BANCA D'ITALIA

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HIGHER MULTILATERAL DEVELOPMENT BANK LENDING, UNCHANGED CAPITAL RESOURCES AND TRIPLE-A RATING. A POSSIBLE TRINITY AFTER ALL?

by Riccardo Settimo*

Abstract

This paper contributes to the literature on Multilateral Development Banks' (MDBs) balance sheet optimization in two ways. First, it looks at solutions to alleviate the 'trilemma' faced by MDBs – stemming from G20 shareholders' calls for increasing development lending while, simultaneously, keeping capital resources and triple-A credit ratings unchanged. The employment of rating methodologies that take into account MDBs' peculiarities more appropriately represents one viable solution, as it would allow them to significantly increase available lending capacity for given rating levels and equity resources. Second, the econometric evidence suggests the existence of a rather narrow difference in the cost of funding between triple-A and AA+ rated institutions. Combining the two results, the paper concludes that applying an alternative rating methodology and opting for an AA+ credit rating (instead of triple-A), the four MDBs considered (IBRD, ADB, IADB and AfDB) could more than triple their spare lending capacity, from USD 415 bn to 1.370 bn, with a relatively limited impact on funding costs, estimated at between 40 and 50 bps.

JEL Classification: F53, G15, G24, O19.
Keywords: multilateral development banks, preferred creditor status, credit ratings, rating agencies, borrowing costs, risk premia.

Contents

* Bank of Italy. Economics, Statistics and Research.

1. Introduction

To fund the investment needs of the 2030 Development Agenda, it is indispensable to intensify discussions on how to move from the 'billions' in Official Development Assistance to the 'trillions' in financial resources of all kinds, public and private, domestic and international, which would be required to meet the Sustainable Development Goals.[1] Given the enormity of global development financing needs, and in the face of mounting pressures on public budgets and the swelling tide of inward-looking policy stances, it is ever more necessary that precious (and scarce) public resources be used to generate the maximum possible amount of development exposures.

Against this background, the Action Plan to Optimize Multilateral Development Banks' Balance Sheets, endorsed by the G20 Leaders at the Summit in Antalya in 2015, was designed to increase these institutions' development lending given current capital resources, whilst preserving triple-A rating levels. A trilemma is nested in the formulation above, as there is an evident tension among the three objectives of (1) expanding MDBs' exposure, (2) leaving capital resources unchanged and (3) preserving top-level credit ratings.

At least to some extent, though, this tension can be alleviated. Following up on the suggestions of the G20, for instance, MDBs have already eased their internal restrictions to expand financial leverage.[2] A number of very important results have already been achieved in this respect, especially with regard to the leveraging of concessional windows' equity (at ADB and IADB) and the introduction of net income measures (pricing updates, expenditure reviews, the reform of transfer policies), which are expected to have beneficial effects on lending capacity in the near term. Following a prolonged period of negotiations among shareholders, the IBRD and IFC have also recently obtained a hard-won increase in capital.

The objective of this paper is twofold. It explores avenues to further ease the tension in the 'impossible trinity', beyond what has already been done under the G20 Plan. In particular, since the specifics of rating methodologies determine the financial leverage attainable by each MDB for any targeted rating level, refining such methodologies to better tailor them to MDBs peculiarities could open up significant lending margins, for given rating and capital resources. Adopting a comparative statics approach – the same used in Standard and Poor's (2016) and Settimo (2017) – the paper compares the impact on MDBs' lending headrooms of two alternative rating methodologies: the one proposed by Standard and Poor's (S&P) in a consultation distributed in October 2017[3] and the one proposed by the Bank of Canada.[4] It does so using 2016

[1] 'From Billions To Trillions: Transforming Development Finance - Post-2015 Financing For Development: Multilateral Development Finance', prepared jointly by the African Development Bank, the Asian Development Bank, the European Bank for Reconstruction and Development, the European Investment Bank, the Inter-American Development Bank, the International Monetary Fund, and the World Bank Group for the Development Committee Meeting of 18 April 2015.

[2] The Plan contained five lines of action aimed at breaking or alleviating the trilemma (Group of Twenty, 2017): (i) increase capital efficiency, i.e. lower financial leverage limits, (ii) perform exposure exchanges, (iii) utilize concessional window equity, (iv) resort to risk transfer instruments for non-sovereign operations, and (v) adopt a set of net income measures.

[3] S&P (2017b). Following the consultation period, in December 2018 (when this paper was already at an advanced stage of the publishing pipeline) S&P published its new Global Ratings criteria for rating multilateral lending institutions (S&P 2018a and S&P 2018b). Based on a broad and preliminary understanding of the new criteria, we do not expect significant changes in the order of magnitude of our estimates of the impact on lending headrooms (see infra).

[4] Bank of Canada (2017).

data for four relatively similar institutions, the IBRD, ADB, IADB and AfDB. Lending space for those MDBs is estimated in both triple-A and AA+ setups. The result is that, depending on the specific rating methodology applied, aggregate spare lending capacity can vary between USD 415 billion to USD 868 billion under a triple-A scenario, and between USD 787 billion to USD 1,370 billion under an AA+ scenario.[5]

Breaking one of the constraints in the trilemma implies that MDBs' shareholders agree to pay the associated costs, such as: forsake the ambitions to expand development exposure to support the 2030 Development Agenda, provide more capital resources, or accept a higher level of risk (and therefore a lower rating level). With regard to this latter, both shareholders and management of MDBs have traditionally shown a strong preference for maintaining triple-A ratings. One of the main reasons for this preference is that triple-A guarantees access to bond markets at very favourable rates, and this, in turn, allows MDBs to offer development financing at very attractive conditions. Moreover, favourable lending rates are also likely to be indispensable in order to preserve the *de facto* preferred creditor status, a distinctive trait of the MDBs' business model.

Therefore, when advancing the proposal for MDBs to operate at a lower than triple-A rating, one should also provide a credible estimate of the associated likely increase in the cost of funding; in particular, if the difference in cost is estimated to be negligible, then one could conclude that it should not endanger the business model of MDBs. This is precisely the second objective of this paper. Exploiting a widely used econometric framework, in Section 4 we attempt to single out the difference in the cost of funding between a triple-A and an AA+ rated issuer, controlling for all other relevant factors. Quite interestingly, in the particular case of multilateral institutions, it is estimated that this difference is not significantly different from zero.

This paper is structured as follows: Section 2 briefly sketches the distinctive characteristics of MDBs and the peculiarity of their business model, highlighting the reasons why the currently used rating methodologies could be penalizing in terms of lending capacity. Section 3 computes the impact on MDBs' lending headrooms of using the rating methodologies proposed by S&P in 2017 and by the Bank of Canada, while Section 4 describes the data and the econometric approach adopted to estimate the difference in the cost of funding between triple-A and AA+ rated multilateral issuers. Section 5 concludes.

[5] Since they are based on 2016 data, the estimates of spare lending capacity do not take into account the additional equity resources that will come from the capital increase recently approved by IBRD shareholders, and from the leveraging of concessional resources at ADB and IADB (operative starting from 1 January 2017). The objective of this paper reamains unchanged, as it provides an estimate of the potential impact on spare lending capacity of refining MDBs' rating methodologies and targeting a lower than triple-A rating *for any given amount of equity resources*.

2. The challenges of designing appropriate rating methodologies for MDBs

MDBs play a crucial role in leveraging public sector resources to channel private capital into long-term investment for global development and poverty reduction. They are supranational institutions, usually not subject to national banking regulations or commercial law; their special status is governed by international treaties and statutory limits. By leveraging cash contributions (paid-in capital) and guarantees (callable capital) from shareholder governments, they raise funds in international capital markets at relatively cheaper rates than those obtainable by individual sovereigns. They then apply a fixed spread to funding costs (to cover administrative expenses) and lend to borrower governments at very attractive conditions. Their successful business model is crucially based on the maintenance of strong credit ratings, which in turn originate from the average strength of their sovereign membership and from usually very prudent levels of financial leverage.

Given the absence of a regulatory framework, limits on MDBs' financial leverage derive from internal capital adequacy frameworks which, in turn, reflect the risk attitude of management and shareholders. Triple-A is targeted explicitly, both in capital adequacy frameworks and in the declarations of the main shareholders.

As discussed in the introduction, there is an evident tension between the three objectives stated by G20 shareholders to increase development exposures, leave capital resources unchanged and preserve top-level ratings. Crucially, the design of the methodologies to assess the credit rating of MDBs is key to ease this trilemma, as it determines the threshold in terms of financial leverage achievable by an MDB for any targeted rating level. This is true a fortiori given the absence of a regulatory authority in charge of producing independent assessments on which agencies can benchmark their valuations.

The literature on this topic is relatively new. Humphrey (2015) argues that existing rating methodologies fundamentally underestimate the financial strength of MDBs, restricting their overall capacity to make use of balance sheets to address development needs. In his opinion, one reason for this result is the tightening of rating criteria in the wake of the global financial crisis. Perraudin et al. (2016), focusing on the Inter-American Development Bank, show that the approach adopted by S&P is highly conservative in its treatment of single name concentration risk (SNC) and makes insufficient allowance for the de facto preferred creditor status (PCS) enjoyed by these institutions. Settimo (2017) extends these results to the seven major MDBs, showing that the impact on the respective lending capacity could be sizeable.

Also based on the above concerns, in October 2017 S&P released a proposal to revise the criteria it uses to assess multilateral lending institutions (S&P 2017b). The Report by the G20 Eminent Persons Group (EPG), published in October 2018, proposes to '*reassess regulatory capital and other prudential norms for MDBs*'; more specifically, it suggests that MDBs '*collectively seek guidance from the Basel Committee and engage credit rating agencies on capital and liquidity requirements, taking into account the MDBs' unique characteristics and default experience*'.[6]

The attribution of a credit rating to MDBs, though, is no easy task, due to the presence of a number of features that have no perfect equivalent in commercial banks (such as callable capital, single name concentration, de facto preferred creditor status) and are objectively difficult to capture using quantitative models. Generally, MDBs are regarded as being institutions of the highest credit quality, as also reflected by the absence of past default episodes, and their ratings tend to be stable over time. The distinctive traits described make MDBs intrinsically stronger

[6] *Making the Global Financial System Work for All* – Report of the Eminent Persons Group on Global Financial Governance, October 2018.

than conventional banks. Rating practitioners usually start with the same approach used to assess commercial banks, but then apply a few adjustments to take account of the special features of MDBs. In the next section we briefly discuss a few examples of why it is challenging to take these features into proper account in quantitative models.

- **Preferred creditor status**: de facto preferred creditor status (PCS) on exposures to sovereigns is a key characteristic of MDBs, which has enabled them to operate with low or no losses throughout their history. Indeed, these institutions are not just 'banks' that provide low-cost finance for development-related projects; they also provide their borrower (member) countries with technical assistance, an external anchor to push through development policies and a voice in the international arena. Moreover, as sovereigns expect that supranational institutions will make available additional financing in times of financial stress, when access to markets and commercial banks is closed they are still likely to service debt owed to MDBs even when defaulting on private debt. As a result, the decision to suspend payments on an MDB loan is more than a mere financial decision and, as history has shown, countries that do stop payments invariably end up repaying principal and interest.[7]

  At the same time, however, PCS is not established contractually; rather, it is a practice that is likely to depend upon the relative importance of the MDB as a development partner for the borrower and is eventually the choice of the defaulting government. Argentina, for example, defaulted on its commercial debt in 2001-2002 and again in 2014, but continued to make timely payments to the IADB, IBRD, and CAF;[8] Belize selectively defaulted in early 2017 but remained current on payments to CDB,[9] IADB, and CABEI[10] (S&P 2017a).

- **Single name concentration**: loan portfolios of MDBs operating mostly or exclusively with sovereign governments are naturally characterized by a limited number of borrowers,[11] especially for the 'regional' institutions. At end-2016, for instance, the AfDB and ADB had 27 sovereign borrowers, while the IADB had 26. Portfolio concentration definitively increases the risk exposure of lending institutions and therefore it needs to be taken into account when producing overall credit ratings; still, the procedures employed need to be calibrated properly. As demonstrated by Perraudin et al. (2016), mechanically applying to MDBs a granularity adjustment designed for portfolios with thousands of borrowers ends up being excessively penalizing, and represents a significant constraint on their ability to expand financial leverage.

- **Extraordinary shareholder support**: this refers to callable capital, i.e. to the portion of capital subscriptions that is not 'paid-in' but committed by each shareholder, jointly and severally with the others, only when this is required to prevent a default on a MDB obligation. Since shareholders are not always willing to increase paid-in capital, due to budget constraints, callable capital normally dwarfs paid-in capital, ranging from around 80% (AfDB) to over 96% (IADB) of total subscribed capital.

  If, on the one hand, callable capital represents an explicit joint guarantee from shareholder governments, on the other hand, it cannot be regarded as a perfect substitute for paid-in capital. First of all, as S&P correctly points out (S&P 2009), there is a certain degree of uncertainty as to the effective capability of some governments to meet their commitments if required. The

[7] Humphrey (2015).

[8] Corporacion Andina de Fomento.

[9] Caribbean Development Bank.

[10] Central American Bank for Economic Integration.

[11] Concentration is not an issue for development institutions with mainly private sector borrowers, such as the EIB, EBRD and IFC, as they have much more granular loan portfolios.

shareholdings of MDBs include a number of member states that have restricted ability to pay. If a capital call were to happen at a time of global financial distress, many vulnerable economies might be unable to fulfil the commitment. Second, for some members, meeting a capital call would require legislative action, which would impact the timeliness of payments. Third, there is a conflict of interest in the procedure to make a capital call, given that it is initiated by a decision of the Boards of Directors, controlled by the same shareholder governments on whom the call is made. Finally, so far no MDB has ever experienced a call on its callable capital, making it difficult to estimate its probability.

For these reasons, striking the right balance when taking account of PCS and SNC, and/or computing callable capital in capital adequacy assessments, is no easy task. The specific approach adopted eventually determines, *ceteris paribus*, the degree of financial leverage attainable by an MDB for given capital endowments and a targeted rating level.

3. Estimating lending headroom

The first aim of this paper is to test the literature's conclusion that rating methodologies fundamentally underestimate the financial strength of MDBs, restricting their overall capacity to increase development exposure. We add to the existing literature by estimating and comparing lending headrooms under three different rating methodologies: the one applied by S&P until December 2018, the one proposed by the same Agency in 2017 and the one used by the Bank of Canada.[12]

In order to preserve comparability, we restrict the analysis to the four largest MDBs – IBRD, ADB, IADB and AfDB – that lend exclusively (or almost exclusively) to sovereign governments.[13] All four institutions enjoy a triple-A credit rating and have an aggregate stock of purpose-related exposures (PREs) of about USD 360 billion as of FY2016.[14] With almost USD 175 billion in total exposures, the IBRD is by far the largest institution (Table 3.1).

Table 3.1 – Multilateral development banks
(***Selected data in USD billions; FY2016***)

	IBRD	AfDB	ADB	IADB
Subscribed capital	263.3	88.0	142.7	170.9
Callable	*247.5*	*81.4*	*135.5*	*164.9*
Paid-in	*15.8*	*6.6*	*7.2*	*6.0*
Adjusted Common Equity (ACE)	37.1	8.9	17.2	26.3
Purpose-Related Exposures (PRE)	174.9	22.8	69.3	92.5
Year of establishment	1944	1963	1966	1959
No. of shareholders	189	80	67	48

Source: MDBs' Annual Reports. Conversion rate: USD/SDR =1.344 (for the AfDB). The source of Adjusted Common Equity (ACE) and Purpose Related Exposures (PREs) is S&P 2017a.

Combined equity[15] is about USD 90 billion, which determines a purpose-related exposure/ equity ratio of four. While drawing comparisons with other kinds of financial institutions is not entirely

[12] In December 2018 S&P released its new criteria for rating multilateral lending institutions (MLIs) (S&P 2018a and S&P 2018b), presenting some further refinements of the methodology proposed in its 2017 consultation document. Based on a broad and preliminary understanding of the new criteria, we do not expect significant changes in the order of magnitude of our estimates of the impact on lending headrooms. This conclusion is supported by the fact that, in the section describing the impact on outstanding ratings, the Agency states that '*Most MLIs affected could be upgraded by one notch, mostly because of our new approach to preferred creditor status*'.

[13] The IBRD (World Bank Group) is the only global entity whose membership exceeds 180 countries, while the other institutions are regional in scope and have fewer member countries (Table 3.1). Other important MDBs (such as the EBRD, EIB and IFC) are excluded since they also (or mainly) lend to the private sector. The institutions taken into consideration also have concessional lending windows. In this paper we limit our analysis to their non-concessional operations. All data refer to FY2016, when the merging with concessional windows was not yet in place.

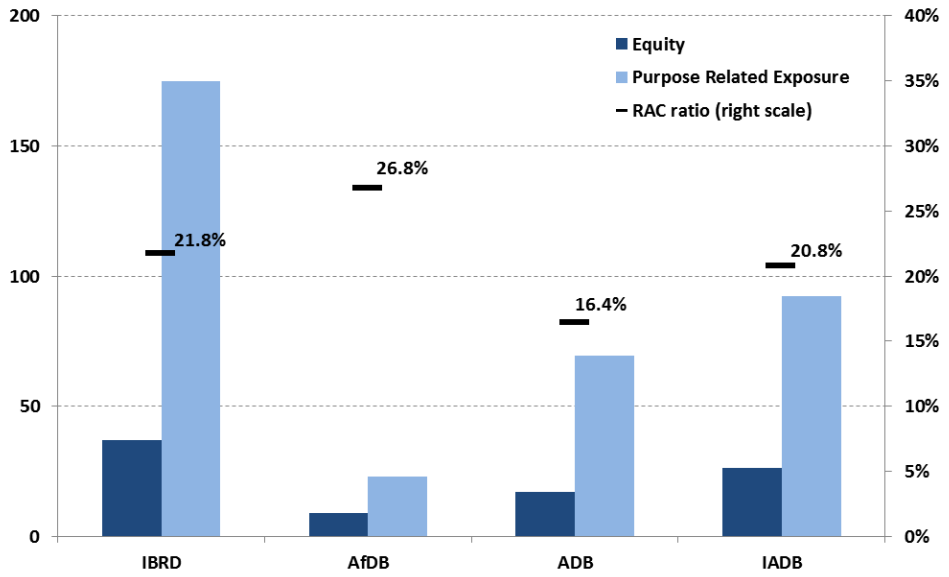
[14] Balance sheet data and information are not reported in a standardized way by all MDBs. For simplicity and uniformity across institutions we use S&P's aggregate 'purpose-related exposures', which include loans, guarantees and investments linked to their respective development missions.

[15] Again, in order to ensure comparability across institutions, we report 'Adjusted Common Equity' (ACE), the globally consistent measure of capital used by S&P, adjusted for MDB-specific factors (see 'Bank Capital Methodology And Assumptions,' S&P, 6 December 2010).

correct, given MDBs' many unique features, it is a matter of fact that they operate at very conservative leverage ratios.

One way of comparing risk exposures across MDBs is to use risk-adjusted capital (RAC) ratios, as computed by S&P, which relate each MDB's capital to its risk-weighted assets (RWAs) after adjustments for preferred creditor status and diversification/concentration. Chart 3.1 reports adjusted RAC ratios for the selected institutions; in 2016 they ranged between a maximum of 26.8% (AfDB) and a minimum of 16.4% (ADB).

Chart 3.1 – Equity, exposures and RAC ratios
(*USD billions; FY 2016*)



The methodology used by S&P until December 2018 – As a benchmark we use the methodology for rating multilateral lending institutions (MLIs, of which MDBs are a subset) used by S&P's until December 2018; where applicable, this replicates the framework used for banks, but with some substantial modifications to reflect MDBs' special characteristics. The methodology consists of two key steps: (i) determining the MLI's stand-alone credit profile (SACP), and; (ii) assessing the impact of 'extraordinary shareholder support', in the form of the addition of callable capital, on the institution's creditworthiness to determine the issuer credit rating (ICR) (Chart 3.2).[16]

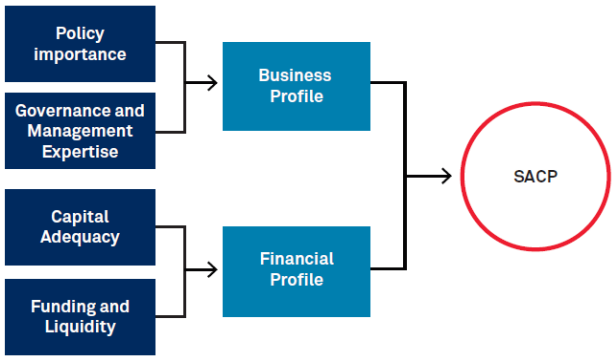
Chart 3.2 – Obtaining the Issuer credit rating (S&P 2017)

The SACP is based on the evaluation of two factors: the business profile, which reflects the assessment of the MLI's policy importance and its governance and management expertise, and

[16] It is worth noting that S&P's methodology for rating multilateral lending institutions is far from mechanical as it contains many profiles in which discretion may be applied. This is even truer in the case of other rating agencies. In applying S&P methodology, therefore, it was inevitable to make a number of simplifying assumptions.

the financial profile, which reflects the assessment of the institution's capital adequacy and its funding and liquidity capacity (Chart 3.3).[17]

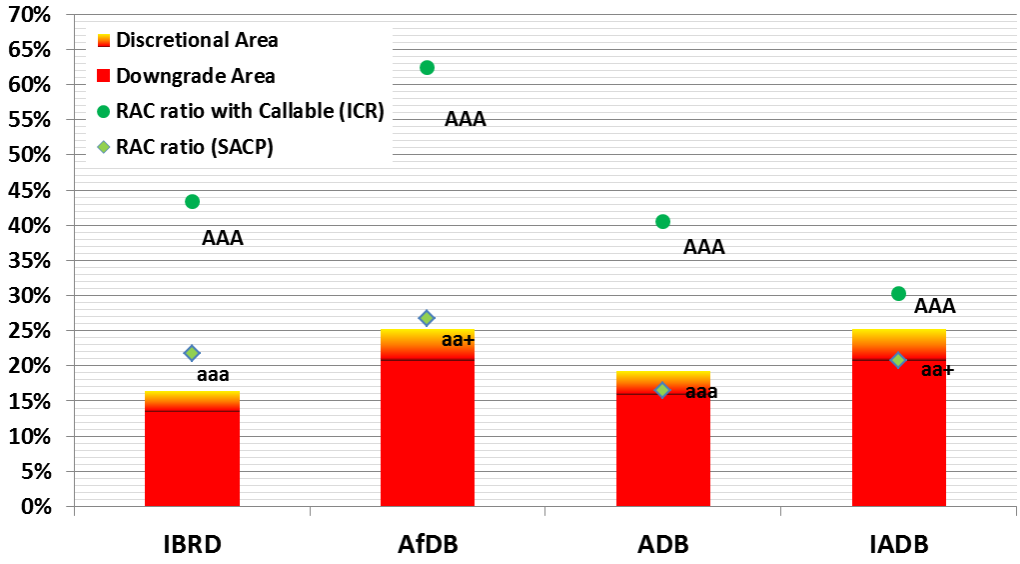
Chart 3.3 – Assessing the Stand-Alone Credit Profile (S&P 2017)



The risk-adjusted capital (RAC) ratio – which compares an MDB's capital to its risk-weighted assets (RWAs) – is the cornerstone of the capital adequacy analysis. Chart 3.4 shows RAC ratios including callable capital (green bullets) and downgrade areas, given assessments on 'business' and 'funding and liquidity' profiles using 2016 as a reference year.[18] The distance between the two is a measure of lending space in terms of the RAC ratio. ICR ratings are triple-A for all MDBs, consistent with RAC ratios being above the red/yellow areas in the graph. The lighter green diamonds represent RAC ratios without callable capital, and thus are associated with SACP ratings.

Chart 3.4 – RAC ratios and downgrade areas

(*FY 2016; in %*)



[17] See S&P 2012 for a detailed description of S&P's methodology for rating MLIs in force until December 2018.

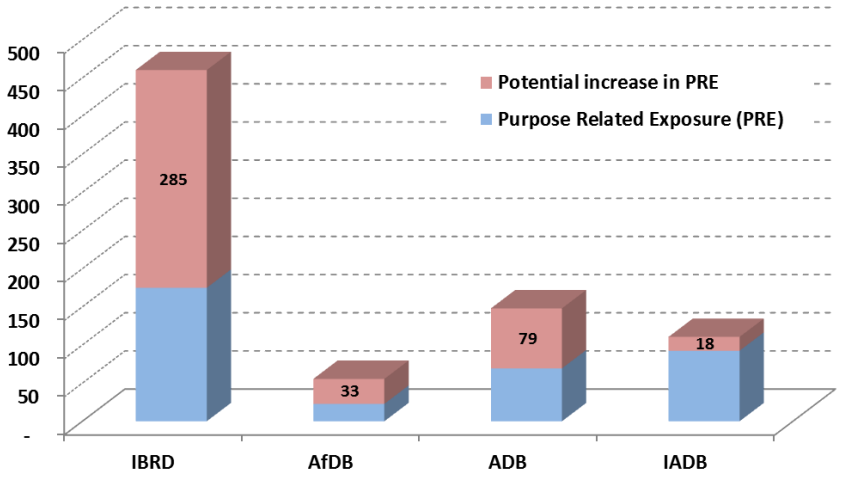
[18] Downgrade thresholds are at 23% for the AfDB and IADB, and at 15% for the IBRD. The ADB only has a threshold slightly above 15%, since calculations take account of the rule that corresponding SACP ratings cannot fall under ICR ratings by over three notches. This implies that if the ICR is required to be triple-A, SACP cannot be lower than aa-. 'Discretional areas' are designed between +10% and –10% of the downgrade thresholds; when RAC ratios fall within this area, S&P retains the right to change its assessment (upwards or downwards) based on forecasts that point to a variation in the RAC ratio during the rating timeframe. In order to estimate conservatively spare lending capacity, we push total exposure to the relative thresholds augmented by 10%.

Following the methodology adopted by S&P (2016a) and Settimo (2017), for each MDB we push total exposures, and therefore RWAs, to the threshold (in terms of the RAC ratio) that would trigger, other things being equal, an issuer credit rating (ICR) downgrade (i.e. a loss of the triple-A). In doing so we assume that all other factors remain unchanged. This implies the following three hypotheses: (i) assessments of other rating profiles for each MDB (e.g. 'funding and liquidity', 'business') do not change; (ii) credit ratings of shareholders and borrowers do not deteriorate; (iii) for each MDB, exposures' distribution by borrower (identified by country, product and sector) remains unchanged. The third assumption also allows us to consider as fixed the adjustments made to RWAs to take account of concentration/diversification and preferred creditor status.[19]

These are, of course, simplifying assumptions; in reality, any increase in exposures is likely to impact on all of the above, leading to a 'consumption' of lending headroom that is higher/lower than our hypothetical case of a 'perfectly proportional' increase. Such a comparative statics approach is therefore to be taken with due caution. Spare lending capacity could actually be lower due to a combination of factors such as: the weakening sovereign credit quality that affects capital ratios, the need to maintain buffers to safeguard the countercyclical lending role, the gradual erosion of highly-rated callable capital, a parallel potential downgrade of the business profile evaluation. More importantly, the 'all else being equal' assumption also implies that liquid treasury assets increase by the same amount as development-related exposures.

Chart 3.5 expresses lending headrooms, i.e. the potential maximum increase in exposures, on top of current (FY 2016) development-related exposures, assuming that all other factors remain unchanged. On aggregate, the four institutions could increase development lending by around USD 415 billion, or +116% with respect to combined exposures in 2016, before risking losing their triple-A ICR ratings. The graph shows how this potential increase in exposures is distributed across MDBs. Consistent with S&P's (2016b) conclusions, some MDBs still have considerable potential for increasing development exposures (IBRD), while others appear to be operating closer to the limit (IADB).

Chart 3.5 – Potential increase in exposure: methodology used by S&P until December 2018
(*Author's estimates; USD billions; FY 2016*)



[19] This assumption is particularly strong in the case of small borrowers, which may be already close to their maximum borrowing or absorbing capacity, while it is less material in the case of larger emerging economies, whose borrowing/absorbing capacity is far from being a constraint.

The methodology proposed by S&P in its consultation document of 2017 – On 11 October 2017, S&P's Global Ratings released a request for comments on its proposed global criteria for rating multilateral lending institutions (MLIs) and other nonbank supranational institutions. Among the most relevant changes introduced by the proposal was the way in which the agency determines the benefit associated with PCS in the RAC framework and in the calculation of the single-name concentration (SNC) adjustment. In particular, instead of adjusting the risk weight for sovereign exposure based on the share of multilateral debt in each sovereign's total external debt (Table 3.2), they proposed to adjust the risk weights based on a PCS evaluation of the individual institution, as defined in the 'policy importance' assessment.[20]

Table 3.2 – Risk weights for sovereign exposures: methodology used by S&P until Dec. 2018 (%)

Sovereign long-term foreign currency credit rating	Share of multilateral debt in the total external debt			
	<25%	25%-50%	50%-75%	>75%
AA- and above	3	3	3	3
A+	3	3	3	5
A	3	3	5	9
A-	3	5	9	15
BBB+	5	9	15	23
BBB	9	15	23	34
BBB-	15	23	34	47
BB+	23	34	47	62
BB	34	47	62	79
BB-	47	62	79	99
B+	62	79	99	122
B	79	99	122	146
B- and below	99	122	146	173

As PCS cannot be legally enforced, it is a discretional status that borrowing member countries offer to each MDB. According to the proposal, an MDB gains PCS through its perceived role and policy importance. In evaluating the MDB's track record with regard to PCS, S&P proposed to assess this aspect on a three-point scale, differentiated by the frequency and materiality arrears and losses.

In particular, if over the past 20 years arrears did not exceed 0.5% of the public sector (PS) outstanding portfolio and if the MDB did not suffer losses beyond 0.5% of the PS outstanding portfolio, then its PCS would be scored as 'Strong'; the score would be considered 'Adequate' if arrears ranged between 0.5% and 5%, and losses ranged between 0.5% and 2%; finally, PCS would be assessed as 'Weak' if arrears were greater than 5% and losses than 2%.

In other words, according to the proposed framework, the benefit from PCS no longer depended on the characteristics of the borrower – the share of multilateral debt in total external debt – but, in our view rather more correctly, on the frequency and materiality of arrears and of restructuring

[20] See S&P (2017b) for a detailed description of the proposed procedure; the considerations made in footnote 15 retain their validity.

events on debt toward the specific MDB; the assumption being that an MDB that enjoys strong PCS will tend to record no arrears or loan losses (Table 3.3).[21]

Table 3.3 – Risk weights for sovereign exposures: methodology proposed by S&P in 2017 (%)

	--PCT Assessment--		
Sovereign long-term foreign currency credit rating	**Strong**	**Adequate**	**Weak**
AA- and above	3	3	3
A+	3	3	5
A	3	3	9
A-	3	5	15
BBB+	3	9	26
BBB	5	15	40
BBB-	9	26	57
BB+	15	40	76
BB	26	57	99
BB-	40	76	125
B+	57	99	153
B	76	125	185
B-	99	153	219
CCC+	125	185	257
CCC	153	219	297
CCC-	185	257	340
CC	219	297	386
D	257	340	428

In the paper containing its reform proposal, S&P does not provide details on how arrears and losses would be calculated. It declared that the occurrence of restructuring events would be considered over the past 20 years. Lack of transparency on such details is likely to add to the already high degree of rating uncertainty, as the impact on lending headroom is material (see below).

Regarding the SNC adjustment, in the proposed framework it was still based on the formula originally described and tested by Gordy and Lütkebohmert.[22] With the only difference that the LGD assumption varied from 10% to 45% depending on the PCS assessment and loss experience track record (10% LGD for institutions with 'Strong' PCS, 27.5% LGD for institutions with adequate PCS, and 45% LGD for institutions with 'Weak' PCS).

Finally, as to extraordinary shareholder support, S&P proposed to treat as eligible (i.e. computable in the RAC ratio) the callable capital provided by sovereigns rated at least equal to the MDB's SACP, rather than the MDB's ICR. This might be an incentive to operate with a SACP lower than triple-A, in order to factor in the callable capital of some large, creditworthy (though non-triple-A) shareholders, such as the US; the cap of three notches to the potential uplift from SACP to ICR, however, represents a substantial boundary to this incentive.[23]

[21] The acronym PCT stands for Preferred Creditor Treatment. In the paper we use PCT or PCS (Preferred Creditor Status) interchangeably.

[22] See 'Granularity adjustment for Basel II', published by the Deutsche Bundesbank as a Discussion Paper, Series 2: Banking and Financial Studies, No. 01/2007 (January 2007). As explained in Perraudin et al. (2016), this formula is based on an approximation to a default mode CreditRisk+ model, which assumes a very different distribution of losses from that otherwise adopted in the basic S&P methodology for deriving capital needs inclusive of diversification effects.

[23] During the presentation of the new criteria in Washington DC, S&P also declared that the targeting of a lower SACP aimed uniquely at including the callable capital of the US or UK or other large non-triple-A shareholders would not be considered positively by the Agency.

Charts 3.6 and 3.7 express the potential maximum increase in exposures, based on the methodology proposed in 2017. On aggregate, the four institutions could increase development lending by between USD 579 and 868 billion, depending on PCS being assessed as 'Adequate' or 'Strong' (respectively +116% and +241% with respect to combined exposures in 2016), before they would risk losing their triple-A ICR ratings. The graphs show how this potential increase in exposures is distributed across MDBs. It is worth noting that, based on 2016 data, only the AfDB would fall in the 'Adequate' PCS class, for having an NPL ratio of 2.1%;[24] all other MDBs have NPL ratios below the 0.5% threshold.

Chart 3.6 – Potential increase in exposure: methodology proposed by S&P in 2017
(*Author's estimates; **Hp: PCS="Adequate"**; USD billions; FY 2016*)

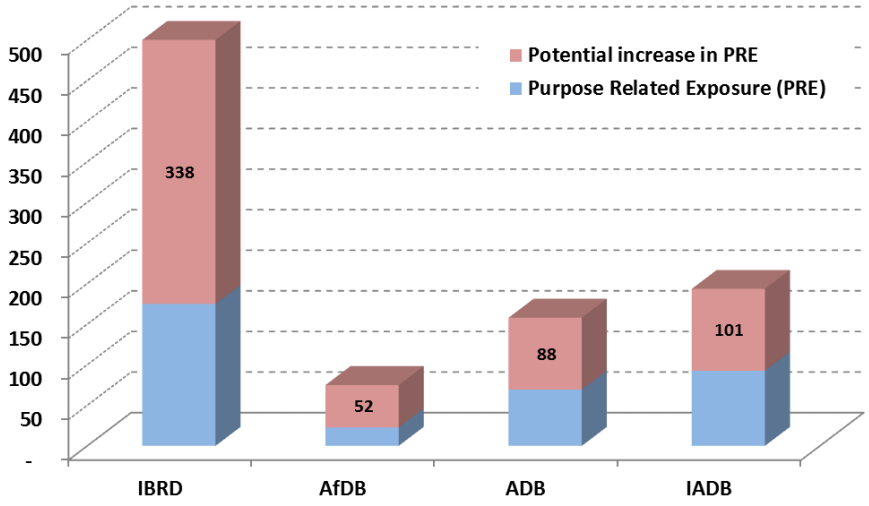
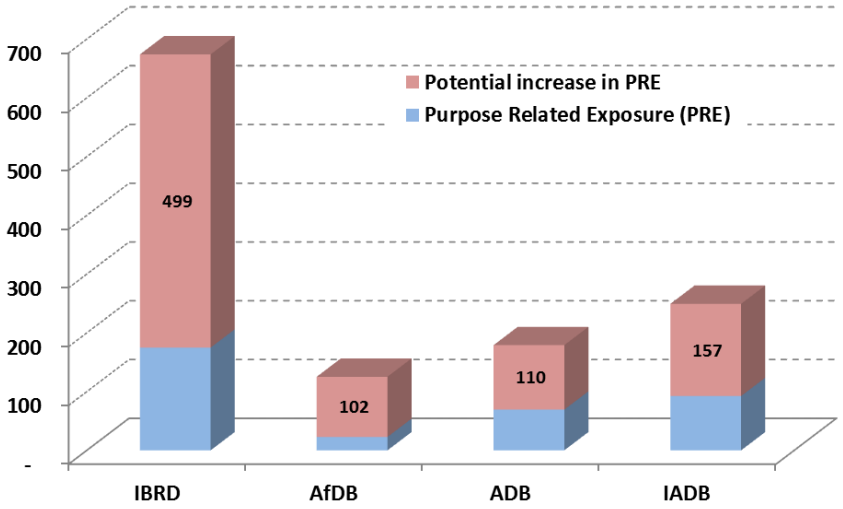


Chart 3.7 – Potential increase in exposure: methodology proposed by S&P in 2017
(*Author's estimates; **Hp: PCS="Strong"**; USD billions; FY 2016*)



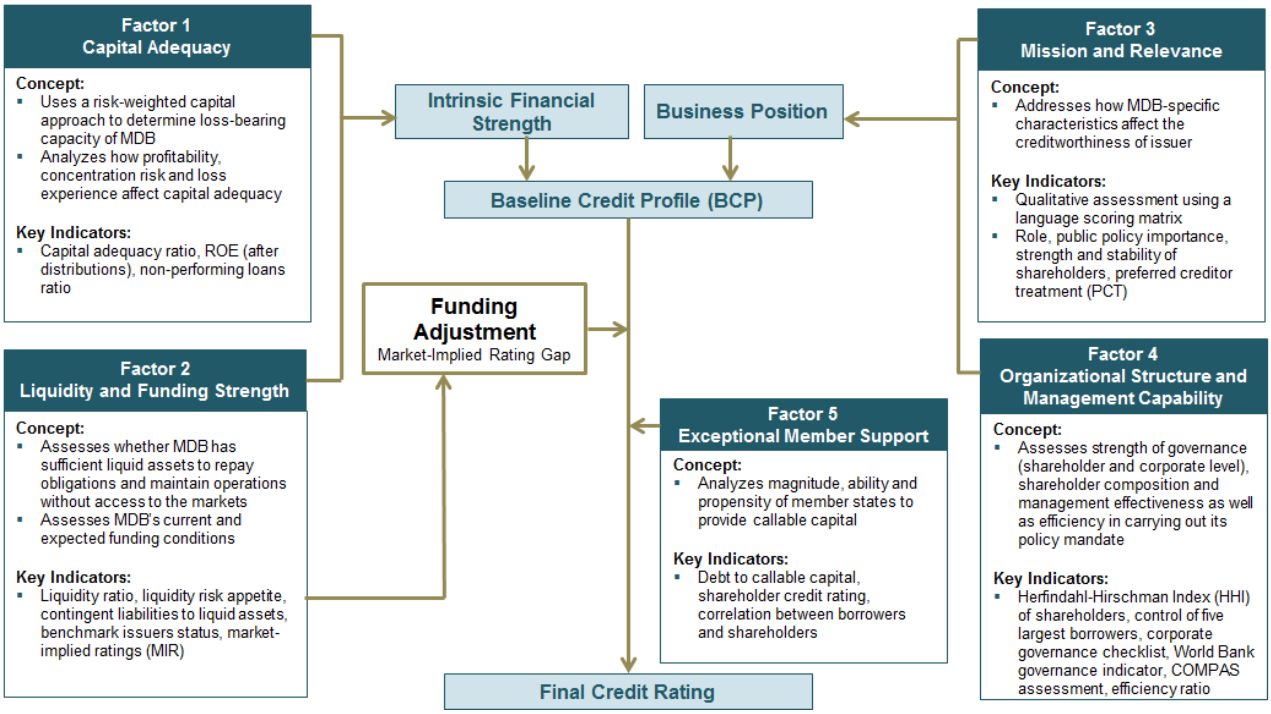
The methodology developed by the Bank of Canada – In order to overcome mechanistic reliance on credit rating agencies and to establish stronger internal credit assessment practices, the Bank of Canada (BoC) has developed a methodology to assign an internal credit rating to multilateral development banks. The methodology – employed to support the investment decision-making process used to manage Canada's foreign exchange reserves – is based on four fundamental

[24] AfDB Financial Report 2016.

constructs: (1) reliance on a governance process that ensures that ratings are influenced only by considerations related to the credit quality of the entity being assessed, (2) generation of credit ratings that are applicable to existing credit risk management policies, (3) generation of ratings of the highest quality, and (4) generation of consistent ratings, produced with a transparent methodology that relies on publicly available data only.[25]

The BoC methodology uses a rating framework broadly similar to S&P's; risk factors include the MDBs' financial position, institutional governance and support of members (Chart 3.8). However, the indicators used to measure specific risks, the weights of the risk factors and the way the risks are accounted for differ. Specifically, the methodology proposes a simple way of estimating the capital adequacy ratio and contains a straightforward approach to evaluate the exceptional support from shareholders using callable capital and the debt level.

Chart 3.8 – The Bank of Canada methodology



Similarly to S&P, the BoC methodology estimates a Capital Adequacy Ratio (CAR) to determine the initial score for the Capital Adequacy Factor. The CAR is defined as an MDB's capital relative to its risk-weighted assets (RWAs) and takes into account credit risk, market risk and operational risk. For many MDBs, the largest risk on their balance sheet is the credit risk associated with their development-related lending portfolio and treasury assets. RWAs are calculated using weights based on the Basel Standardized Approach for credit risk, to avoid reliance on MDBs' internal capital adequacy models or on non-public information that may be available to some rating agencies. RWAs are then modified according to the two concentration adjustments described in chart 3.9.

[25] In 2013, the Bank of Canada established a Credit Rating Assessment Group within its Financial Risk Office, with the purpose of evaluating the credit risks of assets and other financial exposures of the Bank and that the Bank manages on behalf of the Government of Canada. The Group supports the Credit Rating Committee, sponsored jointly by the Bank and the Department of Finance Canada. The ratings are intended to replace or complement those currently being provided by the following Agencies: DBRS, Fitch Ratings, Moody's and Standard & Poor's (S&P). A detailed technical description of the methodology is provided in Bank of Canada (2017); again, the considerations made in footnote 15 retain their validity.

Chart 3.9 – Bank of Canada adjustments for concentration

The computed CAR is then scored according to the scoring matrix in Table 3.4.

Table 3.4 – Bank of Canada CAR score matrix

Category	1	2	3	4	5	6	7
CAR	>30%	20–30%	12–20%	8–12%	5–8%	3–5%	Below 3%

Adjustments to the score are made based on profitability (ROE after distribution) and asset quality (NPL ratio) adjustments.

Like in all major rating agency frameworks, an important factor in evaluating the creditworthiness of MDBs is the potential support available from member countries in exceptional circumstances. The BoC assesses this factor to determine the uplift that can be added to the Baseline Credit Profile (BCP) to attain the Final Credit Rating (FCR) (Chart 3.8).

The way in which exceptional member support is assessed, however, is very different from that followed by other practitioners. For instance, Moody's evaluates such support based on a ratio of debt stock to discounted callable capital, committed only by investment-grade shareholders, while Fitch Ratings uses only callable capital from shareholders rated AA- and above. As mentioned earlier, S&P includes in the numerator of the RAC ratio the callable capital of member countries rated at least equal to the MDB rating (Issuer Credit Rating, ICR, under the framework in force until 2018 or Stand-alone Credit Profile, SACP, according to the proposal advanced in 2017).

Table 3.5 below sets out the two equally weighted sub-factors the BoC uses to determine the initial number of uplifts.

Table 3.5 – Bank of Canada: exceptional member support factors

Exceptional Member Support - Factors and Sub-Factors	Indicators for Sub-Factors or Adjustment
Factor 5 - Exceptional Member Support	
Sub-Factors	
1. Magnitude of Support	Debt as a percentage of callable capital
2. Ability to Support	Weighted-average shareholder rating
Adjustment Factors	
3. Overlap Between Members and Borrowers	Correlation coefficient of ownership between members and borrowers
4. Propensity / Priority of Support	Judgment based on qualitative analysis and the importance of the MDB's policy mandate

The first sub-factor, 'Magnitude of Support', is based on the amount of callable capital relative to debt (how much callable capital is potentially available to meet the obligations of the MDB). Unlike other practitioners, the BoC considers the commitment of *all* shareholders, including non-

investment-grade member sovereigns. In their view, the second sub-factor, 'Ability to Support', discounts the support from lower-rated shareholders. This is measured by the weighted average of shareholder credit rating, as members with higher credit ratings are more likely to be capable to support the MDB in distressed contingencies. The numbers in Table 3.6 represent the initial number of upward notches an institution could receive. By way of example, an MDB with a debt-to-callable capital ratio equal to 1,300 and with a shareholder weighted credit rating equal to AA, can record at most a difference of two notches between the BCP and the FCR.

Table 3.6 – Bank of Canada: initial number of uplift notches

		Debt-to-Callable-Capital Ratio				
		<200%	200–499%	500–999%	1000–1499%	1500% and above
Shareholder Weighted Credit Rating	AAA	4	4	3	2	1
	AA+	4	4	3	2	1
	AA	4	4	3	2	1
	AA-	4	4	3	2	1
	A+	3	3	2	1	1
	A	3	3	2	1	1
	A-	3	2	2	1	1
	BBB+	3	2	2	1	1
	BBB	3	2	2	1	1
	BBB-	2	2	1	1	1
	BB+	2	2	1	1	0
	BB	2	2	1	1	0
	BB-	2	2	1	0	0
	B+	1	1	1	0	0
	B	1	1	1	0	0
	B-	1	1	1	0	0
	Below B-	0	0	0	0	0

The evaluation is completed by two adjustment factors. First, the 'Overlap Between Members and Borrowers', measured by the correlation between borrowing shares and ownership shares. In a situation in which a shareholder that is also a borrowing member is in financial distress and loans from an MDB are being defaulted upon, the country concerned may not be in a position to provide extra support to the institution. The correlation coefficient is used to gauge the level of intersection and provides an objective indicator of this risk. In particular, a one-category negative adjustment is applied if the correlation coefficient between borrowing shares and ownership shares is > 0.75.

The second adjustment factor, 'Propensity to Support', is a one-category discretionary assessment that covers different aspects, ranging from the priority of support in relation to the importance of the MDB, to the credibility of the commitment from shareholders, to the execution of capital calls.[26]

Table 3.7 below shows the indicators of the three factors – 'Magnitude of support', 'Ability to support' and 'Overlap between members and borrowers' – for the four MDBs. The resulting number of uplifts that can be added to the Baseline Credit Profile (BCP) to attain the Final Credit

[26] Some MDBs are considered as being more systemically important than others, and shareholders may devote funds to one but not the other. 'Propensity to Support' also conveys the fact that some member states may not be in the position to credibly offer additional support, despite having pledged callable capital. Finally, the complexity of the MDB-specific rules and procedures on the timeliness of the execution of capital calls can be considered under this adjustment factor. Overall, absent any previous experience with capital calls, the 'Propensity to Support' adjustment factor is a means of applying judgment in this area of the assessment (Bank of Canada, 2017). For convenience, in our analysis this factor is ignored.

Rating (FCR) is three for all institutions, with the exception of the AfDB, for which it is two, due to its lower shareholder weighted credit rating.

We can now estimate lending capacity using the BoC's methodology. As we did before, for each MDB we push total exposures, and therefore RWAs, to the threshold (in terms of the CAR ratio, instead of the RAC ratio) which would trigger, other things being equal, a FCR downgrade. Again, we decide to apply more conservative thresholds, as we add 1 percentage point to the thresholds contained in Table 3.4. [27]

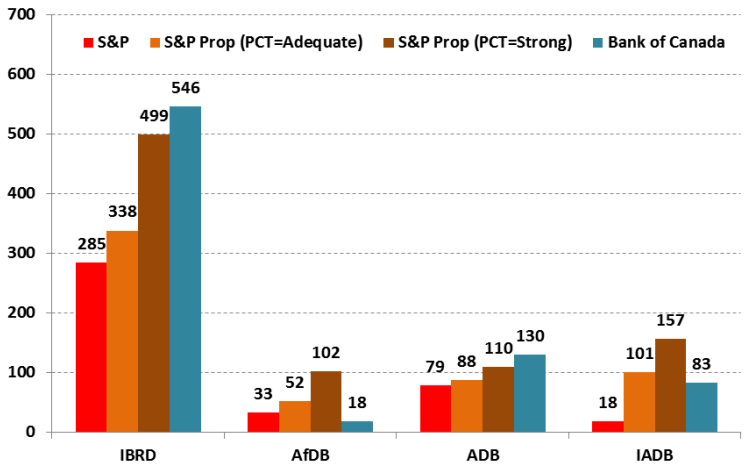
Table 3.7 – Bank of Canada: exceptional member support factors
(*FY2016*)

	IBRD	AfDB	ADB	IADB
1. Magnitude of support				
Debt / Callable capital (%)	73.4	34.1	71.8	50.1
2. Ability to support				
Shareholder weighted credit rating	A	BBB-	A+	A-
3. Overlap between members and borrowers				
Corr. between borrowing and ownership shares	0.17	0.36	0.31	0.38
NUMER OF UPLIFTS:	**3**	**2**	**3**	**3**

Source: Author's calculations based on data from MDBs' Annual Reports. FY 2016.

Chart 3.10 shows lending headrooms on top of current (FY 2016) development-related exposures, using the BoC's methodology and assuming, as usual, that all other factors remain unchanged (light-blue bars). On aggregate, the four institutions could increase development lending by around USD 777 billion, or +216% with respect to combined exposures in 2016, before risking losing their triple-A ICR ratings. The graph shows how this potential increase in exposures is distributed across MDBs and compares it with the results obtained by applying S&P's methodology in force until December 2018 (red bars) and the reform proposal of 2017 (under both the 'Adequate' and 'Strong' PCS assumptions, light-brown and dark-brown bars respectively).

Chart 3.10 – Potential increase in exposure under triple-A scenario
(*Author's estimates; USD billions; FY 2016*)

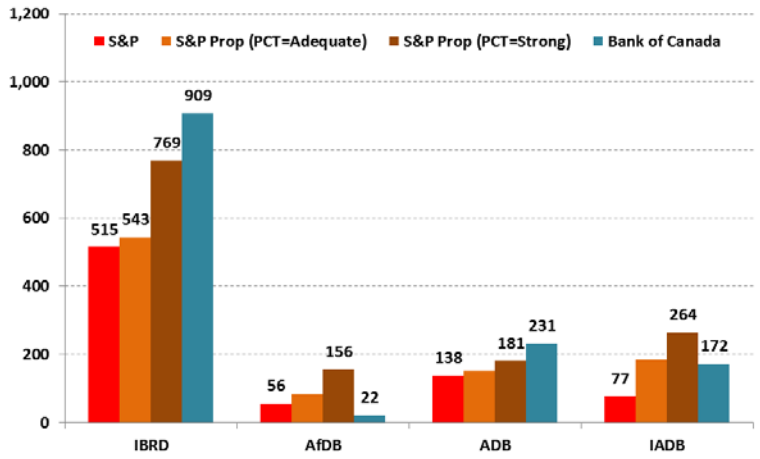


[27] So if, for instance, the threshold level between scores 4 and 5 in Table 3.4 is 8%, we used 9% as the threshold to estimate lending headrooms.

Applying the BoC's methodology delivers the largest lending headrooms in the cases of IBRD and ADB, against the lowest one in the case of the AfDB, essentially due to the low weighted average of shareholder rating and high single-name concentration of its loan portfolio; significant adjustments for single name concentration are responsible for a more moderate estimate of lending headroom in the case of the IADB.

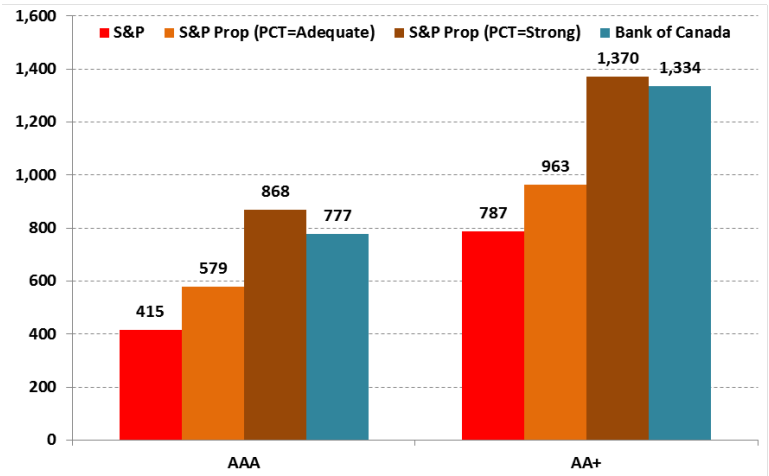
So far estimates have been derived assuming that MDBs wish to retain triple-A ratings. However, what would happen in terms of lending headroom if, hypothetically, shareholders decided that these institutions should increase their risk appetite, expand leverage and therefore accept a lower credit rating? Chart 3.11 expresses lending headrooms on top of FY2016 development-related exposures, using the different rating methodologies and assuming that MDBs accept a one-notch lower (AA+) credit rating.

Chart 3.11 – Potential increase in exposure under AA+ scenario
(*USD billions; FY 2016*)



Finally, Chart 3.12 displays lending headrooms combined across the four institutions. Under a triple-A scenario, aggregate lending capacity could go from USD 415 billion, under the methodology applied by S&P until December 2018, to USD 868 billion (+109%) under the rating framework proposed in 2017 (assuming a 'Strong' PCT assessment), and to USD 777 billion if the BoC rating procedure were to be applied. In a hypothetical AA+ scenario, aggregate spare lending capacity would be USD 787 billion, and would increase to USD 1,370 billion and USD 1,334 billion under the two alternative rating methodologies.

Chart 3.12 – Aggregate potential increases in exposure under AAA and AA+ scenarios
(*IBRD, AfDB, ADB, IADB. USD billions; FY 2016*)



The analysis conducted above shows that MDBs' lending buffers can vary significantly, depending on both the rating methodology applied and the targeted rating level. Given that in the next few years demand for MDB financing is forecast to rise steeply – in connection with the more ambitious 2030 Development Agenda – while the growth of these institutions' equity is likely to be constrained by a lower feasibility of capital increases (due to mounting pressures on public budgets and the spread of inward-looking policy stances), alternative avenues to enhance MDB lending capacity deserve to be pursued.

On the one hand, there is the design of more appropriate rating methodologies, which properly take into account MDBs' peculiarities and do not end up penalizing them excessively in terms of financial leverage; such methodologies should also be as transparent as possible, in order to minimize rating uncertainty. Pursuing this avenue would have the merit of easing tension in our trilemma, i.e. it would allow an expansion of development exposures while keeping capital resources and rating levels unchanged.

On the other hand, a further significant boost in lending capacity could derive from breaking the trilemma on the rating side, i.e. accepting a (slightly) lower rating associated with a (slightly) higher level of risk. This choice depends, of course, on the risk appetite of shareholders. Not surprisingly, among the suggested key priorities for reforming the system of MDBs, the EPG Report includes the provision by G20 shareholders of '*strategic guidance on the risk appetite appropriate to MDBs' roles in achieving development impact*'. Shedding light on the potential costs of taking on more risk could be of great help for shareholders to make a more informed decision on this matter.

Before closing this first part of the paper, it is worth recalling the important caveats relating to our estimates, and in particular the strong ceteris paribus hypothesis; this implies that (i) assessments of other rating profiles for each MDB do not change; (ii) credit ratings of shareholders and borrowers do not deteriorate; (iii) for each MDB, exposures' distribution by borrower remains unchanged. Aggregate spare lending capacity could actually be lower due to a combination of factors such as: the weakening sovereign credit quality that affects capital ratios, the impossibility for some borrowers to absorb further resources or increase indebtedness, the need to maintain buffers to safeguard the countercyclical lending role, the gradual erosion of highly-rated callable capital, a parallel potential downgrade of the business profile evaluation. Moreover, the estimated expansions of lending volumes would imply a surge in bond supply by MDBs; demand could lag behind if there is not perfect substitutability in investors' portfolios with other asset classes (e.g. sovereign assets) or in the presence of limits in the statutes of institutional investors regarding supranational investments.

4. The cost of targeting a lower than triple-A rating

As discussed in the previous section, moving (only slightly) down the rating scale, towards levels that are still indicative of strong financial integrity, would allow for higher financial leverage. This choice, however, is likely to imply an increase in borrowing costs, and, given the application of fixed spreads, a parallel increase in lending rates. Obtaining a reliable estimate of the impact of abandoning the triple-A is therefore crucial in order to appraise the exact terms of this trade-off: if, for instance, the impact on borrowing costs of targeting a one-notch lower credit rating, say AA+, is calculated to be considerable, then targeting the lower rating should be avoided, as it could jeopardize the business model of MDBs and make their loans less attractive for potential borrowers; if, on the contrary, the impact is estimated to be negligible, it could be more efficient for MDBs to target the new rating level and operate with an expanded financial leverage.

Triple-A rating has traditionally been a strategic choice of MDBs, precisely because it is at the heart of their business model. Moreover, it has enabled these institutions to continue operating in times of financial stress and to avoid pro-cyclical behaviour. Moreover, the very prudent stance maintained over the years by MDBs might also reflect the highly risk-adverse attitude of shareholders, who are probably more keen on shielding taxpayer resources from potential losses or capital calls than on maximizing these institutions' development effectiveness. Analogous political economy considerations might explain shareholders' preference in the past for resorting to capital increases, rather than operating with higher leverage ratios, whenever the growing volume of operations put pressure on an MDB's capital adequacy internal limits.[28]

Targeting a lower than triple-A-rating would have the effect of widening lending headroom through two channels. First, it would lower RAC (CAR) downgrade thresholds. Second, based on the S&P rating methodology, targeting a lower than triple-A-rating would permit the inclusion in the RAC ratio calculation of the callable capital from more (and possibly also larger) shareholders. Against this backdrop, at a time when the number of large shareholders with triple-A-ratings is progressively diminishing, it could become more and more costly in terms of capital efficiency for these institutions to maintain triple-A ratings. In this regard, the BoC methodology takes a different approach, as it considers the overall commitment by all shareholders, including non-investment-grade member sovereigns, through its 'Magnitude of Support' factor; by way of its 'Ability to Support' factor (the weighted average of shareholder ratings), before discounting the support from lower-rated shareholders.

The literature on the determinants of credit ratings and their impact (Cantor and Packer, 1996; Afonso et al. 2007), mainly related to the sovereign debt market, shows that ratings can be predicted quite well by a small set of observable economic fundamentals. Yet, there is evidence that rating agencies do provide the market with additional information to that available in public data, and therefore ratings do independently affect spreads, though this result is stronger with regard to non-investment-grade issues.

Some researchers have recently tried to estimate the potential impact of operating with a lower than triple-A rating on the cost of funding. In a contribution presented at the EPG symposium in Frankfurt in December 2017, the New Development Bank provided some evidence that the average funding cost of AAA rated MDBs is approximately a 1bp discount to the 6-month LIBOR, while AA+ rated MDBs would have a funding cost of around 14bps over LIBOR (Table 4.1). This suggests the possibility that the incremental funding cost of moving down one notch from AAA to AA+ could be about 15bps.

[28] Settimo (2017).

Table 4.1 – NDB's estimates of MDBs' funding costs across rating bands

	AAA rated	AA+ rated*	AA rated*	AA- rated	A+ rated*	A rated	A- rated*
Funding cost (bonds with 5 years maturity)	2.21%	2.36%	2.51%	2.66%	2.69%	2.72%	2.75%
Spread over 6M Libor (in bps)	-1	14	29	44	47	50	53

Source: Bloomberg Terminal, access on 15/Nov/2017

Note: i) Funding costs are based on available data form a selected list of indicative MDBs. ii) Funding cost retrieved from Bloomberg on 15/Nov/2017, based on the yield of fixed bonds with maturity around Nov/2022, with no embedded options. iii) Starred rating categories did not have MDBs with comparable bonds outstanding, so funding cost and spread were calculated through interpolation. iv) Data should be interepreted as indicative only, as values could vary upwards or downwards depending on several variables.

As the same authors recognize, however, these rates – retrieved at a given point in time (15 November 2017) and regarding fixed bonds with about 5 years maturity, issued by a very limited number of MDBs – should be deemed as indicative only, since there are many other factors to be taken into account when trying to explain funding costs.

According to the NDB, operating at a one-notch lower credit rating would also not significantly impair the financial health of MDBs, as the probabilities of default of AAA rated and AA+ rated entities are relatively similar.[29] The authors explicitly declare that '*without the pressure to reach and maintain AAA credit ratings, MDBs could more effectively leverage their equity, which would ultimately allow them to provide more lending to their members*'.

In an alternative attempt to compare funding costs for AAA and AA+ institutions, Munir and Gallagher (2018) note that, according to the most recent S&P annual study of global corporate default probabilities, the long term one-year average default rate of institutions rated AAA, AA and A is 0.00%, 0.02% and 0.06% respectively,[30] which leads them to believe that the credit risk difference among the three bands is negligible and as such should not drive any major price differences. In order to provide evidence for this assertion, they use borrowing related interest expense as a percentage of total borrowings and average them over the last ten years, weighing for outstanding borrowing levels. Based on this approach, the additional cost of AAA rated MDBs opting for an AA+ rating is estimated at between 69 and 203 basis points, not exactly a negligible difference.[31]

As recognized by the same authors, however, such estimates should also be interpreted with caution, since the borrowing cost of an institution is a function of various determinants and credit risk or rating is only one of them. Other factors influence costs too, such as liquidity, scarcity and yield curve considerations. Additionally, estimates are constrained by the very few MDBs that publish the necessary data in their Annual Reports and by the limited number of MDBs in the sub AAA categories, and also by the small size of outstanding borrowing in these rating bands.

Empirical approach – Given the variety of factors affecting the cost of funding, the ideal way to proceed is through an econometric investigation, which allows us to disentangle the impact of the rating on funding costs while controlling for all other relevant factors. In so doing, we adopt the approach developed by Morgan and Stiroh (2001), Sironi (2003), and Cardillo and Zaghini (2012).

The dependent variable is a market measure of the risk-related cost of debt issuance, the asset swap spread provided by Datastream (SWSP), which is the difference between the bond yield and

[29] Based on the rating performance of global corporates from 1981-2016, S&P estimates an additional default risk of only 0.02% between 'AAA' and 'AA+' rating bands (Gallagher and Munir, 2018).

[30] 2017 Annual Global Corporate Default Study and Rating Transitions; S&P Global, 5 April 2018.

[31] The authors conclude, with some important caveats, that for most MDBs profitability would be preserved, thanks to the increased revenue generated by deploying additional lending headroom on top of their existing portfolios.

a risk-free rate.[32] In particular, to detect the actual cost of funding, we look at the swap spread on the date of bond issuance or, when the latter was not available, at the average of the following ten days.

In principle, the value of the risk premium paid on bonds reflects several factors that can be grouped into three categories: (a) the characteristics of the issuer, most of which are synthesized by its rating; (b) the characteristics of the bonds, such as issue volume in USD, coupon structure, currency and duration; and (c) the characteristics of the market, such as volatility at the time of issue. Our empirical approach tries to disentangle the contribution of each group of variables, with the aim of obtaining a reliable estimate of the impact of a rating.

Overall our initial dataset comprises 3,011 observations (bond issuances) – of which 618 by supranational institutions[33] and 2,393 by sovereigns – from January 2010 to March 2018 for which the variable SWSP was available from Datastream. Sovereign issues were added for a number of reasons: first, they allow for a more even distribution of issuer ratings, as MDBs are highly concentrated on top rating bands (especially on the triple-A rating class); second, it becomes possible to gauge the difference (if any) between the risk-related cost of debt issuance of sovereigns and supranational issuers.

Table 4.2 contains the simple average values of the dependent variable and of a few explanatory variables by rating band. The latter is the average (discretized) of the ratings issued by the three major agencies (S&P, Fitch and Moody's), effective for any given issuer at the time of issue. These raw data and statistics already display a few expected patterns. Funding costs tend to increase as ratings deteriorate; in particular, AA+ issuers tend to pay on average 15 bps more than triple-A issuers. Amounts issued and durations are higher for better credit ratings. Multilateral institutions are concentrated in the higher rating bands; the last column displays the average of the dummy '*Supranational*', set at 1 when the issuer is a supranational institution and at 0 when it is a sovereign.

[32] The datatype 'SWSP' in Datastream retrieves the life and yield of a bond and compares it with the equivalent swap rate of the currency the bond is denominated in. The spread is then expressed as a yield difference (bond minus swap rate) in basis points. Because most of the bonds for which the spread is calculated will not exactly match the constant maturities of the available swap rates, linear interpolation is used to estimate the swap rate with the same maturity as the analyzed bond. For bonds with a maturity longer than the longest swap rate, the yield is compared to the longest swap rate and not extrapolated. Similarly, bonds with maturities shorter than the shortest swap rate are compared to the shortest available swap rate.

[33] Supranational issuers are international organizations, or unions, whereby sovereign states are shareholders or members. Though with some slight differences, the Supranational issuers included in the sample enjoy the characteristics of de facto preferred creditor status and extraordinary shareholder support described in the first part of this paper. The four MDBs examined before – IBRD, ADB, IADB and AfDB – represent about two thirds of our 'Supranational' subsample.

Table 4.2 – Bond issues by rating

(*SWSP in bps, amount in USD billions, duration in years*)

RATING	SWSP	n. obs.	AMOUNT	n. obs.	DURATION	n. obs.	VIX	n. obs.	Supranational	n. obs.
AAA	9.51	781	4.2	618	9.0	781	16.8	781	0.620	781
AA+	24.38	259	7.4	122	26.5	259	14.3	259	0.280	259
AA	50.01	146	10.0	98	16.4	146	16.5	146	0.200	146
AA-	17.42	202	25.0	84	15.7	202	17.7	202	0.000	202
A+	36.20	585	17.3	209	7.6	585	14.3	585	0.002	585
A	124.11	70	1.4	70	9.3	70	15.6	70	0.171	70
A-	135.50	86	1.8	86	10.5	86	15.7	86	0.093	86
BBB+	191.77	127	4.1	119	16.2	127	14.1	127	0.016	127
BBB	167.16	168	7.3	168	9.2	168	14.5	168	0.030	168
BBB-	235.60	168	2.4	168	9.0	168	15.2	168	0.018	168
BB+	251.04	70	2.0	69	8.3	70	14.8	70	0.000	70
BB	312.33	36	1.8	36	8.2	36	15.2	36	0.056	36
BB-	375.52	47	1.0	47	7.3	47	16.0	47	0.000	47
B+	426.48	88	1.0	88	7.4	88	15.4	88	0.000	88
B	504.79	76	1.1	76	6.8	76	14.0	76	0.000	76
B-	480.87	72	1.7	72	6.6	72	13.9	72	0.000	72
CCC+	420.55	30	2.4	30	4.5	30	12.0	30	0.000	30

In order to estimate properly the impact of ratings on risk premia, we first regress the asset swap spread on the three main groups of factors: issuer characteristics, bond features and market sentiment.[34] Analytically:

$$SWSP_i = \alpha_0 + \sum_j \alpha_j I_{ij} + \sum_n \alpha_n B_{in} + \sum_z \alpha_z M_{iz} + \varepsilon$$

where $SWSP_i$ is the asset swap spread at issue on bond i, I are the j variables characterizing the issuer's features, B are the n variables describing the bond issue and M are the z variables which allow for market conditions. All explanatory variables are taken at the date of issue.

Regarding the issuer (I) variables, we include the credit rating – the average, discretized, of the assessments by the three major agencies – in a scale from 0 (AAA) to 16 (CCC+), and a dummy that takes the value of 1 if the issuer is a supranational institution and 0 otherwise (sovereign issuer). We also add the issuer rating squared, in order to detect potential quadratic effects; in fact, the impact on the risk premium of a one-notch deterioration is likely to be dependent on the specific position in the rating scale.

As concerns the bond features (B), we selected as explanatory variables the duration, the amount issued in USD billions, the currency of denomination, the coupon type. The sample contains bonds issued in five major currencies: US Dollars, Euros, Japanese Yen, UK Sterling and Swiss Francs. Four dummies have been included, taking issues in USD as the benchmark. Coupon type may take three values, Straight, Floating or Zero-coupon, with this latter used as a benchmark (and therefore excluded in the regression). We expect a positive relation between bond duration and asset swap spread, due to the roll-over risk associated with longer redemption horizons. Regarding the volume of issue, the relation should be negative, since a larger issuance volume may entail enhanced liquidity for secondary market trades.

[34] The selection of regressors is based upon the customary drivers of the risk premium. There is a vast literature on this topic; the main references are the seminal contributions by Elton et al. (2001), Collin-Dufresne et al. (2001), Campbell and Taksler (2003). For more recent empirical analyses see Anginer and Warburton (2014), Ahmed et al. (2015), Zaghini (2017).

Finally, as a proxy for market sentiment (M), we include the VIX index.[35] In general we expect that higher volatility is detrimental for investors and therefore leads to an increase in the SWSP. All regressions are run with OLS, with robust standard errors clustered by issuer. The 1st and 99th percentiles of the SWSP variable have been excluded as outliers. The total number of observations considered in the regressions eventually falls to 2,112, due to a more limited availability of the variable 'Amount'.

We begin our analysis with a very simple specification, using a limited set of explanatory variables and assuming that the relationship between SWSP and Rating is linear, i.e. constant for each rating level (column 1 in Table 4.3). Subsequently, we run four consecutive regressions (columns 2 to 5), each time adding the square of rating (to account for possible non-linearities) and new explanatories from each group; dotted lines separate the three categories of explanatory variables.

Table 4.3 – OLS regressions results (1)

(*Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*)

VARIABLES	(1) SWSP	(2) SWSP	(3) SWSP	(4) SWSP	(5) SWSP
Rating	**28.24*** **	**13.86*** **	**16.14*** **	**19.64*** **	**19.40*** **
	(1.160)	(4.352)	(4.276)	(3.902)	(3.647)
Rating_Sqr		**1.121*** **	**1.017*** **	**0.541***	**0.539** **
		(0.354)	(0.326)	(0.274)	(0.260)
Supranational			**16.05**	**-4.455**	**-4.187**
			(16.57)	(8.558)	(8.589)
Duration	**1.469** **	**2.070*** **	**2.122*** **	**2.632*** **	**2.927*** **
	(0.666)	(0.559)	(0.558)	(0.608)	(0.671)
Amount	**-1.984*** **	**-1.675*** **	**-1.537*** **	**-0.391***	**-0.526** **
	(0.258)	(0.270)	(0.328)	(0.219)	(0.244)
Eur				**-63.81*** **	**-59.36*** **
				(10.59)	(9.436)
Swi				**-74.54*** **	**-78.08*** **
				(12.61)	(12.53)
Yen				**-125.3*** **	**-122.4*** **
				(9.712)	(9.622)
Ste				**-39.77*** **	**-41.66*** **
				(12.74)	(11.24)
Str					**34.81** **
					(14.21)
Flo					**1.425**
					(21.73)
VIX	**3.540*** **	**3.462*** **	**3.528*** **	**3.393*** **	**3.087*** **
	(0.721)	(0.673)	(0.669)	(0.653)	(0.607)
Constant	**-71.74*** **	**-59.46*** **	**-72.76*** **	**-28.70** **	**-56.51*** **
	(15.81)	(10.43)	(18.14)	(12.99)	(20.61)
Observations	**2,112**	**2,112**	**2,112**	**2,112**	**2,112**
Adjusted R-squared	**0.738**	**0.758**	**0.759**	**0.803**	**0.808**

[35] We also tried including a complete set of year dummies, though not really appropriate in the case of our dataset of bond issues, with no significant impact on overall results.

The results of the model estimation are broadly consistent with our ex-ante expectations; most coefficients are highly significant and demonstrate a remarkable stability across the five specifications. A one-notch rating difference between AAA and AA+ seems to be associated, on average, with an increase in the asset swap spread of about 20 bps (Table 4.3 col. 5). The variable '*Rating_Sqr*' has the expected positive sign, confirming that a one-notch rating difference in the lower rating scale (higher values) has a greater impact than a one-notch difference in the higher rating area (lower values).[36] The effect of '*Duration*' is positive and significant, while the volume issued ('*Amount*') has the expected negative sign. Most of the remaining bond characteristics – currency of issue and coupon type – are significant with high confidence levels. The VIX has the expected positive sign.

The dummy '*Supranational*' is never significant, suggesting that being a supranational or a sovereign issuer does not influence *per se* the risk premium level. This could be due to the fact that Supranationals are concentrated in a few rating classes, mainly the top ones, and this first specification does not distinguish by rating band.

In order to refine our estimate of the impact of each single rating notch on the risk premium paid at issue by the issuer, we run a second set of regressions, this time using dummy variables for each single rating class. We exclude the dummy for AAA rating, so as to make it our benchmark. The first specification (column 1 in Table 4.4) excludes the dummy 'Supranational' and includes a limited number of control variables. Then, we progressively include 'Supranational' and all other explanatories. For the sake of brevity, Table 4.4 displays only the estimated coefficients of the higher rating dummies (up to BBB-).

As evident from the most complete specification (Table 4.4, column 4), an issuer rated AA+ pays a premium of about 25 bps with respect to a triple-A rated issuer, other things being equal, while an issuer rated AA pays about 60 bps more. Again the dummy '*Supranational*', aimed at investigating for intercept effects, is never significant, while the coefficients of most other controls remain strongly significant; in particular, the non-significance of '*Supranational*' in specification (2), the one with dummies relating only to rating classes, indicates that there is no difference in the cost of funding between triple-A sovereigns and triple-A supranationals.

In order to perform a robustness check, we run the same regression on a subsample that includes bond issues in the 'A' classes only (from AAA to A-); these issues are the most relevant for the 'Supranational' category, as most multilaterals fall in the top rating classes. The coefficients estimated under this second specification remained relatively stable and statistically significant.

[36] As a robustness check, all specifications have been tried both with and without the variable *Rating_Sqr*. When included, the coefficient of *Rating_Sqr* is always positive, significant and the regression yields a higher adjusted R-squared.

Table 4.4 – OLS regressions results (2)

(*Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*)

VARIABLES	(1) SWSP	(2) SWSP	(3) SWSP	(4) SWSP
AA+	**10.69**	**11.60**	**27.06****	**24.71****
	(9.373)	(9.892)	(11.18)	(11.42)
AA	**49.24****	**52.25****	**65.88*****	**59.66*****
	(22.99)	(24.82)	(17.24)	(17.83)
AA-	**44.23**	**48.77***	**88.81*****	**82.25*****
	(28.17)	(26.79)	(17.20)	(17.32)
A+	**20.96**	**26.07**	**98.28*****	**95.82*****
	(20.32)	(19.22)	(12.33)	(12.14)
A	**111.0*****	**115.5*****	**136.5*****	**131.8*****
	(13.00)	(15.55)	(11.23)	(11.56)
A-	**120.4*****	**125.5*****	**144.9*****	**137.0*****
	(16.13)	(18.16)	(16.99)	(17.21)
BBB+	**171.1*****	**176.6*****	**174.0*****	**175.4*****
	(30.29)	(32.70)	(25.99)	(24.26)
BBB	**164.5*****	**169.9*****	**172.5*****	**172.3*****
	(33.31)	(34.19)	(27.50)	(26.74)
BBB-	**225.1*****	**230.8*****	**226.0*****	**222.4*****
	(12.48)	(15.07)	(12.34)	(13.06)
Supranational		**7.875**	**-1.252**	**-1.469**
		(11.14)	(8.495)	(8.547)
Duration	**1.639*****	**1.664*****	**2.448*****	**2.695*****
	(0.534)	(0.527)	(0.510)	(0.581)
Amount	**-1.213****	**-1.163****	**-0.385****	**-0.509****
	(0.467)	(0.463)	(0.164)	(0.200)
Eur			**-60.87*****	**-56.87*****
			(9.135)	(8.496)
Swi			**-77.88*****	**-80.61*****
			(12.07)	(11.50)
Yen			**-132.6*****	**-128.3*****
			(12.42)	(12.11)
Ste			**-39.01*****	**-40.53*****
			(13.47)	(11.82)
Str				**30.95****
				(14.39)
Flo				**-0.719**
				(22.00)
VIX	**3.029*****	**3.066*****	**3.198*****	**2.960*****
	(0.687)	(0.674)	(0.594)	(0.582)
Constant	**-47.54*****	**-54.29*****	**-30.86****	**-54.65*****
	(10.63)	(11.84)	(12.79)	(20.51)
Observations	**2,112**	**2,112**	**2,112**	**2,112**
Adjusted R-squared	**0.774**	**0.774**	**0.810**	**0.813**

Finally, in order to investigate if being a Supranational issuer (rather than a Sovereign) has an effect on funding costs *through rating classes or any other independent variables* we interact the

dummy ‘Supranational’ with all explanatories. We find that the only interactions that are statistically significant are those with rating classes and currencies of issue, the only ones we preserve in Table 4.5.[37] This time, in order to gauge the difference in risk premiums between an AAA and a AA+ rated issuer, in the specific case of supranational institutions, one should add up the two coefficients related to the ‘AA+’ dummy and the ‘Supranational * AA+’ interacted variable. For sovereign issuers, instead, the difference in risk premium between a AAA and a AA+ rated issuer is estimated by the single coefficient of the rating class ‘AA+’.

Under this specification, the premium paid by an AA+ rated supranational institution (over a triple-A rated one) is 5.18 bps (47.32-42.14); in the same vein, an AA rated multilateral institution would pay 7.54 bps more (78.89-71.35) than an AAA rated one. Based on the standard F-test, both premiums are not statistically different from zero. By contrast, the premium paid by a AA+ rated sovereign issuer (over a triple-A rated one) is estimated at between 40 and 50 bps (depending on the selected specification), while an AA rated sovereign would pay between 79 and 84 bps more than an AAA rated one.

As for the cost of funding of triple-A issuers, from regression in column 1 (where the dummy ‘Supranational’ is interacted with rating classes only) it seems that triple-A supranationals pay about 18 bps more than triple-A sovereigns. This difference, though, is driven by the omission of the currencies of issue, as reflected by the following specification (column 2).

[37] For the sake of brevity, Table 4.5 displays only the estimated coefficients of the higher rating classes (up to A).

Table 4.5 – OLS regressions results (3)

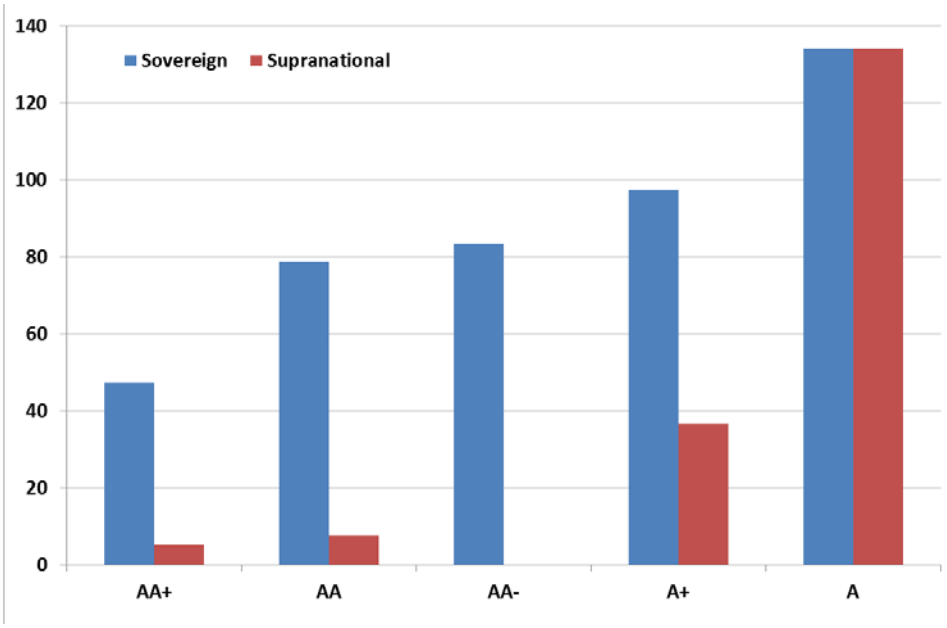
(*Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*)

VARIABLES	(1) SWSP	(2) SWSP	(3) SWSP
AA+	**41.24****	**49.14***	**47.32***
	(19.51)	(25.14)	(24.07)
Supranational * AA+	**-48.34****	**-43.81***	**-42.14***
	(20.03)	(25.72)	(24.85)
AA	**83.81*****	**83.37*****	**78.89*****
	(25.30)	(17.62)	(18.47)
Supranational * AA	**-91.75*****	**-73.13*****	**-71.35*****
	(24.62)	(18.68)	(19.50)
AA-[♣]	**56.21****	**88.32*****	**83.32*****
	(26.05)	(17.61)	(17.91)
A+	**33.52***	**98.76*****	**97.57*****
	(18.56)	(12.77)	(12.78)
Supranational * A+	**-38.74***	**-62.33*****	**-61.01*****
	(20.04)	(16.05)	(16.05)
A	**131.9*****	**137.9*****	**134.3*****
	(15.28)	(13.44)	(13.67)
Supranational * A	**-65.03*****	**-26.30***	**-24.84**
	(15.63)	(15.73)	(16.01)
Duration	**1.719*****	**2.430*****	**2.677*****
	(0.534)	(0.528)	(0.602)
Amount	**-1.185****	**-0.322****	**-0.450****
	(0.453)	(0.133)	(0.173)
Eur		**-66.99*****	**-60.32*****
		(12.08)	(12.19)
Supranational * Eur		**33.28****	**23.79***
		(14.10)	(13.97)
Swi		**-89.82*****	**-89.90*****
		(14.39)	(15.37)
Supranational * Swi		**38.95****	**32.92***
		(18.44)	(18.42)
Yen		**-140.4*****	**-134.5*****
		(14.16)	(14.10)
Supranational * Yen		**35.07***	**25.27**
		(17.72)	(17.69)
Ste		**-74.65*****	**-71.31*****
		(20.75)	(19.28)
Supranational * Ste		**60.07****	**51.21****
		(23.52)	(21.46)
Str			**28.66***
			(15.15)
Flo			**0.933**
			(22.85)
VIX	**2.997*****	**3.051*****	**2.858*****
	(0.664)	(0.588)	(0.582)
Supranational	**17.67****	**-16.57**	**-11.79**
	(8.023)	(12.37)	(11.88)
Constant	**-60.67*****	**-22.91**	**-48.30****
	(10.86)	(15.04)	(23.39)
Observations	**2,112**	**2,112**	**2,112**
Adjusted R-squared	**0.782**	**0.815**	**0.818**

[♣] The interaction between Supranational and AA- is missing since in our dataset there are no issues by

In Chart 4.1 below, for each rating class and with respect to triple-A, we compare the effect of rating class on funding costs for *sovereigns* (blue bars) (i.e. where 'Supranational' = 0), and for *supranationals* (red bars). Again, for multilaterals, ceteris paribus there seems to be no difference in the cost of funding between triple-A and AA+ (or even AA) rated institutions (the respective sums of coefficients are low and not significantly different from zero). This result does not hold for sovereign issuers. The divergence between sovereigns and supranationals seems to be effective up to the rating class A+ and ceases from the rating class A downwards. The results in the range below AA, though, should be interpreted with caution, given that the number of observations in the supranational subsample falls dramatically, moving from AA- downwards.

Chart 4.1 – Estimated impact of rating class on funding cost: sovereigns vs supranationals
(*basis points; difference with respect to triple-A issuers in the same category, 'Sovereign' or 'Supranational'*)



The result is quite interesting, as it indicates that, all other things equal, investors consider the level of risk of AA+ (or even AA) rated supranationals as comparable to that of triple-A rated supranationals. The same does not hold in the case of sovereign issuers. The result could be explained by the fact that investors already take into account that the rating methodologies currently applied to MDBs are excessively penalizing, thereby confirming the result of the first part of the paper. At first sight this could seem at odds with the observation that when comparing triple-A rated supranationals with triple-A rated sovereigns there is no statistically significant difference in funding costs (in column 2 of Table 4.4 the dummy Supranational is not statistically significant). One explanation for this could be the fact that the triple-A rating class does not have an upper bound, so it contains a few sovereign issuers who are considered extremely safe (a sort of quadruple-A) and therefore are characterized by extremely low funding costs. If this is the case, the explanation that investors already account for the conservativeness of MDBs' rating methodologies still holds.

These considerations demand a word of caution if one wishes to combine the above results with the estimates of the potential increase in lending provided in the first part of the paper. Indeed, if rating methodologies are properly reviewed and their conservative bias is removed, one could expect funding cost differentials with respect to triple-A rated supranationals to increase, as they do in the case of sovereigns (where going from triple-A to AA+ implies an increase in funding costs estimated to range between 40 and 50 bps). Also, it is crucial that the hypothetical refinement of rating methodologies for MDBs happens at the same time across all major agencies, otherwise rating uncertainty increases and the conservative bias will not be removed.

The result that targeting an AA+ (or even AA) rating level – rather than AAA – has a negligible impact on the funding cost of multilateral institutions is a crucial one of this paper. Indeed, it allows us to predict a limited influence on the business model of MDBs. Given that MDBs usually determine lending rates by applying fixed spreads to their funding costs, one could foresee no significant impact on the attractiveness of MDB lending for potential borrowers. If this were not the case, a major rise in lender rates could eventually discourage the more creditworthy members from borrowing, leading to an overall credit quality deterioration of the MDB loan portfolio, with potential repercussions on its credit rating.

One further important caveat with the analysis above is that, while comparing the funding costs of AAA institutions versus those of AA+ rated institutions, it says nothing on the possible funding cost *dynamics* of going from triple-A to lower ratings. These dynamics are likely to depend on the underlying drivers: on the one hand, if the loss of triple-A is the result of a generalized deterioration of credit quality, high unexpected losses or a weakening of organizational and management capability, then one could expect more sizeable impacts on funding costs; on the other hand, our results should remain relevant if AA+ ratings are the result of a strategic choice by an MDB, properly communicated by shareholders to the market and implemented gradually and in parallel with the maintenance of strong risk management procedures and high governance profiles.

Last but not least, we are aware that, when opting for a lower than triple-A rating, there are other important considerations to be taken into account, which go beyond borrowing costs. One example is the existence of contractual rigidities, such as the exemption from paying margins in derivative contracts for triple-A rated institutions; another is that a triple-A rating allows MDBs to better safeguard a countercyclical lending role, i.e. to continue financing development projects at accessible lending rates also during periods of distress in private capital markets. Finally, a further obstacle could be represented by the statutory limits that require some institutional investors to invest a minimum share of their resources in triple-A instruments or by the existence of segmentation rules for which investments in supranational bonds cannot be considered as perfect substitutes of investments in sovereign bonds.[38]

[38] See also Munir and Gallagher (2017) for a few further possible concerns associated with the abandonment of triple-A.

5. Conclusions

In this paper we contribute to the literature on MDB balance sheet optimization in two ways. First, we look at solutions to deal with the MDBs' trilemma – stemming from shareholders' calls for increasing development lending, with constant capital resources and while preserving triple-A credit ratings – beyond what has already been achieved by the G20 Action Plan to Optimize Balance Sheets. Based on our results, the employment of rating methodologies that take into account MDBs' peculiarities more appropriately can significantly increase the available lending capacity for a given rating level and equity resources. For instance, in the case of the four MDBs considered – IBRD, ADB, IADB and AfDB – applying a rating methodology alternative to the one adopted by S&P until December 2018 would have the effect of almost doubling aggregate lending headrooms. We also argue that rating methodologies should be as transparent as possible, in order to minimize rating uncertainty for MDB's risk offices.

A further significant boost to lending capacity could derive from breaking the 'trilemma' on the rating side, i.e. accepting a (slightly) lower rating associated with a (slightly) higher level of risk. Such a choice depends, of course, on the risk appetite of shareholders and on their desire to achieve higher 'returns' in connection with larger development exposures. Shedding light on the potential costs of taking on more risk, in terms of higher funding costs, is precisely the second objective of the paper. Applying an econometric approach widely used to disentangle the different contributions to the credit risk premium paid when issuing a bond, we provide evidence that there is no significant difference in the cost of funding between triple-A and AA+ (or even AA) rated multilateral institutions.

The combined results of the paper imply that, applying more appropriate rating methodologies *and* opting for an AA+ rating target (rather than triple-A), the four MDBs considered could more than triple aggregate spare lending capacity – from USD 415 to USD 1,370 billion (using FY2016 data); under the hypothesis that the revision of rating methodologies for MDBs induces the difference in funding costs between AA+ and triple-A supranationals to align with those of sovereigns, the estimated impact on the funding cost could be equal to about 40-50 basis points.

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