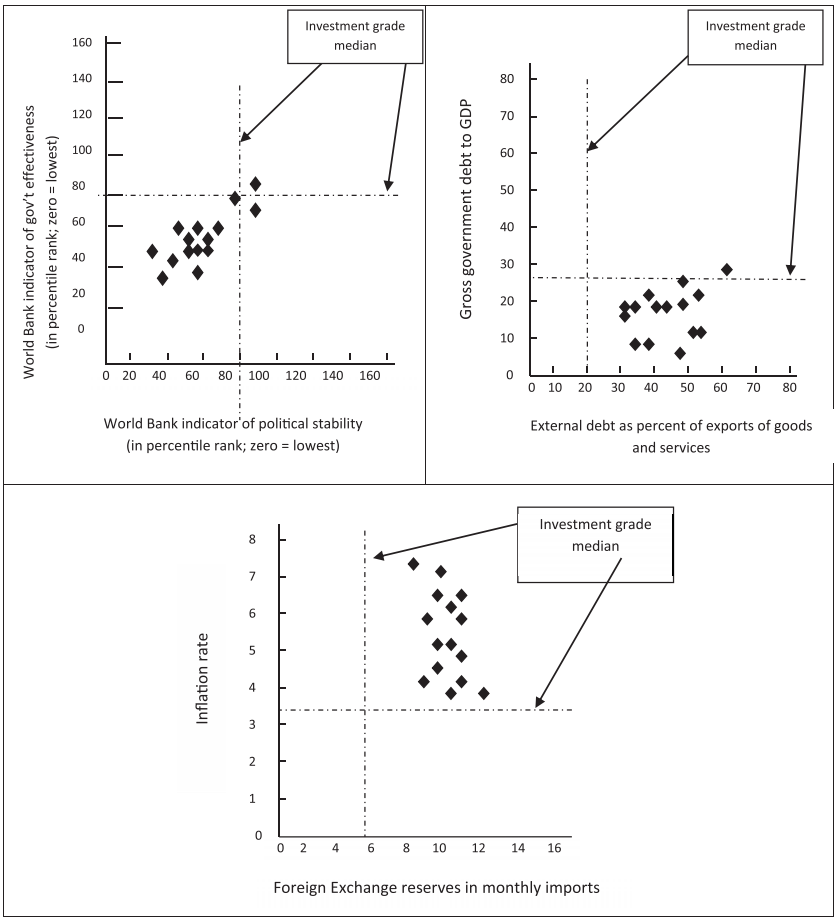
Variable	Pooled Regression	Random Effects	Fixed Effects
Government Budget Balance to GDP	0.01**	0.02**	0.05
Capital Account Balance[5] to GDP	0.03	0.03	0.00
External Debt as Percent of Exports of Goods and Services	-0.09*	-0.25*	-0.22**
Real Per Capita GDP	0.12**	0.20**	0.59
Gross Government Debt to GDP	-0.05*	-0.18**	-0.24**
Inflation Rate	-0.01*	-0.02**	-0.01**
Foreign Exchange Reserves in Months of Imports	0.23**	0.36**	0.91**
World Bank Indicator of Government Effectiveness	0.35*	4.56*	2.64
World Bank Indicator of Political Stability	2.96**	1.80**	3.83
Default History Dummy Variable	-2.43*	-1.44*	-1.27*
Constant	7.53*	6.44*	10.55
R-Squared	0.57	0.61	0.54

*** significant at 1%; ** significant at 5%; * significant at 10%.

Figure 1 depicts the 2011 values of economies that are rated as BB/Ba against the determinants of investment grade economies. The BB/Ba ratings are just a rating category below investment grade (BBB-/Baa3). There are fifteen (15) economies rated one notch below investment grade. In terms of governance and political stability indicators, most of BB/Ba economies are below investment grade median. Moreover, BB/Ba economies reflect worse external debt (as percent of exports of goods and services) and inflation rate with the exception of gross government debt to GDP and foreign exchange reserves in monthly imports. This implies that CRAs tend to place secondary importance on gross government debt to GDP and foreign exchange reserves in monthly imports while more emphasis is put on governance and political stability indicators. In other words, emerging economies which have less government debt and can cover more imports with foreign exchange reserves but still exhibiting poor governance and political instability is likely to remain in the speculative grade status. Unlike the case of developed economies, which while revealing high debt levels and less foreign exchange reserves to service debt but demonstrates superiority in governance and political stability indicators would be rated as investment grade.

5. For the restricted model, we performed the alternative exclusion process by dropping the insignificant variable (capital account balance). We obtain similar robust results even without the excluded variable.

Figure 1: Determinants of Rated BB/Ba Economies against Investment Grade Economies for 2011



A marginal effect analysis on BB/Ba sovereigns would suggest an indicator where efforts should be concentrated for those emerging and developing economies seeking an upgrade to investment grade[6]. Table 6 shows the marginal effects on the probability of investment grade status for the top 5 variables. For instance, a ten (10) point increase in political stability indicators (World Bank indicator of government effectiveness and political stability) which implies an improvement in risk perception would increase the probability of investment grade by 14.3 percentage points. A ten (10) point increase in the level of foreign exchange reserves in months of imports would raise the probability of investment grade by 3.3 percentage points, less than half the size of the impact of political risks. Similarly, a ten (10) percentage point decline on aggregate level of debt (external debt and gross government debt) would increase the probability of investment grade to 3.6 percentage points. More importantly, the analysis of marginal effects offered a deeper insight on the variable that provides the greatest impact on the probability of credit rating upgrade. While it is desirable for BB/Ba economies to improve on all indicators, progress on the process of fiscal consolidation resulting in a steady reduction of debt levels should not be overlooked because of its relative importance in the marginal effects analysis. It also cannot be overemphasized that prioritizing political stability and good governance would be the most important in achieving a better rating.

Table 6: Marginal Effects on the Probability of Investment Grade Status

Variable	Marginal Effects
World Bank indicator of government effectiveness	0.74
World Bank indicator of political stability	0.69
Foreign Exchange reserves in months of imports	0.33
External debt as a percent of exports of goods and services	0.25
Gross government debt to GDP	0.11

6. Most of the SEACEN members included in this study belong to the IMF category of emerging and developing economies.

4. Conclusions

An analysis of the panel data whereby we distinguish investment grade economies from speculative grade revealed an in-depth insight. For speculative grade economies which include a few SEACEN members, one remarkable policy implication arises. The larger weight placed by CRAs on political stability indicators (government effectiveness and political stability) suggests that efforts by speculative grade economies to increase the likelihood of an upgrade to investment category should focus on improving governance and political stability. The good governance and political stability are broad concepts that encompass economic institutions and public sector management including transparency, accountability, regulatory reform and public sector leadership. In the case of emerging market economies including SEACEN members, relevant issues that need to be addressed include combating corruption, building independent judiciaries, observance of civil and political rights, government responsiveness, credible election and promoting stability in the regulatory environment (i.e. price systems, exchange regimes and banking systems). External sector related macroeconomic indicators such as foreign exchange reserves and external debt are seen as important factors as well that need to be addressed for an upgrade to investment category.

A corollary contribution of this paper is to have an estimated model in which we can differentiate variables in terms of economic development. In contrast to other papers where separate models are estimated, the inclusion of dummy variables to distinguish developing economies allows for incorporating the entire sample into a single model, thus increasing the model's precision. This also provides a better understanding of which variables having impacts on which countries or which one affects all of them.

A policy strategy on achieving an investment grade status is a laudable approach in depicting an economy of relative financial stability. Even for economies with investment grade status, an upgrade to a higher notch would further strengthen the depiction of financial stability. As all policymakers would appreciate, a third party vote of confidence on sovereign stability cascades down to the whole economy.

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