Instituto Superior de Economia e Gestão
UNIVERSIDADE TÉCNICA DE LISBOA
DESDE 1911

MASTER IN
MONETARY AND FINANCIAL ECONOMICS

DISSERTATION

SOVEREIGN CREDIT RATING MISMATCHES

ANDRÉ MASSENA DE ALBUQUERQUE

OCTOBER - 2016

MASTER IN
MONETARY AND FINANCIAL ECONOMICS

DISSERTATION

SOVEREIGN CREDIT RATING MISMATCHES

ANDRÉ MASSENA DE ALBUQUERQUE

SUPERVISOR:

PROF. DOUTOR ANTÓNIO MANUEL PEDRO AFONSO

OCTOBER - 2016

Sovereign credit rating mismatches

André Massena de Albuquerque

M.Sc. in Monetary and Financial Economics

Supervisor: Professor Doutor António Manuel Pedro Afonso

Abstract

In this work we study the factors, among the determinants of sovereign ratings found in the literature, leading to differences in sovereign credit ratings from different agencies, for the period 1980-2015. We employ random effects ordered and simple probit approaches to assess the explanatory power of different macroeconomic and government variables. Our results point to an average performance of the estimated models. Structural balance and the existence of a default in the last ten years were the least significant variables whereas the level of net debt, budget balance, GDP per capita and the existence of a default in the last five years were found to be the most relevant variables explaining the rating differences across agencies.

Discrepâncias entre *ratings* de crédito soberanos

André Massena de Albuquerque

Mestrado em Economia Monetária e Financeira

Orientador: Professor Doutor António Manuel Pedro Afonso

Resumo

Este trabalho analisa que fatores, entre os determinantes de *ratings* soberanos encontrados na literatura, são responsáveis pelas diferenças entre os *ratings* de crédito soberanos de diferentes agências de *rating*, no período 1980-2015. Para tal, utilizaram-se modelos *probit* ordenados e simples de efeitos aleatórios com o objetivo de avaliar o poder explicativo de um conjunto de variáveis macroeconómicas e governamentais. Os resultados obtidos com os modelos estimados indicam que o saldo estrutural e a existência de um *default* nos últimos dez anos são as variáveis menos significativas enquanto o nível de dívida líquida, o saldo orçamental, o PIB *per capita* e a existência de um *default* nos últimos cinco anos são as variáveis que mais explicam as diferenças entre *ratings* de agências distintas.

Acknowledgements

Contents

1   Introduction

In the current global financial system, credit rating agencies play a crucial role in reducing information asymmetries in the financial markets and more recently also provide a fundamental input to the financial institutions risk assessment required by regulators, since capital requirements are calculated by applying to the institution financial assets a weighting factor depending on the associated credit rating. Sovereign credit ratings summarise in an ordinal qualitative scale a complex and thorough analysis of the ability a country has to service its debt. Since institutional investors nowadays are only allowed to acquire financial assets above a certain rating, countries willing to issue debt are in practice obliged to pay for a credit rating.

With the globalization of financial markets and the proliferation of credit ratings, rating agencies assigning different credit ratings to the same country became more frequent. This work tries to understand which factors may explain the differences between the sovereign ratings given to countries from the three main international agencies.

To accomplish this, we analysed the rating differences between S&P, Moody's and Fitch in the light of a random-effects probit framework and using as explanatory variables a set of macroeconomic variables found in the literature as important determinants of sovereign ratings.

Our ordered probit results found, for every dataset used, that the structural balance did not contribute to any rating difference here considered. Only the simple probit regressions found the structural balance to explain some of the rating differences. The structural balance and the variable representing a default in the last ten years were the least significant across all our regressions, whereas the level of net debt, budget balance, GDP per capita and the variable representing a default in the last five years contribute in more than 20% of the regressions to the analysed rating differences[1].

This work is organized as follows: the first section introduces credit rating agencies and their importance whereas the second section explains how rating agencies employ their assessment methodologies to produce the ratings and reviews a part of the existent body of knowledge about the history of credit ratings, the determinants of sovereign ratings and split sovereign ratings. Section 3 delves into which variables were chosen to develop

---

[1] Table A8-1 shows how each explanatory variable significance changed across all regressions.

this work and explains the adopted regression framework. In section 4 we describe the dataset and report on the empirical analysis, namely in terms of our estimation results. Section 5 summarises the main findings of this work.

2   Literature review

In spite of being a century old[2], credit ratings only began to play a role in US financial market regulation in 1931, and over time the reliance by regulators on the information conveyed by ratings increased. According to Levich et al. (2012), this increasing usage led, in 1975, to the establishment of guidelines by the US Securities and Exchange Commission for designating National Recognized Statistical Rating Organizations (NRSROs). Given the growing globalization of banking and financial markets since the 1970s, the Bank for International Settlements established a set of risk-based capital adequacy levels, which in 1999 were revised to explicitly consider credit ratings in determining a bank's risk capital.

According to Bhatia (2002), the first sovereign credit ratings were issued by Moody's "just before World War I"[3]. Before the Great Depression, the predecessor of S&P rated bonds from 21 national governments in Europe, South America, North America and Asia. Most sovereign ratings were then suspended during World War II and only after the war, S&P and Moody's began again to rate bonds issued by major industrialized countries. The withdrawal in 1974 of a tax applied to foreign borrowers in 1963 in the US which had driven bond market activity out of the US, marked the beginning of the modern sovereign credit ratings era.

Amstad and Packer (2015) define sovereign ratings as "opinions about the creditworthiness of sovereign borrowers that indicate the *relative* likelihood of default on their outstanding debt obligations". These ratings, like the ratings about other types of credit, try to assess both the ability and willingness of the borrower to pay. To accomplish this, qualitative factors, like institutional strength and the rule of law, and quantitative factors, like measures of fiscal and economic strength, the monetary regime, foreign exchange reserves, are analysed to rate a sovereign issuer. Kiff et al. (2012) state that ratings are not only about credit risk but also convey information about credit stability (changes in credit risk), and the assessments represented by ratings are medium-term outlooks that should not change due to the impact of cyclical components. Rating volatility should be minimized by rating agencies by assessing through the cycle: a rating

---

[2] According to Sylla (2002), John Moody founded the first rating agency in 1909, in the United States, and their first ratings were entirely for the bonded debts of US railroads.
[3] On our rating dataset, obtained from Bloomberg, the oldest rating, a 'AAA' rating, was given by S&P to Finland in April 1972.

should be changed only to reflect a shift in fundamental factors (and consequently a change in basic creditworthiness), and not as a response to a recession or a global liquidity shortage, for example. Kiff et al. (2012) description of this approach is particularly accurate: "vulnerability to cycles affects the rating decision, whereas the current position in the cycle does not".

Bhatia (2002) affirms that the widespread use by investors of the credit ratings attributed by Standard & Poor's (S&P), Moody's Investors Service (Moody's) and Fitch Ratings (Fitch) reflects their utility for the market. This usefulness results from the simplicity and comparability of the rating systems used by those rating agencies, condensing detailed analysis into brief indicators, and from the "perceived analytical strength and independence of the agencies themselves"[4]. Issuers pay for the ratings, expecting to attract more investors, or simply to obtain an assessment of their risk, often asking more than one agency for a rating at the same time. On the other hand, investors incorporate ratings in their decision process (pricing calculations, decisions to buy, sell or hold), turning credit ratings into an integral part of today's capital markets.

A sovereign credit rating normally serves as the "ceiling" of the ratings within its territory, since the sovereign bond yields are considered riskless and therefore used as a benchmark against which returns on domestic investments are compared. In parallel, each sovereign creditworthiness is compared with the most trustworthy issuers (rated with an 'AAA' rating), and among those is the German government, whose bonds are regarded as one of the global risk-free benchmarks. Given the increasing connectedness of the capital markets, the growing issuance of bonded debt and the regulatory role of sovereign ratings on investors risk management, changes in sovereign ratings can have profound implications.

Both the Asian crisis in 1997 and the global financial crisis of 2007-08 highlighted flaws in the rating systems. In the first case, a rating approach based only on macroeconomic fundamentals was the culprit, revealing the importance of contingent liabilities and the international liquidity position of the issuers (Bhatia (2002)). In the latter case, and according to Brunnermeier (2009), one of the deciding factors contributing to the latest financial crisis was the collaboration between banks and rating agencies to ensure their

---

[4] Table II compares the rating scales of the three main credit rating agencies.

structured debt products[5] had always a tranche reaching the 'AAA' rating, even if the underlying default risk was not equivalent to the default risk associated with a 'AAA' bond rating. Fund managers were attracted to buying these structured products offering seemingly high expected returns with an acceptable level of risk, and when the quality of the securitized assets deteriorated (signalled by a spike in the default rate of the so-called subprime mortgages), every holder inevitably faced losses and eventually had to write-down a significant part of their mortgage-related securities.

In the wake of the global financial crisis and the European sovereign debt crisis, Amstad and Packer (2015) highlight the changes in the sovereign risk methodologies used by the major rating agencies. These rating methodologies explain which factors drive the evaluation of the likelihood of default. A common principle to these revisions is that agencies tried to adopt assessment systems more reliant on quantitative inputs, to make ratings more transparent and replicable[6].

Moody's rating methodology will now be analysed, to illustrate how the rating methodologies are now more reliant on quantitative inputs. Moody's Investors Service (2015) explains how it bases its sovereign credit risk assessment on the "interplay" of four key factors: economic strength, institutional strength, fiscal strength and susceptibility to event risk. The following figure show how Moody's broad factors interact to ultimately produce a sovereign credit rating.

Figure 1 Key factors affecting Moody's credit risk assessment.
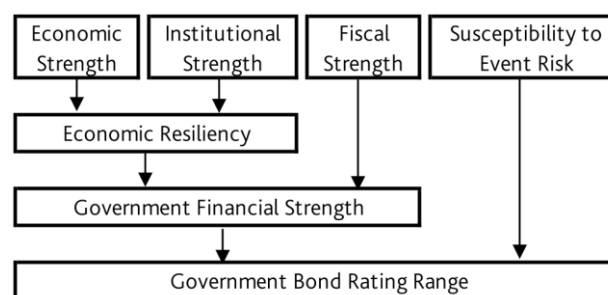
Source: Moody's Investors Service (2015).

These broad rating factors are subdivided into sub-factors, each with a different weight towards the broad factor.

---

[5] Often called collateralized debt obligations (CDO).
[6] Amstad and Packer (2015) find that ratings can be largely explained by a relatively small set of fewer than 10 variables, in line with the results of previous studies.

Table I provides further detail about how Moody's arranges sub-factors into each broad rating factor.

Table I Identification of Moody's key rating factors and corresponding sub-factors.

Broad rating factors	Rating sub-factor[7]
Factor 1: Economic strength	Growth dynamics
	Scale of the economy
	National income
Factor 2: Institutional strength	Institutional framework and effectiveness
	Policy credibility and effectiveness
Factor 3: Fiscal strength	Debt burden
	Debt affordability
Factor 4: Susceptibility to event risk	Political risk
	Government liquidity risk
	Banking sector risk
	External vulnerability risk

Source: Moody's Investors Service (2015).

The transparency achieved by the revision of the Moody's risk assessment methodology is illustrated by Cantor (2012), who showed that using the indicators underlying each factor and their weights as a scorecard, one could predict 70% of Moody's bond ratings within two notches and explain 67% of the variation in bond ratings.

Al-Sakka and ap Gwilym (2010) associate the growing importance of credit rating agencies to the increasing number of issuers and debt products, and globalization, but also to the requirements applied to institutional investors, banks and financial institutions: the first ones are only allowed to trade debt securities rated by NRSROs, whereas the latter, stemming from the Basel II Accord, are obliged to use external credit ratings to assess their credit risks and to determine capital adequacy requirements.

The determinants of sovereign credit ratings are an object of study since the seminal work of Cantor and Packer (1996), a cross sectional OLS estimation which identified per capita income, GDP growth, inflation, external debt, level of economic development and default history as important determinants of sovereign ratings assigned by Moody's and S&P.

---

[7] Each sub-factor encompasses one or more indicator, like average real GDP growth and volatility, nominal GDP, GDP per capita, inflation level and volatility, etc.

This methodology was also used by Afonso (2003), which also included a logistic and an exponential transformation of the ratings, in addition to the linear transformation already used. Mulder and Monfort (2000) and Eliasson (2002) generalized the OLS approach to panel data, both using a linear transformation of the ratings.

To overcome the limitation of OLS regressions with a linear transformation of the ratings[8], Bissoondoyal-Bheenick (2005) used an ordered probit model for a period of five years and 95 countries.

Afonso et al. (2008) analysed the determinants of sovereign ratings from the three main agencies by using a linear regression framework (random effects estimation, pooled OLS estimation and fixed effects estimation) versus an ordered response framework (ordered probit[9] estimation).

Afonso et al. (2011) confirm that logistic and exponential transformations to ratings provide little improvement over the linear transformation, not finding evidence of the so-called "cliff effects" (when investors adjust their portfolio composition to select only investment grade securities). This work also highlights the difference between short- and long-term determinants, concluding that GDP per capita, GDP growth, government debt and budget balance have a short-term impact, whereas government effectiveness, external debt, foreign reserves and default history influence ratings in the long-run.

Starting with Cantor and Packer (1996) selection of macroeconomic variables, the work from different authors that followed progressively converged into a subset of determinants, present in every study here analysed: the level of GDP per capita, real GDP growth, external debt, the level of public debt and the government budget balance were found to predominantly explain the rating scale. In line with the results of previous studies, the recent work of Amstad and Packer (2015), used several explanatory variables as proxies for fiscal, economic and institutional strength, monetary regime, external position and default history and also concludes that a small set of factors can largely explain the rating scale.

---

[8] Ratings represent a qualitative ordinal assessment of a sovereign credit risk, thus the distance between every two adjacent ratings may not be the same. However, an OLS regression with a linear transformation of the ratings assumes a constant distance between adjacent rating notches.

[9] Instead of assuming a rigid shape of the ratings scale, this model estimates the threshold values between rating notches, defining the shape of the ratings curve.

3 Methodology

To understand which factors may explain split sovereign ratings and if some of those factors are considered more relevant by certain agencies, we propose to analyse the collected dataset using a random-effects probit regression framework.

The source of the information used to create the dependent variables were the rating changes obtained from Bloomberg for the three main credit rating agencies[10]. Afterwards, only long-term sovereign foreign currency ratings were kept, all the other rating changes were discarded[11]. For each country and for each year, the last rating change of the year was selected as that country's year rating. Years without any rating change were filled by extending the rating of the previous year and rating withdrawals by the rating agencies were ignored, since the rating given before the withdrawal keeps its relevance for the markets.

The qualitative rating given by the rating agencies were then converted into a numerical scale, from 0 to 21, where 21 corresponded to the 'AAA' from S&P and Fitch/'Aaa' from Moody's and 0 corresponded to a (selective) default, using the correspondence table from Hill et al. (2010) shown below. According to Afonso et al. (2012), a logistic or exponential rating transformation provide little improvement in comparison with the linear transformation, so the latter was used.

---

[10] Standard & Poor's, Moody's Investors Service and Fitch Ratings.
[11] The type of the rating changes downloaded from the Bloomberg platform was "Foreign Currency LT Debt".

Table II A comparison between rating agencies qualitative scales.

Rating number	S&P	Moody's	Fitch
21 (Highest credit rating)	AAA	Aaa	AAA
20	AA+	Aa1	AA+
19	AA	Aa2	AA
18	AA-	Aa3	AA-
17	A+	A1	A+
16	A	A2	A
15	A-	A3	A-
14	BBB+	Baa1	BBB+
13	BBB	Baa2	BBB
12	BBB-	Baa3	BBB-
11	BB+	Ba1	BB+
10	BB	Ba2	BB
9	BB-	Ba3	BB-
8	B+	B1	B+
7	B	B2	B
6	B-	B3	B-
5	CCC+	Caa1	CCC+
4	CCC	Caa2	CCC
3	CCC-	Caa4	CCC-
2	CC	Ca	CC
1	C	C	C
0	SD/D		DDD/DD/D

Source: Hill et al. (2010).
Note: According to S&P Global Ratings (2016), Moody's Investors Service (2016), Fitch Ratings (2014), we considered a numerical sovereign rating of 12 or above to be an investment-grade rating, whereas a rating below that value would be considered a speculative-grade rating.

Our six dependent variables – $Diff\_UP_{it}^{SF}$, $Diff\_DW_{it}^{SF}$, $Diff\_UP_{it}^{MF}$, $Diff\_DW_{it}^{MF}$, $Diff\_UP_{it}^{SM}$ and $Diff\_DW_{it}^{SM}$ – represent the difference in ratings between the credit rating agencies considered in this work. Their definition follows:

- **$Diff\_UP_{it}^{SF}$**. It represents the difference between the numeric ratings given by S&P and Fitch, when S&P rating was higher or equal than Fitch's rating for the pair (country i, year t);

- ***Diff_DW$_{it}^{SF}$***. It represents the difference between the numeric ratings given by S&P and Fitch, when S&P rating was lower or equal than Fitch's rating for the pair (country i, year t);

- ***Diff_UP$_{it}^{MF}$***. It represents the difference between the numeric ratings given by Moody's and Fitch, when Moody's rating was higher or equal than Fitch's rating for the pair (country i, year t);

- ***Diff_DW$_{it}^{MF}$***. It represents the difference between the numeric ratings given by Moody's and Fitch, when Moody's rating was lower or equal than Fitch's rating for the pair (country i, year t);

- ***Diff_UP$_{it}^{SM}$***. It represents the difference between the numeric ratings given by S&P and Moody's, when S&P rating was higher or equal than Moody's rating for the pair (country i, year t);

- ***Diff_DW$_{it}^{SM}$***. It represents the difference between the numeric ratings given by S&P and Moody's, when S&P rating was lower or equal than Moody's rating for the pair (country i, year t)

As an example, let R_{it}^X represent the rating from credit rating agency X for the country i in year t and consider the dependent variable $Diff\_UP_{it}^{SM}$, representing the difference between S&P and Moody's ratings: $Diff\_UP_{it}^{SM} = R_{it}^S - R_{it}^M$, when $R_{it}^S >= R_{it}^M$. If $Diff\_UP_{it}^{SM} > 0$, then S&P considers country i, in time t, more capable of fulfilling its debt obligations than what Moody's finds about the capacity of country i to pay its debt.

This work reports on the results produced by an ordered and a simple probit models and as a result, the values of the dependent variables were transformed accordingly: the target variables of the ordered probit model may assume the values 0, 1 or 2 (as defined by equation (2)), whereas the target variables of the simple probit model may only assume the values 0 or 1 (see equation (3)).

3.1   Explanatory variables

The explanatory variables used in this study were selected according to the existing literature on the determinants of sovereign ratings, where we find previous papers trying to estimate the predictors of sovereign debt rating notations using both linear (see Cantor and Packer (1996), Afonso (2003), Afonso et al. (2011)) and ordered response models

(see Afonso et al. (2008), Afonso et al. (2011)). According to these papers, the predictors which better explain the rating scale are: the level of GDP per capita, real GDP growth, external debt, government debt and the government budget balance.

In addition to the mentioned predictors[12], this work also considered as explanatory variables the government structural balance, inflation and the default history of a country. Here follows the list of explanatory variables used in this work (Appendix 1 describes in more detail each one of these, along with its corresponding source and how each variable was created):

- **Budget balance.** Overall difference between government revenues and spending. Sequential budget deficits may signal problems with the implemented policies;

- **Structural balance.** By decomposing the budget balance into its cyclical and non-cyclical components, one can better understand the cyclical influences on the budget balance. Changes in the non-cyclical, or structural, component, may be indicative of discretionary policy adjustments;

- **Gross debt.** Summation of all liabilities that will require payments of interest and/or principal by the government;

- **Net debt.** Net debt is calculated as gross debt minus the financial assets a government holds;

- **GDP growth rate.** Annual growth rate of the Gross Domestic Product. A higher value strengths the government ability to pay its debt;

- **GDP per capita.** Also called per capita income, measures the average income per person in a country;

- **Inflation.** Annual increase of average consumer prices, over a period of time. It helps governments by reducing the real stock of outstanding debt in domestic currency, but a consistent high value is associated with macroeconomic imbalances;

- **External debt.** Also called foreign debt, represents the total debt a country (its government, corporations and citizens) owes to foreign creditors. It does not include contingent liabilities;

---

[12] With regard to the government debt, this work analysed both gross and net government debt as separate variables.

- **Default-in-the-last-year/2-years/5-years/10-years.** These variables represent a default in the last year, two, five or ten years. The definition of default by Beers and Mavalwalla (2016) here used is consistent with the literature on sovereign defaults and considers that "a default has occurred when debt service is not paid on the due date, payments are not made within the time frame specified under a guarantee or, absent an outright payment default, creditors face material economic losses on the sovereign debt they hold".

3.2   Probit regression framework

In this work we used both a random effects ordered probit and simple probit panel model, similar to what Afonso et al. (2011) used to identify the determinants of sovereign debt credit ratings and what Al-Sakka and ap Gwilym (2010) used to analyse the impact of split ratings on sovereign rating changes. According to Afonso et al. (2011), the ordered and simple probit random-effects estimations consider the existence of an additional cross-country error term and therefore yield better results using panel data when compared with linear regression methods or fixed-effects probit estimations.

Our approach considers the discrete, ordinal nature of rating differences between credit rating agencies. The negative and positive rating differences for each pair of agencies was analysed separately due to expected disparate behaviour, comparable to what Al-Sakka and ap Gwilym (2010) expected with rating migrations.

Consider our probit regression setting, when we are regressing $Diff\_UP_{it}^{SM}$ as the dependent variable (in this case, all observations have the rating from S&P higher or equal than the rating from Moody's). If the resulting coefficient of an explanatory variable, say, real GDP growth, is positive and significant, we conclude that an increase in real GDP growth will contribute to a bigger difference between S&P and Moody's ratings[13]. In a similar way, if the coefficient of the level of public debt is negative, we may conclude that an increase in the level of public debt, will contribute to a smaller difference between the ratings given by S&P and Moody's[14].

---

[13] This could be interpreted as an increase in real GDP growth contributing to a higher S&P rating or a lower Moody's rating.

[14] And in this case this could be interpreted as an increase in the level of public debt contributing to a lower S&P rating or a higher Moody's rating.

Our probit specification is defined as follows, and the value of our y_{it} dependent variable depends on whether we are considering the ordered probit or the simple probit approach:

$$
\begin{aligned}
y_{it} = {} & \beta_1 GovDebtProxy_{it} + \beta_2 NGDP\_RPCH_{it} + \beta_3 NGDPDPC_{it} \\
& + \beta_4 PCPIPCH_{it} + \beta_5 ExtDebtPercGNI_{it} + \gamma DefaultZ_{it} \\
& + \varepsilon_{it}; \ \varepsilon_{it} \sim N(0,1)
\end{aligned}
\tag{1}
$$

$$
i = 1, \dots C \ (no.\,of\ countries), t = 1, \dots Y \ (no.\,of\ years)
$$

Where y_{it} is an ordinal variable equal to either $Diff\_UP_{it}{}^{AB}$ or $Diff\_DW_{it}{}^{AB}$.

On our ordered probit model, $Diff\_UP_{it}{}^{AB}$ ($Diff\_DW_{it}{}^{AB}$) = 1 or 2 if the rating from agency *A* is higher (lower) than the rating from agency *B* by one or more-than-one-notch, respectively, for sovereign *i* in year *t*, and 0 otherwise.

On our simple probit model, $Diff\_UP_{it}{}^{AB}$ ($Diff\_DW_{it}{}^{AB}$) = 1 if the rating from agency *A* is higher (lower) than the rating from agency *B* by one or more notches, for sovereign *i* in year *t*, and 0 otherwise.

$GovDebtProxy_{it}$ may assume the variation value of the budget balance, gross debt, net debt or structural balance of country *i* in year *t*, depending on the chosen specification[15].

$NGDP\_RPCH_{it}$ is the growth rate of GDP for country *i* in year *t*.

$NGDPDPC_{it}$ is the GDP per capita variation for country *i* in year *t*.

$PCPIPCH_{it}$ is the inflation percentage change for country *i* in year *t*.

$ExtDebtPercGNI_{it}$ is the external debt variation for country *i* in year *t*.

$DefaultZ_{it}$ is a dummy variable taking the value of 1 if the country *i* in year *t* had defaulted in the last *Z* years, and 0 otherwise.

In the scope of the ordered probit framework, our six dependent variables were defined as to only have values of 1, 2 or 0, representing a rating gap of 1-notch, 2-or-more-notches or the inexistence of a rating gap, respectively. Equation 2 represents how the target variables were created:

$$
Diff_{\delta_{it}^{\alpha\beta}} =
\begin{cases}
1, if \ \left| R_{it}^{\alpha} - R_{it}^{\beta} \right| = 1 \\
2, if \ \left| R_{it}^{\alpha} - R_{it}^{\beta} \right| \geq 2 \\
\qquad 0, otherwise
\end{cases}
, \delta =
\begin{cases}
UP, if \ R_{it}^{\alpha} \geq R_{it}^{\beta} \\
DW, if \ R_{it}^{\alpha} \leq R_{it}^{\beta}
\end{cases}
\tag{2}
$$

$$
where \ \alpha \ and \ \beta \in \{SF, MF, SM\}.
$$

---

[15] All specifications are defined on Table III.

.

A simple probit regression was also run afterwards, and so the dependent variables were defined accordingly, by only assuming values of 0 or 1, as one may see in the following equation:

$$Diff_{\delta_{it}^{\alpha\beta}} = \begin{cases} 1, if \left| R_{it}^{\alpha} - R_{it}^{\beta} \right| \geq 1 \\ 0, otherwise \end{cases}, \delta = \begin{cases} UP, if \ R_{it}^{\alpha} \geq R_{it}^{\beta} \\ DW, if \ R_{it}^{\alpha} \leq R_{it}^{\beta} \end{cases} \quad (3)$$

$$where \ \alpha \ and \ \beta \in \{SF, MF, SM\}.$$

This leads to, in the context of the simple probit regression, our dependent variables having a value of 1 if there is a rating difference of 1-notch or higher and a value of 0 if the ratings from the considered pair of agencies are equivalent in our numerical rating scale.

Four different specifications of predicting variables were considered to overcome the correlation between some of the variables. Within each specification, the four different default dummies were combined. The composition of each specification can be seen on following table.

Table III Composition of the specifications used in this work, combining the different predicting variables. These specifications were used with both the ordered probit and the simple probit models.

Specification	Predicting variables
Budget balance	BudgetBal_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLastY
	BudgetBal_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast2Y
	BudgetBal_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast5Y
	BudgetBal_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast10Y
Gross debt	GGXWDG_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLastY
	GGXWDG_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast2Y
	GGXWDG_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast5Y
	GGXWDG_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast10Y
Net debt	GGXWDN_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLastY
	GGXWDN_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast2Y
	GGXWDN_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast5Y
	GGXWDN_NGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast10Y

Structural balance	*GGSB_NPGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLastY*
	GGSB_NPGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast2Y
	GGSB_NPGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast5Y
	GGSB_NPGDP, NGDP_RPCH, NGDPDPC, PCPIPCH, ExtDebtPercGNI, DefaultLast10Y

4   Empirical analysis

4.1   Data

With regards to the dependent variables, all the sovereign rating changes[16] were downloaded from Bloomberg and converted into a numerical scale using Table II. Afterwards, we created six dependent variables (described in section 3), two variables for each rating agency pair, with the value of each variable reflecting the numerical rating difference between the ratings given by those specific agencies (comparable to what Livingston et al. (2008) did with the split rated issues).

Figure 2 Total number of countries rated by at least two credit rating agencies, and number of countries rated by each pair of the rating agencies considered in this work.
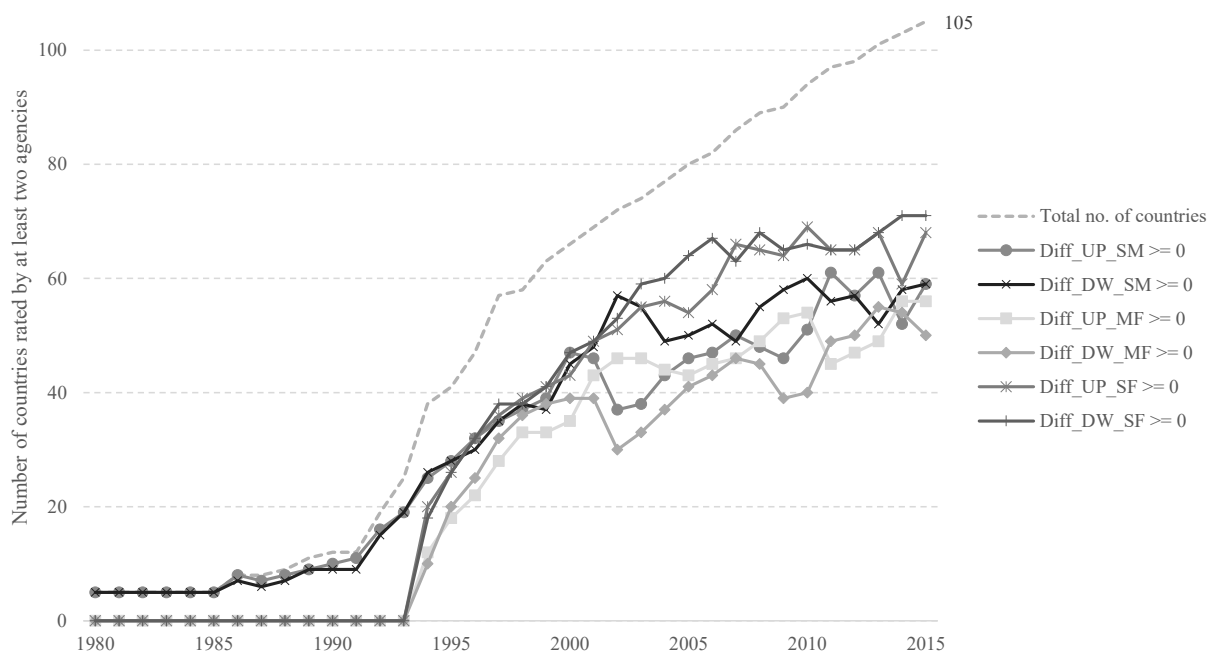
Source: rating agencies and own calculations.

The initial objective of this work was to study rating differences from 1970 onwards. However, and due to the inexistence of both macroeconomic values for many countries

---

[16] We used the sovereign issuer ratings for foreign currency denominated debt.

on those early years and ratings from at least two of the three selected agencies, our observations happened to comprehend only the period between 1980 and 2015. As Figure 2 illustrates, we only have observations with a rating from Fitch from 1994 onwards. From 1990 and until 2000, we observe a bigger increase in the number or countries rated by at least two agencies, whereas from 2000 onwards the pace of this increase slowed, ending with 105 countries in our dataset with ratings from at least two of the main rating agencies.

The distribution of the sovereign ratings on our dataset (seen in Figure 3) show that S&P is the agency which assigns more countries a rating of 'AA-' or above, and that the great majority of our observations are equal or above 'B-'. A higher degree of agreement on the top of the rating scale may explain the number of observations which had a rating of 'AAA' from all three agencies.

Figure 3 Distribution of the sovereign ratings composing our dataset. The time periods are 1980 to 2015 for S&P and Moody's and 1994 to 2015 for Fitch.
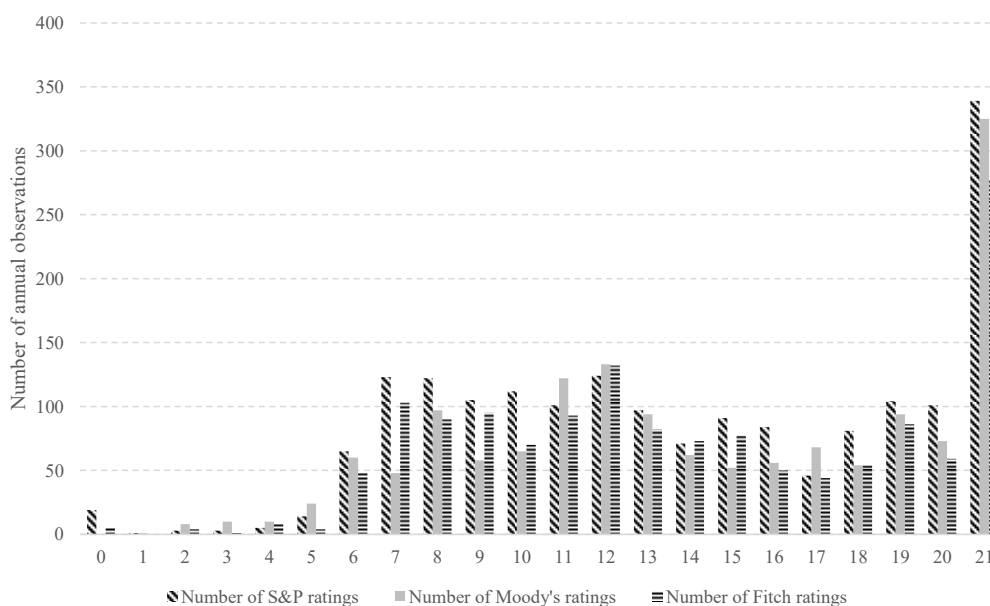
Source: rating agencies and own calculations.

In Table IV one may find some of the countries analysed in the scope of this work. The higher number of countries added to our observations in 1995 and 2000 reflect the behaviour of the total number of countries already seen on Figure 3.

Our independent variables were obtained from datasets from the IMF (World Economic Outlook), World Bank (World Development Indicators), Bank of Canada (Database of

Sovereign Defaults) and from the Quarterly External Debt Statistics dataset developed in collaboration between the World Bank and the IMF. Details on how those variables were created can be found in Table A1-1.

Table IV Countries in our full dataset which in the previous period did not have ratings from two or more of the three main agencies.

1980	1985	1990	1995	2000	2005	2010	2015
Australia		Denmark	Argentina	Barbados	Bahrain	Albania	Angola
Austria		Finland	Belgium	Belize	Cameroon	Azerbaijan	Armenia
United Kingdom		Ireland	Brazil	Bulgaria	Dominican Republic	Belarus	Côte d'Ivoire
Norway		Malaysia	Canada	Costa Rica	El Salvador	Bosnia and Herzegovina	Ethiopia
Sweden		New Zealand	Chile	Croatia	Ghana	Fiji	Honduras
		Spain	China	Ecuador	Guatemala	Gabon	Iraq
		Thailand	Colombia	Egypt	Mali	Georgia	Namibia
			Czech Republic	Estonia	Mongolia	Jordan	Paraguay
			France	India	Mozambique	Kenya	Rwanda
			Germany	Jamaica	Saudi Arabia	Libya	Senegal
			Greece	Kazakhstan	Serbia	Nigeria	Zambia
			Hungary	Korea (Republic of)	Sri Lanka	Seychelles	
			Iceland	Kuwait	Ukraine	Uganda	
			Indonesia	Lebanon	Viet Nam	United Arab Emirates	
			Israel	Morocco			
			Italy	Oman			
			Japan	Panama			
			Luxembourg	Papua New Guinea			
			Mexico	Peru			
			Netherlands	Qatar			
			Pakistan	Romania			
			Philippines	Russian Federation			
			Poland	Slovenia			
			Portugal	Trinidad and Tobago			
			South Africa	Tunisia			
			Switzerland				
			Turkey				
			United States				
			Uruguay				

Source: rating agencies and own calculations.

4.2   Ordered probit panel results

This section will dissect the results generated by the ordered probit panel regression for the rating differences between every pair of rating agencies. We first considered the full dataset in our regressions. Then, our dataset was split into two subsets depending on the value of the average rating from each pair of rating agencies: a set with investment-grade average ratings and a set with speculative-grade average ratings. We ran the ordered probit regressions with the three datasets, for each of the four specifications of predicting variables.

4.2.1   Full sample

We started by running the ordered probit regression with the full dataset. This dataset was composed by more than 850 observations for each dependent variable, comprised a period of at least 22 years (36 years only for the rating agency pair S&P and Moody's) and 69 or more countries. More than 65% of our observations for each of our target variables had no rating difference, whereas a rating difference of 1-notch was found at least in 19% of the observations. A rating difference of two or more notches can only be found 3.5%[17] of the times when analysing comparable ratings from S&P and Fitch; on the other hand, 9%[18] of the observations about the rating differences between S&P and Moody's have a 2-notch rating difference. This shows how S&P and Moody's disagree more when compared with the other rating agency pairs. Table V summarizes the full dataset.

Table V Summary of the full dataset, divided by the six target variables.

	$Diff\_UP_{it}^{SF}$	$Diff\_DW_{it}^{SF}$	$Diff\_UP_{it}^{MF}$	$Diff\_DW_{it}^{MF}$	$Diff\_UP_{it}^{SM}$	$Diff\_DW_{it}^{SM}$
No. of countries	87	87	70	69	82	82
No. of years	22	22	22	22	36	36
First and last year	1994-2015	1994-2015	1994-2015	1994-2015	1980-2015	1980-2015
No. of observations	1149	1194	903	851	1103	1165
Observations with:						
Rating difference = 0	898 (78%)	898 (75%)	606 (67%)	606 (71%)	764 (69%)	764 (66%)
Rating difference = 1	221 (19%)	248 (21%)	223 (25%)	187 (22%)	247 (22%)	286 (25%)
Rating difference = 2	30 (3%)	48 (4%)	74 (8%)	58 (7%)	92 (8%)	115 (10%)
No. of observations with a value:						
GDP per capita	1149 (100%)	1194 (100%)	903 (100%)	851 (100%)	1103 (100%)	1165 (100%)
Real GDP growth rate	1148 (100%)	1194 (100%)	903 (100%)	851 (100%)	1103 (100%)	1165 (100%)

---

[17] This value was obtained by calculating the average of the percentages of a rating difference of two or more notches between S&P and Fitch, when the first gave a higher rating than the latter ($Diff\_UP_{it}^{SF}$) and when the first gave a lower rating than the latter ($Diff\_DW_{it}^{SF}$).

[18] This value was obtained by calculating the average of the percentages of a rating difference of two or more notches between S&P and Moody's, when the first gave a higher rating than the latter ($Diff\_UP_{it}^{SM}$) and when the first gave a lower rating than the latter ($Diff\_DW_{it}^{SM}$).

External debt	841 (73%)	897 (75%)	685 (76%)	648 (76%)	701 (64%)	808 (69%)
Gov. gross debt	1096 (95%)	1135 (95%)	865 (96%)	807 (95%)	1018 (92%)	1065 (91%)
Gov. net debt	1046 (91%)	1085 (91%)	822 (91%)	770 (90%)	954 (86%)	1004 (86%)
Budget balance	1112 (97%)	1153 (97%)	877 (97%)	824 (97%)	1057 (96%)	1104 (95%)
Structural balance	1064 (93%)	1100 (92%)	842 (93%)	774 (91%)	970 (88%)	1028 (88%)
Inflation	1147 (100%)	1191 (100%)	901 (100%)	848 (100%)	1100 (100%)	1160 (100%)
Default in the:						
Last year	312 (27%)	321 (27%)	164 (18%)	211 (25%)	268 (24%)	258 (22%)
Last two years	349 (30%)	363 (30%)	190 (21%)	247 (29%)	311 (28%)	297 (25%)
Last five years	419 (36%)	446 (37%)	248 (27%)	313 (37%)	379 (34%)	375 (32%)
Last ten years	522 (45%)	539 (45%)	331 (37%)	366 (43%)	448 (41%)	454 (39%)

Source: rating agencies and own calculations.

Running the ordered probit regression for the full dataset, when the ratings from S&P are higher or equal to Fitch own ratings ($Diff\_UP_{it}^{SF}$ dependent variable), we get significant values for both budget balance and net debt variables. When budget balance increases, we expect the rating difference to decrease. For the net debt predicting variable the opposite occurs: when its value increases, the rating difference increases as well.

With regard to the $Diff\_DW_{it}^{SF}$ dependent variable (ratings from S&P being lower or equal to Fitch ratings), GDP per capita, external debt and the dummy default-in-the-last-5-years variables have statistically significant coefficients on all specifications. One can then conclude that if GDP per capita or external debt decrease, the rating difference between those two rating agencies increases. The coefficients of the dummy default-in-the-last-5-years are also significant (and positive), showing that a default in the last five years increases the rating difference between S&P and Fitch in this case.

Analysing the rating difference between Moody's and Fitch, when the rating given by Moody's is higher than Fitch's rating ($Diff\_UP_{it}^{MF}$), we find significant values for two dependent variables, GDP growth (negative coefficient on two specifications) and external debt level (positive coefficients on all specifications). These results show that when GDP growth increases, the rating difference between these two agencies becomes

smaller, whereas when the level of external debt increases, the gap between these two agencies increases.

When Moody's rating is lower than the rating from Fitch ($Diff\_DW_{it}^{MF}$), we find that the dummy variable representing a default in the last five years has a positive coefficient in all specifications. For this reason, if a default in the last five years occurred, the rating difference in this setting between Moody's and Fitch increases as well.

The variables gross debt and net debt also have significant values of opposite signs: the gross debt contributes negatively for the rating difference, reducing the rating difference when its value increases, while the net debt has positive coefficients, so its increase is expected to positively influence the magnitude of the rating difference. We need to better understand the opposite signs of these two variables, since they should be correlated to a certain degree. The separate regressions of the investment and speculative ratings may shed some light into this topic.

The results from regressing our dependent variable $Diff\_UP_{it}^{SM}$ (when the S&P rating is higher than Moody's rating), display significant results only for the dummy default variables. The dummy default-in-the-last-2-years has positive coefficients on all specifications, meaning that if a country defaults in the last two years, the rating gap between S&P and Moody's will grow.

The results from regressing the last set of specifications, when the rating from S&P is lower than the rating from Moody's ($Diff\_UP_{it}^{SM}$ dependent variable), show that the budget balance, gross debt, GDP growth and GDP per capita variables all contribute to the rating difference in question. Those first three variables have statistically significant and positive coefficients, meaning that when one of those variables increase, the rating difference between S&P and Moody's ($Diff\_UP_{it}^{SM}$) will increase as well. The coefficient of the GDP per capita variable is negative, so when its value increases, the rating gap between S&P and Moody's becomes smaller.

The main results of running the ordered probit regressions with our full dataset are shown in the table below, and the full results may be seen on Appendix 2:

Table VI Summary of the regressions of the ordered probit full dataset.

Significant variables	Marginal Effect Rating difference = 1	Marginal Effect Rating difference = 2

$Diff\_UP_{it}^{SF}$	(-) Budget balance (4/4)	-0.001%	-0.00008%
	(+) Net debt (4/4)	0.0004%	0.00003%
$Diff\_DW_{it}^{SF}$	(-) GDP per capita (16/16)	-0.3%	-0.03%
	(-) External debt (16/16)	-0.1%	-0.01%
	(+) Default last 1Y (1/4)	12.3%	1.9%
	(+) Default last 2Y (1/4)	11.5%	1.7%
	(+) Default last 5Y (4/4)	10.1%-10.5%	1.3%-1.5%
$Diff\_UP_{it}^{MF}$	(-) GDP growth (9/16)	-0.9%--1%	-0.2%
	(+) External debt (16/16)	0.1%-0.2%	0.03%-0.04%
$Diff\_DW_{it}^{MF}$	(-) Gross debt (2/4)	-0.2%	-0.05%--0.06%
	(+) Net debt (4/4)	0.0003%	0.00007%
	(+) Default last 2Y (3/4)	10.8%-11.4%	2.9%-3%
	(+) Default last 5Y (4/4)	11.3%-12.1%	3%-3.2%
$Diff\_UP_{it}^{SM}$	(+) Default last Y (1/4)	6.1%	2%
	(+) Default last 2Y (4/4)	8.1%-11.4%	2.7%-3.5%
	(+) Default last 5Y (1/4)	12.9%	3.9%
	(+) Default last 10Y (1/4)	12.7%	3.6%
$Diff\_DW_{it}^{SM}$	(+) Budget balance (4/4)	0.005%	0.002%
	(+) Gross debt (4/4)	0.2%	0.07%
	(+) GDP growth (4/16)	0.8%	0.2%
	(-) GDP per capita (8/16)	-0.3%	-0.08%--0.09%

Note: Coefficient signs and number of significant regressions (besides the total number of run regressions) in parenthesis.

4.2.2   Differentiation between investment and speculative ratings

We will now report the ordered probit regression results when the observations used as input were divided into two subsets, depending on the value of the average rating given by the rating agency pair. The observations with a numeric average rating of 12 or more[19] were grouped in the investment-grade subset, whereas those with a numeric rating less than 12 were grouped in the speculative-grade subset.

4.2.2.1   Investment-grade subset

This section will analyse the results from the ordered probit regression when considering only observations with an investment-grade average rating. When compared with the full dataset, the investment-grade dataset had observations for a smaller number of countries,

---

[19] Corresponding to 'BBB-' for S&P and Fitch or to 'Baa3' for Moody's.

between 49 and 57 different countries. The adopted criteria of considering only those observations with an investment-grade average rating reduced as expected the number of observations for each target variable (all target variables had less than 800 observations). It's important to note a higher percentage of observations with the same rating (when compared with the full dataset) from each rating agency in this setting, reflecting a greater coherence between the studied rating agencies when considering investment-grade sovereigns. This may be explained by Livingston et al. (2007) opaqueness idea which associates bond split ratings with the opaqueness of the issuer. In this case, investment-grade sovereign issuers disclose more detailed information, allowing rating agencies to better evaluate their ability to service debt and therefore rating agencies will agree more often about a country's rating in this context, leading to a higher percentage of observations with a rating difference of 0. Table VII summarizes the dataset used in this section.

Our regression, when the S&P rating is higher than the rating from Fitch ($Diff\_UP_{it}^{SF}$ dependent variable), only yield significant results for one of the specifications (only one of the regressions show the budget balance variable as significant). This specification shows a positive correlation between government net debt and the observed rating difference, when the ratings from S&P and Fitch are investment-grade.

When the rating from S&P is lower than the one from Fitch ($Diff\_DW_{it}^{SF}$), the obtained results for all specifications show a negative correlation between GDP per capita and the rating difference. This means that when GDP per capita increases, the rating difference is reduced. Only one of the regressions in this setting shows a significant and positive default dummy variable (the last year one).

Table VII Summary of the investment-grade dataset, divided by the six target variables.

	$Diff\_UP_{it}^{SF}$	$Diff\_DW_{it}^{SF}$	$Diff\_UP_{it}^{MF}$	$Diff\_DW_{it}^{MF}$	$Diff\_UP_{it}^{SM}$	$Diff\_DW_{it}^{SM}$
No. of countries	57	56	50	49	52	52
No. of years	22	22	22	22	36	36
First and last year	1994-2015	1994-2015	1994-2015	1994-2015	1980-2015	1980-2015
No. of observations	773	759	665	555	746	795
Observations with:						

Rating difference = 0	634 (82%)	634 (84%)	466 (70%)	466 (84%)	568 (76%)	568 (71%)
Rating difference = 1	124 (16%)	112 (15%)	145 (22%)	64 (12%)	124 (17%)	157 (20%)
Rating difference = 2	15 (2%)	13 (2%)	54 (8%)	25 (5%)	54 (7%)	70 (9%)
No. of observations with a value:						
GDP per capita	773 (100%)	759 (100%)	665 (100%)	555 (100%)	746 (100%)	795 (100%)
Real GDP growth rate	772 (100%)	759 (100%)	665 (100%)	555 (100%)	746 (100%)	795 (100%)
External debt	491 (64%)	491 (65%)	462 (69%)	370 (67%)	378 (51%)	472 (59%)
Gov. gross debt	750 (97%)	735 (97%)	655 (99%)	544 (98%)	693 (93%)	734 (92%)
Gov. net debt	700 (91%)	675 (89%)	605 (91%)	499 (90%)	641 (86%)	673 (85%)
Budget balance	753 (97%)	738 (97%)	658 (99%)	547 (99%)	717 (96%)	760 (96%)
Structural balance	727 (94%)	713 (94%)	643 (97%)	528 (95%)	661 (89%)	709 (89%)
Inflation	772 (100%)	759 (100%)	665 (100%)	555 (100%)	746 (100%)	795 (100%)
Default in the:						
Last year	74 (10%)	66 (9%)	46 (7%)	42 (8%)	56 (8%)	56 (7%)
Last two years	87 (11%)	76 (10%)	55 (8%)	52 (9%)	65 (9%)	63 (8%)
Last five years	117 (15%)	104 (14%)	77 (12%)	73 (13%)	88 (12%)	87 (11%)
Last ten years	177 (23%)	153 (20%)	124 (19%)	104 (19%)	127 (17%)	130 (16%)

Source: rating agencies and own calculations.

The regressions of our dependent variable $Diff\_UP_{it}^{MF}$ (rating from Moody's higher than the one from Fitch, with the average classified as investment-grade) showed a positive and negative correlation between the rating difference and, respectively, GDP per capita and inflation. In this case, when GDP per capita increases, the rating gap increases, whereas with an inflation increase, the rating divergence between those two agencies will diminish.

While analysing the results when we regress the $Diff\_DW_{it}^{MF}$ (rating difference when the rating from Moody's is lower than the rating from Fitch), we only find one of the

regressions showing a significant coefficient for the government gross debt predicting variable.

All the regressions of the $Diff\_UP_{it}^{SM}$ target variable (rating difference when the rating from S&P is higher than the rating from Moody's, and, on average, both ratings are investment-grade) show a significant negative correlation between external debt and the rating difference, leading to a smaller rating difference when the level of external debt rises.

The last dependent variable, $Diff\_DW_{it}^{SM}$, yield significant results when regressed against our predicting variables: both budget balance and government gross debt have significant positive coefficients[20], meaning that an increase of those variables will lead to an increase in the rating difference between S&P and Moody's, when the rating of the first is lower than the rating of the latter.

The GDP growth predicting variable also has significant positive coefficients on two of the four regressed specifications, showing an effect on the rating difference similar to the described effect of the budget balance and government gross debt on the rating gap. We also observe statistically significant and negative coefficients for two of the default dummy variables[21], meaning that the existence of a default in the last year or two will contribute to a smaller rating difference between S&P and Moody's in this case.

The following table summarizes the significant results obtained when regressing the investment-grade subset (the full results may be consulted in Appendix 3):

Table VIII Summary of the regressions of the ordered probit investment-grade subset.

	Significant variables	Marginal Effect Rating difference = 1	Marginal Effect Rating difference = 2
$Diff\_UP_{it}^{SF}$	(-) Budget balance (1/4)	-0.0005%	-0.00002%
	(+) Net debt (4/4)	0.0003%	0.00001%
$Diff\_DW_{it}^{SF}$	(-) GDP per capita (15/16)	-0.2%	-0.005%--0.007%
	(+) Default last 1Y (1/4)	12.6%	0.52%
$Diff\_UP_{it}^{MF}$	(+) GDP per capita (12/16)	0.4%	0.05%-0.06%
	(-) Inflation (16/16)	-2.0%--2.3%	-0.2%--0.3%
$Diff\_DW_{it}^{MF}$	(-) Gross debt (1/4)	-0.1%	-0.02%
$Diff\_UP_{it}^{SM}$	(-) External debt (16/16)	-0.2%--0.3%	-0.04%

---

[20] With a significance level of 1% for all the relevant regressions.
[21] Default in the last year and in the last two years.

$Diff\_DW_{it}^{SM}$	(+) Budget balance (4/4)	0.004%	0.0008%
	(+) Gross debt (4/4)	0.2%	0.04%
	(+) GDP growth (8/16)	1.1%-1.3%	0.2%-0.3%
	(-) Default last 1Y (4/4)	-10.9%--11.8%	-1.6%--1.8%
	(-) Default last 2Y (4/4)	-8.4%--9.3%	-1.3%--1.5%

Note: Coefficient signs and number of significant regressions (besides the total number of run regressions) in parenthesis.

4.2.2.2   Speculative-grade subset

Lastly, the results from the ordered probit regression using the same specifications will be analysed, but this time using a subset of the full dataset composed only by observations with a speculative-grade average rating. This speculative-grade subset has observations for at least 38 countries[22] and comprehends the period from 1992 to 2015. We have much less observations (between 238 and 435 observations) for the speculative-grade dataset when compared with the investment-grade and full datasets. By analysing Table IX we can observe that the same rating can only be found on 70% of the observations for the $Diff\_UP_{it}^{SF}$ target variable, reaching as low as 47% of the observations for the rating differences between Moody's and Fitch, when the rating from the first is lower than the rating from the latter. This fact reflects how opaque speculative-grade sovereigns are and how difficult is for credit rating agencies to assess the real capability of these sovereigns to service their debt. This lack of transparency leads to the information available to rating agencies having poor quality and increases the probability of a split rating (Al-Sakka and ap Gwilym (2010)).

The following table summarizes the dataset used in this section.

Table IX Summary of the speculative-grade dataset, divided by the six target variables.

	$Diff\_UP_{it}^{SF}$	$Diff\_DW_{it}^{SF}$	$Diff\_UP_{it}^{MF}$	$Diff\_DW_{it}^{MF}$	$Diff\_UP_{it}^{SM}$	$Diff\_DW_{it}^{SM}$
No. of countries	54	53	42	38	50	51
No. of years	22	22	22	22	23	24
First and last year	1994-2015	1994-2015	1994-2015	1994-2015	1993-2015	1992-2015
No. of observations	376	435	238	296	357	370
Observations with:						

---

[22] For the $Diff\_DW_{it}^{MF}$ target variable; the remaining target variables include observations for more than 50 countries.

Rating difference = 0	264 (70%)	264 (61%)	140 (59%)	140 (47%)	196 (55%)	196 (53%)
Rating difference = 1	97 (26%)	136 (31%)	78 (33%)	123 (42%)	123 (34%)	129 (35%)
Rating difference = 2	15 (4%)	35 (8%)	20 (8%)	33 (11%)	38 (11%)	45 (12%)
No. of observations with a value:						
GDP per capita	376 (100%)	435 (100%)	238 (100%)	296 (100%)	357 (100%)	370 (100%)
Real GDP growth rate	376 (100%)	435 (100%)	238 (100%)	296 (100%)	357 (100%)	370 (100%)
External debt	350 (93%)	406 (93%)	223 (94%)	278 (94%)	323 (90%)	336 (91%)
Gov. gross debt	346 (92%)	400 (92%)	210 (88%)	263 (89%)	325 (91%)	331 (89%)
Gov. net debt	346 (92%)	410 (94%)	217 (91%)	271 (92%)	313 (88%)	331 (89%)
Budget balance	359 (95%)	415 (95%)	219 (92%)	277 (94%)	340 (95%)	344 (93%)
Structural balance	337 (90%)	387 (89%)	199 (84%)	246 (83%)	309 (87%)	319 (86%)
Inflation	375 (100%)	432 (99%)	236 (99%)	293 (99%)	354 (99%)	365 (99%)
Default in the:						
Last year	238 (63%)	255 (59%)	118 (50%)	169 (57%)	212 (59%)	202 (55%)
Last two years	262 (70%)	287 (66%)	135 (57%)	195 (66%)	246 (69%)	234 (63%)
Last five years	302 (80%)	342 (79%)	171 (72%)	240 (81%)	291 (82%)	288 (78%)
Last ten years	345 (92%)	986 (89%)	207 (87%)	262 (89%)	321 (90%)	324 (88%)

Source: rating agencies and own calculations.

The first regressions have the $Diff\_UP_{it}^{SF}$ as the dependent variable and produce significant results for the budget balance and government net debt variables (only one of the regressions with this target variable show the dummy default-in-the-last-5-years variable as significant). The budget balance coefficient is negative, leading to a smaller rating difference between S&P and Fitch when the budget balance grows. Government net debt has the opposite effect on the described rating difference: when it increases, the rating disparity between those two agencies increases as well.

With regards to the obtained results when regressing the $Diff\_DW_{it}^{SF}$ variable, it is possible to observe that government net debt, GDP growth, external debt level and the dummy default-in-the-last-10-years variables all have an effect on the rating difference

between S&P and Fitch, when the rating from the first is lower than the rating from the latter. The government net debt variable has a positive coefficient, increasing the rating difference when its value increases. The remaining significant variables (GDP growth, external debt level and the dummy default variable) have negative coefficients, so when their value increases (or becomes one, in the case of the dummy variable), the rating difference between S&P and Fitch shrinks.

Only one of the specifications yield significant results when regressing the $Diff\_UP_{it}^{MF}$ variable (rating difference between Moody's and Fitch, with a higher rating from the first agency). External debt has positive and significant coefficients on two of the regressions, therefore when its value increases, the analysed rating difference increases as well. Two of the four dummy default variables (default in the last year and in the last five years) have significant negative coefficients, thus when a default happened in the last year or in the last five years, the rating difference will get smaller.

The regression of the $Diff\_DW_{it}^{MF}$ target variable against the different specifications of predicting variables highlights the effect of government gross debt and inflation on the rating difference between Moody's and Fitch, when the first is lower than the latter (the dummy default-in-the-last-10-years variable only yielded significant and negative results for one of the regressions). Both gross debt and inflation contribute negatively to the rating gap, therefore, the rating difference will shrink if one of those variables increases.

Table X Summary of the regressions of the ordered probit speculative-grade subset.

	Significant variables (Coefficient sign)	Marginal Effect Rating difference = 1	Marginal Effect Rating difference = 2
$Diff\_UP_{it}^{SF}$	(-) Budget balance (4/4)	-0.002%	-0.0001%
	(+) Net debt (4/4)	0.2%	0.01%
	(-) Default last 5Y (1/4)	-17.3%	-2.8%
$Diff\_DW_{it}^{SF}$	(+) Net debt (4/4)	0.2%	0.04%
	(-) GDP growth (15/16)	-1.2%--1.3%	-0.3%--1%
	(-) External debt (15/16)	-0.1%--0.2%	-0.03%--0.07%
	(-) Default last 10Y (3/4)	-11.7%--12.7%	-3.8%--5.9%
$Diff\_UP_{it}^{MF}$	(+) External debt (2/16)	0.2%	0.05%
	(-) Default last Y (1/4)	-13.2%	-3.1%
	(-) Default last 5Y (1/4)	-20.4%	-5.6%
$Diff\_DW_{it}^{MF}$	(-) Gross debt (4/4)	-0.3%	-0.1%--0.2%

	(-) Inflation (4/4)	-0.3%	-0.1%--0.2%
	(-) Default last 10Y (1/4)	-11%	-10.2%
$Diff\_UP_{it}^{SM}$	(-) Net debt (4/4)	-0.2%	-0.06%
$Diff\_DW_{it}^{SM}$	(+) Budget balance (3/4)	0.007%	0.001%
	(-) GDP per capita (12/16)	-0.4%--0.5%	-0.08%--0.1%
	(-) External debt (4/16)	-0.2%	-0.05%

Note: Coefficient signs and number of significant regressions (besides the total number of run regressions) in parenthesis.

All the ordered probit regressions run with $Diff\_UP_{it}^{SM}$ as the dependent variable show that the government net debt contributes negatively to the rating difference, when the S&P rating is higher than the rating from Moody's. As a result, when the government net debt increases, the rating gap between S&P and Moody's shrinks.

The results from regressing the $Diff\_DW_{it}^{SM}$ target variable show a positive and a negative correlation between the rating difference (when the rating from S&P is lower than the one from Moody's) and, respectively, the budget balance on one hand, and GDP per capita and external debt on the other hand. For this reason, when the budget balance increases, the considered rating gap increases; whereas, when GDP per capita or external debt increase, the same rating gap decreases.

Table X summarizes the significant results obtained when regressing the speculative-grade subset (Appendix 4 contains the full results).

4.3   Simple probit panel results

When regressing our target variables ($Diff\_UP_{it}^{SF}$, $Diff\_DW_{it}^{SF}$, $Diff\_UP_{it}^{MF}$, $Diff\_DW_{it}^{MF}$, $Diff\_UP_{it}^{SM}$ and $Diff\_DW_{it}^{SM}$) with the ordered probit framework, we found that only 3% to 10% of our observations had a rating gap of 2-notches or higher (this can be seen on the summary of Table V). Therefore, we decided to run a simple probit regression for the same observations subsets already used: we first considered the full dataset, and afterwards we split it into two subsets (an investment-grade and a speculative-grade dataset) depending on the average rating of the observation.

The following sections will report on the results of our regressions using a simple probit approach and the same data as before.

4.3.1   Full sample

Regressing our target variables with a simple probit model produced significant results for all specifications[23].

Our regressions, when the ratings from S&P are higher than Fitch own ratings, show that both budget balance and government net debt have an effect on the rating difference between those two agencies. In the first case, when the budget balance grows, the rating difference shrinks (meaning that S&P would downgrade their rating or Fitch will upgrade theirs), whereas when the government net debt increases, the rating difference will increase as well (by means of an upgrade from S&P or a downgrade from Fitch).

The results of regressing $Diff\_DW_{it}^{SF}$ highlight the influence of GDP per capita and the dummy default-in-the-last-5-years variable[24]. When GDP per capita grows, S&P and Fitch will update their ratings, resulting in a smaller rating difference. The opposite happens when there is a default in the last five years: in this case, the rating disagreement between those two agencies will grow.

Our regressions also produce significant results when a positive rating difference between Moody's and Fitch (represented by the $Diff\_UP_{it}^{MF}$ dependent variable) exists. All the regressions show a positive correlation between external debt and the rating difference (so when external debt increases, the rating gap gets bigger as well).

The structural balance variable also impacts on the rating difference, because of its significant and negative coefficients. When structural balance increases for a given country, we can expect the rating difference between Moody's and Fitch to become smaller.

The regressions of our $Diff\_DW_{it}^{MF}$ dependent variable show that government net debt and two of the dummy default variables are all positively correlated with the rating difference. As a consequence, when a country's net debt increases or a default happens in the last two or five years, we may expect a bigger rating difference between Moody's and Fitch.

The results of regressing the $Diff\_UP_{it}^{SM}$ dependent variable only produce significant coefficients for one of the specifications. In the specification no. 4, the external debt

---

[23] The full dataset used in this section was already described on section 4.2.1.
[24] The last specification also yields significant and positive coefficients for the dummy default-in-the-last-year and default-in-the-last-2-years variables.

predicting variable had a significant and negative coefficient for all the regressions, so when its value increased, the rating difference between S&P and Moody's would become smaller. Two regressions of this specification also exposed the positive correlation between a default in the last five or 10 years and an increase of the rating difference.

Finally, the simple probit regressions of the $Diff\_DW_{it}^{SM}$ variable reveal a positive correlation between the rating difference and each one of the budget balance, government gross debt and GDP growth dependent variables. Therefore, when one of the previous variables increases, one may expect a bigger rating gap between S&P and Moody's. In contrast, and derived from the significant and negative coefficients of the GDP per capita variable, when its value increases, one may expect the ratings from S&P and Moody's to converge.

We can find in the following table a summary of the significant results obtained when regressing this full dataset (the full results can be seen on Appendix 5):

Table XI Summary of the simple probit regressions of the full dataset.

	Significant variables (Coefficient sign)	Marginal Effect Rating difference = 1
$Diff\_UP_{it}^{SF}$	(-) Budget balance (4/4)	-0.002%
	(+) Net debt (4/4)	0.0004%
$Diff\_DW_{it}^{SF}$	(-) GDP per capita (16/16)	-0.3%
	(+) Default last Y (1/4)	11.2%
	(+) Default last 2Y (1/4)	10.8%
	(+) Default last 5Y (4/4)	9.5%-10%
$Diff\_UP_{it}^{MF}$	(-) Structural balance (3/4)	-1.6%--1.7%
	(+) External debt (16/16)	0.2%
$Diff\_DW_{it}^{MF}$	(+) Net debt (4/4)	0.0004%
	(+) Default last 2Y (3/4)	10.3%-16.7%
	(+) Default last 5Y (4/4)	16.7%-19.9%
$Diff\_UP_{it}^{SM}$	(-) External debt (4/16)	-0.3%
	(+) Default last 5Y (1/4)	17.3%
	(+) Default last 10Y (1/4)	20%
$Diff\_DW_{it}^{SM}$	(+) Budget balance (4/4)	0.007%
	(+) Gross debt (4/4)	0.4%
	(+) GDP growth (4/16)	1.3%-1.4%
	(-) GDP per capita (12/16)	-0.4%

Note: Coefficient signs and number of significant regressions (besides the total number of run regressions) in parenthesis.

4.3.2   Differentiation between investment and speculative ratings

As previously done using the ordered probit framework, we will now report on the simple probit results when the observations were divided into two subsets, an investment-grade subset and a speculative-grade subset.

4.3.2.1   Investment-grade subset

This section will analyse the results from the simple probit regressions using the investment-grade subset[25].

The regressions of our $Diff\_UP_{it}^{SF}$ target variable only showed positive and significant coefficients for the government net debt variable. For this reason, when the government net debt increases, one can expect a bigger rating difference between S&P and Fitch.

When analysing the results of regressing our observations when the rating from S&P was lower or equal to the rating from Fitch (i.e., $Diff\_DW_{it}^{SF}$ dependent variable), we found that both GDP per capita and inflation have significant coefficient values with opposite signs[26]. While an increase of GDP per capita will decrease the rating difference, an inflation increase will contribute to a bigger rating difference between those two agencies. Our regressions of the variable $Diff\_UP_{it}^{MF}$ showed that budget balance, structural balance, inflation and the dummy variable default-in-the-last-10-years all have negative and significant coefficients. Thus, with an increase of those variables (or the existence of a default in the last ten years), one may expect a reduction in the rating gap between Moody's and Fitch, in this context. We also found two regressions producing positive and significant coefficients for the GDP per capita variable.

By regressing our observations when Moody's rating is lower than Fitch own rating (i.e., when regressing $Diff\_DW_{it}^{MF}$), we found that government net debt had positive coefficients for all the regressions using it. On the other hand, only one of the regressions disclosed a negative coefficient for the government gross debt variable. With this in mind, one may expect an increase of the rating difference when net debt increases, while an increase of the government gross debt will shrink the rating difference.

---

[25] This subset was described previously on section 4.2.2.1, when we applied the ordered probit framework to the investment-grade subset.

[26] Only one of the regressions showed a positive coefficient for the dummy variable representing a country default in the last year.

We find that both external debt and GDP per capita variables have significant and negative coefficients when regressing those observations with a higher rating from S&P than from Moody's ($Diff\_UP_{it}^{SM}$ dependent variable). As a result, when one of those variables increases, the rating gap between S&P and Moody's will get smaller.

Lastly, our regressions of the $Diff\_DW_{it}^{SM}$ target variable yield significant results for three of the four dummy default variables (default in the last year, two and five years), structural balance, GDP growth, budget balance and government gross debt variables. The structural balance and the default in the last year/2-years/5-years dummy predicting variables have a negative coefficient, leading to a smaller rating difference between S&P and Moody's when they increase. On the other hand, the remaining variables (GDP growth, budget balance and the government gross debt) have positive coefficients, increasing the considered rating gap when they increase.

A brief overview of the results obtained with our simple probit regressions applied to the investment-grade dataset can be seen in the following table (the full results are in Appendix 6):

Table XII Summary of the simple probit regressions of the investment-grade dataset.

	Significant variables (Coefficient sign)	Marginal Effect Rating difference = 1
$Diff\_UP_{it}^{SF}$	(+) Net debt (4/4)	0.0002%
$Diff\_DW_{it}^{SF}$	(-) GDP per capita (12/16)	-0.2%
	(+) Inflation (13/16)	0.7%-0.9%
	(+) Default last Y (1/4)	10.9%
$Diff\_UP_{it}^{MF}$	(-) Budget balance (1/4)	-0.002%
	(-) Structural balance (4/4)	-1.9%
	(+) GDP per capita (2/16)	0.4%
	(-) Inflation (13/16)	-2.5%--2.7%
	(-) Default last 5Y (4/4)	-15.7%--16.6%
$Diff\_DW_{it}^{MF}$	(-) Gross debt (1/4)	-0.2%
	(+) Net debt (4/4)	0.0002%
$Diff\_UP_{it}^{SM}$	(-) GDP per capita (8/16)	-0.2%--0.3%
	(-) External debt (16/16)	-0.3%--0.4%
$Diff\_DW_{it}^{SM}$	(+) Budget balance (4/4)	0.005%
	(-) Structural balance (2/4)	-2.0%--6.9%
	(+) Gross debt (4/4)	0.3%

(+) GDP growth (13/16)	1.5%--2.2%
(-) Default last Y (4/4)	-17.3%--19.1%
(-) Default last 2Y (4/4)	-15.8%--17.3%
(-) Default last 5Y (4/4)	-16.5%--17.3%

Note: Coefficient signs and number of significant regressions (besides the total number of run regressions) in parenthesis.

4.3.2.2 Speculative-grade subset

Our simple probit regressions of the speculative-grade dataset produced significant results across all the sovereign rating difference target variables[27].

By regressing the $Diff\_UP_{it}^{SF}$ target variable with the speculative-grade dataset, we find that the budget balance and government net debt variables both have significant coefficients. In the first case, when the budget balance grows, the rating difference between S&P and Fitch becomes smaller. In the latter case, the government net debt has a positive coefficient, so when it grows, the rating gap is expected to grow as well. Two of these regressions also show significant and negative coefficients for the dummy variables representing a default in the last two and five years, so when a default in this conditions happens, the rating difference between S&P and Fitch will become smaller.

The results of regressing the $Diff\_DW_{it}^{SF}$ target variable show that GDP growth and three of the four dummy default variables (representing a default in the last year, two or ten years) contribute to a smaller rating difference between S&P and Fitch, when the rating from the first is lower than the rating from the latter, whereas the government net debt variable has a significant and positive correlation with the rating difference, triggering a bigger rating difference when its value grows.

In contrast to the regressions of the great majority of our target variables, the simple probit regressions of the $Diff\_UP_{it}^{MF}$ variable only produced significant coefficients for two of the regressions: the negative coefficients of the dummy variables representing a default in the last year and in the last five years show how a default in those past periods will contribute to a smaller rating gap between Moody's and Fitch, when the rating from the first is higher than the rating from the latter.

All regressions of the $Diff\_DW_{it}^{MF}$ target variable show that an inflation increase lead to a smaller rating difference when the rating from Moody's is lower than the rating from

---

[27] This subset was already described on section 4.2.2.2.

Fitch. The regressions which used the specification with the structural balance variable also showed a positive and significant correlation between external debt and the rating difference. Thus, when external debt increases, the rating divergence between Moody's and Fitch will grow.

When running our simple probit regressions for the observations with a rating difference between S&P and Moody's (when the first rating is higher than the latter), we find that government net debt contributes negatively to the rating difference, so when its value grows, our target variable $Diff\_UP_{it}^{SM}$ will become smaller.

Table XIII Summary of the simple probit regressions of the speculative-grade dataset.

	Significant variables	Marginal Effect Rating difference = 1
$Diff\_UP_{it}^{SF}$	(-) Budget balance (3/4)	-0.003%--0.004%
	(+) Net debt (4/4)	0.2%
	(-) Default last 2Y (1/4)	-23%
	(-) Default last 5Y (1/4)	-14.9%
$Diff\_DW_{it}^{SF}$	(+) Net debt (4/4)	0.4%
	(-) GDP growth (15/16)	-1.2%--1.9%
	(-) Default last Y (2/4)	-7.5%--13.2%
	(-) Default last 2Y (2/4)	-5.1%--14.6%
	(-) Default last 10Y (4/4)	-24.4%--31.2%
$Diff\_UP_{it}^{MF}$	(-) Default last Y (1/4)	-19.5%
	(-) Default last 5Y (1/4)	-32.8%
$Diff\_DW_{it}^{MF}$	(-) Inflation (16/16)	-0.6%--0.7%
	(+) External debt (4/16)	0.3%-0.4%
$Diff\_UP_{it}^{SM}$	(-) Net debt (4/4)	-0.7%
$Diff\_DW_{it}^{SM}$	(+) Gross debt (4/4)	0.4%-0.5%
	(-) GDP per capita (12/16)	-0.5%--0.7%

Note: Coefficient signs and number of significant regressions (besides the total number of run regressions) in parenthesis.

Lastly, we analyse the result of our simple probit regressions with the speculative-grade dataset, using the $Diff\_DW_{it}^{SM}$ variable as the target variable. These regressions show that both GDP per capita and government gross debt variables have statistically significant coefficients. In the first case, the negative coefficients of GDP per capita indicate that when its value increases, the rating difference shrinks, whereas in the latter case, the positive coefficients of the government gross debt variable show that when gross debt

gets bigger, the rating difference, when the rating from S&P is lower than the rating from Moody's, also increases.

A summary of the obtained results when running our simple probit regressions with the speculative-grade dataset can be seen in Table XIII (whereas the full results can be consulted in Appendix 7).

5   Conclusion

By regressing the rating differences of the three main rating agencies with both an ordered and a simple probit random-effects model, we find some significant results, indicating the influence of some of our explanatory variables on those rating differences.

We used an ordered probit model, due to both the existence of rating differences above 2-notches and Al-Sakka and ap Gwilym (2010) approach to the split ratings topic. Nonetheless, and as a result of a lower percentage of rating differences higher than 1-notch, a simple probit model was also used to find if it improved on the results previously obtained.

For the rating differences between S&P and Fitch, when the assigned rating from the first was higher than the latter, we found that, independently of the dataset (full, investment- or speculative-grade), an increase in the budget balance would decrease the rating difference whereas an increase in net debt would increase that same difference. For the speculative-grade ratings, we also found that the existence of a default in the last two our five years would decrease the rating difference between S&P and Fitch.

When the rating from S&P is lower than the one from Fitch, we find different behaviours when comparing the results from the investment- and speculative-grade datasets: in the first case, GDP per capita contributes for a smaller rating gap, whereas a default in the last year and inflation contribute for a bigger rating difference. In the latter case, only net debt has an increasing effect on the rating difference; external debt, GDP growth and the existence of a default in the last year, two or ten years reduce the rating difference.

The results of our regressions when Moody's assigns a higher sovereign rating than Fitch are less precise. Whereas GDP per capita and inflation respectively influence an investment-grade rating difference in a positive and negative way, external debt and a default in the last year or five years respectively increase and decrease the analogous speculative rating difference. When considering only the investment-grade regressions,

our simple probit results also find the budget and structural balances and a default in the last five years as negatively correlated with the rating difference. On the other hand, in regard to the speculative-grade results about Moody's and Fitch positive rating difference, the simple probit approach does not find external debt as significant, when compared with the ordered probit approach for the same dataset. It's also worth noting the fact that GDP growth only appears as significant for the ordered probit regressions with the full dataset. With regard to a rating difference when Moody's assigns a lower rating than Fitch, a higher level of government gross debt leads to a smaller rating difference for both investment- and speculative-grade datasets, with the exception of the simple probit regressions for speculative rating differences, which did not find gross debt significant. Our simple probit regressions with the investment-grade dataset also find net debt to positively affect the rating difference. Inflation is found to negatively influence a rating difference between Moody's and Fitch when the ratings are in the speculative category (irrespective of the chosen probit approach), and a default on the last ten years affect in the same negative way only the rating differences within the ordered probit results.

Looking at the results obtained for the positive rating difference between S&P and Moody's for the investment-grade dataset, we find that an increase in the level of external debt leads to a smaller rating gap between those two rating agencies. For the same dataset, we find that the simple probit approach also identifies GDP per capita as negatively correlated with the rating difference. For the speculative-grade dataset, both probit methods show net debt as negatively related with the rating difference. It's important to note that for this specific dependent variable, and contrary to what was seen on the regressions of the investment- and speculative- data subsets, only the regressions with the full dataset showed all four default dummy variables as significant and affecting positively the rating gap.

The last dependent variable represents the negative rating difference between S&P and Moody's (that is, a lower rating from S&P than from Moody's). Both of our probit regressions with the investment-grade dataset show a positive relation between budget balance, gross debt and GDP growth and the rating difference and a negative relation between a default in the last year or two and the same rating difference. The simple probit results also point to the structural balance and a default in the last five years as contributing negatively to the rating difference. When considering the speculative-grade

dataset, our results both show that an increase in GDP per capita leads to a smaller rating difference. Both budget balance and gross debt affect the rating difference positively, the former only for the ordered probit regressions and the latter only for the simple probit regressions. External debt also affects negatively the rating difference in our ordered probit regressions.

Table XIV summarises the results from the different regressions run for all specifications of explanatory variables and datasets[28].

There are a few improvements and further questions that may be addressed in the future, in the scope of this work. Our results showed a low pseudo (McFadden's) R^2 value, suggesting that improvements can be made to our model.

One could also find a way of specifying which agency is responsible for the rating difference, or as an alternative, discover which factors, in a split rating situation, are correlated with a specific agency upgrade or downgrade.

Another question that can be further assessed is considering different periods in time (like a period before the 1997 Asian crisis, a period between that crisis and the 2007 global financial crisis and a last period after the last crisis), where one would possibly find different factors affecting the rating differences, reflecting how the rating agencies methodologies were applied in those specific periods.

---

[28] The data and the Stata procedures used to obtain our results can also be found on https://github.com/lejboua/SovereignRatingDifferences

Table XIV Comparison of the results obtained with the random-effects ordered and simple probit estimations for the full, investment-grade and speculative-grade datasets.

Significant variables	Full dataset		Investment-grade dataset		Speculative-grade dataset	
	Ordered probit results	Simple probit results	Ordered probit results	Simple probit results	Ordered probit results	Simple probit results
$Diff\_UP_{it}^{SF}$	(-) Budget balance (4/4)	(-) Budget balance (4/4)	(-) Budget balance (1/4)	(+) Net debt (4/4)	(-) Budget balance (4/4)	(-) Budget balance (3/4)
	(+) Net debt (4/4)	(+) Net debt (4/4)	(+) Net debt (4/4)		(+) Net debt (4/4)	(+) Net debt (4/4)
					(-) Default last 5Y (1/4)	(-) Default last 2Y (1/4)
						(-) Default last 5Y (1/4)
$Diff\_DW_{it}^{SF}$	(-) GDP per capita (16/16)	(-) GDP per capita (16/16)	(-) GDP per capita (15/16)	(-) GDP per capita (12/16)	(+) Net debt (4/4)	(+) Net debt (4/4)
	(-) External debt (16/16)	(+) Default last Y (1/4)	(+) Default last 1Y (1/4)	(+) Inflation (13/16)	(-) External debt (15/16)	(-) GDP growth (15/16)
	(+) Default last 1Y (1/4)	(+) Default last 2Y (1/4)		(+) Default last Y (1/4)	(-) GDP growth (15/16)	(-) Default last Y (2/4)
	(+) Default last 2Y (1/4)	(+) Default last 5Y (4/4)			(-) Default last 10Y (3/4)	(-) Default last 2Y (2/4)
	(+) Default last 5Y (4/4)					(-) Default last 10Y (4/4)
$Diff\_UP_{it}^{MF}$	(-) GDP growth (9/16)	(-) Structural balance (3/4)	(+) GDP per capita (12/16)	(+) GDP per capita (2/16)	(+) External debt (2/16)	(-) Default last Y (1/4)
	(+) External debt (16/16)	(+) External debt (16/16)	(-) Inflation (16/16)	(-) Inflation (13/16)	(-) Default last Y (1/4)	(-) Default last 5Y (1/4)
				(-) Budget balance (1/4)	(-) Default last 5Y (1/4)	
				(-) Structural balance (4/4)		
				(-) Default last 5Y (4/4)		

Significant variables	Full dataset		Investment-grade dataset		Speculative-grade dataset	
	Ordered probit results	*Simple probit results*	*Ordered probit results*	*Simple probit results*	*Ordered probit results*	*Simple probit results*
$Diff\_DW_{it}^{MF}$	(-) Gross debt (2/4)	(+) Net debt (4/4)	(-) Gross debt (1/4)	(-) Gross debt (1/4)	(-) Gross debt (4/4)	(+) External debt (4/16)
	(+) Net debt (4/4)	(+) Default last 2Y (3/4)		(+) Net debt (4/4)	(-) Inflation (4/4)	(-) Inflation (16/16)
	(+) Default last 2Y (3/4)	(+) Default last 5Y (4/4)			(-) Default last 10Y (1/4)	
	(+) Default last 5Y (4/4)					
$Diff\_UP_{it}^{SM}$	(+) Default last Y (1/4)	(-) External debt (4/16)	(-) External debt (16/16)	(-) External debt (16/16)	(-) Net debt (4/4)	(-) Net debt (4/4)
	(+) Default last 2Y (4/4)	(+) Default last 5Y (1/4)		(-) GDP per capita (8/16)		
	(+) Default last 5Y (1/4)	(+) Default last 10Y (1/4)				
	(+) Default last 10Y (1/4)					
$Diff\_DW_{it}^{SM}$	(+) Budget balance	(+) Budget balance (4/4)	(+) Budget balance (4/4)	(+) Budget balance (4/4)	(-) External debt (4/16)	(+) Gross debt (4/4)
	(+) Gross debt	(+) Gross debt (4/4)	(+) Gross debt (4/4)	(-) Structural balance (2/4)	(+) Budget balance (3/4)	(-) GDP per capita (12/16)
	(+) GDP growth	(+) GDP growth (4/16)	(+) GDP growth (8/16)	(+) Gross debt (4/4)	(-) GDP per capita (12/16)	
	(-) GDP per capita	(-) GDP per capita (12/16)	(-) Default last 1Y (4/4)	(+) GDP growth (13/16)		
			(-) Default last 2Y (4/4)	(-) Default last Y (4/4)		
				(-) Default last 2Y (4/4)		
				(-) Default last 5Y (4/4)		

Note: Coefficient signs and number of significant regressions (besides the total number of run regressions) in parenthesis.

References

Afonso, Antonio (2003) "Understanding the determinants of sovereign debt ratings: Evidence for the two leading agencies", *Journal of Economics and Finance*, Vol. 27, pp. 56–74.

Afonso, Antonio, Davide Furceri, and Pedro Gomes (2012) "Sovereign credit ratings and financial markets linkages: Application to European data", *Journal of International Money and Finance*, Vol. 31, pp. 606 – 638, Financial Stress in the Eurozone.

Afonso, Antonio, Pedro Gomes, and Philipp Rother (2007) "What "hides" behind sovereign debt ratings?" Working Paper Series 0711, European Central Bank.

Afonso, Antonio, Pedro Gomes, and Philipp Rother (2008) "What "Hides" Behind Sovereign Debt Ratings?" in Margarida Catalao-Lopes Joao Soares, Joaquim Pina ed. *New Developments in Financial Modelling*: Cambridge Scholars Publishing, Chap. 13, pp. 314–343.

Afonso, Antonio, Pedro Gomes, and Philipp Rother (2011) "Short- and long-run determinants of sovereign debt credit ratings", *International Journal of Finance & Economics*, Vol. 16, pp. 1–15.

Al-Sakka, Rasha and Owain ap Gwilym (2010) "Split sovereign ratings and rating migrations in emerging economies", *Emerging Markets Review*, Vol. 11, pp. 79–97.

Amstad, Marlene and Frank Packer (2015) "Sovereign ratings of advanced and emerging economies after the crisis", *BIS Quarterly Review December*.

Beers, David and Jamshid Mavalwalla (2016) "Database of Sovereign Defaults, 2016", *Bank of Canada Technical Report*, Vol. 101.

Bhatia, Ashok Vir (2002) "Sovereign Credit Ratings Methodology", International Monetary Fund.

Bissoondoyal-Bheenick, Emawtee (2005) "An analysis of the determinants of sovereign ratings", *Global Finance Journal*, Vol. 15, pp. 251–280.

Brunnermeier, Markus K. (2009) "Deciphering the Liquidity and Credit Crunch 2007-2008", *The Journal of Economic Perspectives*, Vol. 23, pp. 77–100.

Cantor, Richard (2012) "Sovereign Risk Measurement Methodologies", Presentation at the 2012 Credit Risk Conference, NYU Stern School of Business.

Cantor, Richard and Frank Packer (1996) "Determinants and impact of sovereign credit ratings", *Economic policy review*, Vol. 2.

Eliasson, Ann-Charlotte (2002) "Sovereign credit ratings", Research Notes 02-1, Deutsche Bank Research.

Fitch Ratings (2014) "Definitions of Ratings and Other Forms of Opinion", Technical report, Fitch Ratings.

Hill, Paula, Robert Brooks, and Robert Faff (2010) "Variations in sovereign credit quality assessments across rating agencies", *Journal of Banking & Finance*, Vol. 34, pp. 1327 – 1343.

Kiff, John, Sylwia Nowak, and Liliana Schumacher (2012) "Are Rating Agencies Powerful? An Investigation Into the Impact and Accuracy of Sovereign Ratings", Technical report, International Monetary Fund.

Levich, R.M., G. Majnoni, and C. Reinhart (2012) *Ratings, Rating Agencies and the Global Financial System*, The New York University Salomon Center Series on Financial Markets and Institutions: Springer US.

Livingston, Miles, Andy Naranjo, and Lei Zhou (2007) "Asset Opaqueness and Split Bond Ratings", *Financial Management*, Vol. 36, pp. 49–62.

Livingston, Miles, Andy Naranjo, and Lei Zhou (2008) "Split bond ratings and rating migration", *Journal of Banking & Finance*, Vol. 32, pp. 1613 – 1624.

Moody's Investors Service (2015) "Sovereign Rating Methodology", Technical report, Moody's Investors Service.

Moody's Investors Service (2016) "Rating Symbols and Definitions", Technical report, Moody's Investors Service.

Mulder, Mr Christian B and Brieuc Monfort (2000) *Using Credit Ratings for Capital Requirementson Lending to Emerging Market Economies: Possible Impact of a New Basel Accord*, No. 0-69: International Monetary Fund.

S&P Global Ratings (2016) "S&P Global Ratings Definitions", URL: https://-www.standardandpoors.com/en_US/web/guest/article/-/view/sourceId/504352, Accessed on 15 September 2016.

Sylla, Richard (2002) "An historical primer on the business of credit rating", in *Ratings, rating agencies and the global financial system*: Springer, pp. 19–40.

Appendix 1.   Explanatory variables

Table A1-1 Summary of the explanatory variables used in this work.

Predicting variables	Name	Variable original description and source	Explanation
BudgetBal_NGDP	Budget balance	*GGR_NGDP*: General government revenue (percentage of GDP) *GGX_NGDP*: General government total expenditure (percentage of GDP) Source: IMF (WEO)	Difference between government revenues and expenses (*GGR_NGDP* and *GGX_NGDP*).
GGSB_NPGDP	Structural balance	General government structural balance (percentage of potential GDP) Source: IMF (WEO)	
GGXWDG_NGDP	Gross debt	General government gross debt (percentage of GDP) Source: IMF (WEO)	
GGXWDN_NGDP	Net debt	General government net debt (percentage of GDP) Source: IMF (WEO)	
NGDP_RPCH	GDP growth rate	Gross domestic product, constant prices Source: IMF (WEO)	Annual percentages of constant price GDP, year-on-year changes.
NGDPDPC	GDP per capita	Gross domestic product per capita, current prices, expressed in current U.S. dollars per person. Source: IMF (WEO)	
PCPIPCH	Inflation	Inflation, average consumer prices Source: IMF (WEO)	Annual percentages of average consumer prices, year-on-year changes.
ExtDebtPercGNI	External debt	GNI_USD: Gross National Income (current US$) Source: WB (WDI) ExtDebtStocksTotalUSD: External debt stocks, total (DOD, current US$) Source: WB (WDI)	The WDI dataset had GNI values for the great majority of countries, so the GNI values came from the WDI dataset. The External Debt values existed on the WDI dataset, but there were no values for OECD countries and the QEDS dataset will replace the WDI dataset as the canonical source for external debt. However, the QEDS dataset only have values from 2003 onwards, so we first used the

		GrossExtDebtPosition: 0059_T1_Gross External Debt Position and External debt stocks, total (DOD, current US$) Source: JE (QEDS)	external debt values from the WDI dataset (ExtDebtStocksTotalUSD), and then we merged the values from the QEDS dataset when available (GrossExtDebtPosition). Since the QEDS dataset is more recent and uses an updated methodology, those values were used when values from both datasets existed. The variable ExtDebtPercGNI was calculated using the combined external debt values (from WDI and QEDS dataset) and the GNI value, and its value equals the external debt value in percentage of GNI.
DefaultLastYear	Default in the last year	CRAG database has the values of debt defaulted by countries along the years, distributed by type of creditor (and the definition of 'default' used by the authors is consistent with much of the literature on sovereign defaults).	The debt value defaulted by country and year was processed and converted into a boolean variable named DefaultThisYear (1 if the country, in that year, had debt defaulted; 0 otherwise). Afterwards, the variables DefaultLastYear, DefaultLast2Years, DefaultLast5Years and DefaultLast10Years were created, assuming the value 1 if the value DefaultThisYear had the value 1 in the previous year/two years/five years/ten years, for the same country, and 0 otherwise.
DefaultLast2Years	Default in the last two years		
DefaultLast5Years	Default in the last five years		
DefaultLast10Years	Default in the last ten years		

Note: The sources of information used in this work were the World Economic Outlook dataset (WEO) from the International Monetary Fund (IMF), the World Development Indicators (WDI) from the World Bank (WB) and the Quarterly External Debt Statistics dataset (QEDS) from the Joint Effort of the WB and the IMF.
The variables BudgetBal_NGDP, GGSB_NPGDP, GGXWDG_NGDP, GGXWDN_NGDP, NGDPDPC and ExtDebtPercGNI are expressed in terms of their year-to-year variation.

Appendix 2. Ordered probit full dataset regressions results

Table A2-1 Results of our ordered probit regressions for the difference between S&P and Fitch ratings (when the first is higher than the latter), with the full dataset.

ORDERED PROBIT (Full dataset)			Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last				
					General government											
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SF	budgetbal	LastYear	-0.0000559**				-0.00216	-0.00758	-0.000427	-0.000846	0.0474				1149	0.00710
			(-2.01)				(-0.21)	(-1.48)	(-1.09)	(-0.31)	(0.21)					
		Last2Years	-0.0000557**				-0.00238	-0.00750	-0.000430	-0.000818		0.0814			1149	0.00724
			(-2.00)				(-0.23)	(-1.48)	(-1.10)	(-0.30)		(0.38)				
		Last5Years	-0.0000552*				-0.00226	-0.00757	-0.000429	-0.000833			0.0510		1149	0.00713
			(-1.89)				(-0.22)	(-1.49)	(-1.09)	(-0.30)			(0.24)			
		Last10Years	-0.0000558**				-0.00254	-0.00758	-0.000445	-0.000791				0.150	1149	0.00769
			(-2.01)				(-0.24)	(-1.48)	(-1.13)	(-0.29)				(0.63)		
	gross_debt	LastYear			0.00160		0.00187	-0.00710	-0.000434	-0.000701	0.0651				1149	0.00542
					(0.76)		(0.12)	(-1.39)	(-1.10)	(-0.25)	(0.29)					
		Last2Years			0.00162		0.00180	-0.00705	-0.000434	-0.000690		0.0786			1149	0.00549
					(0.77)		(0.12)	(-1.39)	(-1.10)	(-0.25)		(0.36)				
		Last5Years			0.00162		0.00182	-0.00709	-0.000435	-0.000689			0.0644		1149	0.00544
					(0.77)		(0.12)	(-1.40)	(-1.10)	(-0.25)			(0.31)			
		Last10Years			0.00165		0.00165	-0.00711	-0.000451	-0.000659				0.156	1149	0.00600
					(0.78)		(0.11)	(-1.39)	(-1.14)	(-0.24)				(0.66)		
	net_debt	LastYear				0.0000200**	-0.00278	-0.00735	-0.000435	-0.000760	0.0658				1149	0.00528
						(2.17)	(-0.27)	(-1.42)	(-1.11)	(-0.27)	(0.29)					
		Last2Years				0.0000201**	-0.00287	-0.00730	-0.000435	-0.000752		0.0764			1149	0.00534
						(2.15)	(-0.28)	(-1.42)	(-1.11)	(-0.27)		(0.34)				
		Last5Years				0.0000200**	-0.00285	-0.00735	-0.000435	-0.000752			0.0614		1149	0.00529
						(2.13)	(-0.27)	(-1.44)	(-1.11)	(-0.27)			(0.29)			
		Last10Years				0.0000195**	-0.00305	-0.00738	-0.000451	-0.000721				0.148	1149	0.00579
						(2.24)	(-0.29)	(-1.43)	(-1.14)	(-0.26)				(0.62)		
	structbal	LastYear		-0.0112			-0.0255	-0.00902	-0.000543	-0.00482	0.0957				922	0.0117
				(-0.30)			(-1.11)	(-1.47)	(-1.23)	(-1.20)	(0.34)					
		Last2Years		-0.0118			-0.0259	-0.00896	-0.000542	-0.00482		0.101			922	0.0118
				(-0.31)			(-1.14)	(-1.48)	(-1.23)	(-1.20)		(0.39)				
		Last5Years		-0.0114			-0.0253	-0.00905	-0.000537	-0.00487			0.0384		922	0.0115
				(-0.30)			(-1.10)	(-1.50)	(-1.22)	(-1.21)			(0.17)			
		Last10Years		-0.0127			-0.0271	-0.00894	-0.000569	-0.00478				0.187	922	0.0126
				(-0.34)			(-1.20)	(-1.46)	(-1.25)	(-1.19)				(0.74)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A2-2 Results of our ordered probit regressions for the difference between S&P and Fitch ratings (when the first is lower than the latter), with the full dataset.

			Budget Balance	Structural Balance	General government Gross debt	General government Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last	Default in the last	Default in the last	Default in the last		
ORDERED PROBIT (Full dataset)																
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SF	budgetbal	LastYear	-0.00000571				-0.0249	-0.0124**	-0.000115	-0.00408**	0.321				1194	0.0203
			(-0.48)				(-1.16)	(-2.56)	(-0.26)	(-1.97)	(1.54)					
		Last2Years	-0.00000943				-0.0250	-0.0124**	-0.0000959	-0.00403*		0.278			1194	0.0195
			(-0.80)				(-1.16)	(-2.56)	(-0.22)	(-1.95)		(1.45)				
		Last5Years	-0.00000950				-0.0277	-0.0125**	-0.0000833	-0.00405*			0.429***		1194	0.0229
			(-0.81)				(-1.27)	(-2.54)	(-0.19)	(-1.91)			(2.67)			
		Last10Years	-0.00000870				-0.0234	-0.0129***	-0.0000744	-0.00439**				0.177	1194	0.0174
			(-0.73)				(-1.07)	(-2.64)	(-0.17)	(-2.11)				(0.97)		
	gross_debt	LastYear			0.00201		-0.0224	-0.0113**	-0.000110	-0.00404**	0.326				1194	0.0208
					(0.49)		(-1.01)	(-2.22)	(-0.25)	(-1.97)	(1.57)					
		Last2Years			0.00205		-0.0224	-0.0114**	-0.0000914	-0.00400*		0.281			1194	0.0198
					(0.50)		(-1.01)	(-2.23)	(-0.21)	(-1.94)		(1.46)				
		Last5Years			0.00218		-0.0250	-0.0113**	-0.0000783	-0.00401*			0.433***		1194	0.0233
					(0.54)		(-1.11)	(-2.21)	(-0.18)	(-1.90)			(2.67)			
		Last10Years			0.00201		-0.0210	-0.0119**	-0.0000695	-0.00435**				0.183	1194	0.0178
					(0.50)		(-0.93)	(-2.32)	(-0.16)	(-2.10)				(1.00)		
	net_debt	LastYear				-0.00000526	-0.0250	-0.0125***	-0.000116	-0.00407**	0.324				1194	0.0203
						(-0.61)	(-1.16)	(-2.59)	(-0.27)	(-1.97)	(1.56)					
		Last2Years				-0.00000536	-0.0252	-0.0126***	-0.0000977	-0.00403*		0.278			1194	0.0194
						(-0.62)	(-1.17)	(-2.60)	(-0.22)	(-1.95)		(1.45)				
		Last5Years				-0.00000456	-0.0279	-0.0126***	-0.0000850	-0.00404*			0.428***		1194	0.0227
						(-0.55)	(-1.27)	(-2.58)	(-0.19)	(-1.90)			(2.66)			
		Last10Years				-0.00000509	-0.0236	-0.0130***	-0.0000760	-0.00438**				0.177	1194	0.0173
						(-0.59)	(-1.08)	(-2.68)	(-0.17)	(-2.11)				(0.97)		
	structbal	LastYear		-0.0198			-0.0241	-0.0142**	-0.0000627	-0.00609*	0.532**				960	0.0302
				(-0.74)			(-0.99)	(-2.38)	(-0.14)	(-1.71)	(2.19)					
		Last2Years		-0.0213			-0.0264	-0.0141**	-0.0000380	-0.00591*		0.508**			960	0.0297
				(-0.79)			(-1.09)	(-2.36)	(-0.09)	(-1.66)		(2.42)				
		Last5Years		-0.0189			-0.0287	-0.0146**	-0.0000226	-0.00653*			0.478***		960	0.0276
				(-0.72)			(-1.17)	(-2.42)	(-0.05)	(-1.72)			(3.05)			
		Last10Years		-0.0148			-0.0245	-0.0147**	-0.0000268	-0.00660*				0.151	960	0.0210
				(-0.57)			(-1.01)	(-2.50)	(-0.06)	(-1.85)				(0.88)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A2-3 Results of our ordered probit regressions for the difference between Moody's and Fitch ratings (when the first is higher than the latter), with the full dataset.

			Budget Balance	Structural Balance	General government		GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last					
ORDERED PROBIT (Full dataset)					Gross debt	Net debt										
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_MF	budgetbal	LastYear	-0.0000154				-0.0396*	0.0109	-0.000621	0.00646*	-0.0157				903	0.00933
			(-0.37)				(-1.90)	(1.38)	(-0.30)	(1.90)	(-0.08)					
		Last2Years	-0.0000145				-0.0400*	0.0110	-0.000633	0.00649*		0.0232			903	0.00934
			(-0.34)				(-1.92)	(1.39)	(-0.29)	(1.90)		(0.12)				
		Last5Years	-0.0000160				-0.0391*	0.0108	-0.000615	0.00641*			-0.0507		903	0.00941
			(-0.37)				(-1.89)	(1.40)	(-0.30)	(1.91)			(-0.19)			
		Last10Years	-0.0000148				-0.0404**	0.0110	-0.000663	0.00646*				0.0652	903	0.00944
			(-0.34)				(-1.96)	(1.40)	(-0.29)	(1.89)				(0.22)		
	gross_debt	LastYear			0.00509		-0.0303	0.0126	-0.000537	0.00648*	-0.0164				903	0.0111
					(1.37)		(-1.41)	(1.50)	(-0.35)	(1.95)	(-0.08)					
		Last2Years			0.00509		-0.0307	0.0126	-0.000549	0.00651*		0.0270			903	0.0112
					(1.38)		(-1.43)	(1.51)	(-0.35)	(1.96)		(0.14)				
		Last5Years			0.00507		-0.0299	0.0125	-0.000533	0.00644**			-0.0459		903	0.0112
					(1.38)		(-1.38)	(1.53)	(-0.35)	(1.97)			(-0.17)			
		Last10Years			0.00507		-0.0311	0.0126	-0.000572	0.00648*				0.0624	903	0.0112
					(1.37)		(-1.45)	(1.51)	(-0.35)	(1.94)				(0.21)		
	net_debt	LastYear				0.000403	-0.0395*	0.0112	-0.000627	0.00644*	-0.0152				903	0.0111
						(0.64)	(-1.87)	(1.42)	(-0.29)	(1.89)	(-0.07)					
		Last2Years				0.000399	-0.0399*	0.0113	-0.000639	0.00647*		0.0233			903	0.0111
						(0.63)	(-1.88)	(1.43)	(-0.29)	(1.90)		(0.12)				
		Last5Years				0.000401	-0.0390*	0.0111	-0.000622	0.00640*			-0.0491		903	0.0112
						(0.63)	(-1.85)	(1.44)	(-0.29)	(1.91)			(-0.18)			
		Last10Years				0.000400	-0.0402*	0.0113	-0.000669	0.00645*				0.0633	903	0.0112
						(0.63)	(-1.92)	(1.44)	(-0.28)	(1.89)				(0.21)		
	structbal	LastYear		-0.0256			-0.0337	0.00763	-0.000393	0.00590*	-0.241				805	0.0113
				(-0.86)			(-1.53)	(1.00)	(-0.31)	(1.76)	(-0.94)					
		Last2Years		-0.0252			-0.0338	0.00761	-0.000418	0.00586*		-0.175			805	0.0109
				(-0.85)			(-1.53)	(1.00)	(-0.32)	(1.75)		(-0.76)				
		Last5Years		-0.0240			-0.0340	0.00760	-0.000425	0.00591*			-0.124		805	0.0106
				(-0.81)			(-1.54)	(1.01)	(-0.33)	(1.79)			(-0.39)			
		Last10Years		-0.0254			-0.0362*	0.00783	-0.000488	0.00596*				0.124	805	0.0106
				(-0.86)			(-1.65)	(1.02)	(-0.33)	(1.79)				(0.42)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A2-4 Results of our ordered probit regressions for the difference between Moody's and Fitch ratings (when the first is lower than the latter), with the full dataset.

			Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last				
ORDERED PROBIT (Full dataset)																
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_MF	budgetbal	LastYear	0.00000521				-0.00379	-0.00134	-0.00273	-0.00377	0.287				851	0.00619
			(1.05)				(-0.16)	(-0.26)	(-0.44)	(-1.24)	(1.31)					
		Last2Years	0.00000138				-0.00911	-0.000588	-0.00254	-0.00366		0.481**			851	0.0120
			(0.28)				(-0.37)	(-0.11)	(-0.40)	(-1.19)		(2.22)				
		Last5Years	0.00000362				-0.0111	-0.00159	-0.00226	-0.00442			0.522**		851	0.0115
			(0.87)				(-0.44)	(-0.29)	(-0.37)	(-1.42)			(2.42)			
		Last10Years	0.00000331				-0.00464	-0.00208	-0.00202	-0.00441				0.293	851	0.00512
			(0.71)				(-0.19)	(-0.38)	(-0.33)	(-1.49)				(1.06)		
	gross_debt	LastYear			-0.0105*		-0.0203	-0.00447	-0.00349	-0.00437	0.264				851	0.0105
					(-1.77)		(-0.81)	(-0.77)	(-0.61)	(-1.35)	(1.20)					
		Last2Years			-0.00983		-0.0244	-0.00358	-0.00325	-0.00424		0.458**			851	0.0158
					(-1.64)		(-0.98)	(-0.60)	(-0.56)	(-1.29)		(2.06)				
		Last5Years			-0.00946		-0.0254	-0.00442	-0.00293	-0.00499			0.488**		851	0.0151
					(-1.57)		(-0.99)	(-0.75)	(-0.51)	(-1.52)			(2.20)			
		Last10Years			-0.0101*		-0.0199	-0.00506	-0.00287	-0.00492				0.237	851	0.00912
					(-1.74)		(-0.77)	(-0.85)	(-0.50)	(-1.55)				(0.83)		
	net_debt	LastYear				0.0000138*	-0.00365	-0.000953	-0.00272	-0.00380	0.279				851	0.00716
						(1.84)	(-0.15)	(-0.18)	(-0.44)	(-1.25)	(1.28)					
		Last2Years				0.0000131*	-0.00914	-0.000245	-0.00254	-0.00368		0.478**			851	0.0130
						(1.73)	(-0.37)	(-0.05)	(-0.40)	(-1.20)		(2.21)				
		Last5Years				0.0000147**	-0.0111	-0.00120	-0.00226	-0.00444			0.520**		851	0.0126
						(2.05)	(-0.44)	(-0.22)	(-0.37)	(-1.43)			(2.42)			
		Last10Years				0.0000139*	-0.00452	-0.00170	-0.00204	-0.00442				0.284	851	0.00613
						(1.93)	(-0.18)	(-0.31)	(-0.33)	(-1.49)				(1.03)		
	structbal	LastYear		0.0134			-0.00702	-0.000815	-0.00325	-0.00306	0.119				776	0.00324
				(0.53)			(-0.28)	(-0.14)	(-0.54)	(-0.90)	(0.51)					
		Last2Years		0.00936			-0.0108	-0.0000778	-0.00305	-0.00272		0.328			776	0.00668
				(0.37)			(-0.43)	(-0.01)	(-0.49)	(-0.81)		(1.47)				
		Last5Years		0.0108			-0.0146	-0.000632	-0.00287	-0.00338			0.425*		776	0.00799
				(0.43)			(-0.57)	(-0.11)	(-0.47)	(-0.96)			(1.81)			
		Last10Years		0.0140			-0.00882	-0.00115	-0.00289	-0.00349				0.177	776	0.00343
				(0.56)			(-0.35)	(-0.20)	(-0.47)	(-1.03)				(0.58)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A2-5 Results of our ordered probit regressions for the difference between S&P and Moody's ratings (when the first is higher than the latter), with the full dataset.

ORDERED PROBIT (Full dataset)			Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last					
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SM	budgetbal	LastYear	0.00000485				-0.00542	-0.00195	-0.00757	-0.00274	0.247*				1103	0.00447
			(0.69)				(-0.23)	(-0.38)	(-1.03)	(-0.95)	(1.66)					
		Last2Years	0.00000187				-0.00767	-0.00167	-0.00791	-0.00249		0.336**			1103	0.00619
			(0.26)				(-0.33)	(-0.32)	(-1.04)	(-0.87)		(1.96)				
		Last5Years	0.00000334				-0.00988	-0.00197	-0.00841	-0.00289			0.349		1103	0.00587
			(0.50)				(-0.42)	(-0.39)	(-1.06)	(-1.02)			(1.54)			
		Last10Years	0.00000358				-0.00556	-0.00224	-0.00710	-0.00293				0.175	1103	0.00315
			(0.52)				(-0.24)	(-0.44)	(-0.98)	(-1.02)				(0.54)		
	gross_debt	LastYear			-0.00000479		-0.00520	-0.00191	-0.00752	-0.00275	0.243				1103	0.00437
					(-0.00)		(-0.23)	(-0.35)	(-1.02)	(-0.96)	(1.64)					
		Last2Years			0.000224		-0.00739	-0.00152	-0.00789	-0.00248		0.338**			1103	0.00618
					(0.07)		(-0.33)	(-0.28)	(-1.04)	(-0.87)		(1.98)				
		Last5Years			0.000337		-0.00944	-0.00175	-0.00837	-0.00288			0.351		1103	0.00584
					(0.11)		(-0.41)	(-0.32)	(-1.05)	(-1.01)			(1.57)			
		Last10Years			-0.0000395		-0.00545	-0.00223	-0.00707	-0.00294				0.175	1103	0.00310
					(-0.01)		(-0.25)	(-0.41)	(-0.97)	(-1.02)				(0.54)		
	net_debt	LastYear				0.0000958	-0.00491	-0.00153	-0.00758	-0.00281	0.240				1103	0.00592
						(0.93)	(-0.21)	(-0.30)	(-1.02)	(-0.97)	(1.61)					
		Last2Years				0.0000929	-0.00731	-0.00129	-0.00795	-0.00255		0.333*			1103	0.00767
						(0.89)	(-0.31)	(-0.25)	(-1.04)	(-0.88)		(1.93)				
		Last5Years				0.000104	-0.00958	-0.00153	-0.00847	-0.00295			0.353		1103	0.00751
						(1.08)	(-0.40)	(-0.30)	(-1.06)	(-1.03)			(1.57)			
		Last10Years				0.0000965	-0.00509	-0.00183	-0.00713	-0.00299				0.171	1103	0.00468
						(1.09)	(-0.22)	(-0.36)	(-0.98)	(-1.03)				(0.53)		
	structbal	LastYear		-0.0283			0.00401	-0.00406	-0.00605	-0.00582	0.222				926	0.00781
				(-0.76)			(0.19)	(-0.72)	(-0.74)	(-1.50)	(1.28)					
		Last2Years		-0.0323			-0.00183	-0.00327	-0.00695	-0.00519		0.448**			926	0.0129
				(-0.89)			(-0.08)	(-0.59)	(-0.80)	(-1.32)		(2.20)				
		Last5Years		-0.0322			-0.00639	-0.00363	-0.00755	-0.00594			0.515**		926	0.0143
				(-0.88)			(-0.29)	(-0.66)	(-0.83)	(-1.57)			(2.05)			
		Last10Years		-0.0271			-0.00385	-0.00417	-0.00599	-0.00612				0.509*	926	0.0123
				(-0.73)			(-0.17)	(-0.76)	(-0.70)	(-1.59)				(1.78)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A2-6 Results of our ordered probit regressions for the difference between S&P and Moody's ratings (when the first is lower than the latter), with the full dataset.

ORDERED PROBIT (Full dataset)			Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last					
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SM	budgetbal	LastYear	0.000206***				0.0146	-0.0105*	-0.000310	0.00325	-0.0263				1165	0.0110
			(3.52)				(0.74)	(-1.66)	(-0.51)	(0.99)	(-0.17)					
		Last2Years	0.000207***				0.0148	-0.0106*	-0.000307	0.00319		-0.0639			1165	0.0111
			(3.53)				(0.76)	(-1.67)	(-0.51)	(0.98)		(-0.43)				
		Last5Years	0.000206***				0.0148	-0.0106*	-0.000313	0.00322			-0.0434		1165	0.0110
			(3.52)				(0.75)	(-1.66)	(-0.51)	(0.98)			(-0.30)			
		Last10Years	0.000206***				0.0146	-0.0105*	-0.000312	0.00327				-0.0291	1165	0.0110
			(3.51)				(0.74)	(-1.66)	(-0.51)	(0.99)				(-0.15)		
	gross_debt	LastYear			0.00884***		0.0290*	-0.00604	-0.000232	0.00338	-0.0192				1165	0.0124
					(3.57)		(1.66)	(-0.89)	(-0.42)	(1.04)	(-0.12)					
		Last2Years			0.00881***		0.0292*	-0.00610	-0.000230	0.00335		-0.0432			1165	0.0124
					(3.57)		(1.67)	(-0.90)	(-0.41)	(1.03)		(-0.29)				
		Last5Years			0.00882***		0.0292*	-0.00609	-0.000233	0.00336			-0.0344		1165	0.0124
					(3.53)		(1.66)	(-0.89)	(-0.42)	(1.03)			(-0.24)			
		Last10Years			0.00884***		0.0290*	-0.00602	-0.000233	0.00340				-0.0215	1165	0.0124
					(3.56)		(1.66)	(-0.89)	(-0.42)	(1.04)				(-0.11)		
	net_debt	LastYear				0.0000891	0.0173	-0.00957	-0.000284	0.00312	-0.0401				1165	0.00668
						(1.04)	(0.89)	(-1.52)	(-0.48)	(0.95)	(-0.26)					
		Last2Years				0.0000905	0.0175	-0.00964	-0.000283	0.00307		-0.0719			1165	0.00680
						(1.03)	(0.90)	(-1.53)	(-0.48)	(0.94)		(-0.49)				
		Last5Years				0.0000876	0.0175	-0.00962	-0.000289	0.00310			-0.0530		1165	0.00672
						(1.00)	(0.89)	(-1.52)	(-0.48)	(0.94)			(-0.37)			
		Last10Years				0.0000877	0.0172	-0.00953	-0.000287	0.00315				-0.0373	1165	0.00667
						(1.02)	(0.88)	(-1.51)	(-0.49)	(0.96)				(-0.19)		
	structbal	LastYear		-0.0392			0.0173	-0.0117*	-0.0000832	-0.000571	-0.0768				976	0.00941
				(-1.61)			(0.83)	(-1.83)	(-0.16)	(-0.15)	(-0.39)					
		Last2Years		-0.0395			0.0169	-0.0116*	-0.0000932	-0.000462		0.0162			976	0.00928
				(-1.63)			(0.81)	(-1.81)	(-0.18)	(-0.12)		(0.09)				
		Last5Years		-0.0396			0.0169	-0.0116*	-0.0000925	-0.000466			0.0192		976	0.00928
				(-1.62)			(0.80)	(-1.81)	(-0.18)	(-0.12)			(0.11)			
		Last10Years		-0.0393			0.0171	-0.0116*	-0.0000898	-0.000480				-0.0208	976	0.00928
				(-1.62)			(0.82)	(-1.82)	(-0.17)	(-0.13)				(-0.10)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Appendix 3.   Ordered probit investment-grade dataset regressions results

Table A3-1 Results of our ordered probit regressions for the difference between S&P and Fitch ratings (when the first is higher than the latter), with the investment-grade dataset.

ORDERED PROBIT (Investment-grade Dataset)				Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last				
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SF	Investment	budgetbal	LastYear	-0.0000355				-0.0174	-0.00827	-0.0310	-0.00592	0.390				773	0.0143
				(-1.52)				(-0.75)	(-1.17)	(-0.89)	(-1.11)	(0.90)					
			Last2Years	-0.0000387*				-0.0203	-0.00780	-0.0334	-0.00644		0.480			773	0.0162
				(-1.83)				(-0.91)	(-1.14)	(-0.94)	(-1.22)		(1.18)				
			Last5Years	-0.0000413				-0.0174	-0.00831	-0.0311	-0.00609			0.120		773	0.0126
				(-1.12)				(-0.77)	(-1.23)	(-0.85)	(-1.14)			(0.36)			
			Last10Years	-0.0000422				-0.0144	-0.00868	-0.0277	-0.00599				-0.0604	773	0.0124
				(-1.05)				(-0.63)	(-1.23)	(-0.76)	(-1.13)				(-0.16)		
Diff_UP_SF	Investment	gross_debt	LastYear			-0.00150		-0.0222	-0.00882	-0.0318	-0.00538	0.424				773	0.0117
						(-0.29)		(-0.86)	(-1.23)	(-0.92)	(-0.98)	(0.96)					
			Last2Years			-0.00121		-0.0240	-0.00847	-0.0335	-0.00573		0.422			773	0.0124
						(-0.23)		(-0.96)	(-1.22)	(-0.95)	(-1.05)		(0.99)				
			Last5Years			-0.00146		-0.0217	-0.00896	-0.0313	-0.00544			0.0977		773	0.00944
						(-0.28)		(-0.86)	(-1.30)	(-0.86)	(-0.98)			(0.29)			
			Last10Years			-0.00170		-0.0196	-0.00933	-0.0283	-0.00538				-0.0647	773	0.00933
						(-0.34)		(-0.75)	(-1.31)	(-0.78)	(-0.96)				(-0.18)		
Diff_UP_SF	Investment	net_debt	LastYear				0.0000182***	-0.0190	-0.00814	-0.0321	-0.00548	0.426				773	0.0127
							(3.59)	(-0.82)	(-1.15)	(-0.92)	(-1.02)	(0.97)					
			Last2Years				0.0000183***	-0.0215	-0.00785	-0.0340	-0.00584		0.426			773	0.0135
							(3.59)	(-0.96)	(-1.14)	(-0.95)	(-1.09)		(1.00)				
			Last5Years				0.0000182***	-0.0186	-0.00828	-0.0317	-0.00554			0.101		773	0.0105
							(3.53)	(-0.83)	(-1.22)	(-0.87)	(-1.01)			(0.30)			
			Last10Years				0.0000184***	-0.0158	-0.00861	-0.0285	-0.00546				-0.0672	773	0.0103
							(3.27)	(-0.69)	(-1.22)	(-0.78)	(-1.00)				(-0.18)		
Diff_UP_SF	Investment	structbal	LastYear		-0.0463			-0.00839	-0.0105	-0.0179	-0.00584	0.489				710	0.0159
					(-0.70)			(-0.25)	(-1.30)	(-0.50)	(-0.94)	(1.12)					
			Last2Years		-0.0500			-0.0108	-0.0102	-0.0201	-0.00632		0.509			710	0.0173
					(-0.75)			(-0.33)	(-1.29)	(-0.54)	(-1.01)		(1.16)				
			Last5Years		-0.0460			-0.00825	-0.0106	-0.0178	-0.00590			0.136		710	0.0131
					(-0.70)			(-0.25)	(-1.37)	(-0.46)	(-0.93)			(0.39)			
			Last10Years		-0.0445			-0.00595	-0.0109	-0.0145	-0.00575				-0.0152	710	0.0127
					(-0.68)			(-0.18)	(-1.36)	(-0.38)	(-0.91)				(-0.04)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A3-2 Results of our ordered probit regressions for the difference between S&P and Fitch ratings (when the first is lower than the latter), with the investment-grade dataset.

ORDERED PROBIT (Investment-grade Dataset)				Budget Balance	Structural Balance	General government Gross debt	General government Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last 2 Years	Default in the last 5 Years	Default in the last 10 Years		
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SF	Investment	budgetbal	LastYear	0.0000113 (0.68)				0.0189 (0.46)	-0.0186** (-2.19)	0.0477 (1.33)	0.0000416 (0.01)	0.687 (1.51)				759	0.0218
			Last2Years	0.00000514 (0.31)				0.0195 (0.48)	-0.0186** (-2.19)	0.0508 (1.37)	0.0000370 (0.01)		0.423 (0.96)			759	0.0193
			Last5Years	0.00000635 (0.38)				0.0180 (0.44)	-0.0189** (-2.21)	0.0528 (1.34)	0.000182 (0.05)			0.320 (0.95)		759	0.0188
			Last10Years	0.0000107 (0.64)				0.0202 (0.50)	-0.0177** (-2.06)	0.0602 (1.42)	0.000108 (0.03)				-0.474 (-1.36)	759	0.0212
Diff_DW_SF	Investment	gross_debt	LastYear			0.00648 (1.53)		0.0294 (0.72)	-0.0149* (-1.69)	0.0472 (1.32)	0.0000668 (0.02)	0.687 (1.53)				759	0.0277
			Last2Years			0.00646 (1.53)		0.0298 (0.73)	-0.0150* (-1.70)	0.0501 (1.34)	0.000100 (0.03)		0.444 (1.02)			759	0.0254
			Last5Years			0.00648 (1.54)		0.0282 (0.68)	-0.0154* (-1.72)	0.0522 (1.31)	0.000259 (0.07)			0.344 (1.03)		759	0.0248
			Last10Years			0.00617 (1.43)		0.0302 (0.74)	-0.0143 (-1.61)	0.0595 (1.39)	0.000133 (0.04)				-0.447 (-1.30)	759	0.0267
Diff_DW_SF	Investment	net_debt	LastYear				-0.0000105 (-1.10)	0.0192 (0.47)	-0.0187** (-2.21)	0.0484 (1.36)	0.00000876 (0.00)	0.680 (1.51)				759	0.0220
			Last2Years				-0.0000103 (-1.09)	0.0196 (0.48)	-0.0188** (-2.22)	0.0513 (1.38)	0.0000358 (0.01)		0.433 (0.99)			759	0.0197
			Last5Years				-0.00000961 (-1.06)	0.0182 (0.44)	-0.0191** (-2.23)	0.0533 (1.35)	0.000163 (0.04)			0.316 (0.94)		759	0.0191
			Last10Years				-0.00000920 (-0.91)	0.0205 (0.50)	-0.0179** (-2.09)	0.0607 (1.43)	0.0000747 (0.02)				-0.468 (-1.36)	759	0.0214
Diff_DW_SF	Investment	structbal	LastYear		-0.00915 (-0.20)			0.0166 (0.33)	-0.0194** (-2.12)	0.0501 (1.07)	-0.00122 (-0.27)	0.807* (1.81)				689	0.0236
			Last2Years		-0.0114 (-0.25)			0.0183 (0.36)	-0.0195** (-2.13)	0.0553 (1.15)	-0.00119 (-0.25)		0.509 (1.18)			689	0.0206
			Last5Years		-0.0122 (-0.27)			0.0158 (0.31)	-0.0201** (-2.16)	0.0587 (1.15)	-0.00110 (-0.22)			0.408 (1.21)		689	0.0201
			Last10Years		-0.0134 (-0.30)			0.0208 (0.42)	-0.0189** (-2.08)	0.0677 (1.26)	-0.00126 (-0.27)				-0.234 (-0.80)	689	0.0188

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A3-3 Results of our ordered probit regressions for the difference between Moody's and Fitch ratings (when the first is higher than the latter), with the investment-grade dataset.

				Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last					
ORDERED PROBIT (Investment-grade Dataset)																		
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_MF	Investment	budgetbal	LastYear	-0.0000328				-0.0394	0.0173*	-0.104***	0.00743	-0.267				665	0.0292
				(-0.88)				(-1.26)	(1.71)	(-2.59)	(1.46)	(-0.61)					
			Last2Years	-0.0000336				-0.0394	0.0172*	-0.103**	0.00739		-0.349			665	0.0298
				(-0.82)				(-1.26)	(1.71)	(-2.55)	(1.44)		(-0.96)				
			Last5Years	-0.0000316				-0.0381	0.0174*	-0.103**	0.00738			-0.406		665	0.0306
				(-0.75)				(-1.21)	(1.72)	(-2.52)	(1.41)			(-1.10)			
			Last10Years	-0.0000256				-0.0389	0.0174*	-0.104**	0.00751				-0.0967	665	0.0287
				(-0.60)				(-1.24)	(1.71)	(-2.56)	(1.47)				(-0.27)		
Diff_UP_MF	Investment	gross_debt	LastYear			0.00424		-0.0316	0.0181*	-0.105**	0.00739	-0.242				665	0.0298
						(0.99)		(-1.05)	(1.72)	(-2.56)	(1.49)	(-0.50)					
			Last2Years			0.00423		-0.0316	0.0180*	-0.104**	0.00736		-0.327			665	0.0304
						(0.99)		(-1.05)	(1.72)	(-2.52)	(1.47)		(-0.85)				
			Last5Years			0.00404		-0.0307	0.0182*	-0.104**	0.00734			-0.387		665	0.0311
						(0.96)		(-1.02)	(1.72)	(-2.49)	(1.44)			(-1.06)			
			Last10Years			0.00414		-0.0312	0.0181*	-0.105**	0.00744				-0.0921	665	0.0294
						(0.97)		(-1.03)	(1.72)	(-2.53)	(1.49)				(-0.26)		
Diff_UP_MF	Investment	net_debt	LastYear				0.000509	-0.0389	0.0178*	-0.105***	0.00745	-0.245				665	0.0319
							(0.84)	(-1.21)	(1.76)	(-2.61)	(1.46)	(-0.50)					
			Last2Years				0.000506	-0.0389	0.0178*	-0.105**	0.00742		-0.329			665	0.0324
							(0.83)	(-1.21)	(1.76)	(-2.57)	(1.44)		(-0.84)				
			Last5Years				0.000475	-0.0377	0.0180*	-0.105**	0.00740			-0.394		665	0.0333
							(0.79)	(-1.17)	(1.77)	(-2.54)	(1.41)			(-1.06)			
			Last10Years				0.000481	-0.0383	0.0179*	-0.105***	0.00750				-0.1000	665	0.0315
							(0.78)	(-1.19)	(1.76)	(-2.58)	(1.47)				(-0.28)		
Diff_UP_MF	Investment	structbal	LastYear		-0.0409			-0.0245	0.0133	-0.0836**	0.00604	-0.120				635	0.0205
					(-1.16)			(-0.73)	(1.30)	(-2.00)	(1.24)	(-0.25)					
			Last2Years		-0.0412			-0.0245	0.0133	-0.0823*	0.00603		-0.236			635	0.0209
					(-1.16)			(-0.73)	(1.30)	(-1.95)	(1.23)		(-0.65)				
			Last5Years		-0.0407			-0.0235	0.0135	-0.0819*	0.00599			-0.309		635	0.0216
					(-1.15)			(-0.70)	(1.31)	(-1.91)	(1.21)			(-0.87)			
			Last10Years		-0.0408			-0.0243	0.0133	-0.0846**	0.00600				0.00746	635	0.0204
					(-1.15)			(-0.73)	(1.30)	(-1.97)	(1.22)				(0.02)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Table A3-4 Results of our ordered probit regressions for the difference between Moody's and Fitch ratings (when the first is lower than the latter), with the investment-grade dataset.

				Budget Balance	Structural Balance	General government — Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last — 2 Years	5 Years	10 Years		
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_MF	Investment	budgetbal	LastYear	0.0000990 (0.79)				0.00710 (0.19)	-0.00426 (-0.56)	0.00640 (0.13)	-0.00740 (-1.12)	0.0675 (0.18)				555	0.00611
			Last2Years	0.0000990 (0.79)				0.00715 (0.19)	-0.00428 (-0.56)	0.00675 (0.14)	-0.00750 (-1.18)		0.0217 (0.05)			555	0.00606
			Last5Years	0.0000989 (0.79)				0.00838 (0.21)	-0.00437 (-0.58)	0.00789 (0.17)	-0.00743 (-1.16)			-0.0529 (-0.15)		555	0.00611
			Last10Years	0.0000946 (0.76)				0.0136 (0.34)	-0.00440 (-0.60)	0.0127 (0.27)	-0.00726 (-1.13)				-0.350 (-0.80)	555	0.00883
Diff_DW_MF	Investment	gross_debt	LastYear			-0.00965 (-1.42)		-0.0135 (-0.32)	-0.00626 (-0.83)	0.00554 (0.12)	-0.00944 (-1.28)	0.0356 (0.09)				555	0.00748
			Last2Years			-0.00970 (-1.44)		-0.0134 (-0.32)	-0.00632 (-0.82)	0.00588 (0.12)	-0.00949 (-1.35)		-0.00651 (-0.02)			555	0.00747
			Last5Years			-0.00991 (-1.48)		-0.0122 (-0.29)	-0.00646 (-0.86)	0.00754 (0.16)	-0.00940 (-1.32)			-0.0961 (-0.27)		555	0.00764
			Last10Years			-0.0107* (-1.73)		-0.00937 (-0.22)	-0.00667 (-0.91)	0.0123 (0.27)	-0.00927 (-1.31)				-0.402 (-0.91)	555	0.0111
Diff_DW_MF	Investment	net_debt	LastYear				0.0000129 (1.64)	0.0115 (0.31)	-0.00297 (-0.39)	0.00468 (0.10)	-0.00840 (-1.20)	0.0656 (0.17)				555	0.00608
			Last2Years				0.0000129 (1.64)	0.0115 (0.31)	-0.00298 (-0.39)	0.00497 (0.10)	-0.00850 (-1.27)		0.0261 (0.06)			555	0.00604
			Last5Years				0.0000128 (1.59)	0.0126 (0.33)	-0.00307 (-0.41)	0.00599 (0.12)	-0.00843 (-1.24)			-0.0437 (-0.12)		555	0.00607
			Last10Years				0.0000129 (1.60)	0.0182 (0.47)	-0.00308 (-0.43)	0.0113 (0.24)	-0.00822 (-1.21)				-0.371 (-0.85)	555	0.00912
Diff_DW_MF	Investment	structbal	LastYear		0.00915 (0.21)			0.00946 (0.24)	-0.00481 (-0.60)	-0.00714 (-0.12)	-0.0101 (-1.29)	0.0997 (0.28)				532	0.00565
			Last2Years		0.00877 (0.20)			0.00954 (0.24)	-0.00483 (-0.60)	-0.00652 (-0.11)	-0.0103 (-1.36)		0.0509 (0.12)			532	0.00557
			Last5Years		0.00899 (0.20)			0.0107 (0.26)	-0.00499 (-0.63)	-0.00471 (-0.08)	-0.0102 (-1.33)			-0.0394 (-0.11)		532	0.00556
			Last10Years		0.0107 (0.24)			0.0157 (0.38)	-0.00517 (-0.68)	0.00365 (0.06)	-0.00996 (-1.31)				-0.374 (-0.83)	532	0.00860

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Table A3-5 Results of our ordered probit regressions for the difference between S&P and Moody's ratings (when the first is higher than the latter), with the investment-grade dataset.

Dependent variables	Type of rating	Independent variables		Budget Balance	Structural Balance	General government — Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Year	Default in the last — 2 Years	5 Years	10 Years	N	Pseudo R^2
				BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SM	Investment	budgetbal	LastYear	0.0000740				-0.00385	-0.00712	-0.0217	-0.0123*	-0.0132				746	0.00934
				(1.48)				(-0.14)	(-1.51)	(-0.68)	(-1.88)	(-0.04)					
			Last2Years	0.0000711				-0.00707	-0.00662	-0.0251	-0.0125*		0.288			746	0.0103
				(1.50)				(-0.25)	(-1.42)	(-0.76)	(-1.92)		(0.71)				
			Last5Years	0.0000737				-0.00382	-0.00711	-0.0217	-0.0122*			-0.00620		746	0.00933
				(1.50)				(-0.13)	(-1.50)	(-0.64)	(-1.87)			(-0.01)			
			Last10Years	0.0000744				-0.000426	-0.00730	-0.0199	-0.0123*				-0.210	746	0.0101
				(1.50)				(-0.01)	(-1.55)	(-0.63)	(-1.88)				(-0.55)		
Diff_UP_SM	Investment	gross_debt	LastYear			0.000197		-0.00168	-0.00655	-0.0211	-0.0125*	0.0269				746	0.00795
						(0.06)		(-0.06)	(-1.26)	(-0.67)	(-1.88)	(0.10)					
			Last2Years			0.000444		-0.00462	-0.00591	-0.0243	-0.0127*		0.300			746	0.00902
						(0.12)		(-0.17)	(-1.16)	(-0.74)	(-1.93)		(0.74)				
			Last5Years			0.000182		-0.00152	-0.00659	-0.0209	-0.0125*			0.0000775		746	0.00794
						(0.05)		(-0.06)	(-1.27)	(-0.62)	(-1.88)			(0.00)			
			Last10Years			0.000113		0.00186	-0.00683	-0.0190	-0.0125*				-0.206	746	0.00865
						(0.03)		(0.07)	(-1.30)	(-0.60)	(-1.88)				(-0.53)		
Diff_UP_SM	Investment	net_debt	LastYear				0.000134	-0.000868	-0.00612	-0.0213	-0.0126*	0.0199				746	0.0105
							(0.35)	(-0.03)	(-1.29)	(-0.67)	(-1.89)	(0.07)					
			Last2Years				0.000125	-0.00413	-0.00567	-0.0244	-0.0129*		0.293			746	0.0115
							(0.43)	(-0.14)	(-1.20)	(-0.74)	(-1.93)		(0.71)				
			Last5Years				0.000134	-0.00111	-0.00610	-0.0215	-0.0127*			0.0230		746	0.0105
							(0.35)	(-0.04)	(-1.28)	(-0.64)	(-1.89)			(0.05)			
			Last10Years				0.000190	0.00312	-0.00634	-0.0192	-0.0127*				-0.213	746	0.0112
							(0.21)	(0.10)	(-1.34)	(-0.60)	(-1.89)				(-0.53)		
Diff_UP_SM	Investment	structbal	LastYear		-0.0684			0.00957	-0.00967	-0.0241	-0.0151*	0.122				672	0.0236
					(-1.42)			(0.28)	(-1.47)	(-0.82)	(-1.90)	(0.39)					
			Last2Years		-0.0710			0.00389	-0.00887	-0.0297	-0.0156**		0.467			672	0.0266
					(-1.46)			(0.11)	(-1.36)	(-0.94)	(-1.99)		(1.04)				
			Last5Years		-0.0698			0.00664	-0.00944	-0.0266	-0.0154**			0.182		672	0.0240
					(-1.43)			(0.19)	(-1.44)	(-0.82)	(-1.97)			(0.34)			
			Last10Years		-0.0682			0.0104	-0.00984	-0.0228	-0.0152*				0.00880	672	0.0235
					(-1.41)			(0.29)	(-1.50)	(-0.77)	(-1.91)				(0.02)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A3-6 Results of our ordered probit regressions for the difference between S&P and Moody's ratings (when the first is lower than the latter), with the investment-grade dataset.

				Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last				
ORDERED PROBIT (Investment-grade Dataset)																	
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SM	Investment	budgetbal	LastYear	0.000178***				0.0416	-0.00533	-0.0403	0.00902	-0.558**				795	0.0232
				(3.10)				(1.50)	(-0.68)	(-1.27)	(1.40)	(-2.47)					
			Last2Years	0.000178***				0.0417	-0.00527	-0.0414	0.00902		-0.411*			795	0.0222
				(3.11)				(1.51)	(-0.67)	(-1.29)	(1.39)		(-1.71)				
			Last5Years	0.000176***				0.0425	-0.00505	-0.0426	0.00895			-0.377		795	0.0222
				(3.09)				(1.55)	(-0.64)	(-1.30)	(1.34)			(-1.34)			
			Last10Years	0.000178***				0.0408	-0.00450	-0.0414	0.00943				-0.401	795	0.0228
				(3.11)				(1.51)	(-0.57)	(-1.27)	(1.44)				(-1.24)		
Diff_DW_SM	Investment	gross_debt	LastYear			0.00795***		0.0565**	-0.00122	-0.0347	0.00855	-0.620***				795	0.0243
						(3.44)		(2.33)	(-0.15)	(-1.06)	(1.43)	(-2.90)					
			Last2Years			0.00787***		0.0563**	-0.00117	-0.0360	0.00854		-0.462**			795	0.0232
						(3.41)		(2.34)	(-0.14)	(-1.09)	(1.42)		(-2.01)				
			Last5Years			0.00776***		0.0569**	-0.000997	-0.0374	0.00844			-0.406		795	0.0230
						(3.41)		(2.38)	(-0.12)	(-1.11)	(1.37)			(-1.50)			
			Last10Years			0.00776***		0.0553**	-0.000393	-0.0361	0.00892				-0.413	795	0.0234
						(3.40)		(2.35)	(-0.05)	(-1.08)	(1.48)				(-1.30)		
Diff_DW_SM	Investment	net_debt	LastYear				0.000191	0.0467*	-0.00419	-0.0406	0.00861	-0.612***				795	0.0203
							(0.35)	(1.73)	(-0.54)	(-1.26)	(1.35)	(-2.70)					
			Last2Years				0.000147	0.0466*	-0.00413	-0.0417	0.00859		-0.452*			795	0.0192
							(0.46)	(1.73)	(-0.53)	(-1.28)	(1.34)		(-1.89)				
			Last5Years				0.000120	0.0471*	-0.00394	-0.0429	0.00850			-0.377		795	0.0188
							(0.57)	(1.76)	(-0.51)	(-1.29)	(1.30)			(-1.39)			
			Last10Years				0.000117	0.0456*	-0.00335	-0.0417	0.00898				-0.404	795	0.0194
							(0.84)	(1.73)	(-0.43)	(-1.26)	(1.39)				(-1.24)		
Diff_DW_SM	Investment	structbal	LastYear		-0.0521			0.0488	-0.00486	-0.0318	0.00675	-0.577**				743	0.0171
					(-1.38)			(1.61)	(-0.60)	(-0.91)	(1.07)	(-2.37)					
			Last2Years		-0.0515			0.0489	-0.00485	-0.0337	0.00671		-0.413*			743	0.0160
					(-1.38)			(1.61)	(-0.60)	(-0.94)	(1.06)		(-1.71)				
			Last5Years		-0.0495			0.0493	-0.00470	-0.0356	0.00659			-0.331		743	0.0156
					(-1.32)			(1.63)	(-0.58)	(-0.96)	(1.02)			(-1.18)			
			Last10Years		-0.0480			0.0473	-0.00423	-0.0347	0.00701				-0.314	743	0.0157
					(-1.29)			(1.62)	(-0.52)	(-0.94)	(1.09)				(-0.92)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Appendix 4. Ordered probit speculative-grade dataset regressions results

Table A4-1 Results of our ordered probit regressions for the difference between S&P and Fitch ratings (when the first is higher than the latter), with the speculative-grade dataset.

ORDERED PROBIT (Speculative-grade Dataset)				Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last					
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SF	Non-Investment	budgetbal	LastYear	-0.0000675**				-0.00253	-0.00126	-0.000623	0.00185	-0.290				376	0.00768
				(-2.50)				(-0.27)	(-0.16)	(-1.45)	(0.46)	(-0.91)					
			Last2Years	-0.0000661**				-0.00246	-0.00129	-0.000634	0.00147		-0.430			376	0.0105
				(-2.40)				(-0.27)	(-0.16)	(-1.48)	(0.37)		(-1.32)				
			Last5Years	-0.0000872***				-0.00267	-0.000837	-0.000629	0.00122			-0.537		376	0.0130
				(-2.61)				(-0.29)	(-0.11)	(-1.47)	(0.31)			(-1.49)			
			Last10Years	-0.0000750***				-0.00457	0.000444	-0.000617	0.00157				-0.797	376	0.0136
				(-2.85)				(-0.53)	(0.06)	(-1.34)	(0.39)				(-1.48)		
Diff_UP_SF	Non-Investment	gross_debt	LastYear			0.000400		-0.00165	-0.000766	-0.000628	0.00172	-0.301				376	0.00607
						(0.59)		(-0.16)	(-0.10)	(-1.44)	(0.44)	(-0.94)					
			Last2Years			0.000389		-0.00161	-0.000807	-0.000639	0.00135		-0.439			376	0.00896
						(0.58)		(-0.15)	(-0.10)	(-1.47)	(0.34)		(-1.35)				
			Last5Years			0.000419		-0.00200	-0.000226	-0.000638	0.00114			-0.504		376	0.0103
						(0.62)		(-0.19)	(-0.03)	(-1.47)	(0.29)			(-1.49)			
			Last10Years			0.000463		-0.00355	0.000992	-0.000624	0.00146				-0.788	376	0.0117
						(0.66)		(-0.35)	(0.14)	(-1.33)	(0.37)				(-1.47)		
Diff_UP_SF	Non-Investment	net_debt	LastYear				0.00675*	-0.0106	0.00194	-0.000644	0.00161	-0.293				376	0.00896
							(1.78)	(-1.04)	(0.24)	(-1.45)	(0.39)	(-0.92)					
			Last2Years				0.00649*	-0.0102	0.00177	-0.000655	0.00124		-0.427			376	0.0116
							(1.76)	(-0.99)	(0.22)	(-1.47)	(0.31)		(-1.31)				
			Last5Years				0.00622*	-0.0104	0.00222	-0.000653	0.00105			-0.484		376	0.0127
							(1.76)	(-1.01)	(0.28)	(-1.47)	(0.26)			(-1.44)			
			Last10Years				0.00712*	-0.0131	0.00383	-0.000644	0.00131				-0.798	376	0.0149
							(1.84)	(-1.30)	(0.52)	(-1.33)	(0.32)				(-1.49)		
Diff_UP_SF	Non-Investment	structbal	LastYear		0.00237			-0.0315	-0.00426	-0.000988	-0.00387	-0.327				212	0.0176
					(0.08)			(-0.89)	(-0.38)	(-0.96)	(-0.64)	(-0.87)					
			Last2Years		0.00730			-0.0279	-0.00473	-0.00108	-0.00473		-0.509			212	0.0243
					(0.23)			(-0.80)	(-0.43)	(-0.77)	(-0.83)		(-1.42)				
			Last5Years		0.0173			-0.0205	-0.00538	-0.00115	-0.00420			-0.655*		212	0.0319
					(0.53)			(-0.57)	(-0.65)	(-0.65)	(-0.72)			(-1.87)			
			Last10Years		0.00109			-0.0322	-0.00310	-0.00107	-0.00417				-0.703	212	0.0260
					(0.04)			(-0.92)	(-0.30)	(-0.68)	(-0.71)				(-1.56)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Table A4-2 Results of our ordered probit regressions for the difference between S&P and Fitch ratings (when the first is lower than the latter), with the speculative-grade dataset.

Dependent variables	Type of rating	Independent variables		Budget Balance	Structural Balance	Gross debt	Net debt (General government)	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Year	Default in the last 2 Years	5 Years	10 Years	N	Pseudo R^2
ORDERED PROBIT (Speculative-grade Dataset)				BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SF	Non-Investment	budgetbal	LastYear	-0.0000222				-0.0447**	-0.00856	-0.000254	-0.00456**	-0.240				435	0.0232
				(-0.41)				(-2.18)	(-1.32)	(-0.53)	(-2.03)	(-1.36)					
			Last2Years	-0.0000176				-0.0437**	-0.00847	-0.000278	-0.00467**		-0.266			435	0.0237
				(-0.32)				(-2.12)	(-1.31)	(-0.57)	(-2.10)		(-1.43)				
			Last5Years	-0.0000189				-0.0468**	-0.00815	-0.000280	-0.00442**			-0.0914		435	0.0208
				(-0.37)				(-2.27)	(-1.29)	(-0.59)	(-2.03)			(-0.45)			
			Last10Years	-0.0000205				-0.0434**	-0.00790	-0.000366	-0.00421**				-0.460*	435	0.0246
				(-0.40)				(-2.06)	(-1.26)	(-0.69)	(-1.97)				(-1.70)		
Diff_DW_SF	Non-Investment	gross_debt	LastYear			-0.00191		-0.0469**	-0.00977	-0.000267	-0.00455**	-0.238				435	0.0234
						(-0.46)		(-2.19)	(-1.52)	(-0.54)	(-1.98)	(-1.34)					
			Last2Years			-0.00201		-0.0459**	-0.00973	-0.000291	-0.00466**		-0.268			435	0.0239
						(-0.48)		(-2.14)	(-1.50)	(-0.59)	(-2.05)		(-1.43)				
			Last5Years			-0.00199		-0.0490**	-0.00940	-0.000293	-0.00441**			-0.0959		435	0.0210
						(-0.47)		(-2.30)	(-1.48)	(-0.60)	(-1.99)			(-0.47)			
			Last10Years			-0.00231		-0.0459**	-0.00934	-0.000386	-0.00419*				-0.467*	435	0.0250
						(-0.55)		(-2.11)	(-1.46)	(-0.70)	(-1.92)				(-1.74)		
Diff_DW_SF	Non-Investment	net_debt	LastYear				0.00678*	-0.0417*	-0.00610	-0.000257	-0.00456**	-0.209				435	0.0275
							(1.93)	(-1.92)	(-0.94)	(-0.53)	(-2.03)	(-1.15)					
			Last2Years				0.00659*	-0.0409*	-0.00609	-0.000277	-0.00465**		-0.228			435	0.0277
							(1.86)	(-1.88)	(-0.93)	(-0.57)	(-2.09)		(-1.17)				
			Last5Years				0.00714*	-0.0441**	-0.00559	-0.000272	-0.00444**			-0.0301		435	0.0254
							(1.91)	(-2.04)	(-0.88)	(-0.57)	(-2.02)			(-0.14)			
			Last10Years				0.00627*	-0.0410*	-0.00571	-0.000351	-0.00425**				-0.389	435	0.0283
							(1.77)	(-1.87)	(-0.89)	(-0.68)	(-1.98)				(-1.34)		
Diff_DW_SF	Non-Investment	structbal	LastYear		-0.0126			-0.0381*	-0.0118	-0.000253	-0.00734*	-0.0651				271	0.0260
					(-0.47)			(-1.95)	(-1.54)	(-0.56)	(-1.67)	(-0.32)					
			Last2Years		-0.0132			-0.0383**	-0.0118	-0.000254	-0.00736*		-0.0250			271	0.0258
					(-0.47)			(-1.97)	(-1.54)	(-0.57)	(-1.68)		(-0.12)				
			Last5Years		-0.0126			-0.0377*	-0.0118	-0.000261	-0.00726*			-0.0526		271	0.0259
					(-0.44)			(-1.92)	(-1.54)	(-0.59)	(-1.67)			(-0.29)			
			Last10Years		-0.00748			-0.0313	-0.0113	-0.000363	-0.00626				-0.491*	271	0.0326
					(-0.26)			(-1.58)	(-1.48)	(-0.77)	(-1.47)				(-1.73)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A4-3 Results of our ordered probit regressions for the difference between Moody's and Fitch ratings (when the first is higher than the latter), with the speculative-grade dataset.

				Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last					
ORDERED PROBIT (Speculative-grade Dataset)																		
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_MF	Non-Investment	budgetbal	LastYear	0.000274				-0.0188	0.00347	-0.000868	0.00479	-0.0786				238	0.00857
				(1.33)				(-0.55)	(0.44)	(-0.42)	(1.05)	(-0.37)					
			Last2Years	0.000278				-0.0205	0.00376	-0.000873	0.00479		-0.0202			238	0.00835
				(1.32)				(-0.59)	(0.46)	(-0.43)	(1.04)		(-0.08)				
			Last5Years	0.000265				-0.0125	0.00233	-0.000897	0.00458			-0.341		238	0.0130
				(1.30)				(-0.36)	(0.30)	(-0.37)	(1.01)			(-1.24)			
			Last10Years	0.000274				-0.0193	0.00376	-0.000880	0.00485				-0.147	238	0.00877
				(1.32)				(-0.55)	(0.50)	(-0.40)	(1.05)				(-0.33)		
Diff_UP_MF	Non-Investment	gross_debt	LastYear			0.00366		-0.0122	0.00709	-0.000726	0.00551	-0.0835				238	0.00712
						(0.85)		(-0.35)	(0.77)	(-0.57)	(1.22)	(-0.38)					
			Last2Years			0.00359		-0.0143	0.00738	-0.000731	0.00552		-0.0106			238	0.00685
						(0.83)		(-0.40)	(0.78)	(-0.58)	(1.20)		(-0.04)				
			Last5Years			0.00406		-0.00510	0.00621	-0.000731	0.00531			-0.362		238	0.0121
						(0.93)		(-0.14)	(0.70)	(-0.53)	(1.18)			(-1.32)			
			Last10Years			0.00383		-0.0122	0.00750	-0.000728	0.00561				-0.178	238	0.00748
						(0.87)		(-0.33)	(0.86)	(-0.54)	(1.21)				(-0.39)		
Diff_UP_MF	Non-Investment	net_debt	LastYear				-0.000289	-0.0174	0.00406	-0.000805	0.00504	-0.0756				238	0.00590
							(-0.04)	(-0.51)	(0.51)	(-0.47)	(1.09)	(-0.36)					
			Last2Years				-0.000321	-0.0194	0.00438	-0.000808	0.00506		-0.00685			238	0.00568
							(-0.05)	(-0.56)	(0.54)	(-0.48)	(1.08)		(-0.03)				
			Last5Years				-0.000138	-0.0108	0.00285	-0.000829	0.00482			-0.349		238	0.0106
							(-0.02)	(-0.31)	(0.36)	(-0.42)	(1.05)			(-1.28)			
			Last10Years				-0.000195	-0.0177	0.00432	-0.000815	0.00511				-0.153	238	0.00615
							(-0.03)	(-0.50)	(0.57)	(-0.45)	(1.09)				(-0.34)		
Diff_UP_MF	Non-Investment	structbal	LastYear					-0.0173	0.00683	-0.000928	0.00819*	-0.494*				170	0.0258
								(-0.48)	(0.95)	(-0.23)	(1.69)	(-1.92)					
			Last2Years					-0.0194	0.00715	-0.000963	0.00792		-0.404			170	0.0229
								(-0.52)	(0.98)	(-0.23)	(1.55)		(-1.43)				
			Last5Years					-0.00781	0.00460	-0.00126	0.00816			-0.757***		170	0.0388
								(-0.21)	(0.68)	(-0.16)	(1.62)			(-2.91)			
			Last10Years					-0.0262	0.00847	-0.000754	0.00835*				-0.201	170	0.0186
								(-0.68)	(1.25)	(-0.36)	(1.65)				(-0.42)		

Note: t-statistics in parentheses. The Pseudo R² values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Table A4-4 Results of our ordered probit regressions for the difference between Moody's and Fitch ratings (when the first is lower than the latter), with the speculative-grade dataset.

Dependent variables	Type of rating	Independent variables		Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last Year	2 Years	5 Years	10 Years	N	Pseudo R^2
				BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_MF	Non-Investment	budgetbal	LastYear	8.70e-08				-0.00762	0.0000191	-0.0111	-0.000175	-0.102				296	0.00928
				(0.02)				(-0.25)	(0.00)	(-1.43)	(-0.04)	(-0.39)					
			Last2Years	0.000000996				-0.0152	0.000877	-0.0107	0.00000747		0.132			296	0.00955
				(0.23)				(-0.48)	(0.09)	(-1.35)	(0.00)		(0.44)				
			Last5Years	0.00000119				-0.0104	0.000419	-0.0110	-0.0000788			-0.0102		296	0.00870
				(0.29)				(-0.34)	(0.04)	(-1.41)	(-0.02)			(-0.03)			
			Last10Years	0.000000973				-0.000569	0.00116	-0.0133*	0.000625				-0.617	296	0.0148
				(0.22)				(-0.02)	(0.12)	(-1.81)	(0.15)				(-1.48)		
Diff_DW_MF	Non-Investment	gross_debt	LastYear			-0.0122*		-0.0213	-0.00411	-0.0113	-0.000694	-0.107				296	0.0148
						(-1.80)		(-0.72)	(-0.38)	(-1.45)	(-0.16)	(-0.41)					
			Last2Years			-0.0119*		-0.0281	-0.00317	-0.0109	-0.000521		0.114			296	0.0148
						(-1.69)		(-0.92)	(-0.29)	(-1.37)	(-0.12)		(0.38)				
			Last5Years			-0.0123*		-0.0231	-0.00369	-0.0113	-0.000525			-0.0560		296	0.0143
						(-1.68)		(-0.79)	(-0.35)	(-1.45)	(-0.13)			(-0.17)			
			Last10Years			-0.0145**		-0.0149	-0.00372	-0.0141*	0.000142				-0.700*	296	0.0223
						(-2.16)		(-0.54)	(-0.35)	(-1.92)	(0.03)				(-1.65)		
Diff_DW_MF	Non-Investment	net_debt	LastYear				-0.00288	-0.00970	-0.00118	-0.0110	-0.000314	-0.104				296	0.0101
							(-1.06)	(-0.33)	(-0.11)	(-1.41)	(-0.07)	(-0.40)					
			Last2Years				-0.00271	-0.0170	-0.000240	-0.0106	-0.000123		0.126			296	0.0103
							(-0.98)	(-0.55)	(-0.02)	(-1.33)	(-0.03)		(0.42)				
			Last5Years				-0.00286	-0.0122	-0.000733	-0.0108	-0.000191			-0.0218		296	0.00949
							(-1.02)	(-0.40)	(-0.07)	(-1.40)	(-0.05)			(-0.07)			
			Last10Years				-0.00382	-0.00277	-0.000389	-0.0133*	0.000493				-0.647	296	0.0162
							(-1.32)	(-0.10)	(-0.04)	(-1.83)	(0.11)				(-1.51)		
Diff_DW_MF	Non-Investment	structbal	LastYear		0.0151			-0.00562	0.00250	-0.0125	0.00306	-0.404				244	0.0207
					(0.44)			(-0.17)	(0.21)	(-1.58)	(0.57)	(-1.47)					
			Last2Years		0.0101			-0.0102	0.00355	-0.0118	0.00345		-0.123			244	0.0127
					(0.29)			(-0.30)	(0.31)	(-1.46)	(0.66)		(-0.41)				
			Last5Years		0.00882			-0.00896	0.00403	-0.0119	0.00398			-0.173		244	0.0128
					(0.24)			(-0.27)	(0.36)	(-1.49)	(0.75)			(-0.48)			
			Last10Years		0.00946			-0.00348	0.00505	-0.0138*	0.00490				-0.609	244	0.0186
					(0.26)			(-0.11)	(0.44)	(-1.76)	(0.93)				(-1.49)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A4-5 Results of our ordered probit regressions for the difference between S&P and Moody's ratings (when the first is higher than the latter), with the speculative-grade dataset.

Dependent variables	Type of rating	Independent variables		Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last				N	Pseudo R^2
						General government											
ORDERED PROBIT (Speculative-grade Dataset)				BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SM	Non-Investment	budgetbal	LastYear	0.00000448				0.00171	0.00151	-0.0111	0.00333	0.133				357	0.00913
				(0.63)				(0.06)	(0.18)	(-1.12)	(0.93)	(0.70)					
			Last2Years	0.00000285				0.00175	0.00147	-0.0110	0.00350		0.132			357	0.00902
				(0.41)				(0.06)	(0.17)	(-1.11)	(0.96)		(0.68)				
			Last5Years	0.00000322				0.000531	0.00131	-0.0111	0.00323			0.153		357	0.00890
				(0.49)				(0.02)	(0.15)	(-1.11)	(0.91)			(0.68)			
			Last10Years	0.00000319				-0.000296	0.00120	-0.0105	0.00321				0.252	357	0.00898
				(0.48)				(-0.01)	(0.14)	(-1.05)	(0.91)				(0.65)		
Diff_UP_SM	Non-Investment	gross_debt	LastYear			-0.00812		-0.00660	-0.00133	-0.0116	0.00347	0.125				357	0.0106
						(-0.74)		(-0.23)	(-0.14)	(-1.14)	(0.97)	(0.67)					
			Last2Years			-0.00787		-0.00633	-0.00132	-0.0116	0.00362		0.124			357	0.0105
						(-0.72)		(-0.21)	(-0.13)	(-1.13)	(1.00)		(0.63)				
			Last5Years			-0.00768		-0.00672	-0.00141	-0.0116	0.00336			0.128		357	0.0103
						(-0.69)		(-0.22)	(-0.14)	(-1.13)	(0.95)			(0.55)			
			Last10Years			-0.00765		-0.00738	-0.00145	-0.0111	0.00335				0.211	357	0.0103
						(-0.69)		(-0.25)	(-0.15)	(-1.08)	(0.95)				(0.52)		
Diff_UP_SM	Non-Investment	net_debt	LastYear				-0.00752**	-0.00128	-0.00166	-0.0109	0.00330	0.121				357	0.0128
							(-2.25)	(-0.05)	(-0.19)	(-1.11)	(0.93)	(0.64)					
			Last2Years				-0.00743**	-0.00116	-0.00170	-0.0108	0.00345		0.118			357	0.0127
							(-2.26)	(-0.04)	(-0.19)	(-1.11)	(0.96)		(0.59)				
			Last5Years				-0.00738**	-0.00166	-0.00183	-0.0109	0.00321			0.119		357	0.0125
							(-2.23)	(-0.06)	(-0.21)	(-1.11)	(0.91)			(0.51)			
			Last10Years				-0.00737**	-0.00231	-0.00188	-0.0104	0.00319				0.199	357	0.0125
							(-2.27)	(-0.08)	(-0.21)	(-1.06)	(0.91)				(0.49)		
Diff_UP_SM	Non-Investment	structbal	LastYear		0.0273			0.00208	0.00537	-0.0102	0.00395	-0.118				254	0.0126
					(0.67)			(0.07)	(0.63)	(-0.97)	(0.87)	(-0.50)					
			Last2Years		0.0227			-0.00447	0.00609	-0.0102	0.00418		0.0648			254	0.0121
					(0.55)			(-0.15)	(0.71)	(-0.97)	(0.87)		(0.25)				
			Last5Years		0.0206			-0.00990	0.00632	-0.0103	0.00399			0.199		254	0.0131
					(0.51)			(-0.33)	(0.76)	(-0.96)	(0.89)			(0.70)			
			Last10Years		0.0236			-0.0103	0.00594	-0.00968	0.00377				0.299	254	0.0132
					(0.60)			(-0.36)	(0.72)	(-0.90)	(0.85)				(0.67)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Table A4-6 Results of our ordered probit regressions for the difference between S&P and Moody's ratings (when the first is lower than the latter), with the speculative-grade dataset.

				Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last					
ORDERED PROBIT (Speculative-grade Dataset)																	
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SM	Non-Investment	budgetbal	LastYear	0.000253				0.00815	-0.0159**	-0.000373	0.0000743	0.0000183				370	0.0133
				(1.63)				(0.38)	(-2.09)	(-0.61)	(0.02)	(0.00)					
			Last2Years	0.000257*				0.00934	-0.0159**	-0.000370	0.0000833		-0.0840			370	0.0136
				(1.66)				(0.42)	(-2.09)	(-0.60)	(0.03)		(-0.53)				
			Last5Years	0.000255*				0.00677	-0.0159**	-0.000365	0.0000102			0.0893		370	0.0136
				(1.66)				(0.30)	(-2.07)	(-0.60)	(0.00)			(0.35)			
			Last10Years	0.000255*				0.00487	-0.0160**	-0.000358	-0.000169				0.270	370	0.0145
				(1.65)				(0.22)	(-2.09)	(-0.59)	(-0.05)				(0.85)		
Diff_DW_SM	Non-Investment	gross_debt	LastYear			0.00405		0.0126	-0.0125	-0.000334	0.000287	0.00144				370	0.0107
						(0.95)		(0.63)	(-1.43)	(-0.57)	(0.09)	(0.01)					
			Last2Years			0.00401		0.0134	-0.0125	-0.000331	0.000289		-0.0668			370	0.0109
						(0.96)		(0.65)	(-1.44)	(-0.56)	(0.09)		(-0.42)				
			Last5Years			0.00407		0.0114	-0.0125	-0.000328	0.000231			0.0798		370	0.0109
						(0.94)		(0.54)	(-1.41)	(-0.56)	(0.07)			(0.31)			
			Last10Years			0.00408		0.00941	-0.0125	-0.000321	0.0000477				0.264	370	0.0118
						(0.93)		(0.47)	(-1.43)	(-0.55)	(0.01)				(0.82)		
Diff_DW_SM	Non-Investment	net_debt	LastYear				0.00569	0.0124	-0.0145*	-0.000356	-0.000178	0.0107				370	0.0109
							(1.53)	(0.60)	(-1.87)	(-0.60)	(-0.05)	(0.07)					
			Last2Years				0.00552	0.0131	-0.0145*	-0.000352	-0.000166		-0.0556			370	0.0110
							(1.49)	(0.62)	(-1.87)	(-0.59)	(-0.05)		(-0.35)				
			Last5Years				0.00591	0.0112	-0.0144*	-0.000348	-0.000246			0.0960		370	0.0112
							(1.53)	(0.52)	(-1.84)	(-0.58)	(-0.07)			(0.37)			
			Last10Years				0.00631	0.00945	-0.0145*	-0.000340	-0.000454				0.296	370	0.0123
							(1.52)	(0.45)	(-1.86)	(-0.58)	(-0.14)				(0.89)		
Diff_DW_SM	Non-Investment	structbal	LastYear		-0.0129			0.00366	-0.0199**	-0.000286	-0.00735**	-0.0931				233	0.0196
					(-0.41)			(0.16)	(-2.45)	(-0.53)	(-2.15)	(-0.44)					
			Last2Years		-0.0149			0.00190	-0.0199**	-0.000286	-0.00737**		0.0324			233	0.0192
					(-0.48)			(0.08)	(-2.43)	(-0.53)	(-2.16)		(0.16)				
			Last5Years		-0.0167			-0.0000483	-0.0199**	-0.000271	-0.00757**			0.129		233	0.0198
					(-0.54)			(-0.00)	(-2.42)	(-0.50)	(-2.11)			(0.43)			
			Last10Years		-0.0148			0.00117	-0.0201**	-0.000284	-0.00759**				0.0966	233	0.0194
					(-0.49)			(0.05)	(-2.48)	(-0.52)	(-2.20)				(0.33)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Appendix 5.   Simple probit full dataset regressions results

Table A5-1 Results of our simple probit regressions for the difference between S&P and Fitch ratings (when the first is higher than the latter), with the full dataset.

			Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last					
SIMPLE PROBIT (Full dataset)																
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SF	budgetbal	LastYear	-0.0000806*				-0.00687	-0.00495	-0.000518	-0.00161	0.0671				1149	0.00807
			(-1.90)				(-0.59)	(-0.85)	(-1.28)	(-0.48)	(0.26)					
		Last2Years	-0.0000807*				-0.00702	-0.00487	-0.000519	-0.00158		0.0900			1149	0.00820
			(-1.90)				(-0.60)	(-0.84)	(-1.28)	(-0.47)		(0.38)				
		Last5Years	-0.0000797*				-0.00706	-0.00491	-0.000520	-0.00159			0.0712		1149	0.00812
			(-1.83)				(-0.60)	(-0.85)	(-1.28)	(-0.47)			(0.30)			
		Last10Years	-0.0000807*				-0.00756	-0.00493	-0.000546	-0.00150				0.223	1149	0.00949
			(-1.90)				(-0.63)	(-0.85)	(-1.34)	(-0.46)				(0.85)		
	gross_debt	LastYear			0.000373		-0.00671	-0.00478	-0.000527	-0.00143	0.0931				1149	0.00376
					(0.21)		(-0.48)	(-0.81)	(-1.29)	(-0.42)	(0.36)					
		Last2Years			0.000402		-0.00663	-0.00475	-0.000525	-0.00143		0.0851			1149	0.00373
					(0.22)		(-0.48)	(-0.81)	(-1.29)	(-0.42)		(0.35)				
		Last5Years			0.000406		-0.00678	-0.00476	-0.000529	-0.00141			0.0858		1149	0.00377
					(0.23)		(-0.48)	(-0.82)	(-1.29)	(-0.42)			(0.38)			
		Last10Years			0.000483		-0.00703	-0.00477	-0.000554	-0.00135				0.227	1149	0.00511
					(0.26)		(-0.50)	(-0.81)	(-1.35)	(-0.41)				(0.88)		
	net_debt	LastYear				0.0000198***	-0.00782	-0.00467	-0.000529	-0.00147	0.0927				1149	0.00464
						(3.26)	(-0.66)	(-0.79)	(-1.29)	(-0.44)	(0.36)					
		Last2Years				0.0000199***	-0.00780	-0.00465	-0.000526	-0.00148		0.0840			1149	0.00461
						(3.25)	(-0.66)	(-0.80)	(-1.29)	(-0.44)		(0.34)				
		Last5Years				0.0000198***	-0.00794	-0.00467	-0.000529	-0.00146			0.0833		1149	0.00463
						(3.22)	(-0.67)	(-0.80)	(-1.29)	(-0.43)			(0.37)			
		Last10Years				0.0000191***	-0.00831	-0.00471	-0.000554	-0.00139				0.220	1149	0.00588
						(3.20)	(-0.69)	(-0.80)	(-1.35)	(-0.42)				(0.83)		
	structbal	LastYear		-0.00549			-0.0290	-0.00809	-0.000700	-0.00622	0.108				922	0.0124
				(-0.16)			(-1.20)	(-1.16)	(-1.30)	(-1.21)	(0.35)					
		Last2Years		-0.00573			-0.0289	-0.00809	-0.000694	-0.00624		0.0777			922	0.0122
				(-0.17)			(-1.20)	(-1.17)	(-1.30)	(-1.22)		(0.27)				
		Last5Years		-0.00545			-0.0284	-0.00816	-0.000690	-0.00629			0.0282		922	0.0121
				(-0.16)			(-1.15)	(-1.19)	(-1.30)	(-1.23)			(0.11)			
		Last10Years		-0.00746			-0.0313	-0.00797	-0.000746	-0.00616				0.237	922	0.0140
				(-0.23)			(-1.30)	(-1.15)	(-1.27)	(-1.20)				(0.85)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A5-2 Results of our simple probit regressions for the difference between S&P and Fitch ratings (when the first is lower than the latter), with the full dataset.

			Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last					
SIMPLE PROBIT (Full dataset)																
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SF	budgetbal	LastYear	-0.0000114				-0.0182	-0.0122**	-0.000105	-0.00312	0.225				1194	0.0166
			(-0.85)				(-0.78)	(-2.24)	(-0.24)	(-1.36)	(1.02)					
		Last2Years	-0.0000140				-0.0180	-0.0123**	-0.0000951	-0.00309		0.194			1194	0.0162
			(-1.04)				(-0.77)	(-2.25)	(-0.22)	(-1.35)		(1.00)				
		Last5Years	-0.0000141				-0.0209	-0.0122**	-0.0000989	-0.00298			0.374**		1194	0.0200
			(-1.06)				(-0.88)	(-2.22)	(-0.23)	(-1.28)			(2.12)			
		Last10Years	-0.0000135				-0.0169	-0.0126**	-0.0000845	-0.00336				0.143	1194	0.0152
			(-0.99)				(-0.71)	(-2.30)	(-0.19)	(-1.48)				(0.71)		
	gross_debt	LastYear			0.00156		-0.0163	-0.0114**	-0.000103	-0.00311	0.231				1194	0.0167
					(0.45)		(-0.69)	(-2.04)	(-0.24)	(-1.37)	(1.06)					
		Last2Years			0.00160		-0.0161	-0.0115**	-0.0000928	-0.00308		0.194			1194	0.0161
					(0.46)		(-0.68)	(-2.05)	(-0.21)	(-1.35)		(1.00)				
		Last5Years			0.00171		-0.0189	-0.0113**	-0.0000963	-0.00297			0.375**		1194	0.0200
					(0.49)		(-0.79)	(-2.02)	(-0.22)	(-1.29)			(2.12)			
		Last10Years			0.00161		-0.0150	-0.0118**	-0.0000820	-0.00335				0.146	1194	0.0152
					(0.46)		(-0.63)	(-2.11)	(-0.19)	(-1.49)				(0.72)		
	net_debt	LastYear				-0.00000599	-0.0185	-0.0124**	-0.000107	-0.00310	0.231				1194	0.0165
						(-0.69)	(-0.79)	(-2.28)	(-0.25)	(-1.35)	(1.06)					
		Last2Years				-0.00000604	-0.0183	-0.0125**	-0.0000971	-0.00308		0.193			1194	0.0159
						(-0.69)	(-0.78)	(-2.29)	(-0.22)	(-1.34)		(1.00)				
		Last5Years				-0.00000571	-0.0212	-0.0124**	-0.000101	-0.00297			0.372**		1194	0.0197
						(-0.68)	(-0.89)	(-2.26)	(-0.23)	(-1.27)			(2.10)			
		Last10Years				-0.00000602	-0.0172	-0.0128**	-0.0000864	-0.00335				0.143	1194	0.0150
						(-0.69)	(-0.72)	(-2.34)	(-0.20)	(-1.47)				(0.71)		
	structbal	LastYear		-0.0140			-0.0182	-0.0134**	-0.0000799	-0.00407	0.432*				960	0.0241
				(-0.51)			(-0.66)	(-1.99)	(-0.18)	(-1.15)	(1.67)					
		Last2Years		-0.0153			-0.0198	-0.0134**	-0.0000648	-0.00388		0.424**			960	0.0241
				(-0.55)			(-0.72)	(-1.97)	(-0.15)	(-1.10)		(2.03)				
		Last5Years		-0.0137			-0.0211	-0.0139**	-0.0000622	-0.00440			0.383**		960	0.0221
				(-0.50)			(-0.76)	(-2.01)	(-0.14)	(-1.18)			(2.20)			
		Last10Years		-0.0103			-0.0174	-0.0139**	-0.0000569	-0.00460				0.0742	960	0.0171
				(-0.38)			(-0.64)	(-2.06)	(-0.13)	(-1.31)				(0.39)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A5-3 Results of our simple probit regressions for the difference between Moody's and Fitch ratings (when the first is higher than the latter), with the full dataset.

SIMPLE PROBIT (Full dataset)			Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last					
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_MF	budgetbal	LastYear	-0.0000483				-0.0316	0.00755	-0.00286	0.00620*	-0.0608				903	0.00964
			(-1.10)				(-1.50)	(1.01)	(-0.35)	(1.80)	(-0.21)					
		Last2Years	-0.0000477				-0.0317	0.00755	-0.00290	0.00621*		-0.0470			903	0.00961
			(-1.06)				(-1.50)	(1.01)	(-0.35)	(1.79)		(-0.18)				
		Last5Years	-0.0000516				-0.0288	0.00688	-0.00284	0.00603*			-0.253		903	0.0119
			(-1.14)				(-1.36)	(0.93)	(-0.36)	(1.74)			(-0.94)			
		Last10Years	-0.0000473				-0.0314	0.00759	-0.00280	0.00626*				-0.0858	903	0.00977
			(-1.04)				(-1.50)	(1.03)	(-0.34)	(1.81)				(-0.33)		
	gross_debt	LastYear			0.00644		-0.0201	0.00948	-0.00242	0.00636*	-0.0536				903	0.0120
					(1.56)		(-0.91)	(1.21)	(-0.30)	(1.86)	(-0.18)					
		Last2Years			0.00642		-0.0203	0.00948	-0.00246	0.00636*		-0.0383			903	0.0120
					(1.56)		(-0.91)	(1.21)	(-0.30)	(1.86)		(-0.14)				
		Last5Years			0.00633		-0.0176	0.00881	-0.00238	0.00618*			-0.239		903	0.0140
					(1.55)		(-0.78)	(1.14)	(-0.31)	(1.81)			(-0.90)			
		Last10Years			0.00644		-0.0198	0.00951	-0.00233	0.00640*				-0.0869	903	0.0122
					(1.56)		(-0.89)	(1.22)	(-0.30)	(1.87)				(-0.33)		
	net_debt	LastYear				0.000868	-0.0316	0.00804	-0.00299	0.00628*	-0.0550				903	0.0125
						(1.00)	(-1.50)	(1.08)	(-0.36)	(1.81)	(-0.19)					
		Last2Years				0.000864	-0.0317	0.00804	-0.00303	0.00628*		-0.0447			903	0.0125
						(0.99)	(-1.49)	(1.08)	(-0.37)	(1.81)		(-0.17)				
		Last5Years				0.000857	-0.0289	0.00738	-0.00297	0.00611*			-0.247		903	0.0146
						(0.99)	(-1.36)	(1.01)	(-0.37)	(1.76)			(-0.91)			
		Last10Years				0.000861	-0.0313	0.00807	-0.00292	0.00632*				-0.0887	903	0.0127
						(0.98)	(-1.49)	(1.10)	(-0.36)	(1.83)				(-0.34)		
	structbal	LastYear		-0.0555*			-0.0211	0.00559	-0.00100	0.00597*	-0.397				805	0.0199
				(-1.70)			(-0.97)	(0.74)	(-0.14)	(1.72)	(-1.16)					
		Last2Years		-0.0548*			-0.0207	0.00540	-0.00115	0.00588*		-0.375			805	0.0200
				(-1.67)			(-0.93)	(0.72)	(-0.15)	(1.68)		(-1.30)				
		Last5Years		-0.0513			-0.0190	0.00486	-0.00112	0.00590*			-0.427		805	0.0223
				(-1.56)			(-0.85)	(0.66)	(-0.15)	(1.69)			(-1.41)			
		Last10Years		-0.0537*			-0.0234	0.00606	-0.000945	0.00619*				-0.0972	805	0.0166
				(-1.67)			(-1.07)	(0.82)	(-0.16)	(1.83)				(-0.36)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Table A5-4 Results of our simple probit regressions for the difference between Moody's and Fitch ratings (when the first is lower than the latter), with the full dataset.

			Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last					
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_MF	budgetbal	LastYear	0.0000117				0.0132	-0.00317	-0.00208	-0.00316	0.386				851	0.0106
			(0.78)				(0.59)	(-0.49)	(-0.38)	(-0.94)	(1.56)					
		Last2Years	0.00000685				0.00819	-0.00244	-0.00186	-0.00305		0.552**			851	0.0174
			(0.46)				(0.36)	(-0.37)	(-0.35)	(-0.89)		(2.28)				
		Last5Years	0.0000110				0.00442	-0.00348	-0.00157	-0.00381			0.676***		851	0.0209
			(0.74)				(0.19)	(-0.51)	(-0.37)	(-1.06)			(3.19)			
		Last10Years	0.00000980				0.0113	-0.00424	-0.00130	-0.00405				0.428	851	0.00942
			(0.66)				(0.49)	(-0.62)	(-0.57)	(-1.22)				(1.52)		
	gross_debt	LastYear			-0.0111		-0.00454	-0.00621	-0.00277	-0.00385	0.360				851	0.0156
					(-1.64)		(-0.19)	(-0.90)	(-0.56)	(-1.06)	(1.45)					
		Last2Years			-0.0104		-0.00844	-0.00534	-0.00251	-0.00371		0.530**			851	0.0220
					(-1.54)		(-0.35)	(-0.76)	(-0.49)	(-1.00)		(2.13)				
		Last5Years			-0.00976		-0.0107	-0.00619	-0.00210	-0.00448			0.643***		851	0.0249
					(-1.44)		(-0.42)	(-0.87)	(-0.42)	(-1.16)			(2.96)			
		Last10Years			-0.0103		-0.00442	-0.00705	-0.00183	-0.00463				0.372	851	0.0139
					(-1.56)		(-0.18)	(-0.99)	(-0.38)	(-1.30)				(1.27)		
	net_debt	LastYear				0.0000153*	0.0135	-0.00270	-0.00208	-0.00319	0.374				851	0.0120
						(1.92)	(0.61)	(-0.42)	(-0.38)	(-0.95)	(1.53)					
		Last2Years				0.0000146*	0.00825	-0.00199	-0.00187	-0.00306		0.549**			851	0.0189
						(1.82)	(0.36)	(-0.30)	(-0.35)	(-0.90)		(2.26)				
		Last5Years				0.0000158**	0.00467	-0.00300	-0.00157	-0.00382			0.671***		851	0.0223
						(2.07)	(0.20)	(-0.44)	(-0.37)	(-1.07)			(3.17)			
		Last10Years				0.0000151**	0.0116	-0.00378	-0.00132	-0.00406				0.416	851	0.0108
						(1.98)	(0.51)	(-0.56)	(-0.55)	(-1.22)				(1.47)		
	structbal	LastYear		0.0237			0.00803	-0.00224	-0.00284	-0.00187	0.178				776	0.00571
				(0.84)			(0.34)	(-0.32)	(-0.54)	(-0.56)	(0.68)					
		Last2Years		0.0197			0.00467	-0.00155	-0.00262	-0.00154		0.360			776	0.00968
				(0.70)			(0.19)	(-0.22)	(-0.49)	(-0.46)		(1.45)				
		Last5Years		0.0195			-0.00139	-0.00185	-0.00236	-0.00196			0.580**		776	0.0159
				(0.70)			(-0.06)	(-0.26)	(-0.44)	(-0.58)			(2.52)			
		Last10Years		0.0242			0.00484	-0.00275	-0.00223	-0.00248				0.303	776	0.00675
				(0.86)			(0.20)	(-0.39)	(-0.41)	(-0.74)				(0.94)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A5-5 Results of our simple probit regressions for the difference between S&P and Moody's ratings (when the first is higher than the latter), with the full dataset.

SIMPLE PROBIT (Full dataset)			Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last				
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SM	budgetbal	LastYear	0.0000387				0.00326	-0.00340	-0.00973	-0.00372	0.189				1103	0.00697
			(0.80)				(0.15)	(-0.59)	(-1.37)	(-1.15)	(0.97)					
		Last2Years	0.0000380				0.00124	-0.00314	-0.0101	-0.00354		0.284			1103	0.00860
			(0.76)				(0.06)	(-0.55)	(-1.39)	(-1.10)		(1.43)				
		Last5Years	0.0000448				-0.00236	-0.00326	-0.0109	-0.00386			0.361		1103	0.00976
			(0.90)				(-0.11)	(-0.57)	(-1.42)	(-1.20)			(1.54)			
		Last10Years	0.0000397				-0.000537	-0.00340	-0.00954	-0.00378				0.299	1103	0.00785
			(0.80)				(-0.02)	(-0.60)	(-1.34)	(-1.17)				(1.04)		
	gross_debt	LastYear			0.00114		0.00580	-0.00279	-0.00933	-0.00366	0.182				1103	0.00539
					(0.30)		(0.28)	(-0.45)	(-1.30)	(-1.13)	(0.93)					
		Last2Years			0.00142		0.00387	-0.00239	-0.00974	-0.00345		0.294			1103	0.00732
					(0.37)		(0.19)	(-0.39)	(-1.33)	(-1.07)		(1.48)				
		Last5Years			0.00167		0.000900	-0.00241	-0.0104	-0.00376			0.361		1103	0.00823
					(0.43)		(0.04)	(-0.39)	(-1.35)	(-1.16)			(1.54)			
		Last10Years			0.00129		0.00213	-0.00272	-0.00914	-0.00370				0.300	1103	0.00636
					(0.34)		(0.10)	(-0.45)	(-1.27)	(-1.14)				(1.04)		
	net_debt	LastYear				0.000160	0.00482	-0.00285	-0.00946	-0.00379	0.174				1103	0.00774
						(0.32)	(0.22)	(-0.49)	(-1.33)	(-1.16)	(0.89)					
		Last2Years				0.000154	0.00258	-0.00260	-0.00988	-0.00360		0.282			1103	0.00952
						(0.33)	(0.11)	(-0.45)	(-1.35)	(-1.11)		(1.40)				
		Last5Years				0.000154	-0.000801	-0.00267	-0.0106	-0.00391			0.357		1103	0.0106
						(0.43)	(-0.04)	(-0.47)	(-1.37)	(-1.21)			(1.52)			
		Last10Years				0.000134	0.000958	-0.00284	-0.00931	-0.00383				0.291	1103	0.00868
						(0.64)	(0.04)	(-0.50)	(-1.30)	(-1.18)				(1.01)		
	structbal	LastYear		-0.0154			0.00545	-0.00551	-0.00794	-0.00912**	0.112				926	0.00917
				(-0.41)			(0.23)	(-0.84)	(-1.07)	(-2.05)	(0.50)					
		Last2Years		-0.0194			-0.000369	-0.00472	-0.00893	-0.00867**		0.383			926	0.0138
				(-0.53)			(-0.02)	(-0.72)	(-1.13)	(-1.96)		(1.63)				
		Last5Years		-0.0206			-0.00643	-0.00486	-0.00994	-0.00923**			0.526**		926	0.0175
				(-0.56)			(-0.27)	(-0.76)	(-1.17)	(-2.12)			(2.00)			
		Last10Years		-0.0158			-0.00678	-0.00542	-0.00862	-0.00943**				0.620**	926	0.0183
				(-0.42)			(-0.28)	(-0.85)	(-1.08)	(-2.11)				(2.40)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A5-6 Results of our simple probit regressions for the difference between S&P and Moody's ratings (when the first is lower than the latter), with the full dataset.

			Budget Balance	Structural Balance	General government											
					Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last				
SIMPLE PROBIT (Full dataset)																
Dependent variables	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SM	budgetbal	LastYear	0.000216***				0.0224	-0.0129**	-0.000657	0.00245	-0.135				1165	0.0145
			(2.92)				(0.99)	(-2.16)	(-0.60)	(0.78)	(-0.66)					
		Last2Years	0.000218***				0.0227	-0.0130**	-0.000668	0.00236		-0.165			1165	0.0149
			(2.93)				(1.00)	(-2.18)	(-0.59)	(0.76)		(-0.84)				
		Last5Years	0.000215***				0.0224	-0.0129**	-0.000679	0.00248			-0.0824		1165	0.0142
			(2.90)				(0.97)	(-2.15)	(-0.59)	(0.79)			(-0.47)			
		Last10Years	0.000216***				0.0217	-0.0128**	-0.000676	0.00259				-0.0149	1165	0.0139
			(2.90)				(0.94)	(-2.14)	(-0.61)	(0.82)				(-0.06)		
	gross_debt	LastYear			0.0106***		0.0399*	-0.00832	-0.000512	0.00260	-0.124				1165	0.0168
					(3.00)		(1.77)	(-1.35)	(-0.69)	(0.83)	(-0.60)					
		Last2Years			0.0105***		0.0400*	-0.00844	-0.000519	0.00253		-0.140			1165	0.0169
					(3.01)		(1.78)	(-1.37)	(-0.69)	(0.81)		(-0.71)				
		Last5Years			0.0106***		0.0399*	-0.00834	-0.000528	0.00263			-0.0664		1165	0.0164
					(2.97)		(1.77)	(-1.34)	(-0.69)	(0.83)			(-0.37)			
		Last10Years			0.0107***		0.0394*	-0.00817	-0.000528	0.00272				-0.00368	1165	0.0163
					(3.01)		(1.74)	(-1.32)	(-0.70)	(0.86)				(-0.02)		
	net_debt	LastYear				0.0000979	0.0255	-0.0119**	-0.000610	0.00232	-0.153				1165	0.00985
						(0.97)	(1.14)	(-2.00)	(-0.63)	(0.74)	(-0.74)					
		Last2Years				0.0000995	0.0258	-0.0120**	-0.000621	0.00223		-0.177			1165	0.0102
						(0.99)	(1.15)	(-2.02)	(-0.62)	(0.72)		(-0.90)				
		Last5Years				0.0000923	0.0254	-0.0120**	-0.000633	0.00235			-0.0940		1165	0.00941
						(0.94)	(1.12)	(-1.99)	(-0.63)	(0.75)			(-0.54)			
		Last10Years				0.0000923	0.0247	-0.0118**	-0.000630	0.00246				-0.0256	1165	0.00913
						(0.97)	(1.09)	(-1.97)	(-0.64)	(0.79)				(-0.11)		
	structbal	LastYear		-0.0371			0.0160	-0.0121*	-0.000345	-0.00149	-0.236				976	0.0122
				(-1.36)			(0.68)	(-1.96)	(-0.56)	(-0.44)	(-0.90)					
		Last2Years		-0.0372			0.0156	-0.0120*	-0.000359	-0.00137		-0.109			976	0.0110
				(-1.37)			(0.66)	(-1.94)	(-0.58)	(-0.41)		(-0.46)				
		Last5Years		-0.0367			0.0159	-0.0121*	-0.000364	-0.00133			-0.121		976	0.0111
				(-1.34)			(0.67)	(-1.94)	(-0.59)	(-0.40)			(-0.60)			
		Last10Years		-0.0372			0.0153	-0.0118*	-0.000354	-0.00119				-0.102	976	0.0109
				(-1.38)			(0.65)	(-1.90)	(-0.59)	(-0.35)				(-0.38)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Appendix 6. Simple probit investment-grade dataset regressions results

Table A6-1 Results of our simple probit regressions for the difference between S&P and Fitch ratings (when the first is higher than the latter), with the investment-grade dataset.

SIMPLE PROBIT (Investment-grade Dataset)				Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last				
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SF	Investment	budgetbal	LastYear	-0.0000493				-0.0345	-0.00673	-0.0365	-0.00620	0.478				773	0.0219
				(-1.09)				(-1.30)	(-0.79)	(-1.02)	(-0.97)	(0.95)					
			Last2Years	-0.0000529				-0.0366	-0.00629	-0.0382	-0.00663		0.476			773	0.0228
				(-1.22)				(-1.40)	(-0.76)	(-1.06)	(-1.02)		(1.05)				
			Last5Years	-0.0000584				-0.0331	-0.00695	-0.0353	-0.00637			0.0760		773	0.0188
				(-0.97)				(-1.24)	(-0.85)	(-0.95)	(-0.98)			(0.21)			
			Last10Years	-0.0000594				-0.0300	-0.00732	-0.0321	-0.00636				-0.0923	773	0.0189
				(-0.97)				(-1.10)	(-0.86)	(-0.86)	(-0.99)				(-0.23)		
Diff_UP_SF	Investment	gross_debt	LastYear			-0.00208		-0.0412	-0.00749	-0.0375	-0.00530	0.533				773	0.0170
						(-0.35)		(-1.48)	(-0.86)	(-1.06)	(-0.80)	(1.05)					
			Last2Years			-0.00180		-0.0419	-0.00723	-0.0384	-0.00555		0.403			773	0.0159
						(-0.30)		(-1.53)	(-0.84)	(-1.07)	(-0.82)		(0.83)				
			Last5Years			-0.00209		-0.0392	-0.00785	-0.0357	-0.00530			0.0506		773	0.0129
						(-0.35)		(-1.40)	(-0.93)	(-0.97)	(-0.77)			(0.14)			
			Last10Years			-0.00235		-0.0370	-0.00822	-0.0327	-0.00532				-0.100	773	0.0131
						(-0.42)		(-1.26)	(-0.94)	(-0.89)	(-0.78)				(-0.26)		
Diff_UP_SF	Investment	net_debt	LastYear				0.0000181***	-0.0367	-0.00657	-0.0379	-0.00542	0.534				773	0.0183
							(4.40)	(-1.38)	(-0.77)	(-1.06)	(-0.83)	(1.06)					
			Last2Years				0.0000181***	-0.0381	-0.00636	-0.0388	-0.00569		0.409			773	0.0173
							(4.41)	(-1.46)	(-0.76)	(-1.08)	(-0.86)		(0.85)				
			Last5Years				0.0000181***	-0.0347	-0.00692	-0.0361	-0.00542			0.0542		773	0.0142
							(4.34)	(-1.31)	(-0.84)	(-0.97)	(-0.81)			(0.15)			
			Last10Years				0.0000184***	-0.0318	-0.00724	-0.0330	-0.00543				-0.103	773	0.0144
							(3.84)	(-1.17)	(-0.84)	(-0.89)	(-0.82)				(-0.25)		
Diff_UP_SF	Investment	structbal	LastYear		-0.0264			-0.0314	-0.00868	-0.0259	-0.00588	0.597				710	0.0190
					(-0.45)			(-0.87)	(-0.89)	(-0.69)	(-0.76)	(1.18)					
			Last2Years		-0.0294			-0.0324	-0.00845	-0.0269	-0.00622		0.468			710	0.0179
					(-0.51)			(-0.92)	(-0.88)	(-0.71)	(-0.78)		(0.95)				
			Last5Years		-0.0255			-0.0294	-0.00898	-0.0239	-0.00580			0.0775		710	0.0139
					(-0.44)			(-0.83)	(-0.96)	(-0.60)	(-0.73)			(0.21)			
			Last10Years		-0.0240			-0.0271	-0.00929	-0.0210	-0.00575				-0.0569	710	0.0139
					(-0.42)			(-0.75)	(-0.96)	(-0.52)	(-0.73)				(-0.13)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A6-2 Results of our simple probit regressions for the difference between S&P and Fitch ratings (when the first is lower than the latter), with the investment-grade dataset.

				Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last					
SIMPLE PROBIT (Investment-grade Dataset)																		
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SF	Investment	budgetbal	LastYear	0.00000898				0.0233	-0.0170*	0.0622*	0.000364	0.617				759	0.0235
				(0.57)				(0.51)	(-1.89)	(1.85)	(0.10)	(1.41)					
			Last2Years	0.00000360				0.0238	-0.0170*	0.0648*	0.000358		0.359			759	0.0212
				(0.23)				(0.53)	(-1.89)	(1.86)	(0.09)		(0.84)				
			Last5Years	0.00000467				0.0225	-0.0172*	0.0664*	0.000484			0.265		759	0.0208
				(0.29)				(0.49)	(-1.90)	(1.80)	(0.13)			(0.80)			
			Last10Years	0.00000924				0.0246	-0.0160*	0.0739*	0.000486				-0.541	759	0.0251
				(0.57)				(0.54)	(-1.75)	(1.86)	(0.13)				(-1.53)		
Diff_DW_SF	Investment	gross_debt	LastYear			0.00486		0.0314	-0.0143	0.0620*	0.000375	0.614				759	0.0266
						(1.38)		(0.70)	(-1.54)	(1.85)	(0.10)	(1.42)					
			Last2Years			0.00484		0.0317	-0.0143	0.0644*	0.000398		0.373			759	0.0244
						(1.38)		(0.71)	(-1.54)	(1.85)	(0.11)		(0.89)				
			Last5Years			0.00487		0.0304	-0.0146	0.0660*	0.000534			0.281		759	0.0240
						(1.39)		(0.68)	(-1.56)	(1.79)	(0.14)			(0.86)			
			Last10Years			0.00452		0.0321	-0.0135	0.0735*	0.000495				-0.520	759	0.0278
						(1.27)		(0.72)	(-1.44)	(1.86)	(0.14)				(-1.49)		
Diff_DW_SF	Investment	net_debt	LastYear				-0.0000110	0.0235	-0.0172*	0.0630*	0.000353	0.613				759	0.0240
							(-1.15)	(0.52)	(-1.91)	(1.87)	(0.09)	(1.41)					
			Last2Years				-0.0000108	0.0239	-0.0172*	0.0654*	0.000371		0.368			759	0.0218
							(-1.14)	(0.53)	(-1.91)	(1.87)	(0.10)		(0.87)				
			Last5Years				-0.0000105	0.0226	-0.0174*	0.0670*	0.000483			0.261		759	0.0213
							(-1.14)	(0.50)	(-1.92)	(1.82)	(0.13)			(0.80)			
			Last10Years				-0.00000959	0.0248	-0.0162*	0.0745*	0.000471				-0.535	759	0.0255
							(-0.95)	(0.55)	(-1.77)	(1.88)	(0.12)				(-1.53)		
Diff_DW_SF	Investment	structbal	LastYear		-0.00774			0.0238	-0.0187*	0.0693	-0.000942	0.715*				689	0.0264
					(-0.17)			(0.42)	(-1.85)	(1.57)	(-0.20)	(1.67)					
			Last2Years		-0.00975			0.0253	-0.0187*	0.0738	-0.000916		0.423			689	0.0236
					(-0.21)			(0.45)	(-1.86)	(1.62)	(-0.19)		(1.01)				
			Last5Years		-0.0104			0.0232	-0.0192*	0.0764	-0.000829			0.332		689	0.0231
					(-0.22)			(0.41)	(-1.88)	(1.59)	(-0.17)			(1.00)			
			Last10Years		-0.0115			0.0282	-0.0181*	0.0858*	-0.000897				-0.316	689	0.0231
					(-0.25)			(0.51)	(-1.80)	(1.70)	(-0.19)				(-1.05)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Table A6-3 Results of our simple probit regressions for the difference between Moody's and Fitch ratings (when the first is higher than the latter), with the investment-grade dataset.

SIMPLE PROBIT (Investment-grade Dataset)				Budget Balance	Structural Balance	Gross debt (General government)	Net debt (General government)	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last 2 Years	5 Years	10 Years	N	Pseudo R^2
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_MF	Investment	budgetbal	LastYear	-0.0000733*				-0.0279	0.0147	-0.101**	0.00657	-0.535				665	0.0347
				(-1.66)				(-0.98)	(1.51)	(-2.10)	(1.33)	(-0.73)					
			Last2Years	-0.0000756				-0.0280	0.0146	-0.0996**	0.00652		-0.741			665	0.0379
				(-1.62)				(-0.98)	(1.50)	(-2.07)	(1.29)		(-1.22)				
			Last5Years	-0.0000730				-0.0249	0.0147	-0.102**	0.00656			-0.898*		665	0.0425
				(-1.51)				(-0.88)	(1.50)	(-2.04)	(1.24)			(-1.89)			
			Last10Years	-0.0000612				-0.0268	0.0149	-0.100**	0.00673				-0.251	665	0.0328
				(-1.23)				(-0.94)	(1.53)	(-2.05)	(1.37)				(-0.64)		
Diff_UP_MF	Investment	gross_debt	LastYear			0.00715		-0.0153	0.0161	-0.103**	0.00667	-0.467				665	0.0357
						(1.34)		(-0.51)	(1.60)	(-2.10)	(1.38)	(-0.61)					
			Last2Years			0.00715		-0.0154	0.0160	-0.102**	0.00664		-0.682			665	0.0387
						(1.34)		(-0.51)	(1.59)	(-2.07)	(1.34)		(-1.06)				
			Last5Years			0.00665		-0.0134	0.0159	-0.104**	0.00666			-0.848*		665	0.0431
						(1.26)		(-0.45)	(1.57)	(-2.03)	(1.29)			(-1.73)			
			Last10Years			0.00692		-0.0145	0.0162	-0.103**	0.00678				-0.234	665	0.0343
						(1.29)		(-0.48)	(1.61)	(-2.04)	(1.41)				(-0.60)		
Diff_UP_MF	Investment	net_debt	LastYear				0.00122	-0.0270	0.0157*	-0.105**	0.00681	-0.487				665	0.0399
							(1.36)	(-0.94)	(1.65)	(-2.16)	(1.34)	(-0.61)					
			Last2Years				0.00122	-0.0271	0.0156	-0.104**	0.00677		-0.693			665	0.0429
							(1.36)	(-0.95)	(1.63)	(-2.13)	(1.31)		(-1.05)				
			Last5Years				0.00114	-0.0243	0.0157	-0.105**	0.00680			-0.866*		665	0.0475
							(1.30)	(-0.85)	(1.62)	(-2.09)	(1.25)			(-1.73)			
			Last10Years				0.00114	-0.0259	0.0159*	-0.104**	0.00692				-0.259	665	0.0384
							(1.25)	(-0.91)	(1.66)	(-2.10)	(1.38)				(-0.66)		
Diff_UP_MF	Investment	structbal	LastYear		-0.0721*			-0.00286	0.0111	-0.0828*	0.00551	-0.382				635	0.0291
					(-1.74)			(-0.10)	(1.14)	(-1.67)	(1.19)	(-0.47)					
			Last2Years		-0.0725*			-0.00290	0.0110	-0.0807	0.00552		-0.623			635	0.0321
					(-1.74)			(-0.10)	(1.13)	(-1.62)	(1.16)		(-0.94)				
			Last5Years		-0.0720*			0.000102	0.0110	-0.0811	0.00548			-0.813*		635	0.0366
					(-1.73)			(0.00)	(1.12)	(-1.59)	(1.10)			(-1.68)			
			Last10Years		-0.0705*			-0.00229	0.0112	-0.0834	0.00550				-0.148	635	0.0280
					(-1.70)			(-0.08)	(1.15)	(-1.62)	(1.19)				(-0.39)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A6-4 Results of our simple probit regressions for the difference between Moody's and Fitch ratings (when the first is lower than the latter), with the investment-grade dataset.

				Budget Balance	Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	General government	Default in the last				N	Pseudo R^2
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years		
Diff_DW_MF	Investment	budgetbal	LastYear	0.0000783				0.0442	-0.00991	0.0212	-0.00601	0.108				555	0.0112
				(0.54)				(1.26)	(-1.06)	(0.43)	(-0.82)	(0.28)					
			Last2Years	0.0000781				0.0436	-0.00982	0.0210	-0.00620		0.115			555	0.0113
				(0.54)				(1.24)	(-1.04)	(0.43)	(-0.86)		(0.26)				
			Last5Years	0.0000789				0.0427	-0.00989	0.0202	-0.00622			0.0989		555	0.0113
				(0.55)				(1.18)	(-1.05)	(0.40)	(-0.85)			(0.27)			
			Last10Years	0.0000756				0.0482	-0.01000	0.0254	-0.00600				-0.193	555	0.0121
				(0.52)				(1.32)	(-1.09)	(0.51)	(-0.83)				(-0.42)		
Diff_DW_MF	Investment	gross_debt	LastYear			-0.0120		0.0181	-0.0126	0.0208	-0.00816	0.0713				555	0.0155
						(-1.49)		(0.45)	(-1.36)	(0.44)	(-0.93)	(0.18)					
			Last2Years			-0.0120		0.0177	-0.0126	0.0207	-0.00831		0.0795			555	0.0156
						(-1.48)		(0.44)	(-1.34)	(0.43)	(-0.97)		(0.18)				
			Last5Years			-0.0120		0.0174	-0.0126	0.0204	-0.00832			0.0549		555	0.0155
						(-1.49)		(0.42)	(-1.36)	(0.41)	(-0.97)			(0.15)			
			Last10Years			-0.0127*		0.0210	-0.0129	0.0257	-0.00813				-0.245	555	0.0171
						(-1.66)		(0.50)	(-1.41)	(0.53)	(-0.95)				(-0.53)		
Diff_DW_MF	Investment	net_debt	LastYear				0.0000147*	0.0476	-0.00858	0.0193	-0.00689	0.103				555	0.0132
							(1.72)	(1.40)	(-0.91)	(0.39)	(-0.87)	(0.27)					
			Last2Years				0.0000147*	0.0469	-0.00848	0.0191	-0.00709		0.116			555	0.0133
							(1.72)	(1.38)	(-0.89)	(0.38)	(-0.91)		(0.26)				
			Last5Years				0.0000149*	0.0460	-0.00855	0.0181	-0.00712			0.105		555	0.0133
							(1.74)	(1.31)	(-0.89)	(0.35)	(-0.91)			(0.28)			
			Last10Years				0.0000149*	0.0520	-0.00864	0.0239	-0.00686				-0.219	555	0.0143
							(1.76)	(1.47)	(-0.93)	(0.47)	(-0.88)				(-0.48)		
Diff_DW_MF	Investment	structbal	LastYear		0.0275			0.0371	-0.0106	0.00952	-0.00855	0.140				532	0.0121
					(0.56)			(0.92)	(-1.06)	(0.16)	(-0.92)	(0.37)					
			Last2Years		0.0269			0.0367	-0.0105	0.00937	-0.00886		0.135			532	0.0122
					(0.54)			(0.90)	(-1.04)	(0.15)	(-0.98)		(0.29)				
			Last5Years		0.0266			0.0361	-0.0106	0.00840	-0.00889			0.107		532	0.0121
					(0.53)			(0.88)	(-1.06)	(0.13)	(-0.97)			(0.27)			
			Last10Years		0.0280			0.0414	-0.0108	0.0175	-0.00860				-0.224	532	0.0132
					(0.57)			(0.99)	(-1.12)	(0.28)	(-0.94)				(-0.47)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A6-5 Results of our simple probit regressions for the difference between S&P and Moody's ratings (when the first is higher than the latter), with the investment-grade dataset.

				Budget Balance	Structural Balance	Gross debt	Net debt (General government)	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last				
SIMPLE PROBIT (Investment-grade Dataset)																	
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SM	Investment	budgetbal	LastYear	0.000107				0.000831	-0.0106*	-0.00728	-0.0146**	0.0727				746	0.0151
				(1.41)				(0.03)	(-1.81)	(-0.26)	(-2.09)	(0.18)					
			Last2Years	0.000106				-0.00209	-0.0102*	-0.0104	-0.0148**		0.326			746	0.0166
				(1.42)				(-0.07)	(-1.75)	(-0.35)	(-2.08)		(0.69)				
			Last5Years	0.000108				0.000398	-0.0106*	-0.00742	-0.0147**			0.0469		746	0.0151
				(1.43)				(0.01)	(-1.81)	(-0.25)	(-2.06)			(0.09)			
			Last10Years	0.000108				0.00240	-0.0107*	-0.00598	-0.0146**				-0.0677	746	0.0152
				(1.43)				(0.08)	(-1.82)	(-0.21)	(-2.08)				(-0.19)		
Diff_UP_SM	Investment	gross_debt	LastYear			0.00261		0.00868	-0.00883	-0.00656	-0.0147**	0.127				746	0.0130
						(0.48)		(0.34)	(-1.35)	(-0.23)	(-2.06)	(0.33)					
			Last2Years			0.00298		0.00625	-0.00824	-0.00959	-0.0150**		0.364			746	0.0147
						(0.53)		(0.24)	(-1.28)	(-0.33)	(-2.06)		(0.77)				
			Last5Years			0.00265		0.00823	-0.00884	-0.00667	-0.0148**			0.0754		746	0.0129
						(0.49)		(0.31)	(-1.35)	(-0.22)	(-2.04)			(0.14)			
			Last10Years			0.00249		0.0104	-0.00906	-0.00477	-0.0148**				-0.0621	746	0.0129
						(0.46)		(0.39)	(-1.36)	(-0.17)	(-2.06)				(-0.18)		
Diff_UP_SM	Investment	net_debt	LastYear				0.000347	0.00668	-0.00945	-0.00622	-0.0151**	0.0946				746	0.0172
							(0.47)	(0.23)	(-1.60)	(-0.22)	(-2.10)	(0.24)					
			Last2Years				0.000324	0.00364	-0.00904	-0.00917	-0.0154**		0.326			746	0.0185
							(0.45)	(0.12)	(-1.54)	(-0.31)	(-2.09)		(0.68)				
			Last5Years				0.000349	0.00591	-0.00941	-0.00670	-0.0152**			0.0791		746	0.0172
							(0.47)	(0.20)	(-1.59)	(-0.22)	(-2.07)			(0.15)			
			Last10Years				0.000378	0.00881	-0.00960	-0.00457	-0.0152**				-0.0777	746	0.0172
							(0.51)	(0.29)	(-1.61)	(-0.16)	(-2.09)				(-0.22)		
Diff_UP_SM	Investment	structbal	LastYear		-0.0647			0.0139	-0.0140*	-0.0101	-0.0183**	0.207				672	0.0300
					(-1.26)			(0.38)	(-1.85)	(-0.34)	(-2.31)	(0.49)					
			Last2Years		-0.0671			0.00913	-0.0133*	-0.0148	-0.0188**		0.495			672	0.0332
					(-1.29)			(0.25)	(-1.78)	(-0.48)	(-2.32)		(0.96)				
			Last5Years		-0.0667			0.0104	-0.0137*	-0.0125	-0.0187**			0.237		672	0.0306
					(-1.28)			(0.28)	(-1.82)	(-0.40)	(-2.32)			(0.41)			
			Last10Years		-0.0659			0.0113	-0.0140*	-0.00992	-0.0185**				0.192	672	0.0303
					(-1.27)			(0.30)	(-1.85)	(-0.33)	(-2.29)				(0.53)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Table A6-6 Results of our simple probit regressions for the difference between S&P and Moody's ratings (when the first is lower than the latter), with the investment-grade dataset.

				Budget Balance	Structural Balance	General government Gross debt	General government Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last				
SIMPLE PROBIT (Investment-grade Dataset)																	
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SM	Investment	budgetbal	LastYear	0.000189**				0.0559	-0.0112	-0.0497	0.00514	-0.855*				795	0.0324
				(2.34)				(1.61)	(-1.44)	(-1.59)	(1.20)	(-1.88)					
			Last2Years	0.000189**				0.0559	-0.0112	-0.0509	0.00509		-0.739*			795	0.0316
				(2.35)				(1.63)	(-1.44)	(-1.60)	(1.17)		(-1.69)				
			Last5Years	0.000186**				0.0583*	-0.0110	-0.0529	0.00489			-0.765***		795	0.0332
				(2.32)				(1.71)	(-1.41)	(-1.61)	(1.06)			(-2.90)			
			Last10Years	0.000190**				0.0542	-0.0101	-0.0517	0.00540				-0.509	795	0.0300
				(2.37)				(1.62)	(-1.30)	(-1.55)	(1.26)				(-1.38)		
Diff_DW_SM	Investment	gross_debt	LastYear			0.0126***		0.0797**	-0.00629	-0.0453	0.00491	-0.922**				795	0.0377
						(2.78)		(2.43)	(-0.79)	(-1.32)	(1.22)	(-2.18)					
			Last2Years			0.0125***		0.0795**	-0.00628	-0.0466	0.00485		-0.794*			795	0.0366
						(2.78)		(2.45)	(-0.79)	(-1.34)	(1.19)		(-1.92)				
			Last5Years			0.0120***		0.0808**	-0.00626	-0.0486	0.00457			-0.779***		795	0.0375
						(2.78)		(2.52)	(-0.78)	(-1.36)	(1.06)			(-3.13)			
			Last10Years			0.0119***		0.0768**	-0.00522	-0.0475	0.00509				-0.497	795	0.0339
						(2.83)		(2.46)	(-0.66)	(-1.31)	(1.27)				(-1.37)		
Diff_DW_SM	Investment	net_debt	LastYear				0.000282	0.0622*	-0.0100	-0.0504	0.00479	-0.925**				795	0.0299
							(0.48)	(1.87)	(-1.29)	(-1.60)	(1.13)	(-2.23)					
			Last2Years				0.000233	0.0620*	-0.00997	-0.0514	0.00472		-0.792*			795	0.0289
							(0.38)	(1.89)	(-1.29)	(-1.61)	(1.10)		(-1.93)				
			Last5Years				0.000180	0.0636*	-0.00984	-0.0532	0.00448			-0.766***		795	0.0295
							(0.29)	(1.95)	(-1.27)	(-1.62)	(0.99)			(-3.15)			
			Last10Years				0.000138	0.0598*	-0.00880	-0.0519	0.00498				-0.510	795	0.0264
							(0.52)	(1.86)	(-1.15)	(-1.55)	(1.17)				(-1.37)		
Diff_DW_SM	Investment	structbal	LastYear		-0.0693*			0.0607*	-0.00901	-0.0458	0.00329	-0.929*				743	0.0295
					(-1.71)			(1.66)	(-1.10)	(-1.28)	(0.75)	(-1.92)					
			Last2Years		-0.0684*			0.0607*	-0.00905	-0.0478	0.00321		-0.784*			743	0.0284
					(-1.70)			(1.67)	(-1.11)	(-1.31)	(0.73)		(-1.72)				
			Last5Years		-0.0643			0.0620*	-0.00896	-0.0508	0.00291			-0.747***		743	0.0290
					(-1.59)			(1.72)	(-1.09)	(-1.32)	(0.64)			(-2.84)			
			Last10Years		-0.0617			0.0575*	-0.00816	-0.0506	0.00333				-0.412	743	0.0247
					(-1.57)			(1.66)	(-1.02)	(-1.28)	(0.76)				(-1.04)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Appendix 7.   Simple probit speculative-grade dataset regressions results

Table A7-1 Results of our simple probit regressions for the difference between S&P and Fitch ratings (when the first is higher than the latter), with the speculative-grade dataset.

				Budget Balance	General government Structural Balance	Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last				
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SF	Non-Investment	budgetbal	LastYear	-0.000113*				-0.00689	0.00256	-0.000703	0.000799	-0.317				376	0.0105
				(-1.66)				(-0.56)	(0.27)	(-1.51)	(0.18)	(-1.01)					
			Last2Years	-0.000112				-0.00697	0.00250	-0.000716	0.000382		-0.435			376	0.0131
				(-1.60)				(-0.55)	(0.27)	(-1.54)	(0.08)		(-1.50)				
			Last5Years	-0.000130*				-0.00724	0.00298	-0.000714	0.000273			-0.477		376	0.0139
				(-1.79)				(-0.57)	(0.32)	(-1.54)	(0.06)			(-1.28)			
			Last10Years	-0.000121*				-0.00901	0.00348	-0.000706	0.000870				-0.384	376	0.00858
				(-1.72)				(-0.72)	(0.38)	(-1.46)	(0.19)				(-0.69)		
Diff_UP_SF	Non-Investment	gross_debt	LastYear			0.00124		-0.00418	0.00336	-0.000707	0.000639	-0.331				376	0.00744
						(0.64)		(-0.29)	(0.35)	(-1.49)	(0.14)	(-1.06)					
			Last2Years			0.00113		-0.00457	0.00326	-0.000722	0.000220		-0.447			376	0.0101
						(0.61)		(-0.31)	(0.34)	(-1.52)	(0.05)		(-1.56)				
			Last5Years			0.00116		-0.00513	0.00388	-0.000722	0.000162			-0.444		376	0.00949
						(0.63)		(-0.35)	(0.41)	(-1.53)	(0.04)			(-1.28)			
			Last10Years			0.00118		-0.00676	0.00432	-0.000713	0.000727				-0.372	376	0.00497
						(0.62)		(-0.46)	(0.46)	(-1.45)	(0.16)				(-0.67)		
Diff_UP_SF	Non-Investment	net_debt	LastYear				0.00817*	-0.0152	0.00623	-0.000732	0.000624	-0.324				376	0.0109
							(1.94)	(-1.15)	(0.64)	(-1.47)	(0.13)	(-1.03)					
			Last2Years				0.00780*	-0.0148	0.00596	-0.000746	0.000216		-0.434			376	0.0133
							(1.92)	(-1.10)	(0.62)	(-1.50)	(0.05)		(-1.49)				
			Last5Years				0.00757*	-0.0153	0.00647	-0.000745	0.000175			-0.422		376	0.0125
							(1.95)	(-1.13)	(0.67)	(-1.50)	(0.04)			(-1.22)			
			Last10Years				0.00844**	-0.0175	0.00726	-0.000738	0.000685				-0.387	376	0.00878
							(1.97)	(-1.29)	(0.77)	(-1.42)	(0.14)				(-0.69)		
Diff_UP_SF	Non-Investment	structbal	LastYear		0.00530			-0.0121	-0.00724	-0.00108	-0.00615	-0.418				212	0.0201
					(0.16)			(-0.31)	(-0.58)	(-0.93)	(-0.83)	(-1.12)					
			Last2Years		0.0102			-0.00839	-0.00785	-0.00116	-0.00738		-0.617*			212	0.0296
					(0.31)			(-0.22)	(-0.63)	(-0.76)	(-1.04)		(-1.83)				
			Last5Years		0.0204			-0.00219	-0.00794	-0.00120	-0.00652			-0.722**		212	0.0361
					(0.59)			(-0.05)	(-0.66)	(-0.74)	(-0.91)			(-1.99)			
			Last10Years		0.000685			-0.0188	-0.00574	-0.00108	-0.00618				-0.456	212	0.0168
					(0.02)			(-0.48)	(-0.48)	(-0.90)	(-0.84)				(-0.83)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A7-2 Results of our simple probit regressions for the difference between S&P and Fitch ratings (when the first is lower than the latter), with the speculative-grade dataset.

SIMPLE PROBIT (Speculative-grade Dataset)				Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last					
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SF	Non-Investment	budgetbal	LastYear	-0.0000560				-0.0484**	-0.00594	-0.000452	-0.00313	-0.356*				435	0.0310
				(-0.80)				(-2.25)	(-0.82)	(-0.71)	(-1.22)	(-1.76)					
			Last2Years	-0.0000478				-0.0475**	-0.00571	-0.000489	-0.00334		-0.391**			435	0.0321
				(-0.69)				(-2.16)	(-0.79)	(-0.74)	(-1.31)		(-1.98)				
			Last5Years	-0.0000525				-0.0514**	-0.00532	-0.000482	-0.00293			-0.215		435	0.0254
				(-0.80)				(-2.36)	(-0.77)	(-0.77)	(-1.20)			(-0.93)			
			Last10Years	-0.0000549				-0.0476**	-0.00486	-0.000689	-0.00272				-0.705**	435	0.0349
				(-0.84)				(-2.10)	(-0.70)	(-0.59)	(-1.12)				(-2.27)		
Diff_DW_SF	Non-Investment	gross_debt	LastYear			-0.00138		-0.0503**	-0.00699	-0.000470	-0.00307	-0.350*				435	0.0301
						(-0.30)		(-2.18)	(-1.01)	(-0.71)	(-1.20)	(-1.71)					
			Last2Years			-0.00151		-0.0493**	-0.00683	-0.000507	-0.00329		-0.392**			435	0.0315
						(-0.33)		(-2.11)	(-0.98)	(-0.73)	(-1.30)		(-1.99)				
			Last5Years			-0.00171		-0.0535**	-0.00659	-0.000501	-0.00287			-0.217		435	0.0248
						(-0.36)		(-2.32)	(-0.99)	(-0.76)	(-1.17)			(-0.94)			
			Last10Years			-0.00200		-0.0499**	-0.00631	-0.000728	-0.00265				-0.706**	435	0.0344
						(-0.43)		(-2.09)	(-0.93)	(-0.55)	(-1.09)				(-2.28)		
Diff_DW_SF	Non-Investment	net_debt	LastYear				0.0105*	-0.0457**	-0.00222	-0.000463	-0.00318	-0.324				435	0.0405
							(1.84)	(-1.96)	(-0.32)	(-0.73)	(-1.21)	(-1.57)					
			Last2Years				0.0102*	-0.0449*	-0.00213	-0.000496	-0.00337		-0.353*			435	0.0413
							(1.79)	(-1.92)	(-0.30)	(-0.75)	(-1.30)		(-1.73)				
			Last5Years				0.0106*	-0.0491**	-0.00163	-0.000486	-0.00299			-0.155		435	0.0353
							(1.82)	(-2.12)	(-0.25)	(-0.78)	(-1.18)			(-0.64)			
			Last10Years				0.00998*	-0.0451*	-0.00163	-0.000693	-0.00281				-0.647**	435	0.0435
							(1.74)	(-1.88)	(-0.24)	(-0.60)	(-1.12)				(-1.98)		
Diff_DW_SF	Non-Investment	structbal	LastYear		-0.00304			-0.0435**	-0.00717	-0.000426	-0.00408	-0.200				271	0.0261
					(-0.12)			(-2.08)	(-0.82)	(-0.78)	(-0.84)	(-0.78)					
			Last2Years		-0.00324			-0.0433**	-0.00716	-0.000434	-0.00419		-0.137			271	0.0247
					(-0.12)			(-2.08)	(-0.82)	(-0.81)	(-0.86)		(-0.59)				
			Last5Years		-0.000441			-0.0407**	-0.00696	-0.000466	-0.00366			-0.257		271	0.0265
					(-0.02)			(-2.08)	(-0.81)	(-0.82)	(-0.77)			(-1.18)			
			Last10Years		0.00192			-0.0334	-0.00630	-0.000654	-0.00260				-0.818**	271	0.0450
					(0.07)			(-1.63)	(-0.74)	(-0.72)	(-0.58)				(-2.34)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A7-3 Results of our simple probit regressions for the difference between Moody's and Fitch ratings (when the first is higher than the latter), with the speculative-grade dataset.

Dependent variables	Type of rating	Independent variables		Budget Balance BudgetBal_NGDP_Var	Structural Balance GGSB_NPGDP_Var	General government Gross debt GGXWDG_NGDP_Var	Net debt GGXWDN_NGDP_Var	GDP Growth NGDP_RPCH	GDP Per Capita NGDPDPC_Var	Inflation PCPIPCH	External Debt %GNI ExtDebtPercGNI_Var	Default in the last Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_MF	Non-Investment	budgetbal	LastYear	0.000248				-0.0230	-0.000970	-0.00546	0.00522	-0.0350				238	0.0174
				(1.31)				(-0.72)	(-0.10)	(-0.64)	(0.93)	(-0.11)					
			Last2Years	0.000246				-0.0262	-0.000479	-0.00541	0.00526		0.0774			238	0.0176
				(1.21)				(-0.77)	(-0.05)	(-0.63)	(0.92)		(0.18)				
			Last5Years	0.000237				-0.0124	-0.00302	-0.00568	0.00499			-0.455		238	0.0268
				(1.27)				(-0.39)	(-0.34)	(-0.67)	(0.91)			(-1.19)			
			Last10Years	0.000244				-0.0193	-0.00107	-0.00561	0.00545				-0.351	238	0.0202
				(1.28)				(-0.62)	(-0.12)	(-0.64)	(0.96)				(-0.77)		
Diff_UP_MF	Non-Investment	gross_debt	LastYear			0.00745		-0.0106	0.00420	-0.00435	0.00608	-0.0459				238	0.0193
						(1.02)		(-0.33)	(0.39)	(-0.55)	(1.09)	(-0.13)					
			Last2Years			0.00744		-0.0144	0.00475	-0.00429	0.00613		0.0965			238	0.0195
						(1.00)		(-0.42)	(0.43)	(-0.53)	(1.07)		(0.22)				
			Last5Years			0.00773		0.000413	0.00236	-0.00452	0.00581			-0.473		238	0.0293
						(1.05)		(0.01)	(0.24)	(-0.58)	(1.06)			(-1.23)			
			Last10Years			0.00798		-0.00594	0.00443	-0.00445	0.00636				-0.400	238	0.0229
						(1.08)		(-0.19)	(0.43)	(-0.55)	(1.11)				(-0.85)		
Diff_UP_MF	Non-Investment	net_debt	LastYear				-0.00180	-0.0233	-0.000632	-0.00519	0.00545	-0.0316				238	0.0145
							(-0.24)	(-0.75)	(-0.07)	(-0.60)	(0.96)	(-0.10)					
			Last2Years				-0.00180	-0.0269	-0.0000993	-0.00512	0.00549		0.101			238	0.0149
							(-0.24)	(-0.82)	(-0.01)	(-0.59)	(0.95)		(0.24)				
			Last5Years				-0.00164	-0.0122	-0.00275	-0.00543	0.00522			-0.461		238	0.0241
							(-0.22)	(-0.39)	(-0.30)	(-0.63)	(0.93)			(-1.20)			
			Last10Years				-0.00146	-0.0192	-0.000716	-0.00536	0.00567				-0.352	238	0.0173
							(-0.19)	(-0.64)	(-0.08)	(-0.60)	(0.98)				(-0.77)		
Diff_UP_MF	Non-Investment	structbal	LastYear		-0.0726			-0.0272	0.00470	-0.00371	0.00836	-0.601**				170	0.0667
					(-1.30)			(-0.87)	(0.54)	(-0.38)	(1.51)	(-2.01)					
			Last2Years		-0.0719			-0.0295	0.00509	-0.00374	0.00818		-0.476			170	0.0606
					(-1.25)			(-0.88)	(0.60)	(-0.38)	(1.42)		(-1.29)				
			Last5Years		-0.0624			-0.0149	0.00170	-0.00459	0.00875			-0.962***		170	0.0905
					(-1.08)			(-0.45)	(0.24)	(-0.46)	(1.51)			(-3.05)			
			Last10Years		-0.0762			-0.0346	0.00655	-0.00301	0.00875				-0.398	170	0.0569
					(-1.40)			(-1.11)	(0.86)	(-0.30)	(1.51)				(-0.78)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A7-4 Results of our simple probit regressions for the difference between Moody's and Fitch ratings (when the first is lower than the latter), with the speculative-grade dataset.

SIMPLE PROBIT (Speculative-grade Dataset)				Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI	Default in the last Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_MF	Non-Investment	budgetbal	LastYear	0.00000548				-0.00570	0.00558	-0.0150***	0.00230	-0.0369				296	0.0204
				(0.39)				(-0.20)	(0.64)	(-2.99)	(0.47)	(-0.12)					
			Last2Years	0.00000550				-0.0117	0.00621	-0.0146***	0.00243		0.159			296	0.0218
				(0.40)				(-0.39)	(0.71)	(-2.84)	(0.50)		(0.48)				
			Last5Years	0.00000617				-0.0106	0.00556	-0.0145***	0.00207			0.166		296	0.0213
				(0.45)				(-0.36)	(0.64)	(-2.93)	(0.43)			(0.51)			
			Last10Years	0.00000528				0.00217	0.00685	-0.0173***	0.00322				-0.605	296	0.0269
				(0.38)				(0.08)	(0.75)	(-3.91)	(0.64)				(-1.09)		
Diff_DW_MF	Non-Investment	gross_debt	LastYear			-0.00940		-0.0165	0.00266	-0.0150***	0.00180	-0.0482				296	0.0243
						(-1.15)		(-0.61)	(0.28)	(-2.99)	(0.37)	(-0.16)					
			Last2Years			-0.00904		-0.0220	0.00339	-0.0146***	0.00193		0.146			296	0.0254
						(-1.09)		(-0.78)	(0.35)	(-2.83)	(0.40)		(0.44)				
			Last5Years			-0.00892		-0.0204	0.00287	-0.0146***	0.00164			0.133		296	0.0247
						(-1.04)		(-0.74)	(0.30)	(-2.95)	(0.35)			(0.39)			
			Last10Years			-0.0116		-0.0100	0.00345	-0.0178***	0.00278				-0.680	296	0.0325
						(-1.39)		(-0.39)	(0.35)	(-3.96)	(0.56)				(-1.18)		
Diff_DW_MF	Non-Investment	net_debt	LastYear				-0.00290	-0.00816	0.00463	-0.0147***	0.00218	-0.0433				296	0.0210
							(-0.62)	(-0.29)	(0.48)	(-2.91)	(0.45)	(-0.14)					
			Last2Years				-0.00271	-0.0141	0.00534	-0.0144***	0.00232		0.156			296	0.0223
							(-0.58)	(-0.47)	(0.57)	(-2.77)	(0.48)		(0.47)				
			Last5Years				-0.00267	-0.0128	0.00474	-0.0144***	0.00198			0.156		296	0.0217
							(-0.56)	(-0.43)	(0.50)	(-2.85)	(0.41)			(0.47)			
			Last10Years				-0.00404	-0.00100	0.00559	-0.0171***	0.00310				-0.632	296	0.0281
							(-0.85)	(-0.04)	(0.57)	(-3.85)	(0.62)				(-1.12)		
Diff_DW_MF	Non-Investment	structbal	LastYear		0.0234			-0.00548	0.0121	-0.0174***	0.00933*	-0.437				244	0.0488
					(0.61)			(-0.18)	(1.19)	(-3.63)	(1.85)	(-1.33)					
			Last2Years		0.0195			-0.00845	0.0129	-0.0167***	0.00953*		-0.193			244	0.0392
					(0.50)			(-0.26)	(1.36)	(-3.40)	(1.93)		(-0.57)				
			Last5Years		0.0138			-0.0125	0.0135	-0.0164***	0.00993*			-0.0257		244	0.0372
					(0.34)			(-0.37)	(1.44)	(-3.32)	(1.92)			(-0.07)			
			Last10Years		0.0163			-0.00263	0.0157	-0.0192***	0.0119**				-0.717	244	0.0472
					(0.40)			(-0.09)	(1.57)	(-4.06)	(2.29)				(-1.20)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.
*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table A7-5 Results of our simple probit regressions for the difference between S&P and Moody's ratings (when the first is higher than the latter), with the speculative-grade dataset.

| | | | | Budget Balance | Structural Balance | Gross debt | Net debt | GDP Growth | GDP Per Capita | Inflation | External Debt %GNI | | Default in the last | | | | |
| SIMPLE PROBIT (Speculative-grade Dataset) | | | | | | | | | | | | | | | | | |
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_UP_SM	Non-Investment	budgetbal	LastYear	0.0000266				0.0125	0.00570	-0.0168	0.00428	0.0220				357	0.0230
				(1.02)				(0.38)	(0.55)	(-1.54)	(1.11)	(0.09)					
			Last2Years	0.0000263				0.0121	0.00573	-0.0167	0.00433		0.0366			357	0.0230
				(1.00)				(0.36)	(0.55)	(-1.54)	(1.11)		(0.14)				
			Last5Years	0.0000274				0.00915	0.00581	-0.0168	0.00421			0.137		357	0.0236
				(0.99)				(0.27)	(0.56)	(-1.54)	(1.09)			(0.50)			
			Last10Years	0.0000276				0.00130	0.00595	-0.0159	0.00418				0.499	357	0.0268
				(1.00)				(0.04)	(0.58)	(-1.44)	(1.10)				(1.28)		
Diff_UP_SM	Non-Investment	gross_debt	LastYear			-0.00656		0.00626	0.00348	-0.0170	0.00443	0.000209				357	0.0220
						(-0.63)		(0.19)	(0.31)	(-1.52)	(1.15)	(0.00)					
			Last2Years			-0.00648		0.00562	0.00358	-0.0170	0.00447		0.0313			357	0.0221
						(-0.63)		(0.16)	(0.32)	(-1.52)	(1.16)		(0.12)				
			Last5Years			-0.00613		0.00370	0.00378	-0.0170	0.00437			0.108		357	0.0224
						(-0.57)		(0.11)	(0.34)	(-1.52)	(1.14)			(0.37)			
			Last10Years			-0.00542		-0.00330	0.00425	-0.0161	0.00433				0.469	357	0.0253
						(-0.52)		(-0.09)	(0.39)	(-1.43)	(1.15)				(1.16)		
Diff_UP_SM	Non-Investment	net_debt	LastYear				-0.0190*	0.00156	0.000608	-0.0165	0.00443	-0.00766				357	0.0325
							(-1.83)	(0.04)	(0.06)	(-1.55)	(1.15)	(-0.03)					
			Last2Years				-0.0190*	0.00134	0.000634	-0.0166	0.00443		0.00191			357	0.0325
							(-1.84)	(0.04)	(0.06)	(-1.55)	(1.15)		(0.01)				
			Last5Years				-0.0188*	-0.00000380	0.000771	-0.0166	0.00440			0.0559		357	0.0326
							(-1.75)	(-0.00)	(0.07)	(-1.55)	(1.15)			(0.18)			
			Last10Years				-0.0184*	-0.00715	0.00122	-0.0158	0.00435				0.405	357	0.0348
							(-1.66)	(-0.20)	(0.11)	(-1.45)	(1.15)				(0.95)		
Diff_UP_SM	Non-Investment	structbal	LastYear		0.0418			0.00204	0.0103	-0.0164	0.00246	-0.295				254	0.0351
					(1.06)			(0.06)	(0.91)	(-1.42)	(0.41)	(-0.88)					
			Last2Years		0.0353			-0.00598	0.0111	-0.0164	0.00237		-0.0469			254	0.0302
					(0.88)			(-0.17)	(0.98)	(-1.42)	(0.40)		(-0.14)				
			Last5Years		0.0289			-0.0169	0.0119	-0.0165	0.00248			0.246		254	0.0323
					(0.75)			(-0.48)	(1.09)	(-1.41)	(0.44)			(0.74)			
			Last10Years		0.0318			-0.0280	0.0118	-0.0156	0.00196				0.671	254	0.0390
					(0.87)			(-0.80)	(1.10)	(-1.31)	(0.36)				(1.62)		

Note: t-statistics in parentheses. The Pseudo R^2 values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Table A7-6 Results of our simple probit regressions for the difference between S&P and Moody's ratings (when the first is lower than the latter), with the speculative-grade dataset.

				Budget Balance	Structural Balance	General government Gross debt	Net debt	GDP Growth	GDP Per Capita	Inflation	External Debt %GNI		Default in the last					
SIMPLE PROBIT (Speculative-grade Dataset)																		
Dependent variables	Type of rating	Independent variables		BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	Year	2 Years	5 Years	10 Years	N	Pseudo R^2
Diff_DW_SM	Non-Investment	budgetbal	LastYear	0.000231				-0.00243	-0.0138*	-0.000752	0.00183	-0.111				370	0.0206
				(1.48)				(-0.12)	(-1.90)	(-0.60)	(0.41)	(-0.62)					
			Last2Years	0.000241				-0.000955	-0.0138*	-0.000789	0.00178		-0.206			370	0.0221
				(1.54)				(-0.04)	(-1.92)	(-0.55)	(0.40)		(-1.02)				
			Last5Years	0.000232				-0.00452	-0.0140*	-0.000737	0.00174			0.0526		370	0.0200
				(1.47)				(-0.22)	(-1.92)	(-0.63)	(0.38)			(0.20)			
			Last10Years	0.000237				-0.0108	-0.0143**	-0.000662	0.00139				0.451	370	0.0244
				(1.49)				(-0.53)	(-1.96)	(-0.72)	(0.31)				(1.14)		
Diff_DW_SM	Non-Investment	gross_debt	LastYear			0.0119*		0.0110	-0.00801	-0.000611	0.00216	-0.0928				370	0.0231
						(1.70)		(0.45)	(-1.05)	(-0.70)	(0.49)	(-0.50)					
			Last2Years			0.0116*		0.0118	-0.00808	-0.000630	0.00211		-0.170			370	0.0242
						(1.70)		(0.47)	(-1.06)	(-0.68)	(0.48)		(-0.84)				
			Last5Years			0.0123*		0.00936	-0.00810	-0.000599	0.00204			0.0725		370	0.0229
						(1.73)		(0.39)	(-1.04)	(-0.71)	(0.46)			(0.26)			
			Last10Years			0.0131*		0.00373	-0.00819	-0.000549	0.00165				0.482	370	0.0278
						(1.79)		(0.16)	(-1.05)	(-0.75)	(0.37)				(1.13)		
Diff_DW_SM	Non-Investment	net_debt	LastYear				0.00329	0.000567	-0.0126*	-0.000718	0.00170	-0.108				370	0.0164
							(0.74)	(0.03)	(-1.79)	(-0.62)	(0.38)	(-0.60)					
			Last2Years				0.00296	0.00146	-0.0127*	-0.000745	0.00164		-0.185			370	0.0176
							(0.66)	(0.07)	(-1.81)	(-0.59)	(0.37)		(-0.92)				
			Last5Years				0.00358	-0.00116	-0.0127*	-0.000707	0.00161			0.0513		370	0.0159
							(0.75)	(-0.05)	(-1.79)	(-0.65)	(0.36)			(0.19)			
			Last10Years				0.00448	-0.00673	-0.0128*	-0.000638	0.00125				0.461	370	0.0205
							(0.87)	(-0.32)	(-1.80)	(-0.73)	(0.28)				(1.11)		
Diff_DW_SM	Non-Investment	structbal	LastYear		-0.0220			-0.0147	-0.0179**	-0.000474	-0.00844	-0.223				233	0.0318
					(-0.63)			(-0.65)	(-2.25)	(-0.72)	(-1.51)	(-0.90)					
			Last2Years		-0.0247			-0.0172	-0.0181**	-0.000471	-0.00855		-0.0350			233	0.0290
					(-0.70)			(-0.77)	(-2.24)	(-0.74)	(-1.51)		(-0.14)				
			Last5Years		-0.0268			-0.0191	-0.0181**	-0.000456	-0.00867			0.0602		233	0.0291
					(-0.76)			(-0.87)	(-2.25)	(-0.72)	(-1.50)			(0.20)			
			Last10Years		-0.0272			-0.0221	-0.0187**	-0.000446	-0.00920				0.253	233	0.0309
					(-0.80)			(-1.01)	(-2.34)	(-0.73)	(-1.64)				(0.60)		

Note: t-statistics in parentheses. The Pseudo R² values were obtained using the McFadden's (1974) approach. The coloured cells highlight significant results.

*** Significant at 1% level.

** Significant at 5% level.

* Significant at 10% level.

Appendix 8.   Significance of the explanatory variables across all regressions

Table A8-1 Number of regressions where our explanatory variables were significant, split by dataset and type of model used.

Count significant vars (total)	BudgetBal_NGDP_Var	GGSB_NPGDP_Var	GGXWDG_NGDP_Var	GGXWDN_NGDP_Var	NGDP_RPCH	NGDPDPC_Var	PCPIPCH	ExtDebtPercGNI_Var	LastYear	Last2Years	Last5Years	Last10Years
ORDERED PROBIT (Full Dataset)	8	0	6	8	13	24	0	32	2	8	9	1
ORDERED PROBIT (Investment Grade Dataset)	5	0	5	4	8	27	16	16	5	4	0	0
ORDERED PROBIT (Speculative Grade Dataset)	7	0	4	12	15	12	4	21	1	0	2	4
SIMPLE PROBIT (Full Dataset)	8	3	4	8	4	28	0	20	1	4	9	1
SIMPLE PROBIT (Investment Grade Datset)	5	6	5	8	13	22	26	16	5	4	8	0
SIMPLE PROBIT (Speculative Grade Dataset)	3	0	4	12	15	12	16	4	3	4	2	4
Number of regressions where the explanatory variable was significant	36	9	28	52	68	125	62	109	17	24	30	10
Number of regressions using the explanatory variable	144	144	144	144	576	576	576	576	144	144	144	144
	25,00%	6,25%	19,44%	36,11%	11,81%	21,70%	10,76%	18,92%	11,81%	16,67%	20,83%	6,94%