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Case Study: DBRS Sovereign Rating of Portugal. Analysis of Rating Methodology and Rating Decisions

Annika Luisa Hofmann, Miguel Ferreira, João Lampreia

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Annika Luisa Hofmann, Miguel Ferreira, João Lampreia[1]

Abstract

This paper analyzes and assesses the DBRS sovereign credit rating methodology and its rating decisions on Portugal. A replicated rating model on Portugal allows to assess the DBRS rating methodology and to identify country-specific risk factors. An OLS regression compares rating effects of ten fundamental variables among S&P, Moody's, Fitch Ratings and DBRS. Further, a rating scale model fractionally disentangles DBRS rating grades into their subjective and objective rating components. Both qualitative and empirical findings attest DBRS a comparably lenient rating behavior on Portugal – in comparison to other rating agencies as well as within the DBRS cross-country rating decisions.

Keywords: Sovereign Risk Model, Portugal, Subjective Rating Component

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1 Introduction

Sovereign credit ratings exercise strong economic and political influence on a country, particularly through its strong market signaling effects.[2] Ratings take a significant role in determining a country's (re-) financing conditions on the financial markets. Further, a potential credit downgrade can expose a country to limited institutional support – institutional investors are legally constrained from buying bonds with ratings below specific rating levels classified as "non-investment" status. Instancing, Portugal has been withdrawn the sovereign "investment grade" status by all renown rating agencies in the course of the financial crisis – primarily due to high public and private sector indebtedness, weak economic growth and a labile banking sector. The rather unknown Canadian rating agency DBRS on the contrary has been holding on to attesting Portugal "investment grade" status. The attestation of a sovereign "investment grade" by at least one major rating agency acts as the legal prerequisite for the government bond buying and refinancing programs of the ECB, and thereby ascribes the DBRS (future) sovereign risk assessment of Portugal decisive political and economic influence.[3]

This paper has been established in the course of a directed research internship at Banco de Investimento Global. The objective of this paper is to qualitatively and empirically analyze the DBRS sovereign credit rating methodology. Focus is specifically laid on its rating decisions on Portugal. The replication of the DBRS sovereign risk model of Portugal serves to identify and quantify key risk factors as well as give an assessment on technical specifications. The qualitative part assesses cross-agency historical ratings of Portugal and elaborates on general differences in rating methodologies among the major rating agencies. The empirical analysis of DBRS ratings closely follows the analysis approach by Vernazza, Nielsen and Gkionakis (2014). A panel OLS regression allows to compare rating effects of ten best-fitted fundamental variables among rating agencies. A rating scale model introduced by Studer and Winkelman (2016) fragments DBRS rating grades into their subjective and objective rating components.

This paper contributes to existing academic literature as well as adds value for active market participants. Current literature on sovereign ratings is mostly limited to the rating analysis of S&P, Moody's and Fitch Ratings. The inclusion of DBRS rating decisions – applied at the case of Portugal – therefore allows to undertake a more comprehensive discussion on sovereign ratings. Further, an alternative statistical rating model for the purpose of sovereign risk analysis is being introduced and applied. Against the backdrop of DBRS's significance with reference to the continuation of the bond purchase and financial sector refinancing programs, a better understanding and estimation of DBRS (future) rating decisions serves a crucial purpose equally for investors, institutions and politicians.

My key findings can be summarized as follow. The DBRS rating methodology lacks transparency. Susceptibility to debt shocks is significantly underrepresented. The replicated DBRS sovereign risk model of Portugal identifies the "political commitment to fiscal consolidation" as the striking justification for the ongoing issuance of investment-grading.[4] The OLS regression identifies a country's past default history, governmental effectiveness, rule of law and the long-term growth rate to have significantly greater effects under the DBRS rating framework than it is the case for S&P, Moody's and Fitch Ratings. The rating scale model by Studer and Winkelmann attests DBRS to subjectively inflate its objective (fundamental) rating decisions of Portugal on average by one rating notch. Portugal's subjective rating component has been diminishing over time, suggesting the rating grades to gradually approach their "fundamental" value. The cross-country subjective adjustment average is neutral. The DBRS rating decision on Portugal is, in the

[2] Sovereign credit ratings are defined as long-term foreign-currency issuer ratings throughout this paper.
[3] The ECB purchases governmental bonds through the Public Sector Purchase Programs (PSPP) since March 2015. Further, the ECB stimulates bank lending to the real economy through targeted longer-term refinancing operations (TLTRO) since June 2014.
[4] DBRS Rating Report of Portugal from 21 October 2016 and 21 April 2017.

absence of changes in fundamental economic and political conditions, not expected to change in the medium-term.

The remainder of my paper proceeds as follows. In Section 2, I present and review relevant literature. Section 3 covers the qualitative rating analysis. Section 4 presents the DBRS rating model replication. Section 5 provides the empirical analysis of rating decisions on Portugal, both in comparison with the major rating agencies as well as within DBRS cross-country ratings. A rating outlook is presented in section 6. In section 7, I conclude and make suggestions for future rating research.

2 Literature Review

Bhatia and Lin (2002) provide a comprehensive introduction and qualitative evaluation of the sovereign credit rating methodologies of S&P, Moody's and Fitch Ratings. Potential methodological improvements and rating failures across time are thereby examined. Literature on the determinants of sovereign risk is sizeable. Cantor and Packer (1996) identify per capita income, GDP growth, inflation, external debt, level of economic development and default history as S&P's and Moody's risk determinants under the application of an OLS regression. Several papers since then have evaluated sovereign risk determinants, mostly using ordinary least squared regressions or ordered probit models.[5] Afonso et al. (2011) extend the research by distinguishing between short-term and long-term determinants employing linear and ordered response models.

Given the partially limited access and low transparency on agencies (sovereign) rating methodologies, the literature on rating model replications is scarce. D'Agostino and Lennkh (2016) reverse-engineer the Moody's sovereign rating model to obtain sovereign ratings of 19 Euro member countries from 2005 to 2015.

This paper's quantitative section closely follows Vernazza, Nielsen and Gkionakis's research approach (2014). Ratings are decomposed into their subjective and objective rating components using OLS regressions. Significant subjective rating distortions for specific country groups – predominantly during the 2009-2011 sovereign debt crisis – are attested. Teker et al. (2013) have followed similar rating analysis through a factor based ordered probit model. Focus is laid on pre and post-crisis differences of Fitch Ratings' decisions for various country groups. Moor, Luitel, Sercu and Vanpee (2017) apply an ordered logit model to investigate the subjective rating components and find that investment-graded countries are more prone to positive subjective adjustments. An EC regulatory framework was installed in 2009 with the purpose to increase transparency in the sovereign rating processes, ergo to reduce the degree of subjective judgement in final rating decisions.[6] However, Amstad and Packer (2015) empirically disprove methodological improvements.

[5] Afonso et al. (2007) identify GDP per capita, real GDP growth, government debt, government effectiveness, external debt, external reserves and default history as determinants under the application of random effects ordered probit models.
[6] EC Regulation No.1060/2009.

3 Qualitative Rating Analysis

3.1 Rating History on Portugal

The Canadian rating agency DBRS started issuing sovereign credit ratings in 2000. Since then, DBRS has continuously been expanding its rating portfolio to a total of 36 countries.[7] Portugal was first rated by the agency in November 2011. In comparison with the Big Three, DBRS follows a rather lenient rating behaviour on Portugal.[8]

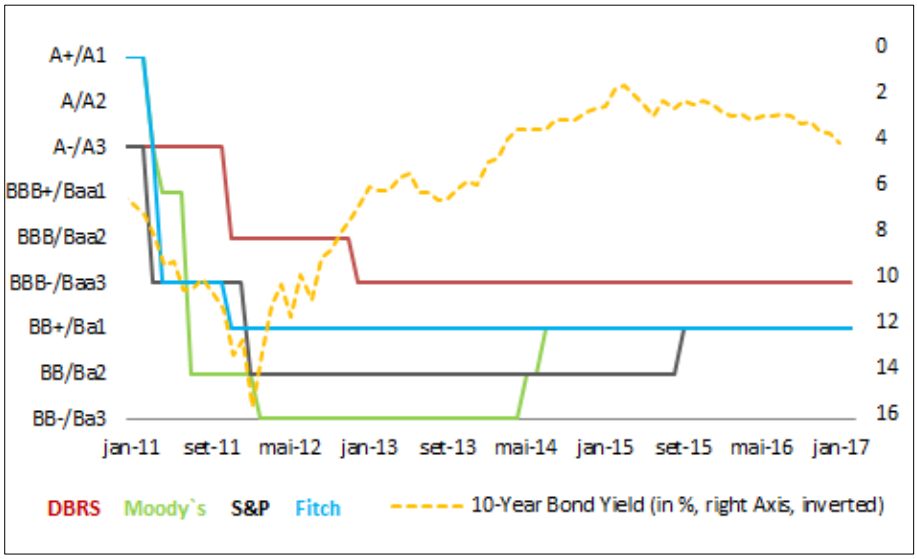

Figure 1: Historic sovereign ratings - Portugal

Source: DBRS, S&P, Fitch Ratings, Moody's, Bloomberg[9]

The Big Three have downgraded Portugal in the course of the European sovereign debt crisis 2009-2011 to "speculative" status. Moody's firstly withdrew Portugal investment grading in July 2011, Fitch Ratings and S&P followed shortly in November 2011 respectively January 2012.[10] The 10 Year yield curve of Portugal reacted correspondingly, reaching a record high of 15 percent in January 2012. DBRS on the contrary has continuously been holding on to attesting Portugal "investment grade" status. While its rating has also been downgraded in 2011 and 2012, the rating grades have steadily been above the "speculative grade" threshold. Since December 2012, DBRS attests Portugal the lowest possible sovereign investment grade "*BBB-".* The comparably dovish rating behaviour of DBRS on Portugal cannot be generalized for all DBRS country rating decisions.[11]

[7] Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Cyprus, Denmark, Finland, France, Germany, Greece, India, Ireland, Italy, Japan, Luxembourg, Malta, Mexico, Netherlands, Norway, Peru, Poland, Portugal, Singapore, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States of America, Uruguay.
[8] S&P, Moody's and Fitch Ratings are referred to as the " Big Three" throughout this paper.
[9] Rating decisions retrieved and collected from S&P, Moody's, Fitch Rating's and DBRS's online databases.
[10] All rating equal or higher than "BBB-"/"Baa3" are defined as "investment grades", any ratings below "BBB-"/"Baa3" are classified as "speculative".
[11] Instancing, S&P has been issuing Greece the rating "*B-*" since January 2016, while DBRS has been issuing the lower "*CCC+*" grade since June 2016.

3.2 Comparison with S&P, Moody's and Fitch Ratings

For the purpose to analyze the degree of rating disparities between the Big Three and DBRS, I convert all four rating agencies' alphanumeric ratings into their numeric values following the transformation matrix in Appendix 1.

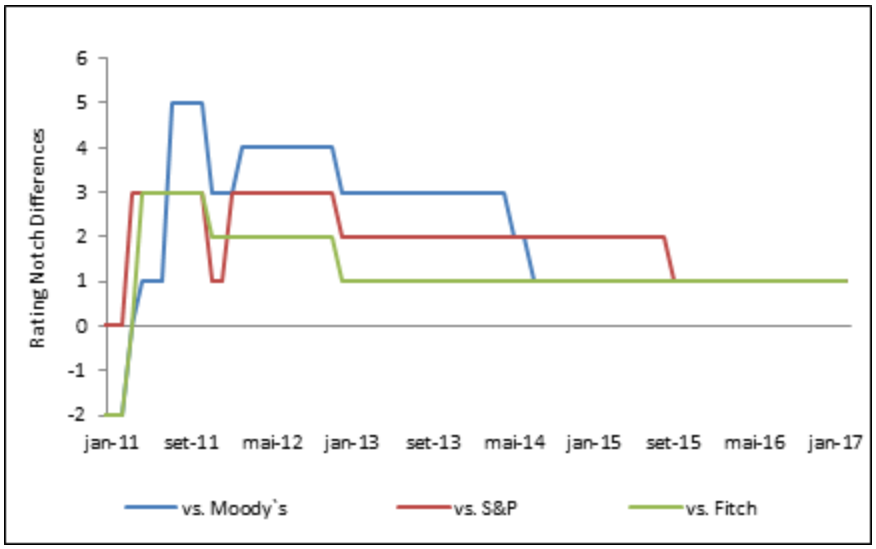

Figure 2: Rating differences – Portugal

Source: DBRS, S&P, Fitch Ratings, Moody's[12]

Followed by S&P and Fitch Ratings, Moody's shows the biggest discrepancies to DBRS's rating decisions on Portugal, up to a maximum of five rating notches.[13] Rating disparities have diminished over time though. Since September 2015 the rating decisions of the Big Three and DBRS differ by only one rating notch – the decisive rating threshold between "investment grade" and "speculative" status though.

All four rating agencies define sovereign default risk in a different manner. Moody's ratings capture the expected loss, a function of the probability default and expected recovery rate after default. S&P ratings only reflect the probability of a default event; timing, severity and recovery values are subordinate. Fitch Ratings reflect the probability of default until default occurs, only accounting for expected recovery rates after the default event already incurred (Bhatia, 2002). DBRS ratings reflect the probability of default or the likelihood of full debt repayment in a timely manner.[14]

[12] Rating decisions are retrieved and collected from the agencies' online research portals.
[13] In fall 2011, DBRS was issuing a stable investment grade of "A-" while Moody's already engaged in attesting Portugal the speculative rating grade "*Ba2*" (respective "*BB*").
[14] DBRS. 2016. "Rating Sovereign Governments Methodology" manual.

Table 1: Core rating risk factors of the Big Three and DBRS

DBRS	S&P	Fitch Ratings	Moody's
Fiscal Management and Policy	Institutional Assessment	Structural Features	Economic Strength
Debt and Liquidity	Economic Assessment	Macroeconomic Performance, Policies and Prospects	Institutional Strength
Economic Structure and Financial Stability	External Assessment	Public Finances	Fiscal Strength
Monetary Policy and Financial Stability	Fiscal Assessment	External Finances	Susceptibility to Event Risk
Balance of Payments	Monetary Assessment		
Political Environment			

Source: DBRS, S&P, Fitch Ratings, Moody's[15]

The Moody's rating model consists of four core risk categories, each indicator's performance is assessed on a range of very high plus (VH+) to very low minus (VL-). The rating procedure is rather cumbersome. Event scenarios under which the scorecard generated ratings are subjectively adjusted are outlined, the actual adjustment range however remains arbitrary. The S&P rating model is comprised of five key factors, each factor's performance is assessed on a scale from one (weakest) to six (strongest). The final sovereign indicative rating is subject to max. +/- one subjective notch adjustment. The rating methodology is only partly-transparent, specifications on rating weightings are undisclosed. Fitch Ratings follows a multiple regression model accounting for 18 key risk variables. A forward-looking "Qualitative Overlay" framework allows the regression results to be adjusted for factors not captured by the model. Each one of the four rating pillars are subject to max. +/- two notch adjustments with an overall rating adjustment range of max. +/- three notches. The DBRS rating framework accounts for total six risk categories, assessed on a numeric scale of zero (low risk) to ten (high risk). Subjective rating adjustments are fully incomprehensible. Details on the DBRS rating methodology are introduced in the subsequent section 4.1.

[15] Publicly available methodology manuals of S&P, Moody's, Fitch Ratings and DBRS.

4 Rating Model Replication

4.1 Structure and Composition

The DBRS rating framework is composed of two analytical pillars, a sovereign scorecard and a debt sustainability analysis. The latter has an effective impact of only five percent on the overall rating grade.

Within the sovereign scorecard, the risk factors (of both qualitative and quantitative nature) are grouped into six categories. Each risk category is comprised of minimum one primary element, in turn consisting of minimum one core indicator. Evaluated based on their historical and prospected performance, risk factors are individually scaled from 0=low risk to 10=high risk. Scores are individually weighted within and summed across the six categories and thus generate an overall scorecard result from 0=no default risk to 60=high default risk. The composite numeric score is lastly transformed into its respective alphanumeric rating grade.

DBRS claims that its rating decisions are more responsive to changes in fundamental characteristics rather than to changes in "cyclical economic conditions" – technical specifications are not disclosed.[16] The transparency on the DBRS sovereign rating approach overall is considerably low – characteristic for the (sovereign) credit rating industry as a whole. Further, DBRS reserves for its final rating committee decisions to significantly deviate from the scorecard-generated result as "the relative importance of risk factors can vary" across countries. Tangible rules or adjustment ranges at this are fully undisclosed.

4.2 Replication Procedure

The replicated sovereign risk model of Portugal consists of total 43 qualitative and quantitative indicators. DBRS provides the data evaluation, threshold application and weighting of 16 risk indicators outlined in a hypothetical country rating model.[17] I augment this model with additional 27 risk indicators collected from a risk indicator list further provided by DBRS.[18] Those 27 indicators' evaluation, thresholds and weightings follow – to the extent possible – the the data assessment, scoring and weighting of the 16 indicators provided with in the hypothetical country rating model. For transparency, the 27 indicators following self-evaluated data assessment and threshold establishments are color-marked green in my model. The 16 indicators with fully disclosed data assessment and threshold establishment are non color-marked.

For simplicity, subsequent rating steps a) - e) are illustrated at hand of the risk category *Debt and Liquidity.*[19] The full list of all 43 indicators' data assessment, performance evaluation and weighing is provided in the Appendix.

a) Data Evaluation

Each risk factor is individually evaluated, predominantly by taking the average of a combination of historical and forecasted data points. Data is mainly collected from large international institutions such as IMF, World Bank and OECD. The individual data evaluation of all 43 indicators is provided in Appendix 3.

[16] DBRS outlines fiscal responsibility, debt sustainability, economic diversification, price stability and the stability of the political system as exemplary fundamental country factors.
[17] DBRS. 2016. "Rating Sovereign Governments Methodology". Appendix B, Table 1.
[18] DBRS. 2016. "Rating Sovereign Governments Methodology". Appendix A.
[19] To shortly exhibit the general model structure at this example, *Debt and Liquidity* represents one of the six risk categories. *Debt Stock*, *Maturity Structure* and *Liquid Assets* represent two of the category's primary elements, *General Government Gross Debt* and *Short-Term Public Debt* in turn two of its total seven core elements. The number of primary elements and core elements varies across categories.

Table 2: Replicated model - Data evaluation

Debt & Liquidity	Indicator	Data assessment
Debt Stock	General Government Gross Debt (%GDP)	Projected debt stock as of end of next calendar year
Private Sector Debt	Non-Financial Corporate Debt (%GDP)	Average of 5 years historical data
	Household Debt (%GDP)	Average of 5 years historical data
Maturity Structure and Liquid Assets	Short-Term Public Debt (%GDP)	Last available data
	Average Maturity of Public Sector Debt (Years)	Last available data
	State Borrowing Requirements (%GDP)	Average of 3 years projections
Susceptibility to Debt Shocks	Debt Sustainability Analysis - Change in Debt Stock	Total net change from base year 2016 to 2021 (mixed shock scenario) – IMF DSA 2016

b) Indicator Scaling

Evaluated based on their historical and prospected future performance, each factor is scaled from 0=low risk to 10=high risk under the application of individual – and mostly arbitrarily chosen – thresholds. If not given guidance by similar indicators outlined in the hypothetical country model, indicator values of worse and better performing OECD countries are used as a strong guide for the threshold establishment of the additional 27 indicators.[20] The indicator scaling for all factors is provided in Appendix 4.

Table 3: Replicated model - Indicator scaling

Debt and Liquidity	Indicator	Unit	Thresholds		Value	Score (0-10)
			Low risk	High risk		
Debt Stock	General Government Gross Debt (%GDP)	%	30,00	130,00	127,73	9,77
Private Sector Debt	Non-Financial Corporate Debt (%GDP)	%	30,00	130,00	147,09	10,00
	Household Debt (%GDP)	%	30,00	130,00	86,70	5,67
Maturity Structure and Liquid Assets	Short-Term Public Debt (%GDP)	%	5	15	11,93	6,93
	Average Maturity of Public Sector Debt	years	10,00	3,00	8,42	2,25
	State Borrowing Requirements (%GDP)	%	3,00	10,00	9,17	8,81
Susceptibility to Debt Shocks	Debt Sustainability Analysis - Change in Debt Stock	%	5,00	30,00	18,50	5,40

c) Weightings

Each primary element's score represents the average of its core elements' scores, weightings within a category can vary. Each one of the six categories is equally weighted within the rating framework. The weighting for my augmented model is built on the weighting structure provided for the DBRS hypothetical country model.[21] The weighting structure of the entire replicated model is outlined in Appendix 5.

[20] Instancing, the threshold establishment for income inequality takes the Gini coefficient of Norway (0.25) and Brazil (0.5) as its low and high risk benchmarks.
[21] DBRS. 2016. "Rating Sovereign Governments Methodology". Appendix A. Table 2.

Table 4: Replicated model – Weighting

Debt and Liquidity	Indicator	Individual Score	Averaged within Primary Element	Weighting within Category	Individual overall rating weight
Debt stock	General Government Gross Debt (%GDP)	9,77	9,77	30%	5,00%
Private Sector Debt	Non-Financial Corporate Debt (%GDP)	10,00	7,83	20%	3,33%
	Household Debt (%GDP)	5,67			3,33%
Maturity Structure & Liquid Assets	Short-Term Public Debt (%GDP)	6,93	6,00	20%	3,33%
	Average Maturity of Public Sector Debt (Years)	2,25			3,33%
	State Borrowing Requirements (%GDP)	8,81			3,33%
Susceptibility to Debt Shocks	Debt Susceptibility Analysis - Change in Debt Stock	5,40	5,40	30%	5,00%

d) Scorecard Mapping

Lastly, the indicative scorecard result is transformed into its respective alphanumeric rating grade following a sovereign scorecard map. In the case of Portugal, the current sovereign credit rating of "*BBB-*" corresponds to a numeric value of roughly 34.

Table 5: Sovereign scorecard map

Credit Rating	Minimum score
AAA	12
AA range	18
A range	24
BBB range	30
BB range	36
B range	42
CCC range	48
CC range	54
C range	60

Source: DBRS[22]

e) Foreign currency vs. local currency sovereign rating

As it is the case for all advanced country, the strong international market integration of Portugal makes a differentiation between foreign currency and local currency sovereign rating redundant.

4.3 Results

My replicated model generates a numeric scorecard result falling within the lower "BBB range" as corresponding to *Table 5*. The replicated sovereign scorecard identifies *Fiscal Management & Policy* and *Debt & Liquidity* as the highest risk categories. Positive momentum emanates from *Political Environment*, the degree of "political commitment to fiscal consolidation" thereby plays a significant role.[23] Strong

[22] DBRS.2016. "Rating Sovereign Governments Methodology" manual.
[23] DBRS Rating Report of Portugal from 21 October 2016 and 21 April 2017.

positive effects emanate from individual risk factors such as the *Rate of Inflation*, *Current Account Balance* and *Capital Account Balance*.[24] Negative momentum originates from the individual risk factors *Interest Payment (% Revenue)*, *Public* and *Non-Financial Corporate Debt*, *State Borrowing Requirements*, *Total Domestic Savings Rate*, *Loan to Deposit Ratio* as well as *Net International Investment Position* and *Gross External Liabilities*.

Table 6: Replicated model - Scorecard results for Portugal

Categories	**Scorecard results**
Fiscal Management & Policy	6,78
Debt and Liquidity	7,32
Economic Structure & Performance	4,34
Monetary Policy & Financial Stability	5,43
Balance of Payments	6,17
Political Environment	3,98
Total	34,02

Political Environment is the most qualitatively captured category of all. The category consists of two purely qualitative primary elements: a) *Institutional environment* is assessed based on World Bank Indexes, while b) *Political commitment to address economic challenges and service debt* is based fully on the subjective assessment of the DBRS rating committee. Latter holds 50% of the category's rating scale and 8.33% on the final rating scale. DBRS provides a qualitative assessment on *Political Environment* in its rating reports, the justification and transparency of this category is however not satisfactory. As already stated, this paper identifies the "political commitment to fiscal consolidation" as the striking justification for ongoing investment grading of Portugal. The currently most decisive rating aspect therefore underlies a fully subjective assessment, making potential crucial rating alterations in large part incomprehensible for external parties.

Although presented as a major rating pillar, the debt sustainability analysis has a rather negligible effect on DBRS rating decision. Given Portugal's comparably high public debt stock, its susceptibility to (external) shocks – along with its harmful risk channels – should be given a stronger significance within the model.

Given its individual rating weights, the model output is most sensitive to changes in following variables: *Net International Investment Position* (4.17%), *Gross External Liabilities* (4.17%), *General Government Gross Debt (5%)*, *Debt Susceptibility Analysis* (5%), and *Commitment to address economic challenges and service debt* (8.33%).

The results are evidently subject to the appropriateness of the replicated model. Yet, identified risk sources are robust to various weight and threshold calibrations.

[24] Full list of risk factors' scores provided in Appendix 4.

5 Empirical Analysis

5.1 Risk factor effects: Cross-agency comparison

For the empirical analysis of rating differences among S&P, Moody's, Fitch Ratings and DBRS, I compare the cross-agency rating effects of ten fundamental economic variables. I thereby closely follow the OLS regression approach conducted by Vernazza, Nielsen and Gkionakis (2014), who already modeled rating decisions of Moody's, S&P and Fitch Ratings on ten best-fitting risk variables. By replicating their approach to DBRS rating grades, parameter estimates can directly be compared across all four rating agencies.

A panel data set of total 224 end-of-year DBRS rating decisions of 36 different countries i from November 2000 until March 2017 are OLS-regressed on the fundamental variables vector χ_{it} and a macro time effect Z_t.[25]

$$rating_{it} = \beta' \chi_{it} + Z_t + \varepsilon_{it} \quad (1)$$

Alphanumeric rating variables are again converted into numeric values following the conversion table in Appendix 1. The ten fundamental economic variables are chosen based on goodness-of-fit tests conducted by Vernazza, Nielsen and Gkionakis.

Table 7: Definition of variables – OLS regression

Variable	Definition	Units	Data Source[26]
Nominal GDP	GDP in current prices	USD tn.	IMF
GDP per capita	Nominal GDP per person, PPP-adjusted	USD thous.	IMF
GDP growth	Average annual real GDP growth, t-9 to t	Percent	IMF
Public Debt	General government gross debt	Percent of GDP	IMF, own calculations
Current Account	Annual current account balance	Percent of GDP	IMF
External Debt	Gross external debt	Percent of GDP	BIS, own calculations
Past Default	Dummy variable taking value 1 in all years following a default event since 1960, 0 otherwise	Binary	IMF, Reinhard & Rogoff, own calculation
Advanced Country	Dummy variable taking the value 1 if country classified as Advanced Country by IMF, 0 otherwise	Binary	IMF
Government	World Bank Government Effectiveness Index	Index	World Bank
Law	World Bank Rule of Law Index	Index	World Bank

[25] Ratings from 2017 are grades published in the first half of the year as end-of-year ratings are not available yet.
[26] IMF World Economic Outlook 2017, BIS= Bank of International Settlement

Table 8: OLS regression results

Variable	Moody's[+a]	S&P[+a]	Fitch Ratings[+a]	DBRS[+]
Nominal GDP	0.13 [0.09]	0.17 [0.12]	0.13* [0.07]	0.24*** [0.07]
GDP per capita	0.15*** [0.04]	0.14*** [0.04]	0.14*** [0.04]	0.02 [0.03]
GDP growth	0.10** [0.05]	0.23*** [0.06]	0.11*** [0.04]	0.44*** [0.13]
Public Debt	-0.04*** [0.01]	-0.04*** [0.01]	-0.03*** [0.01]	-0.02*** [0.01]
Current Account	-0.05*** [0.01]	-0.02 [0.01]	-0.02* [0.01]	-0.04 [0.05]
External Debt	-1.5E-4*** [2.6E-5]	-1.3E-4* [7.0E-5]	-8.5E-5*** [1.9E-5]	-5.4E-4 [3.6E-4]
Past Default	-1.75*** [0.51]	-0.27 [0.33]	-2.05*** [0.67]	-3.1*** [0.65]
Advanced Country	3.23*** [1.09]	3.98*** [0.98]	2.95** [1.18]	0.01 [1.16]
Government	0.64*** [0.41]	1.01*** [0.32]	1.11*** [0.34]	3.5*** [0.96]
Law	0.48** [0.45]	0.27 [0.34]	7.6E-4 [0.33]	0.95 [0.75]
No. Observations	999	1108	971	224
No. Countries	94	103	94	36
R-sq.	0.79	0.82	0.79	0.98

[+] Significance level: * 10%; ** 5%; ***1%

[a] Regression results for S&P, Moody's and Fitch Ratings are taken from Vernazza, Nielsen and Gkionakis (2016), DBRS regression results are depicted in Appendix 2.

A number of DBRS parameters are statistically insignificant. This might be due to the significantly smaller number of available DBRS rating observations or due to the inappropriateness of the best-fitted explanatory variables under the DBRS rating framework.[27]

The regression model predicts *Public Debt*, *Current Account* and *External Debt* to similarily affect rating decisions across all agencies. *GDP per capita* and the dummy variable *Advanced Country* appear to play a comparably smaller role under the DBRS rating framework, the estimators are also statistically insignificant. *Past Default* history, long-term *GDP growth* as well as the *Government* and *Law* index are expected to have significant larger effects under the DBRS rating framework than it is the case for S&P, Moody's or Fitch Ratings.[28]

[27] The S&P results from Vernazza, Nielsen and Gkionakis show similar levels of low significance.
[28] As it is the case under most agencies, the *Law* indicator is statistically insignificant for DBRS as well.

5.2 Subjective rating component analysis among DBRS cross-country ratings

In the paper by Vernazza, Nielsen and Gkionakis (2014) rating grades are further broken down into their subjective and objective rating components. The fitted values of their OLS regressions are thereby defined as the objective component – ratings solely based on the ten fundamental variables. The difference between the observed and fitted values (residuals) are interpreted as the subjective rating adjustment.[29]

As already assessed in this paper, DBRS fails to deliver tangible rules on its subjective rating adjustments, thereby leaving a potentially significant component of the DBRS rating decision on Portugal incomprehensible. The motivation to further analyze the significance of the subjective rating components for the rating decisions on Portugal – in specific its comparison within the DBRS cross-country ratings – is therefore considerably high.

Cross-panel DBRS rating decisions are therefore fragmented into their subjective and objective rating component following the Vernaza, Nielsen and Gkionakis analysis approach. The model itself is however significantly altered in this paper.

(a)

The analysis of rating dependent variables under the application of an OLS-regression has significant shortcomings. The dependent variable is unbounded, categories are assumed to be equi-distant and marginal effects to be constant. Ratings are however bounded within the rating scale from default status "*D*" to highest investment grading "*AAA*". Changes in risk variables along the rating scale can depict varying marginal effects – in specific when reaching the upper and lower rating grade limits. An OLS regression is therefore only suitable to a limited extent. Ordered probit models treat variables as ordinal, and thereby cannot serve the purpose to fractionally decompose DBRS rating grades. Further, the ordered probit model's interpretation becomes laborious with an increasing number of categories – a minimum of 24 ordinal categories in the sovereign risk rating case.

I therefore follow an alternative rating scale model developed by Studer and Winkelmann (2016), applying a Bernoulli quasi-maximum likelihood estimation (QMLE).[30] The random component y_{it} is assumed to follow a Bernoulli distribution. The expected value of y_{it} (mean response) depends on the linear predictor of the explanatory variables through a probit function $G(x)$.[31] The model allows me to obtain fitted fractional values, to comply with rating boundaries and to allow for non-constant marginal effects.

Following the Bernoulli distribution, the limited dependent variable y_{it} has to lie within the range of $[0, y_{max}]$ with a probability of 1 and y_{max} as the rating grade "*AAA*". The numerically converted rating variables (again following the rating conversion table in Appendix 1) therefore need to be transformed into their respective fractional values. The lowest rating bound "*D*" corresponds to a numeric value of 2. The dependent fractional variable y_i therefore has to be computed as follow

$$y_{it} = (y_{it} - 2)/y_{max} \qquad with\, y_{max} = 22 \tag{2}$$

with the scaled probit model version of

$$G(x'_{it}\beta + \gamma Z_t + \varepsilon_{it}) = y_{max}\phi(x'_{it}\beta + \gamma Z_t + \varepsilon_{it}) \tag{3}$$

[29] Vernazza, Nielsen and Gkionakis follow a rather "maximalist definition" by lumping the entire residual into the subjective part (Moor, Luitel, Sercu and Vanpee, 2017).
[30] Studer and Winkelmann apply the QMLE rating model for the analysis of health care ratings.
[31] The model can also be run with a logistic link function, coefficients are however slightly more significant under probit.

and the Bernoulli quasi-likelihood function for n observations of

$$L = \prod_{i=1}^{n} \left(\frac{G(x'_{it}\beta)}{y_{max}}\right)^{\frac{y_{it}}{y_{max}}} \left(\frac{y_{max} - G(x'_{it}\beta)}{y_{max}}\right)^{\frac{1-y_{it}}{y_{max}}} \quad (4)$$

Marginal effects diminish as the model approaches its upper and lower bounds, ultimately reaching zero in the limit (l).

$$\frac{\partial E(y_{it}|x_{it})}{\partial x_{il}} = y_{max}\phi(x'_{it}\beta)\beta_l \quad (5)$$

Robust standard errors are used, the macro-time effect also remains in place.[32]

(b)

The ten best-fitting regressors under the Vernazza, Nielsen and Gkionakis OLS model are not fully satisfactory and appropriate for my QMLE model. I replace *PastDefault*, *Advanced Country*, *Law* and *Government* with the new variables *Investment, Unemployment Rate, National Savings Rate* and *Inflation*.[33] Further, all variables are evaluated following the DBRS rating methodology.[34] Data is collected from the IMF World Economic Outlook 2017.[35] Again, the model is based on a panel data set of 224 observations, consisting of DBRS end-of-year rating decisions of total 36 different countries i from November 2000 until March 2017.

Table 9: Definition of variables - Rating scale model

Variable	Definition	Units	Data Evaluation
Public Debt	General Gov. Gross Debt	Percent of GDP	Projected next calendar year value
GDP growth	Real GDP growth rate	USD tn.	10 years historical data + 3 years projections
GDP p. c	Nominal GDP p. c	USD thous.	10 years historical data
Structural Balance	General Gov. Structural Balance	Percent of GDP	10 years historical data + 3 years projections
Current Account	Current Account	Percentage of GDP	5 Years historical data + 3 years projections
Investment	Total Investment	Percent of GDP	5 Years historical data + 3 years projections
Unemployment Rate	Unemployment rate	Percent of total labor force	5 Years historical data + 3 years projections
Inflation	Inflation, Average Consumer Prices	Percentage change	5 Years historical data + 3 years projections
National Savings Rate	Total National Savings	Percent of GDP	Last available data
External Debt	Gross External Debt	Percent of GD	Last available data

[32] As the dependent variable is not binary but a rating variable, Studer and Winkelmann (2016) apply robust standard errors.
[33] Indicators are either insignificant under the new model or not accounted for under the DBRS rating framework.
[34] Accounting for the DBRS longer-term rating approach (e.g. taking the average of 10/5 Y historic data + 3 Y forecasted data points), in individual cases constrained by data availability (e.g. *External Debt*). *National Savings Rate* is accounted for as "Last available data" and *Public Debt* as "Projected next calendar year value" value under the DBRS rating framework.
[35] With the exception for *External Debt*, collected from the Bank of International Settlement (SDDS Databank).

Regression results are presented in Appendix 2. The coefficients reported are asymptotically equivalent to maximum likelihood estimators. All variables are statistically strongly significant. The estimated effects and standard errors need to be re-transformed into their actual values by multiplying by y_{max}. Parameter signs are as anticipated, with the exception of *GDP Growth*. Further coefficients interpretation is however not objective of this empirical analysis.

Following Vernazza, Nielsen and Gkionakis, the difference between observed and fitted ratings represent the subjective rating component. The fitted fractional rating grades y_{it}^{*} are obtained as follow.

$$y_{it}^{*} = y_{it}^{fitted} * y_{max} + 2 \qquad (6)$$

The model's goodness-of fit is tested under the criterion of deviance as well as the Akaike (AIC) and Bayesian (BIC) information criteria.

The model attests DBRS a comparably "dovish" rating behavior on Portugal, on average inflating the objective rating by one subjective notch adjustment (+1.01). The subjective rating component among all DBRS cross-country ratings is neutral (-2.5E-5).[36] A generally more lenient rating characteristic of DBRS across all countries can therefore not be testified.

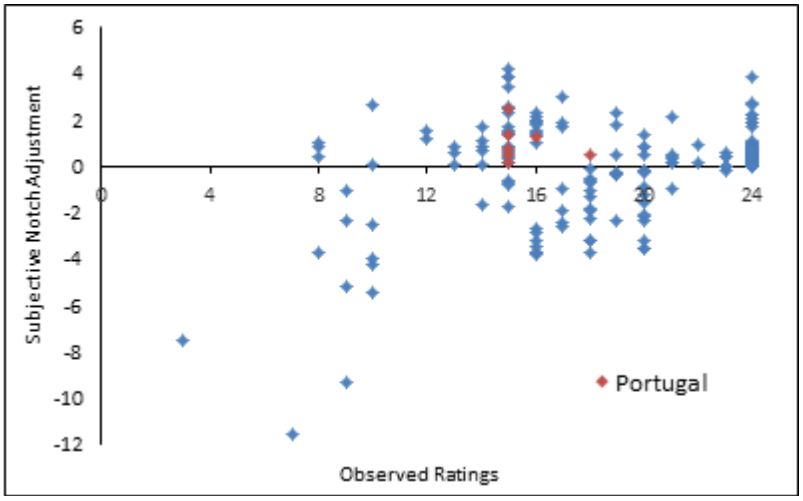

Figure 3: Subjective rating component - Panel results

When depicting the subjective rating component of Portugal across time, the extent of subjective rating adjustment appears to diminish since reaching its peak in 2013. The model therefore suggests DBRS rating decisions on Portugal to gradually approach their fundamental, quantifiable rating values.[37]

[36] Interestingly, the negative outliers depicted in Figure 3 are DBRS rating decisions on Cyprus in the years 2013 and 2014, and Argentina in 2015.
[37] The numeric rating value of 15 corresponds to the alphanumeric rating grade of "BBB-".

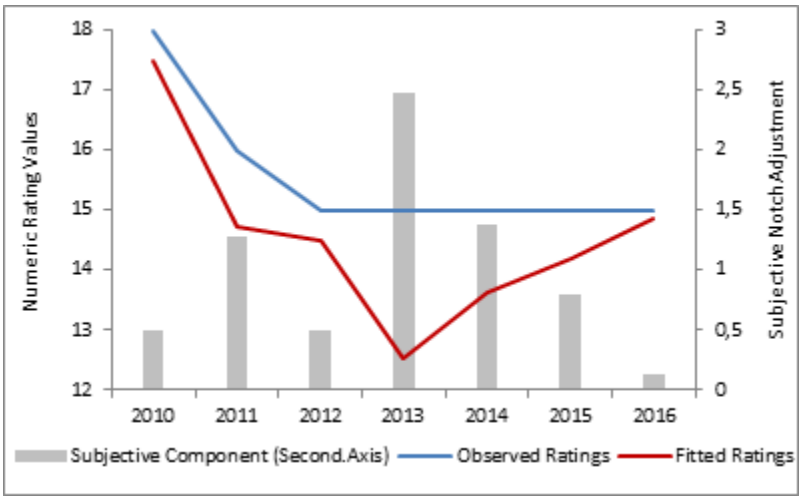

Figure 4: Subjective rating component – Portugal

6 Rating Outlook

S&P and Moody's have reaffirmed their "*BB+*" respectively "*Ba1*" ratings earlier this year, and both outlooks remain stable. In line with the predictions provided based on preliminary results of my models, DBRS has kept its rating decision on April 21, 2017 unchanged to "*BBB-*" with a stable outlook. Fundamental economic and political conditions have not changed substantially since its last rating report in October 2016. The high indebtedness of both the private (non-financial corporate debt level of 117 percent of GDP) and public sector (gross government debt of 128 percent GDP) remain the limiting factors. External debt (220 percent of GPD) is one of the highest worldwide. Commitment to fiscal consolidation is assessed to still be strong. Budget deficit improvements (2 percent of GDP in 2016) will likely allow Portugal to leave the Excessive Deficit Procedure early. Large parts of fiscal improvements are however due to one-off measures (e.g. the PERES program) and significant cuts in public investment.[38] Receding banking sector risks (due to e.g. the finalized sale of Novo Banco and the recapitalization of Caixa Geral de Depositós and Banco Comercial Português) give a positive momentum, are however not expected to change the rating grade. The share of non-performing loans remains alerting (12% of total loans). The ECB has been gradually reducing its monthly bond buying purchase volumes, expected to be tapering out by the end of this year.[39] Pressure on governmental bond yields is (ceteris paribus) anticipated.

Against the backdrop of the outlined economic situation of Portugal as well as the potential rating adjustment scenarios given by DBRS itself, I expect the DBRS rating decision on Portugal to remain unchanged for this calendar year.

[38] Special Program for Reduction of Debt to the State Department (PERES): incentive-creating tax repayment scheme for households and corporations. The program is estimated of having generated 300 Mio. EUR one-off state revenues for the 2016 state budget.
[39] Constrained by the capital key and the ECB rule to hold max. one third of a country's total outstanding debt as well as the PSPP program's expected termination by the end of this year.

Table 10: Scenarios of Future Rating Adjustments

Downward	Upward
Deterioration in public debt dynamics	Sustainable improvement in public finances
Contraction of fiscal consolidation/political commitment	Robust medium-term growth prospects

Source: DBRS[40]

7 Conclusion

In this paper, I provide a comprehensive analysis and assessment of the DBRS sovereign rating methodology. Both my qualitative and empirical analysis attest DBRS a comparably dovish rating behavior on Portugal, not only in comparison with the Big Three's rating decisions but also within the DBRS cross-country ratings. The replicated model identifies *Fiscal Management & Policy* and *Debt & Liquidity* as the highest risk categories. A positive momemtum emanates from the risk category *Political Environment*. The "political commitment to fiscal consolidation" is identified as the striking qualitative justification of ongoing investment grading of Portugal. The transparency on the DBRS rating methodology is significantly low. On average, the Portuguese objective rating is subjectively inflated by one rating notch.

From a technical point of view, it could be interesting to study further the rating scale model introduced by Studer and Winkelmann (2016) and to compare its results obtained in this paper employing alternative rating analysis approaches.[41] Additionally, one could elaborate further what events or indicator changes underlie the extraordinary positive subjective rating adjustment in 2013. Further, one could extend the subjective rating component analysis to other countries. For example, Cyprus, Argentina and Greece would be of great interest to analyze, in specific its component developments during the sovereign debt crisis.

Just like any other model, the DBRS rating model has its shortcomings. This paper finds significant subjective rating adjustment in the case of Portugal, which does not necessarily indicate that the DBRS rating model is flawed and imprecise per se. The incorporation of (qualitative) country-specific advantages and disadvantages can result in more appropriate and sophisticated final rating decisions than to purely follow quantifiable output. Rating agencies should however – particularly DBRS – be more transparent in their rating assessment. D'Agostino and Lennkh (2016) recommend the publication of two distinct credit ratings: a) a purely quantitatively derived grade as well as b) a final rating including the rating agency's subjective adjustment. Market participants could then assess and evaluate the appropriateness of the subjective rating adjustment by themselves.

[40] DBRS Rating Report of Portugal from 21 October 2016 and 21 April 2017.
[41] In specific in comparison with the well-established and frequently applied ordered probit model.

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9 Appendix

Appendix 1: Rating conversion table

Fitch Ratings	Moody's	S&P	DBRS	Numerical Scale
AAA	Aaa	AAA	AAA	24
AA+	Aa1	AA+	AA+	23
AA	Aa2	AA	AA	22
AA-	Aa3	AA-	AA-	21
A+	A1	A+	A+	20
A	A2	A	A	19
A-	A3	A-	A-	18
BBB+	Baa1	BBB+	BBB+	17
BBB	Baa2	BBB	BBB	16
BBB-	Baa3	BBB-	BBB-	15
BB+	Ba1	BB+	BB+	14
BB	Ba2	BB	BB	13
BB-	Ba3	BB-	BB-	12
B+	B1	B+	B+	11
B	B2	B	B	10
B-	B3	B-	B-	9
CCC+	Caa1	CCC+	CCC+	8
CCC	Caa2	CCC	CCC	7
CCC-	Caa3	CCC-	CCC-	6
CC	Ca	CC	CC	5
C	C	C	C	4
DDD		SD	SD	3
DD		D	D	2
D				1

Appendix 2: Regression Output

	OLS Regression^{+} (ordinal dependent rating variable)	**QMLE Regression**$^{+}$***** (fractional dependent rating variable)
Nominal GDP	0.241***	
	(0.069)	
GDP per capita	0.017	
	(0.028)	
GDP growth	0.442***	
	(0.125)	
Public Debt	-0.021***	
	(0.006)	
Current Account	-0.041	
	(0.051)	
External Debt (OLS as well as QMLE)	-0.001	-0.001***
	(0.000)	(0.000)
Past Default	-3.134***	
	(0.645)	
Advanced Country	0.010	
	(1.158)	
Government Effectiveness Index	3.483***	
	(0.955)	
Rule of Law Index	0.948	
	(0.753)	
Public Debt (QMLE)		-0.009***
		(0.001)
GDP Growth (QMLE)		-0.131***
		(0.039)
National Savings Rate (QMLE)		-0.066**
		(0.027)
Current Account (QMLE)		0.105***

		(0.021)
GDP per capita (QMLE)		0.052***
		(0.006)
Structural Balance (QMLE)		-0.071***
		(0.021)
Unemployment Rate (QMLE)		-0.039***
		(0.008)
Inflation Rate (QMLE)		-0.082***
		(0.017)
Investment Rate (QMLE)		0.128***
		(0.027)
Observations	224	224
Adjusted R^2	0.984	
Deviance		13.55

+Significance level: * 10%; ** 5%; ***1%

***The QMLE Regression uses different data assessment than the OLS regression in the attempt to replicate the DBRS rating methodology as close as possible (Table 9).**

Appendix 3: Replicated Model - Data Assessment

Primary Element	Indicator	Methodology
Fiscal Management & Policy		
Overall Fiscal Performance	Overall Fiscal Balance (%GDP)	Average of 10 years historical data + 3 years projection
	Structural Fiscal Balance (%GDP)	Average of 10 years historical data + 3 years projection
	Primary Fiscal Balance (%GDP)	Average of 10 years historical data + 3 years projection
	Interest Payments (%Revenues)	Last available data
Gov. Policy Management & Budget Control	Government Policymaking Transparency	Global Competitiveness Index - Last available data
	Quality of Public Spending	Global Competitiveness Index - Last available data
	Public Investment (%GDP)	Last available data
Debt and Liquidity		
Debt Stock	General Government Gross Debt (%GDP)	Projected debt stock as of end of next calendar year
Private Sector Debt	Non-Financial Corporate Debt (%GDP)	Average of 5 years historical data
	Household Debt (%GDP)	Average of 5 years historical data
Maturity Structure & Liquid Assets	Short-Term Public Debt (%GDP)	Last available data
	Average Maturity of Public Sector Debt (Years)	Last available data
	State Borrowing Requirements (%GDP)	Average of 3 years projections
Susceptibility to Debt Shocks	Debt Sustainability Analysis - Change in Debt Stock	Total net change from base year 2016 to 2021 (mixed shock scenario) - IMF DSA 2016
Economic Structure & Performance		
Econ. Growth & Productivity	Real GDP p.c. Growth (%)	Average of 10 years historical data + 3 years projections
	GDP p.c. (Thous. USD)	Average of 10 years historical data
	Human Development Index	UNDP Index - Last available data
Econ. Resilience & Flexibility	Output Volatility (%)	Standard deviation of real GDP growth rate measured over 20 years of historical data + projected next 3 years
	Unemployment Rate (%)	Average of 5 years historical data + 3 years projection
	Doing Business Ranking World Bank	World Bank Index - Last available data
	Change in Real Unit Labor Cost (%)	Average of 5 years historical data

Private Sector Investment & Savings	Households Investment Rate	Average of 5 years historical data
	Non-Financial Corporate Investment Rate	Average of 5 years historical data
Demographics	Population Growth	Average of 10 years historical data + 3 years projection
Income Distribution	Gini-Coefficient	Last available data
Monetary Policy & Financial Stability		
Policy Credibility	Rate of Inflation (%)	Average of 5 years historical data + 3 years projections
	Total Domestic Savings (%GDP)	Last available data
	Change in 10Y PGB Yields during Economic Slowdown*	Average annual change over 17 years historical data (Bps)
Financial Risk	Gross Non-Performing Loans (%Total Loans)	Last available data
	Loan to Deposit Ratio	Last available data
	Tier 1 Capital Ratio	Last available data
	Regulation Securities Exchanges	Global Competitiveness Index - Last available data
Balance of Payments		
External Imbalance	Current Account Balance (%GDP)	Average of 5 years historical data + 3 years projections
	Capital Account Balance (%GDP)	Average of 5 years historical data + 3 years projections
	Foreign Direct Investment (%GDP)	Average of 5 years historical data
	Change in Terms of Trade	Average of 5 years historical data
Net Investment Position & Foreign Reserves Liquidity	Net International Investment Position (%GDP)	Average of 5 years historical data
	Gross External Liabilities (%GDP)	Average of 5 years historical data
Political Environment		
Institutional Environment	Voice and Accountability (Index)	World Bank Governance Indicators - Last availble data
	Rule of Law (Index)	World Bank Governance Indicators - Last availble data
	Government Effectiveness (Index)	Global Competitiveness Index - Last available data
	Judicial Independence (Index)	Global Competitiveness Index - Last available data
Commitment to address economic challenges and service debt	Government capacity and willingness to act in response to economic and financial challenges	subjective assessment based on thought exchange with institutional representatives and bank-intern discussions

***Economic slowdown defined as: real annual GDP growth ≤ 0.5 of standard deviation of historical real GDP growth (17 years)**

Appendix 4: Replicated Model - Indicator Scaling

Primary Element	Indicator	Unit	Threshold		Value	Score (0-10)
			Low risk	High risk		
Fiscal Management & Policy						
Overall Fiscal Performance	Overall Fiscal Balance (%GDP)	%	0,00	-8,00	-5,25	6,56
	Structural Fiscal Balance (%GDP)	%	0,00	-6,00	-3,64	6,07
	Primary Fiscal Balance (%GDP)	%	0,00	-3,00	-1,53	5,08
	Interest Payment (%Revenue)	%	5,00	8,00	10,29	10,00
Gov. Policy Management & Budget Control	Government Policymaking Transparency	Index	7,00	1,00	3,90	5,17
	Quality of Public Spending	Index	7,00	1,00	2,80	7,00
	Public Investment (%GDP)	%	10,00	0,00	2,27	7,73
Debt and Liquidity						
Debt Stock	General Government Gross Debt (%GDP)	%	30	130	127,73	9,77

Private Sector Debt	Non-Financial Corporate Debt (%GDP)	%	30,00	130,00	147,09	10,00
	Household Debt (%GDP)	%	30,00	130,00	86,70	5,67
Maturity Structure & Liquid Assets	Short-Term Public Debt (%GDP)	%	5	15	11,93	6,93
	Average Maturity of Public Sector Debt	Years	10,00	3,00	8,42	2,25
	State Borrowing Requirements (%GDP)	%	3,00	10,00	9,17	8,81
Susceptibility to Debt Shocks	Debt Sustainability Analysis - Change in Debt Stock	%	5	30	18,50	5,40
Economic Structure & Performance						
Econ. Growth & Productivity	Real GDP p.c. Growth (%)	%	4,00	-1,00	0,83	6,34
	GDP p.c. (Thous. USD)	1000 USD	35	5	21,99	4,34
	Human Development Index	Index	1,00	0,00	0,83	1,70
Econ. Resilience & Flexibility	Output Volatility (%)	%	1,00	6,00	2,15	2,31
	Unemployment Rate (%)	%	5,00	15,00	12,91	7,91
	Doing Business Ranking World Bank	Index	100,00	0,00	77,40	2,26
	Change in Real Unit Labor Cost (%)	%	0,00	2,00	0,47	2,36
Private Sector Investment & Savings	Households Investment Rate	%	10,00	2,00	4,78	6,53
	Non-Financial Corporate Investment Rate	%	30,00	10,00	20,33	4,83
Demographics	Population Growth	%	0,25	-0,25	-0,06	6,18
Income Distribution	Gini-Coefficient	Index	25,00	50,00	34,00	3,60
Monetary Policy & Financial Stability						
Policy Credibility	Rate of Inflation (%)	%	3,00	15,00	0,88	0,00
	Total Domestic Savings (%GDP)	%	200	20	14,81	10,00
	Change in 10Y PGB Yields during Econ. Slowdown (Bps)	bps	-50	200	-41,92	0,32
Financial Risk	Gross Non-Performing Loans (%Total Loans)	%	3,00	15,00	12,20	7,67
	Loan to Deposit Ratio	%	80,00	100,00	109,70	10,00
	Tier 1 Capital Ratio	%	20,00	8,00	12,78	6,02
	Regulation Securities Exchanges	Index	7,00	1,00	3,40	6,00
Balance of Payments						
External Imbalance	Current Account Balance (%GDP)	%	-1,00	-8,00	-0,28	0,00
	Capital Account Balance (%GDP)	%	-1,00	-5,00	1,40	0,00
	Foreign Direct Investment (%GDP)	%	10,00	2,00	5,01	6,24
	Change in Terms of Trade	%	2,00	-2,00	0,76	3,11
Net Investment Position & Foreign Reserves Liquidity	Net International Investment Position (%GDP)	%	0	-50	-130,18	10,00
	Gross External Liabilities (%GDP)	%	30,00	130,00	223,13	10,00
Political Environment						
Institutional Environment	Voice and Accountability (Index)	Index	2,50	-2,50	1,12	2,75
	Rule of Law (Index)	Index	2,50	-2,50	1,14	2,71
	Government Effectiveness	Index	2,50	-2,50	1,23	2,54
	Judicial Independence (Index)	Index	7,00	1,00	4,70	3,83
Commitment to address economic challenges and service debt	Gov. capacity & willingness to act in response to economic & financial challenges	arbitrary*	0,00	10,00	5,00	5,00

*subjective assessment based on thought exchange with institutional representatives and bank-intern discussions

Appendix 5: Replicated Model - Weighting

Primary Element	Indicator	Indiv. Scaling	Weightning averaged w/in primary element	w/in category	overall individually	Scorecard results
Fiscal Management & Policy						6,78
Overall Fiscal Performance	Overall Fiscal Balance (%GDP)	6,56	6,93	50%	2,08%	
	Structural Fiscal Balance (%GDP)	6,07			2,08%	
	Primary Fiscal Balance (%GDP)	5,08			2,08%	
	Interest Payment (%Revenue)	10,00			2,08%	
Gov. Policy Management & Budget Control	Government Policymaking Transparency	5,17	6,63	50%	2,78%	
	Quality of Public Spending	7,00			2,78%	
	Public Investment (%GDP)	7,73			2,78%	
Debt and Liquidity						7,32
Debt stock	General Government Gross Debt (%GDP)	9,77	9,77	30%	5,00%	
Private Sector Debt	Non-Financial Corporate Debt (%GDP)	10,00	7,83	20%	1,67%	
	Household Debt (%GDP)	5,67			1,67%	
Maturity Structure & Liquid Assets	Short-Term Public Debt (%GDP)	6,93	6,00	20%	1,11%	
	Average Maturity of Public Sector Debt (Years)	2,25			1,11%	
	State Borrowing Requirements (%GDP)	8,81			1,11%	
Susceptibility to Debt Shocks	Debt Susceptibility Analysis - Change in Debt Stock	5,40	5,40	30%	5,00%	
Economic Structure & Performance						4,34
Econ. Growth & Productivity	Real GDP p.c. Growth (%)	6,34	4,12	45%	2,50%	
	GDP p.c. (Thous. USD)	4,34			2,50%	
	Human Development Index	1,70			2,50%	
Econ. Resilience & Flexibility	Output Volatility (%)	2,31	4,16	30%	1,25%	
	Unemployment Rate (%)	7,91			1,25%	
	Doing Business Ranking WorldBank	2,26			1,25%	
	Change in Real Unit Labor Cost (%)	2,36			1,25%	
Private Sector Investment & Savings	Households Investment Rate	6,53	5,68	10%	0,83%	
	Non-Financial Corporate Investment Rate	4,83			0,83%	
Demographics	Population Growth	6,18	6,18	5%	0,83%	
Income Distribution	Gini-Coefficient	3,60	3,60	10%	1,67%	
Monetary Policy & Financial Stability						5,43
Policy credibility	Rate of Inflation (%)	0,00	3,44	50%	2,78%	
	Total Domestic Savings (%GDP)	10,00			2,78%	
	Change in 10Y PGB Yields during Econ. Slowdown (Bps)	0,32			2,78%	
Financial risk	Gross Non-Performing Loans (%Total Loans)	7,67	7,42	50%	2,08%	
	Loan to Deposit Ratio	10,00			2,08%	
	Tier 1 Capital Ratio	6,02			2,08%	
	Regulation Securities Exchanges	6,00			2,08%	
Balance of Payments						6,17

External Imbalance	Current Account Balance (%GDP)	0,00	2,34	50%	2,08%	
	Capital Account Balance (%GDP)	0,00			2,08%	
	Foreign Direct Investment	6,24			2,08%	
	Change in Terms of Trade	3,11			2,08%	
Net Investment Position & Foreign Reserves Liquidity	Net International Investment Position (%GDP)	10,00	10,00	50%	4,17%	
	Gross External Liabilities (%GDP)	10,00			4,17%	
Political Environment						3,98
Institutional Environment	Voice and Accountability (Index)	2,75	2,96	50%	2,08%	
	Rule of Law (Index)	2,71			2,08%	
	Government Effectiveness	2,54			2,08%	
	Judicial Independence (Index)	3,83			2,08%	
Commitment to address economic challenges and service debt	Government capacity and willingness to act in response to economic and financial challenges	5,00	5,00	50%	8,33%	