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Sovereign Rating

What is the probability of a downgrade to Chile´s sovereign rating?

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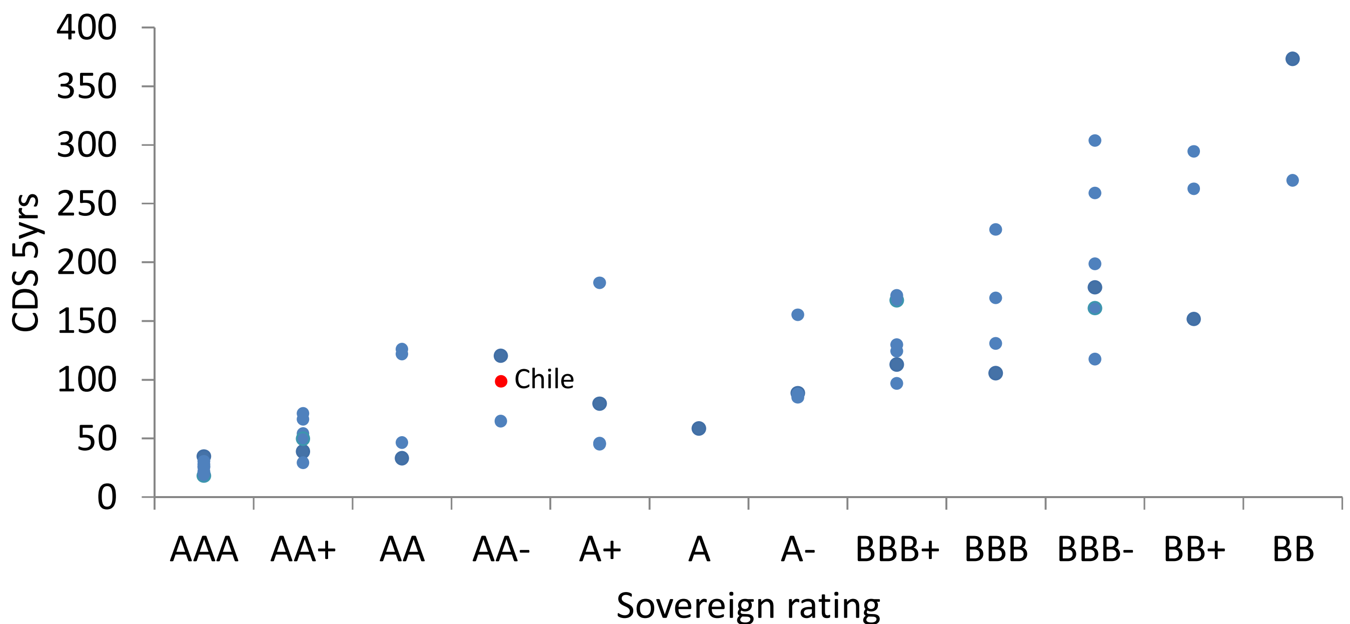
After the significant fall in commodity prices in 2015 and the weakening of developing economies, credit rating agencies have issued several warnings or outright rating cuts on emerging sovereigns. These actions affect perceptions on sovereign creditworthiness as well as borrowing costs in the global markets. See chart 1.

Chart 1: Sovereign rating and credit default swaps

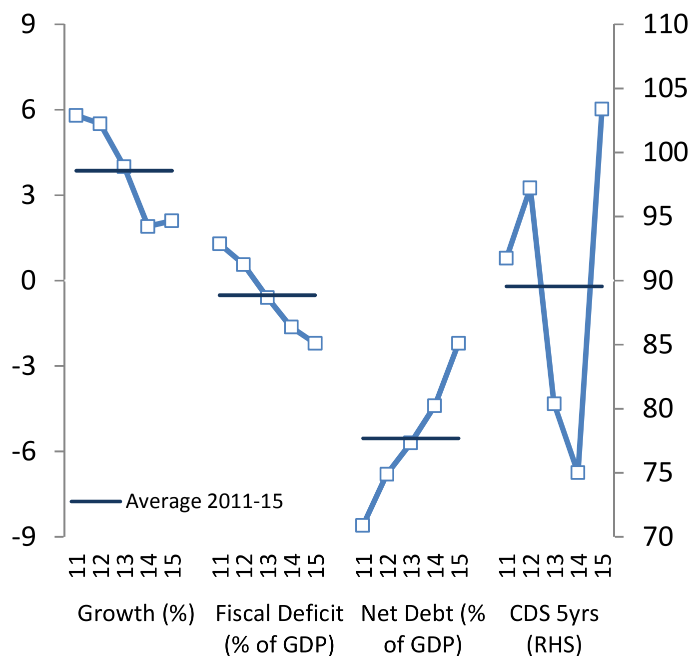


Source: Bloomberg, BTG Pactual

Chile has not been absent in the discussion. In fact, on February 23, Moody's released an "Issuer Comment" on Chile's government debt, saying: "weaker economic growth is driving debt levels higher, a credit negative". A few days later (February 29) the Ministry of Finance announced a 0.25% GDP cut on fiscal spending for 2016. **In this report, we comment on recent fiscal developments in Chile, estimate a model of the empirical determinants of credit ratings across sovereigns, use this model to estimate the probability of a rating cut for Chile, and discuss policy alternatives**.

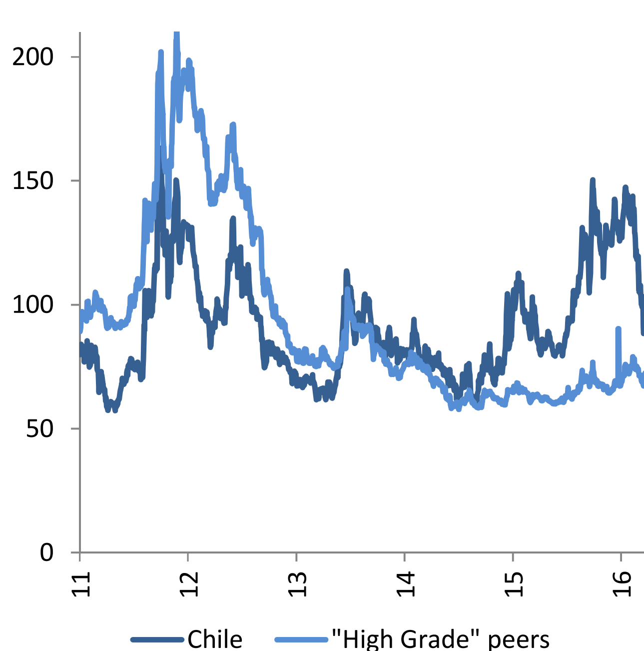
The end of the commodity super cycle has been a "credit negative" for Chile. Chile has experienced a significant growth slowdown, a deterioration of its fiscal balance and rising public debt. Additionally, Chile´s sovereign CDS premiums have increased along with other emerging market economies, but somewhat above its rating peers. See charts 2 and 3. **The government has started a gradual tightening process to reduce the headline and structural public deficit, but this is still an ongoing process as structural parameters may continue to be revised downwards**.

Chart 2: Evolution of key variables for debt sustainability - Chile



Source: Central Bank, Dipres, Bloomberg, BTG Pactual

Chart 3: Chile and "high grade" peers CDS 5yrs



Source: Bloomberg, BTG Pactual. "High Grade" peers: Czech Republic, South Korea, Estonia, Israel, China, Slovakia

Over the last 25 years, Chile's credit rating has improved continuously, moving from "lower medium grade" in 1992, to "upper medium grade" in 1995, and "high grade" since 2010. See table 1. Throughout this period, Chile has taken significant steps towards improving fiscal accounts, reducing its gross and net public debt and improving fiscal institutions through the introduction of a structural balance fiscal rule (since 2006, the Fiscal Responsibility Law).[1]

Table 1: Chile's Long-Term Foreign Currency Sovereign Rating History

Moodys's		S&P		FITCH	
Date	Rating	Date	Rating	Date	Rating
Initial 1995	Baa1	17-Aug-92	BBB (Stable)	10-Nov-94	BBB+
7-Jul-06	A2	30-Nov-92	BBB (Stable)	30-Aug-95	A-
23-Mar-09	A1	21-Dec-93	BBB+ (Stable)	26-Oct-95	A-
16-Jun-10	Aa3 (Stable)	11-Jul-95	A- (Stable)	25-Nov-96	A-
28-Jul-10	Aa3 (Stable)	16-Apr-02	A- (Positive)	3-Dec-97	A-
4-Nov-13	Aa3 (Stable)	14-Jan-04	A (Stable)	21-Sep-00	A- (Stable)
Today	Aa3 (Stable)	1-Nov-05	A (Stable)	24-Feb-03	A- (Stable)
		3-Nov-05	A (Stable)	2-Feb-04	A- (Positive)
		14-Dec-06	A (Positive)	28-Mar-05	A (Stable)
		18-Dec-07	A+ (Positive)	15-May-07	A (Positive)
		16-Dec-10	A+ (Positive)	10-Nov-08	A (Stable)
		26-Dec-12	AA- (Stable)	1-Feb-11	A+ (Stable)
		Today	AA- (Stable)	Today	A+ (Stable)

Source: Credit Rating Agencies, BTG Pactual

Over the last two years, the fiscal framework has struggled to reconcile the need to adjust to a permanent decline in structural revenues, with the need to provide transitory fiscal support to lackluster economic growth. In 2014, the Bachelet government passed a big tax reform to increase fiscal revenues by 3% of GDP and finance additional expenditures on education and health, as well as achieving a structural balance by 2018 (from a -0.9% structural deficit projected for 2014). In the budget law for 2015 (released in October 2014), the government postponed the fiscal adjustment and presented a budget with a slightly higher structural fiscal deficit to 1.1% of GDP in 2015. Strong fiscal spending (+9.9% y/y) would help smooth the cyclical deceleration of the Chilean economy. One year

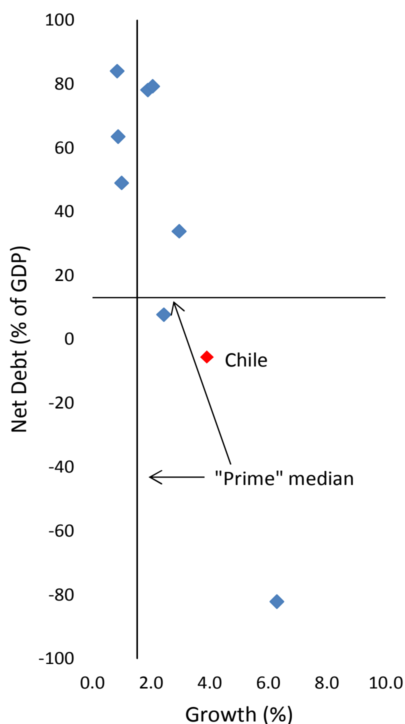
[1] Chile's structural balance rule is designed to distinguish between temporary and permanent factors (long-term copper price and potential output) affecting fiscal revenues, and determining the structural balance. The rule provides flexibility to accommodate transitory or cyclical fluctuations in copper prices and economic activity, while requiring the government to attain a target.

later, however, the government acknowledged that the Chilean economy was actually going through a more permanent deceleration, so the actual structural deficit was larger than previously projected. The actual fiscal deficit in 2015 reached 2.2% of GDP, of which government estimations suggest that 1.9% of GDP corresponded to a structural deficit, well above the initial objective of 1.1% of GDP, reflecting that much of it is permanent given both lower trend GDP growth and long term copper prices. The fiscal target was amended to a reduction of the structural public deficit of -0.25% of GDP per year, implying a target of -0.8% of GDP for 2018.

Last February, the government announced an additional fiscal adjustment, justified by lower projections for both trend GDP growth (implicit in the Ministry of Finance estimations) and long term copper prices (US$2.57/lb vs US$2.98/lb previously). After a public spending cut amounting to 0.25% of GDP (~US$540mn), the structural fiscal deficit is projected to stand at 1.3% of GDP in 2016. The government adjustment received cross-party support across the whole political spectrum, reflecting the country's commitment to fiscal responsibility. **However, despite this effort it is still unclear whether the government will anchor its fiscal policy on (a) 2018's -0.8% of GDP structural target, independent of possible changes in the long-term parameters and re-estimations of the structural deficit, or (b) if it will stick to its plan of a smooth fiscal adjustment of -0.25pp of GDP each consecutive year to attenuate the effects on domestic demand, as proposed in the 2016 fiscal law**.

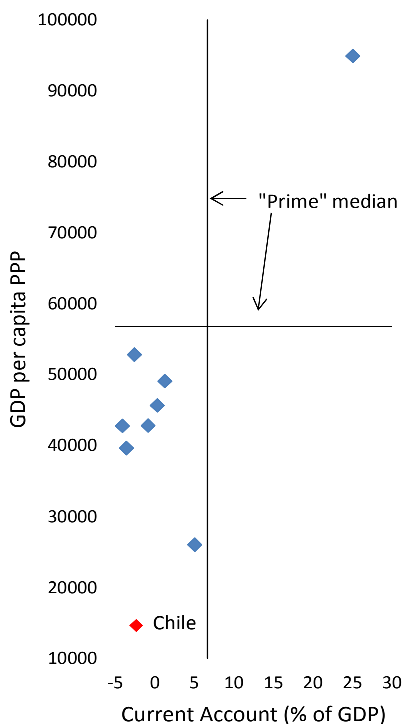
Even though Chile´s public finances are widely regarded as sound, it faces challenges to maintain its privileged position in the risk classification of major rating agencies. Chile's current credit rating for its long-term foreign currency debt stands at Aa3 with Moody's and AA- for S&P and A+ with Fitch, meaning very strong (in the case of S&P and Moody's) or strong (in the case of Fitch) capacity to meet its financial commitments. This privileged position puts the Chilean government debt rating at the same or similar level as sovereigns such as Qatar, Abu Dhabi, Czech Republic, South Korea, France, Belgium, Taiwan, China, to name just a few. The favorable rating is mainly sustained on its relatively low net debt-to-GDP ratio and high economic growth over the past three decades. However, we note that for other relevant indicators such as the level of GDP per capita, dependence on commodity exports, rule of law, Chile is below the median of its peers. See charts 4, 5, and 6.

Chart 4: Growth and Net Debt for "High Grade" Countries (average of the last five years)



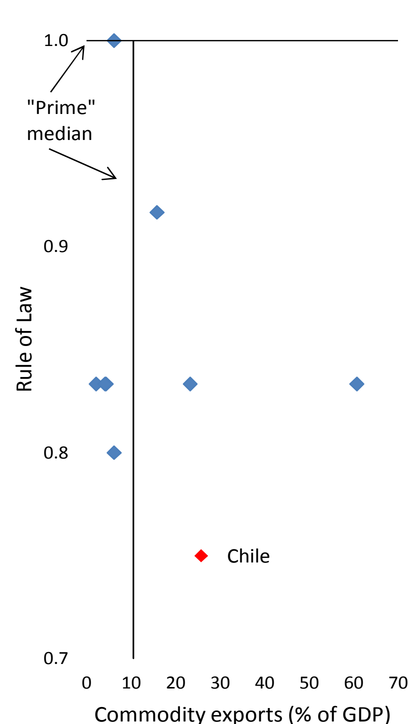
Source: IMF, Central Banks, BTG Pactual

Chart 5: Current Account and GDP per capita PPP for "High Grade" Countries (average of the last five years)



Source: IMF, Central Banks, BTG Pactual

Chart 6: Exposure to Commodities and Rule of Law for "High Grade" Countries (average of the last five years)



Source: Central Banks, World Bank, PRS, BTG Pactual

We estimate an econometric model to assess the probability of a rating downgrade. Our method is to estimate an expected value for Chile´s long-term foreign currency rating with a probabilistic approach. We use a sample of 64 countries based on data availability. In order to ensure the accuracy of the model, we built a simplified rating

indicator (“prime”, high grade”, upper medium grade”, “lower medium grade”, “non-investment grade speculative”, “highly speculative”, and “substantial risks and above”), with an ordinal ranking that goes from 1 to 7, instead of the usual 21 categories. In constructing these indicators, we do a rounded average of the risk classifications of the rating agencies, and in the case of Chile, as two of the major rating agencies (Moody’s and S&P) consider its rating a “high grade”, we assign this rating classification.

We run a cross-sectional ordered choice model using as dependent variable country ratings and as explanatory variables a set of quantitative and qualitative data.[2] Using the equivalence between rating categories, we build a unified ordinal indicator for the rating classification for 64 countries. As for the explanatory variables, we test a set of 30 variables related to (i) macro/growth indicators: GDP per capita PPP growth, GDP per capita US$, growth, savings to GDP, investment to GDP, unemployment, inflation; (ii) government balance (flows): government balance, primary government balance, fiscal revenues to GDP; (iii) government debt: net debt-to-GDP, net debt-to-fiscal revenues, gross debt-to-GDP; (iv) international finance flows and stocks: current account, reserves to GDP, net international investment position; (v) political: democracy, political stability and absence of violence; (vi) structural/institutional variables: rule of law, voice accountability, government effectiveness, regulatory quality, control of corruption; (vii) others: the GINI indicator, a dummy variable of default in the last 25 years, a dummy variable if the country is advanced or developing, trade-to-GDP, financial openness, exports of commodities to total exports, exports of commodities to GDP - sources: IMF, World Bank, PRS, Barro dataset). For details of the factors influencing sovereign credit ratings read chapter 3 of the 2010 Global Financial Stability Report “The Uses and Abuses of Sovereign Credit Ratings”.

In our model, a small group of eight variables are able to explain with 64% of accuracy the rating classification of the countries in the sample. In delving into the “black box” of rating classifications, we found as key explanatory variables: (i) GDP per capita PPP growth (annualized growth in the last five years), (ii) the GDP per capita US$ level (average of the last five years), (iii) inflation (average of the last five years), (iv) the net debt to GDP ratio (average of the last five years), (v) a democracy indicator (average of the last five years, for available data), (vi) the rule of law indicator (average of the last five years, for available data), (vii) a government effectiveness indicator (average of the last five years, for available data), (viii) commodity exports to GDP (average of the last five years, for available data). See table 2. Other variables appeared to be not statistically significant, with the wrong coefficient, or required to impute data for some countries.[3] It is worth mentioning that gross debt-to-GDP had a lower performance in the model than net debt-to-GDP.[4] See Appendix (we use a small sample of explanatory variables for illustrative purposes).

[2] This class of model is commonly used in economic literature for ordinal dependent variables, in this case the rating classification, where the ranking does not have a numerical meaning other than its order (this methodology was first introduced in the analysis of sovereign credit rating by Bissoondoyal-Bheenick (2005), “An Analysis of the Determinants of Sovereign Ratings”, Global Finance Journal 15 251-280).
[3] For example, despite increasing the accuracy of the model, we decided to exclude the net international investment position to GDP, since it contained several imputed data for omitted variables (regression 2 of the appendix continues to hold that there is a higher probability of Chile belonging to “upper medium grade” than to “high grade” group).
[4] We also found that net debt-to-GDP had no significant statistical difference when dividing these data into developed and undeveloped countries.

Table 2: Ordered Choice Model (normal distribution)

	Coefficient	Std. Error	Probability (p)	
GDP per capita PPP (growth) (annulized growth in the last five years)	-0.320	0.133	0.02	**
GDP per capita (US$, thousand) (average of the last five years)	-0.060	0.017	0.00	***
Inflation (average of the last five years)	0.207	0.067	0.00	***
Net debt (% of GDP) (average of the last five years)	0.037	0.007	0.00	***
Democracy (average of the last five years, for available data)	-1.526	0.706	0.03	**
Rule of Law (average of the last five years, for available data)	-2.201	1.214	0.07	*
Government Effectiveness (average of the last five years, for available data)	-2.392	1.013	0.02	**
Commodity Exports (% of GDP) (average of the last five years, for available data)	0.046	0.016	0.01	**
Pseudo R-squared	0.524			
Statistical significance at: *** p<0.01, **p<0.05, *p<0.1				

Source: BTG Pactual

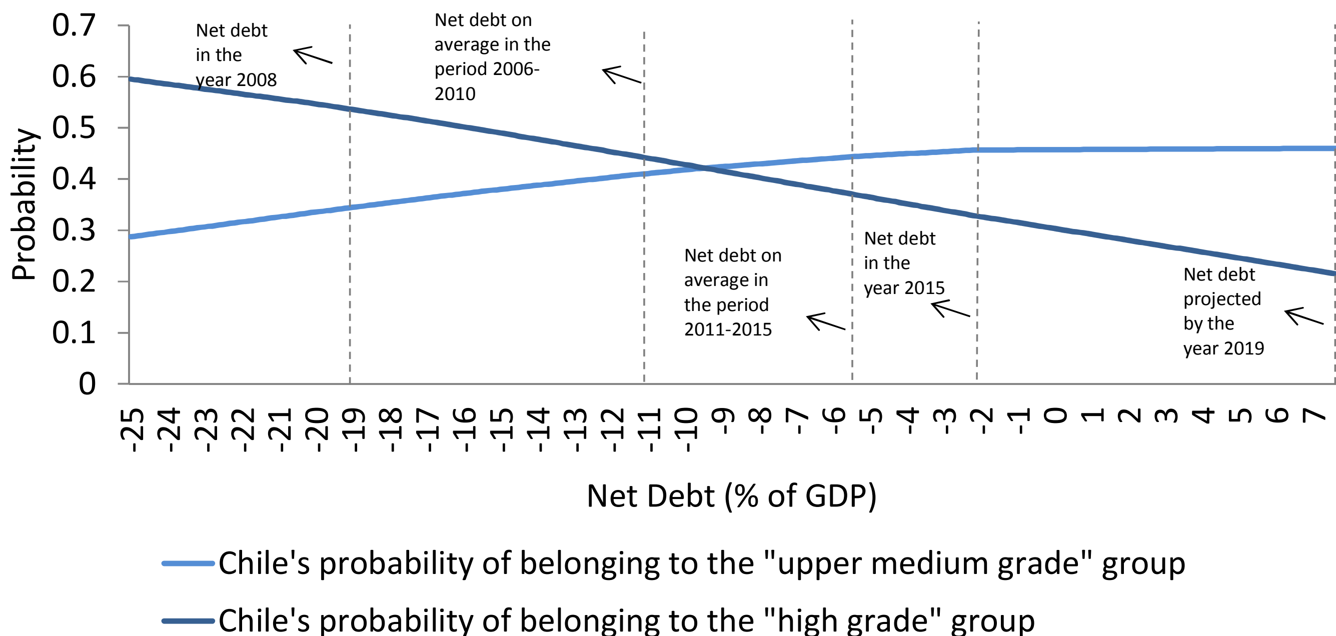
At face value, our results indicate a higher probability of Chile belonging to the "upper medium grade" than to the "high grade" group, implying that Chile´s sovereign rating is close to the border between both categories. In fact, in our preferred version of the model, a Wald test suggests that Chile belongs to the "high grade" group with 37.1% probability, while the probability of being one notch below - in the "upper medium grade" (current Fitch rating for Chile) - stands at 44.3%. Other versions of the model arrive to the same conclusion (higher probability of Chile belonging to the "upper medium grade" than to the "high grade" group), although the specific number varies (see Appendix). In this sense, we cannot discard that Chile could receive a negative outlook by those agencies that consider its rating "high grade" (Moody's and S&P). But there is significant inertia in risk classifications, so the threshold may be much higher than we have found.

It is important to note that in the past, Chile´s "high grade" rating was mainly explained – according to our model – by its high growth and low debt-to-GDP ratios. In the past few years, however, we have observed deterioration in these key variables, while other relevant variables, such as GDP per capita, inflation, concentration on commodity exports, rule of law, remain stable. In our model, our results suggest that a main factor behind the deterioration of Chile's rating score has been the increase of the net debt-to-GDP ratio in the last few years. In fact, a Wald test of our model suggests that when using the five years ago moving-average values for the net debt-to-GDP ratio (-11.3% of GDP vs. the average net debt-to-GDP in the last five years of -5.5%), the probability of Chile belonging to the "high grade" group increases to 44.7% (+7.6pp), while the probability of Chile's rating being considered in the "upper medium grade" group drops to 40.6% (-3.7pp). The results for the rest of the models lead to the same conclusion (the increase in net debt-to-GDP has been a major factor in the deterioration of Chile's rating score).

Another interesting exercise is to model the probabilities of Chile's rating with the actual and projected levels of net debt-to-GDP. We find that a net debt-to-GDP ratio of -2.2% - thus a net debt-to-GDP ratio unchanged from the estimated levels for 2015 - increases the probability of belonging to "upper medium grade" to 45.7%; in this case, the probability of belonging to the "high grade" group falls to 32.9% (-6.2p.p. from current probability). Doing the same exercise with the projected medium-term fiscal deficit (Budget Office projections in the 2016 Budget Law) for the period 2016-2019 (-2.9% of GDP in 2016, -3.0% of GDP in 2017, -2.3% of GDP in 2018, and -1.8% of GDP in 2019; consistent with a net debt to GDP ratio of 7.8% by 2019), the probability of Chile being considered an "upper medium grade" is 46% (21.3% probability of belonging to the "high grade" group; -15.8pp from current probability).

As expected, the rest of the models show similar results (the higher/lower the net debt-to-GDP ratio, the higher/lower the probability of belonging to the "upper medium grade" group (as an example, in the case of regression 2, the probability of belonging to the "upper medium grade" group with a net debt-to-GDP ratio of -2.2% is 51.8% ("high grade" probability 40.5%), while for the projected numbers for the period 2016-2019, the probability of belonging to the "upper medium grade" is 59.1% ("high grade" probability 26.8%); see original probabilities in the Appendix). We find it interesting to note that Chile's rating would have a 50% chance of being considered "high grade" at a net debt-to-GDP ratio of -16%, which is well below the median of its "high grade" peers (48.9% of GDP), reflecting the fact that Chile still has a significant negative gap in other variables considered by the rating agencies (using regression 2, we obtain a 50% chance of being considered "high grade" at a net debt-to-GDP ratio of -8.8%). See chart 7.

Chart 7: Probability of a rating classification and net debt to GDP ratio



Source: BTG Pactual

Summing up, our empirical results suggest that Chile's privileged "high grade" position could be jeopardized by the surge in net debt-to-GDP, which has increased by 17.1p.p. of GDP in the last 8 years. We find a significant probability that Chile's rating could receive a "negative outlook" even if its net debt is significantly lower than peers'. Further, if the fiscal deficit continues as projected, there would be a significant chance of a downgrade in the next few years. Our results suggest that further fiscal adjustment would be necessary to increase the probability of maintaining the current "high grade" rating position with Moody's and S&P. A different discussion is whether that is a proper fiscal target, but certainly it is a political concern. In this sense, the 2017 budget law, which will be presented to Congress by October this year, will be crucial to reflect the government's commitment to a 0.8% of GDP structural deficit by 2018.

Appendix

Table 3: Ordered Choice Models (normal distribution)

		Coefficient (Std. Error) statistical significance / X if unexpected sign					
		(1)	(2)	(3)	(4)	(5)	(6)
Macro/Growth	GDP per capita PPP (growth) (annulized growth in the last five years)	-0.320 (0.133) **	-0.472 (0.153) ***	-0.389 (0.146) ***	-0.371 (0.124) ***		
	GDP per capita (US$, thousand) (average of the last five years)	-0.060 (0.017) ***	-0.058 (0.018) ***	-0.061 (0.015) ***	-0.062 (0.015) ***	-0.064 (0.014) ***	-0.077 (0.011) ***
	GDP (growth, constant local prices) (average of the last five years)					-0.045 (0.081)	0.045 (0.074) X
	Inflation (average of the last five years)	0.207 (0.067) ***	0.229 (0.072) ***	0.208 (0.068) ***	0.194 (0.063) ***		
Public finance	Primary Government Balance (% of GDP) (average of the last five years)					0.148 (0.066) ** X	0.186 (0.061) *** X
	Fiscal Revenues (% of GDP) (average of the last five years)			-0.009 (0.02)			
Debt	Net debt (% of GDP) (average of the last five years)	0.037 (0.007) ***	0.039 (0.008) ***	0.023 (0.009) ***	0.023 (0.005) ***	0.023 (0.005) ***	0.018 (0.005) ***
	Gross Debt (% of GDP) (average of the last five years)			0.001 (0.009)			
External finance	Net International Investment Position (% of GDP){i} (average of the last five years, for available data)		-0.01 (0.003) ***				
Political	Democracy (average of the last five years, for available data)	-1.526 (0.706) **	-2.808 (0.854) ***	-1.829 (0.67) ***	-2.433 (0.645) ***	-2.531 (0.645) ***	
Structural/ Institutional	Rule of Law (average of the last five years, for available data)	-2.201 (1.214) *	-3.524 (1.382) ***		-2.199 (1.168) ***	-2.118 (1.086) *	
	Government Effectiveness (average of the last five years, for available data)	-2.392 (1.013) **	-2.881 (1.053) ***	-2.102 (1.032) **			
Other	GINI indicator (last available data)				0.003 (0.02)		
	Dummy of default in the last 25 years (last available data)			0.52 (0.456)			
	Commodity Exports (% of GDP) (average of the last five years, for available data)	0.046 (0.016) **	0.054 (0.018) ***				
	Pseudo R-squared	0.524	0.588	0.485	0.468	0.418	0.344
	Accuracy	0.641	0.672	0.547	0.547	0.484	0.469
	Probability of belonging to "upper medium grade"	0.443	0.484	0.402	0.421	0.404	0.267
	Probability of belonging to "high grade"	0.371	0.453	0.356	0.326	0.332	0.106
	Observations	64	64	64	64	64	64

Statistical significance at: *** p<0.01, **p<0.05, *p<0.1
{i}: the variable contains several imputed data

Source: BTG Pactual

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