



# George Washington University

IBI – Institute of Brazilian Business & Public Management Issues

Washington DC

## SOVEREIGN DEBT EXPOSURE – OPPORTUNITIES FOR REGULATORY IMPROVEMENTS

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*The Minerva Program – Spring 2015*

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<sup>1</sup> The views expressed in this work are those of the author and do not necessarily reflect those of the Banco Central do Brasil or its members.



## INTRODUCTION

Historically, episodes of sovereign distress and/or defaults have generally been associated with banking crises. These episodes share common characteristics, such as high levels of government debt, of which banks held a significant portion. As such, sovereign distress could have an impact on the banking system and financial stability.

2. From late 2009, fears of a sovereign default developed among investors as a result of the rising private and government debt levels around the world coupled with a wave of downgrading of government debt in some European states. Causes of the crisis varied by country. In some countries, private debts arising from a property bubble were transferred to sovereign debt as a result of banking system bailouts and government responses to slowing economies post-bubble. In others, like Greece, high public sector wage and pension commitments were connected to the debt increase. The structure of the Eurozone as a currency union without fiscal union contributed to the crisis and harmed the ability of European leaders to respond.

3. Markets started questioning the risk-free status of debt issued by a number of governments worldwide. As a consequence, we saw an across-the-board rise of sovereign risk in financial markets. It was reflected in the widening of sovereign spreads in the bond (cash) markets and on the CDS (derivatives) premia. This rise in sovereign risk in the financial markets reflected the rise in its perception of probability of default.

4. The global sovereign debt crisis has exposed potential gaps in the regulatory treatment of sovereign risk. However, some specialists argue that this deficiency was not a reflection of Basel standards itself but actually in the way those standards have been applied in some countries and



especially in the European Union. Critics blamed bank regulators and supervisors for having tilted the standards, allowing the sovereign risk exposures to be underestimated in order to provide incentives for banks to accumulate large stakes.

5. A key objective for governments in advanced economies is to earn back the quasi-risk-free status of their debt. However, the return to fiscal discipline will bring public debt down only progressively and, in the meantime, the sovereign risk incurred by banks will have to be properly measured and covered by adequate capital.

6. This paper deals with the present set-up of the treatment of sovereign risk in banking regulation, describes the factors that have raised doubts on its risk-free status granted in the Basel framework, particularly on those sovereigns denominated in domestic currency, and discuss the challenges to an adequate modeling of this risk. In addition, it explores the pros and cons of policy alternatives to modify the current regulatory framework and provides suggestions to move forward.



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## FIRST PART

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### 1 Sovereign risk

7. Sovereign risk can crystallize due to a range of factors. Episodes of sovereign distress have been recurrent events in history. Regardless of the causes of those episodes, the link between sovereign and banking crises has been historically intertwined, with shocks being transmitted between banks and sovereigns through multiple channels in a negative feedback loop that exacerbates the risks to both.

8. To identify potential policy options, it is important to set out first the sources and channels of sovereign risk in the banking system. This part reviews the concept of sovereign risk, highlights the differences between external and domestic sovereign debt distress, and explains conceptual channels by which sovereign risk may crystallize.

#### 1.1 Definition of sovereign risk

9. Sovereign risk arises when a sovereign, or an associated public body, is perceived to be unable or unwilling to fulfill its contractual debt obligations in a timely manner. Obligations include those to the financial sector, non-financial private sector, and foreign creditors. Failure to meet contractual obligations can take the form of an outright default (i.e. by not paying the agreed principal/interest) or a forced restructuring of the contractual obligations to less favorable terms to creditors.



10. Sovereign risk may also come in many different shapes and sizes besides the obvious risk of loss of principal from outright default and from debt restructuring (credit risk). There is the risk of the breakup of a currency union and redenomination risk. There is the risk that currency devaluation could make it difficult for a country to service its foreign denominated debt (foreign exchange risk). There is interest rate risk resulting from exposures to changes in domestic and international interest rates. Finally, there is the risk of loss from unanticipated, higher inflation.

11. For sovereign debt, the requirement to guarantee payment and to monitor contract compliance differs from the requirements governing credit for private agents or sub-national and non-sovereign sectors in the public sphere. Moreover, the determinants for payment capacity and of willingness to repay debt are of a different nature, reflecting macroeconomic variables, including the available stock of foreign currency reserves and balance of payments flows, economic growth prospects and capacity to generate tax receipts, and a variety of political factors.

12. Usually, a sovereign debt crisis arises as a result of a fiscal imbalance where a sovereign's expenditures grows in an unsustainable way and outpaces its revenues.<sup>2</sup> The causes for such imbalances include:

- i. Excessive public expending – e.g. military expenses during a war, costly infrastructure constructions, subsidies to industries which may need financial support, or simply lack of effective budget controls, etc; and/or

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<sup>2</sup> More precisely, a sovereign debt crisis results from the incapacity of the government to generate primary surpluses of a size sufficient to keep the level of debt in terms of GDP at sustainable levels.



- ii. Insufficient public revenue – e.g. low taxation, high degree of tax evasion, inefficient and loss-making public-owned entities;
  - iii. Other factors – e.g. macroeconomic conditions, political and economic reasons and demographic structures (i.e. rising pension and health costs related to the aging of their population).
13. More specifically, sovereigns can be subjected to both solvency and liquidity problems as described below:
- i. Solvency problem – occurs when the present value of the sovereign’s expenses exceeds their capacity to raise revenues; and
  - ii. Liquidity problem – occurs when the sovereign is unable to raise financing to service existing debt or raise even more financing when there are primary deficits. This inability to raise the needed financing results from several causes, including financial, economic and even political.
14. In principle, a combination of these two issues is possible. At times, the problems often start as a liquidity problem and develop into a solvency problem as the government is obliged to rollover its debt in the short-term at a higher cost.
15. The Figure 1 below presents a simplified balance sheet of the general government (including the central bank). In particular, changes in the present value of revenues and/or the size of the sovereign debt, for example, will result in changes in the net worth of the government.

**Figure 1** - Conceptual Government Balance Sheet

<b>Assets</b>	<b>Liabilities</b>
PV of fiscal revenues	<b>Direct Liabilities</b>
Foreign exchange reserves	PV of fiscal expenditures
Marketable securities	Net market value of sovereign debt
Onlending (e.g., WB loans)	<b>Contingent Liabilities</b>
Investments in State Owned Enterprises	Explicit contingent liabilities
Investment in infrastructure (e.g. roads)	Implicit contingent liabilities
	<b>Equity</b>
	Net worth of government estate

Source: Currie and Velandia-Rubiano (2002)

## 1.2 Special features of sovereign debt

16. Sovereign debt is different from private debt because creditors do not have a well-defined claim on the sovereign's assets. The lack of a procedure for enforcing sovereign debt contracts is partly due to the principle of “sovereign immunity”. Sovereigns enjoy a (de facto) protection from legal enforcement mechanisms that could facilitate recovery by the creditors in the event of



a default, which means that even when creditors obtain a favorable ruling, they cannot attach assets which are located within the borders of the defaulting country, and in fact have had limited success in going after assets located abroad<sup>3</sup>.

### 1.3 Costs of sovereign debt crises

17. If sovereign debt contracts cannot be enforced one might ask why sovereigns usually pay their debts. Sovereign defaults are associated with significant costs, some of them measurable and with short-term impacts and others more subjective and on a longer-term perspective.

18. Borensztein and Panizza (2009) list four possible costs of default:

- i. Loss of reputation - defaulting countries usually suffer in terms of subsequent access to the international capital markets. Default episodes are associated with an immediate drop of credit rating and a jump in sovereign spreads. However, this effect tends to be short lived and disappears between three and five years after the default episode;
- ii. Reductions in trade - default episodes are associated with a drop in bilateral trade. It's not clear the channel through which default affects trade, however it also tends to be short lived;
- iii. Costs to the domestic economy - default episodes are associated with a decrease in output growth of 2.5 percentage points in the year of the default episode; and

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<sup>3</sup> For example, the decision of the UN Tribunal for the Law of the Sea that ordered to release a Argentina's naval flagship (called the Libertad), which was temporarily detained at a port in Ghana on behalf of Elliott Capital Management after the country's debt restructuring.



- iv. Political costs - ruling governments in countries that defaulted observed a 16 percent decrease in electoral support.<sup>4</sup>

#### 1.4 Pricing of sovereign risk in the financial markets

19. One well-documented feature of sovereign debt and its borrowing costs is that during economic booms, discrimination by the market is not strong enough: risk premia are usually tiny and too discreet to encourage countries to make efforts to generate primary surpluses and reduce the level of debt. Anticipation of possible bailouts compromises market discipline in good times, encouraging excessive leverage, risk taking, and reinforcing the systemic risk in the system.

20. In fact, one often-heard explanation for what happened during the Eurosystem's first decade is that the complacent market environment led to a relaxation of the budget constraint on euro area sovereigns and induced them to borrow recklessly.

21. Despite the Maastricht Treaty<sup>5</sup> prohibitions, market participants assumed that any sovereign that got into trouble would be bailed out. Indeed, sovereign spreads in the euro area, when considering credit default swaps (CDS) market's behavior, remained almost totally insensitive to credit ratings, showing that market's perception of sovereign risk remained very low until the crisis emerged.

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<sup>4</sup> The presence of such political costs has two implications. On the positive side, a high political cost would increase the country's willingness to pay and hence its level of sustainable debt. On the negative side, politically costly defaults might lead to "gamble for redemption" and possibly amplify the eventual economic costs of default if the gamble does not pay off and results in larger economic costs.

<sup>5</sup> One of the obligations of the treaty for the members was to keep sound fiscal policies, with debt limited to 60% of GDP and annual deficits no greater than 3% of GDP.



22. Higher deficits and debt levels and weaker growth prospects lead to increased sovereign risk, but the degree to which this translates into higher default probabilities in the narrow sense is not clear. Markets, and rating agencies alike, tend to underestimate sovereign risk during economic booms and overestimate it during crises.

23. A number of particular characteristics of sovereign debt complicate the pricing and assessment of the associated credit risk. It is hard to model in advance sovereign debt probability of default<sup>6</sup> since it depends not only on macroeconomic data but also, and sometimes more significantly, on political factors that are very difficult to assess and require a different kind of analysis. The same difficulties apply to the assessment of sovereign debt loss-given-default<sup>7</sup> since the willingness to pay and the aforementioned principle of “sovereign immunity” plays a much larger role when compared to the case of private debt.

24. In a long-term perspective, sovereign risk pricing in financial markets tends to follow a well-known pattern of long periods of market complacency during which risk premia and risk perceptions are unusually low while risks build up. These periods of complacency are then followed by sudden changes in market sentiment, which are both abrupt and too late.

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<sup>6</sup> Probability of default (PD) is a financial term describing the likelihood of a default over a particular time horizon. It provides an estimate of the likelihood that a borrower will be unable to meet its debt obligations.

<sup>7</sup> Loss-given-default (LGD) is the share of an asset that is lost when a borrower defaults.



## 1.5 Differences between domestic and external sovereign debt risk

### 1.5.1 Domestic Sovereign Debt

25. Although there is always default risk, lending to a national government in the country's own sovereign currency is often considered "risk free" and is done at a so-called "risk-free interest rate." This is because, up to a point, the debt and interest can be repaid by raising tax receipts (either by economic growth or raising tax revenue), a reduction in spending, or failing that by simply printing more money. It is well known that this last option (the printing of money) will increase inflation and thus reduce the value of the invested capital (at least for debt not linked to inflation). This has happened many times throughout history, and a typical example of this is provided by Weimar Germany of the 1920s, which suffered from hyperinflation due to its government's inability to pay the national debt deriving from the costs of World War I and the payment of reparations to other countries agreed at the Versailles Treaty.

26. The main ways a troubled sovereign could avoid defaulting on its domestic debt are:

- i. Debt monetization – it occurs when the central bank buys government bonds and holds them to maturity; or
- ii. Financial repression - by requiring certain classes of investors (i.e. banks and pension funds) to hold government debt and allowing inflation to erode its real value.

27. These measures can be very costly in terms of the medium and longer-term macroeconomic performance. When a sovereign sells bonds to its central bank (monetization),



the monetary base expands. At the time those bonds come due, they are redeemed and paid to the central bank that then returns any fund received back to the treasury by means of dividend payments. Monetizing debt is thus a two-step process where the government issues debt to finance its spending and the central bank purchases the debt, holding it until it is at maturity, and leaving the system with an increased supply of money. The end result of this monetary expansion is high inflation, which causes distortions to the economy.

28. Nevertheless, in many countries central banks are forbidden by law from purchasing debt directly from the government. In Brazil, for example, the central bank is expressly forbidden by law to directly purchase government debt.<sup>8</sup> Their debt purchases have to be made strictly in the secondary markets. The central bank is also prohibited to issue debt. This decision has a lot to do with their long experience with high inflation.<sup>9</sup>

29. As for the financial repression, its effects on growth, inflation and financial stability are also well known. However, these costs may be seen by a sovereign as outweighing the costs of a repudiation of its debt or having to adopt politically unfeasible draconian expense cuts.

### 1.5.2 External Sovereign Debt

30. Governments often borrow money in a currency in which the demand for debt securities is strong. An advantage of issuing bonds in a currency such as the US dollar, the pound sterling, or the euro is that many investors wish to invest in such bonds. Relatively few investors are willing to invest in currencies that do not have a long track record of stability. A disadvantage for

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<sup>8</sup> Complementary Law n° 101/2000 also known as “Lei de Responsabilidade Fiscal”.

<sup>9</sup> As opposite, Mexico’s national constitution clearly states that in order to avoid the possibility of default of its domestic sovereign debt, the central bank has to intervene by buying back the debt and issuing a new one.



a government issuing bonds in a foreign currency is that there is a risk that it will not be able to obtain the foreign currency to pay the interest or redeem the bond. It also makes them more prone to suffer speculative attacks on its currency.

31. From the point of view of foreign investors, lending to a national government in a currency other than its own does not give the same confidence in the ability to repay, but this may be offset by reducing their own exchange rate risk. On the other hand, national debt in foreign currency cannot be disposed of by starting a hyperinflation; and this increases the credibility of the debtor. Usually small states with volatile economies have most of their national debt issued in a foreign currency. For countries in the Eurozone, although the euro is the local currency, no single state can trigger inflation by creating more currency.

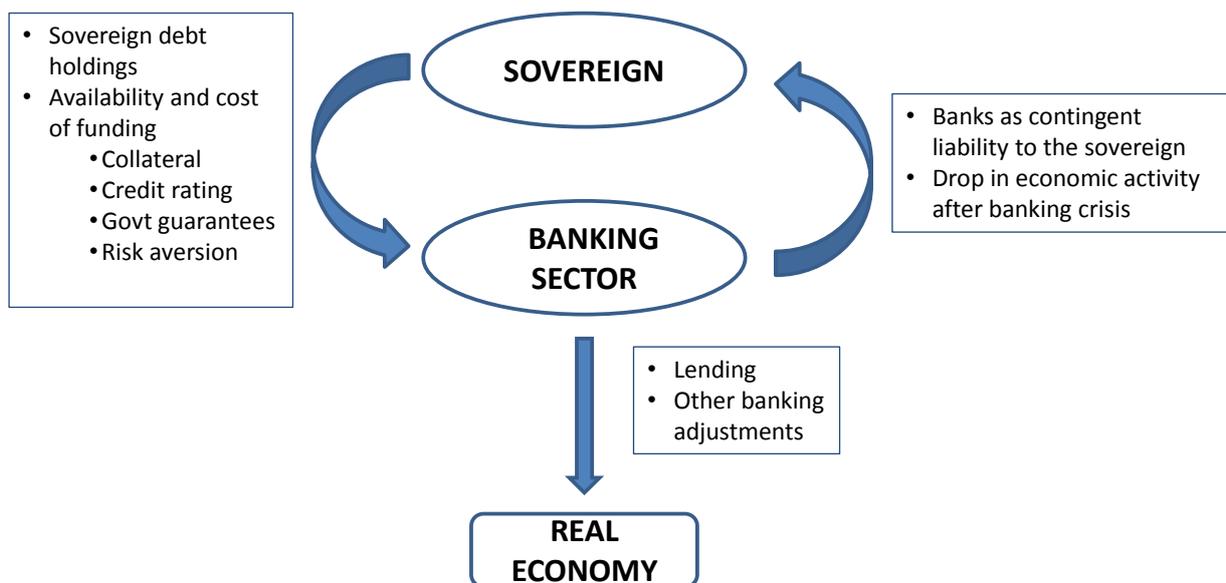
## **2 Sources and channels of sovereign risk in the banking system**

32. The financial crisis and global economic downturn have caused a sharp deterioration in public finances across advanced economies. The situation is currently most severe in some euro area countries like Greece, Ireland, Portugal and Spain. Those countries had their credit ratings downgraded several notches and saw their debt spreads to soar.

33. The driver of the increase of sovereign risk differs across these countries. In Greece, the financial crisis exacerbated an already weak fiscal position. Sovereign risk compounded the problems in the Greek banking sector. Meanwhile, in Ireland original causality went from banks to the sovereign. The government's fiscal position was considered strong before the crisis, but was severely affected by the cost of bailing out their banks.

34. Sovereign risk is intrinsically linked to the banking system across a number of transmission channels. Those channels can develop rapidly into a “negative feedback loop” that amplifies the problems from one sector to the other. For example, a sovereign stress may affect, as explained below, the cost and availability of banks’ funding, impairing the ability of banks to maintain its lending to the real economy, which in turn could amplify shocks to the macroeconomy and lead to a further deterioration of the sovereign’s fiscal position. Conversely, in a banking crisis, the government’s ‘safety net’ provisions (e.g. bail outs, debt guarantees, and central banking emergency liquidity operations) may increase its (contingent) liabilities. This can worsen its own solvency position, thereby exacerbating the channel described above.

**Figure 2** – Negative feedback loop between sovereigns and the banking sector





## 2.1 Transmission channels

35. One of the main challenges for authorities is to minimize the negative consequences of sovereign risk increases for banking funding and the real economy. This section describes the channels through which sovereign risk affects the cost and availability of bank funding. It does not mean however that causality may not go the other way around from banks to sovereign (i.e. Ireland), but even in this case, sovereign risk eventually acquires its own dynamics and compounds the problems of the banking sector.

### 2.1.1 Sovereign risk to banking sector channels

36. Increases in sovereign risk adversely affect banks' funding costs through several channels, due to the pervasive role of government debt in the financial system. First, losses on holdings of government debt weaken banks' balance sheets, increasing their riskiness and making funding more costly and difficult to obtain. Second, higher sovereign risk reduces the value of the collateral banks can use to raise wholesale funding and central bank liquidity. Third, sovereign downgrades generally flow through to lower ratings for domestic banks, increasing their wholesale funding costs, and potentially impairing their market access. Fourth, a weakening of the sovereign reduces the funding benefits that banks derive from implicit and explicit government guarantees.

#### 2.1.1.1 Asset holdings

37. Increases in sovereign risk may affect banks through their direct holdings of sovereign debt. Banks tend to hold sovereign portfolios that are both very large and heavily weighted towards the home sovereign. They do it for different reasons. In several countries, sovereign



securities are the most liquid asset available, and banks can use them to store their liquid reserves to satisfy deposit redemptions.

38. However, losses on sovereign portfolios weaken banks' balance sheets and increase their riskiness, with adverse effects on the cost and availability of funding. The extent of the impact depends on whether the securities are carried on the balance sheet at market value (held in the trading book) or at amortized cost (held-to-maturity banking book). In the first case, a fall in the value of sovereign bonds has direct and immediate effects on banks' profit and loss statements, and on their equity and leverage. In the second case, accounting principles imply that losses are recorded only when the securities are impaired (e.g. when a sovereign restructuring or default becomes likely); nonetheless, these exposures may affect bank funding conditions prior to this occurring, to the extent that investors become concerned about the solidity of the bank and tend to consider those exposures at market value.

**Table 1** – Loss recognition accounting methods on sovereign exposures

	Accounting Standards	
	Impact	Valuation method
<b>Trading Book</b>	Realized loss/gain in profit and loss account	Fair value
<b>Available for sale</b>	Unrealized loss/gain, impact on equity	Fair value
<b>Held to maturity</b>	Provisions in profit and loss account	Amortized cost, net of any impairment provision, based on "incurred loss"



Source: Based on International Monetary Fund (2011)

#### 2.1.1.2 Collateral/liquidity

39. Sovereign securities are used extensively by banks as collateral to secure wholesale funding from central banks, private repo operations, issuance of covered bonds, and to collateralize over the counter (OTC) derivative positions. Increases in sovereign risk reduce the availability or eligibility of collateral, and hence banks' funding capacity and liquidity conditions, through several mechanisms:

- i. When the price of a sovereign bond falls, the value of the collateral pool for institutions holding that asset automatically shrinks. If the asset was already posted in specific transactions, mark to market valuation of collateral could trigger an additional margin call. A downgrade could even exclude a government's bonds from the pool of collateral eligible for specific operations or accepted by specific investors (e.g. foreign money market or pension funds).
- ii. The increased collateral valuation uncertainty, market liquidity, and credit risk could increase the size of the haircuts applied to sovereign securities. Because of the usual good performance of sovereign bonds on these aspects, they tend to have smaller haircuts, and therefore, be the preferable asset for collateralization. But in periods of sovereign stress, market participants might apply non-negligible haircuts even to sovereign debt. Moreover, as sovereign bond haircuts often serve as a benchmark for those applied on other securities, the impact on bank funding conditions could be magnified through changes in haircuts on other securities.



- iii. The provision of central banking liquidity, through both open market and rediscount operations, is typically conducted through repurchase agreements or secured transactions. Sovereign distress can put additional liquidity pressure on banks, as haircuts tend to be procyclical. Banks' sovereign portfolios have their capacity to raise funds undermined even further, in a situation of already tight liquidity, because haircuts have to be adjusted to reflect the new market conditions.

#### 2.1.1.3 Credit ratings

40. Sovereign downgrades have direct negative consequences both on the cost of banks' debt funding and their ability to raise equity.<sup>10</sup> Due to the intertwined links between the banking sector and the government explained in previous sections, sovereign downgrades generally lead to downgrades of domestic banks (including because of their large holdings of sovereign debt). Also, for the same reasons, sovereign ratings tend to represent a ceiling for the ratings of domestic banks. In rare occasions, some banks can exceed the rating of the sovereign as long as they can show a superior capacity to service their debt, even in the case of its home sovereign default. This might be the case of some foreign-owned banks, because of expectations of support from their foreign parents.

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<sup>10</sup> Correa et al (2011) find that, over the past 15 years, sovereign downgrades in advanced countries and emerging economies had a significant effect on banks' equity financing costs: on average, a one-notch downgrade reduced bank equity returns by 2 percentage points in advanced countries, and by 1 percentage point in emerging economies.



#### 2.1.1.4 Implicit government guarantees

41. Systemic banks, considered too-big-to-fail, have traditionally had an implicit government guarantee that lowers the cost of their debt funding when compared to what small banks are usually obliged to pay. Since the full amount of the deposits and debts of "too big to fail" banks are effectively guaranteed by the government, large depositors and investors view investments with these banks as a safer investment than deposits with smaller banks. It reflects investors' expectation that, if the bank is in trouble, the government would step in to prevent a bankruptcy that could trigger a "bank run" in the system and avoid the legal and operational complexities involved in their resolution.

42. In October 2009, Sheila Bair, at that time the Chairperson of the US Federal Deposit Insurance Corporation (FDIC), commented:

*"Too big to fail' has become worse. It's become explicit when it was implicit before. It creates competitive disparities between large and small institutions, because everybody knows small institutions can fail. So it's more expensive for them to raise capital and secure funding."<sup>11</sup>*

43. There is a rich literature confirming that larger and complex financial institutions can find funding at significant lower cost because of implicit government support, and mainly reflecting

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<sup>11</sup> Wiseman, Paul; Gogoi Pallavi (2009). "FDIC chief: Small banks can't compete with bailed-out giants". USA Today.



the creditworthiness of sovereign rather than the actual institution.<sup>12</sup> However, the worsening of sovereign fiscal positions could reduce the value of this guarantee.

44. Moreover, regulatory changes may weaken implicit guarantees in the future. Some measures aim at limiting the size and systemic relevance of financial institutions. Others are targeted to facilitate the resolution of a failing bank and minimize the burden of a possible bailout from taxpayers to bank's creditors (i.e. bail in and contingent capital).

45. Although those measures are expected to increase the cost of funding for banks, it would likely be offset by banks' improved market discipline and reduced excessive risk-taking, as well as gains brought by a more leveled playing field for competition among larger and smaller banks.

#### **2.1.1.5 Risk aversion**

46. Sovereign tensions may cause a rise in investors' risk aversion, which in turn may increase the premia demanded on banks' securities and reduce banks' funding availability. It may also cause a generalized decline in asset prices and market transactions, which can reduce trading and investment banking revenues and trigger additional losses for banks.

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<sup>12</sup> See Levy and Zaghini (2010).



## SECOND PART

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### **3 Stocktaking on the regulatory treatment of sovereign risk in the Basel framework**

47. Building on the analysis of sources and channels of sovereign risk discussed in the previous part, this section tries to evaluate the extent to which the existing regulatory framework adequately mitigates sovereign risk.

#### **3.1 Overview**

48. There are varying instances throughout the Basel framework where the regulatory treatment of sovereigns is generally more favorable relative to other exposures. Historically, the rationale for this treatment was based on the assumption that sovereign exposures have lower perceived risks (e.g. credit, market, liquidity); serve an important economic purpose; and/or have unique features relative to other asset classes. There have also been political economy considerations that have been taken into account in the construct of the regulatory framework.

#### **3.2 Main critics of the regulatory treatment of sovereign risk**

49. The global sovereign debt crisis has exposed fault lines in the regulatory treatment of sovereign risk. However, the deficiency is not in the Basel standards but in the way the global standards have been applied in some countries and especially in the European Union. Although, as mentioned above, the main anomaly with hindsight remains how complacently sovereign risk was priced by financial markets in the decade up to 2009 under the assumption that any sovereign that got into trouble would be bailed out.



50. Critics have charged bank regulators and supervisors with tilting the treatment of sovereign risk to provide regulatory incentives for banks to accumulate large sovereign exposures. They cite four aspects that combined could be seen as supporting “financial repression”:

- i. Number one: a zero risk weight applied to AAA and AA- rated sovereigns.
- ii. Number two: national supervisors are allowed to exercise discretion and set a lower risk weight provided that the exposures are denominated and funded in the currency of the corresponding state.
- iii. Number three: government bills and bonds form a substantial part of the liquid assets required in the newly established liquidity coverage ratio (LCR). This new ratio could be seen as incentivizing banks to hold sovereign debt.
- iv. Number four: the large exposure regime in some countries excludes highly rated sovereigns from the 25% of equity limit on large exposures.

### **3.3 Current treatment of sovereign risk in the regulatory framework**

51. Risk sensitivity is at the core of the capital framework. Basel II and III prescribe minimum capital requirements commensurate with the credit risk of all exposures. This risk sensitivity also applies to sovereign exposures.



### 3.3.1 Credit risk in the banking book

52. Regulatory capital for sovereign exposures is, for Basel Committee member countries and many other countries, calculated under the Basel II release of the Basel framework.<sup>13</sup> The Basel framework offers two methods for calculating capital requirements for credit risk: the standardized approach (SA) and the internal ratings-based (IRB) approach. Basel II allows banks to make the choice between the two broad methodologies. The most relevant standard for internationally active banks is the internal ratings-based (IRB) approach.<sup>14</sup>

#### Standard approach (SA)

53. The standardized approach is based on the same general principle as Basel I: banks classify their exposures according to the type of counterparty (sovereign, bank, corporate or retail) in the transaction. However, one of the major improvements is that banks are permitted to risk-weight exposures in the sovereign, bank and corporate portfolios as a function of ratings issued by external credit assessment institutions (ECAI).

54. This approach replaces the Basel I risk weights that were not reflecting the level of risk: only claims on sovereign from the OECD Group countries were assigned a zero per cent risk weight while claims on central governments of countries which do not belong to the OECD Group and which are not denominated and financed in the local currency were assigned a 100% risk weight.

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<sup>13</sup> See Basel Committee on Banking Supervision (2006)

<sup>14</sup> See Bank for International Settlements (2013)



55. Under the Basel II standardized approach, the level of risk is better captured thanks to the consideration of external ratings but sovereigns still have a preferential treatment compared to other categories of counterparties. A same bucket of external credit rating on corporates or banks results generally in a risk weight that is less favorable than that assigned to claims on sovereigns. For instance, AAA sovereign exposures have a zero percent risk weight while AAA corporate exposures have a twenty per cent risk weight.

**Table 2** – Standardized approach risk weights for sovereign exposures<sup>15</sup>

Credit assessment	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk Assessment	0%	20%	50%	100%	150%	100%

**National discretions under the SA**

56. Under the standardized approach, the risk weights on sovereigns have two variants depending on the debt’s currency denomination, i.e. either foreign or domestic currency. The risk weights applicable to sovereign debt denominated in foreign currency is based on the sovereign credit rating, using the weights shown in table 2.

57. The risk weight for sovereign debt denominated in domestic currency is based on national discretion and is often in practice zero as allowed in Basel rules:

*“At national discretion, a lower risk weight may be applied to banks’ exposures to their sovereign (or central bank) of incorporation denominated in domestic currency and*

<sup>15</sup> The notations follow the methodology used by Standard & Poor’s. The use of Standard & Poor’s credit ratings is an example only; those of some other external credit assessment institutions could equally well be used.



*funded in that currency. Where this discretion is exercised, other national supervisory authorities may also permit their banks to apply the same risk weight to domestic currency exposures to this sovereign (or central bank) funded in that currency.”*

58. From a prudential perspective, sovereign domestic local currency debt is then viewed as risk-free under the standardized approach and has no capital charge. This has become more and more questionable.

#### **Internal ratings-based approach (IRB)**

59. The IRB approach requires banks to assess the credit risk of individual exposures using a scale of risk weights that is more granular than under the SA in order to allow for greater differentiation of risk. Exposures are categorized into broad classes of assets with different underlying risk characteristics. The sovereign portfolio is one such class; the other broad classes are corporate, bank, retail and equity. The sovereign portfolio under the IRB approach covers all exposures to counterparties treated as sovereigns under the standardized approach.

60. The risk weight for each sovereign exposure is determined by inputting estimated risk parameters into the risk weight functions specified in the Basel II framework. There is one risk-weight function for the sovereign, bank and corporate asset classes. The required risk parameters are probability of default (PD), loss-given-default (LGD), exposure-at-default (EAD) and effective maturity (M).

61. The framework offers two approaches for determining risk parameters for sovereign exposures. The first, the foundation IRB approach, requires that banks calculate PD and apply



the supervisory-specified measures of LGD, EAD and M. The second, the advanced IRB approach, requires that banks estimate risk parameters for each of PD, LGD, EAD and M.

62. For sovereign exposures, the PD is the one-year PD associated with the risk-rating grade to which a bank allocated the exposures. By contrast, for corporate and bank exposures, the PD is the greater of the one-year PD and 0.03% (in other words, there is a floor of 0.03% on the estimated PD for corporate and bank exposures but not for sovereign exposures).

63. Under the IRB foundation approach, the LGD for sovereign exposures that are not secured by collateral is 45%. Since Basel II provides a minimum standard, some Committee members have elected to require LGD values above 45%. Subordinated claims on corporates, sovereigns and banks are assigned a 75% LGD. Under the advanced IRB approach, supervisors may permit banks to use own estimates of LGD for sovereign exposures, as well as corporate and bank exposures. There are no requirements in the framework specific to the treatment of sovereign exposures in relation to EAD and M.

64. The Basel framework is based on the premise that banks use the IRB approach across the entire banking group and across all asset classes. But it allows national supervisors to permit banks to gradually phase in the approach across the banking group and, only if the exposures are non-material in terms of both size and risk, to keep certain exposures in the external ratings-based, standardized approach (SA) indefinitely.

65. In general, banks assign a zero risk weight to more than half of their sovereign debt holdings. This is particularly true for portfolios under the SA, which cover the majority of banks' sovereign exposures, but also for some IRB portfolios. Interestingly, the tendency to use the



potentially more permissive SA is not related to the capitalization of the bank but rather to perceived increases in the riskiness of the borrower. In particular, exposures to sovereigns in the euro area periphery tend to be overwhelmingly under the SA, thus obtaining zero risk weights.

66. Furthermore, banks may be authorized, under some conditions and to various extents across countries, to implement the standardized approach for sovereign exposures – applying then a zero risk weight – and the IRB approach for other exposures. The rationale behind this partial use possibility is that the estimation of credit risk parameters, notably the PD but also LGD, for sovereigns is particularly challenging. Indeed, the accuracy of outputs of statistical models is usually conditioned by the size, representativeness, and quality of the statistical sample. All these conditions are difficult to meet for sovereigns and could, even when complemented by an in-depth qualitative analysis, result in the use of external ratings. Credit rating agencies arguably face the same challenges to assess the quality of public finances in advanced economies.

### **3.3.2 Regulatory treatment of sovereign exposure in the trading book**

67. The Basel framework requires that banks hold regulatory capital to buffer potential losses arising from market risk in banks' trading books. Two broad options are offered: the standard method (SM) and an internal models approach (IMA).

68. The SM captures general market risk and specific risk. The IMA captures, broadly, the same type of trading book risks, but they are measured at a more granular level. General market risk is considered in terms of value-at-risk and stressed value-at-risk. Specific risk is considered in terms of an incremental risk capital requirement that comprises default risk that is incremental



to the bank's value-at-risk model, as well credit migration and credit spread/liquidity risks. To the extent that a bank cannot model this risk, the SM is used.

69. Banks may have exposure to sovereigns in their trading books through physical positions (i.e. holdings of government bonds) or synthetic positions (such as credit derivatives). The regulatory treatment of general market risk arising from sovereign exposures (i.e. the risk arising from possible movements in the general level of interest rates) does not distinguish between sovereign securities and other types of physical security holdings because, by definition, this risk is not specific to an individual issuer. There are therefore no specific requirements for the general market risk exposure arising from sovereign positions under the IMA.

70. For specific risk, sovereign securities form part of a category referred to as government, which comprises all forms of government paper including bonds, Treasury bills and other short-term instruments and, at national discretion, local and regional governments paper subject to a zero credit risk weight in the banking book. Specific risk capital is determined by applying a prescribed risk weight to the value of the security on the basis of its rating and maturity (see Table 3).



**Table 3** - Specific risk weights for sovereign exposures in trading book

Categories	External credit assessment	Specific risk capital charge
Government	AAA to AA-	0%
	A+ to BBB-	0.25% (residual term to final maturity 6 months or less)
		1.00% (residual term to final maturity greater than 6 and up to and including 24 months)
		1.60% (residual term to final maturity exceeding 24 months)
	BB+ to B-	8.00%
	Below B-	12.00%
Unrated	8.00%	

71. The framework allows supervisors to apply a different risk weight to securities issued by certain foreign governments, especially to securities denominated in a currency other than that of the issuing government. As is the case for the banking book, when government securities are denominated in the domestic currency and funded by the bank in the same currency, at national discretion a lower specific risk charge may be applied. As is the case for general market risk, under the IMA there are no specific requirements for specific risk that are unique to sovereign securities.



### 3.3.3 Sovereign exposures in the Basel leverage framework

72. The Basel III framework introduced a simple, transparent, non-risk based leverage ratio<sup>16</sup> to act as a credible supplementary measure to the risk-based capital requirements. The leverage ratio is intended to:

- i. restrict the build-up of leverage in the banking sector to avoid destabilizing deleveraging processes that can damage the broader financial system and the economy; and
- ii. reinforce the risk-based requirements with a simple, non-risk based “backstop” measure.

73. The Basel III leverage ratio is defined as the capital measure (the numerator) divided by the exposure measure (the denominator).

$$\text{Leverage ratio} = \frac{\text{Capital measure}}{\text{Exposure measure}}$$

74. The capital measure for the leverage ratio is, as currently proposed, the Tier 1 capital amount defined in the risk-based capital framework. The exposure measure is the sum of:

- i. on-balance sheet exposures;

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<sup>16</sup> See more at Basel Committee on Banking Supervision (2014)



- ii. derivative exposures;
- iii. securities financing transaction (SFT) exposures; and
- iv. off-balance sheet items.

75. In general, these items follow the accounting value, but are net of specific provisions or accounting valuation adjustments and do not reflect credit risk mitigation unless noted (such as in the case of collateral received against derivative exposures). Physical holdings of sovereign securities will therefore be incorporated into the exposure measure at their book or market values. Synthetic exposures to sovereign risk, such as through derivative contracts, will be incorporated into the exposure measure in the same way as other derivative contracts. That is, the exposure measure captures the exposure arising from the underlying asset in the derivative contract and the counterparty credit risk exposure from transacting the derivative. Banks will be required to hold Tier 1 capital of at least 3% of their non-risk weighted assets.

76. In fact, the introduction of a leverage ratio in the Basel framework guarantees a non-zero capital charge for sovereign exposures and complements the risk-based system of capital requirements. It also reduces the costs of any model risk in the system of risk-weighted assets. Sovereign exposures are fully included in the denominator of the leverage ratio.

#### **3.3.4 Sovereign exposures in the Basel liquidity framework**

77. The Basel framework includes two minimum standards for liquidity that will make banks to build larger buffers of liquid assets to meet their liquidity needs. The first is the liquidity



coverage ratio (LCR), which requires a bank to have an adequate stock of unencumbered<sup>17</sup> high-quality liquid assets (HQLA) that can be converted easily and immediately in private markets into cash to meet the bank’s liquidity needs for a 30-day liquidity stress scenario specified by supervisors. The second is the net stable funding ratio (NSFR) that promotes a sustainable maturity structure of assets and liabilities over a one-year time horizon. Specific requirements for sovereign exposures feature in both standards but particularly in the LCR.

#### Liquidity coverage ratio

<b>LIQUIDITY COVERAGE RATIO (LCR)</b>	
$\frac{\text{Stock of high quality liquid assets (level 1+level 2)}}{\text{Cash outflows - min[inflows;75\% outflows] over the next 30 days}} \geq 100\%$	

78. The LCR builds on traditional liquidity “coverage ratio” methodologies used internally by banks to assess exposure to contingent liquidity events. The total net cash outflows for the scenario are to be calculated for 30 calendar days into the future. The standard requires that, absent a situation of financial stress, the value of the ratio be no lower than 100% (i.e. the stock of HQLA should at least equal total net cash outflows) on an ongoing basis because the stock of unencumbered HQLA is intended to serve as a defense against the potential onset of liquidity stress.

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<sup>17</sup> “Unencumbered” means free of legal, regulatory, contractual or other restrictions on the ability of the bank to liquidate, sell, transfer, or assign the asset. An asset in the stock should not be pledged (either explicitly or implicitly) to secure, collateralize or credit-enhance any transaction, nor be designated to cover operational costs (such as rents and salaries)



79. The term total net cash outflows is defined as the total expected cash outflows minus total expected cash inflows in the specified stress scenario for the subsequent 30 calendar days. Total expected cash outflows are calculated by multiplying the outstanding balances of various categories or types of liabilities and off-balance sheet commitments by the rates at which they are expected to run off or be drawn down. Total expected cash inflows are calculated by multiplying the outstanding balances of various categories of contractual receivables by the rates at which they are expected to flow in under the scenario up to an aggregate cap of 75% of total expected cash outflows.

80. In the stock of liquid assets, Level 1 liquid assets, principally comprising government bonds (as well as cash and central bank reserves), can be included without limit while Level 2 liquid assets are limited to 40% of the stock of liquid assets. As a consequence, banks will need to hold a sufficient amount of Level 1 liquid assets and might therefore be encouraged to purchase sovereign debt. Furthermore, as the inflows are limited to 75% of the outflows, banks will have to hold a stock of liquid assets at least equal to 25% of their outflows, even if their liquidity risk profile is perfectly balanced. Coupled with the cap of 40% of Level 2 assets in the stock of liquid assets, this may constitute another incentive for banks to purchase sovereign debt.

81. However, some experts<sup>18</sup> argue that the LCR liquidity requirement cannot be seen as “financial repression” as it does not designate government securities as the only qualifying liquid assets. In the Basel III liquidity rules, highly rated corporate and covered bonds also qualify as liquid assets (Level 2), albeit subject to some limits, including a 40% limit for Level 2 assets. On

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<sup>18</sup> See Hannoun, H. (2011).



the contrary: it recognizes that, for most banks, corporate and covered bonds will help promote a diversification of the liquid asset pool. Moreover, the Basel Committee’s quantitative impact study found that banks currently hold Level 2 assets amounting to well below 40% of their total liquid assets. Therefore, banks are free to diversify both their sovereign and corporate liquidity buffers globally, provided they have sound processes to manage any foreign exchange risk.

#### Net Stable Funding Ratio (NSFR)

$$\frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} > 100\%$$

82. To promote more medium and long-term funding of the assets and activities of banking organizations, the Basel Committee has developed the Net Stable Funding Ratio (NSFR). This metric establishes a minimum acceptable amount of stable funding based on the liquidity characteristics of an institution’s assets and activities over a one-year horizon. This standard is designed to act as a minimum enforcement mechanism to complement the LCR and reinforce other supervisory efforts by promoting structural changes in the liquidity risk profiles of institutions away from short-term funding mismatches and toward more stable, longer-term funding of assets and business activities.

83. To determine the ratio, liabilities and capital are grouped into buckets and an available stable funding factor (ASF) is applied. The higher the factor, the more stable the source of funding. Funding with residual maturity of less than one year from sovereigns, public sector



entities (PSEs) and multilateral and national development banks are subject to a 50% ASF factor. Funding from central banks and financial institutions with residual maturity between six months and one year are weighted at 50% and with residual maturities of less than six months the weighting is 0%.

84. Assets and off-balance sheet items are similarly grouped into buckets and a required stable funding factor (RSF) is applied. For assets, the lower the factor the lower the funding need of the asset. All central bank reserves (including required reserves and excess reserves) are assigned a 0% RSF factor. Some assets are assigned a factor of 5%. These include marketable securities representing claims on or guaranteed by sovereigns, central banks and PSEs risk-weighted at 0% in the Basel framework, as well as those non-0% risk-weighted sovereign or central bank debt securities specified in the LCR as level 1 assets. These same assets when assigned a 20% risk weight under the Basel framework and comprising unencumbered level 2A assets are assigned a 15% factor. Non-HQLA loans to sovereigns, central banks and PSEs that have a residual maturity of less than one year are assigned a 50% factor.

### **3.3.5 Sovereign exposures in the Basel larger exposures framework**

85. The Basel framework includes requirements in relation to banks' large exposures to minimize large losses resulting from the sudden default of a single counterparty. The large exposures framework is constructed to serve as a backstop and complement to the risk-based capital standards. A bank must consider all exposures to third parties across the relevant regulatory consolidation group and compare the aggregate of those exposures with the group's eligible capital base.



86. Sovereigns and central banks as well as PSEs treated as sovereigns in the Basel framework are exempted from large exposure limits. Any portion of an exposure guaranteed by, or secured by financial instruments issued by, sovereigns is similarly excluded to the extent that the eligibility criteria for recognition of the credit risk mitigation are met. However, a bank must report exposures subject to the sovereign exemption if these exposures meet the criteria for definition as a large exposure.



## THIRD PART

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### 4 Possible regulatory alternatives and its impacts

#### 4.1 Context

87. The sovereign debt crisis has revealed the full implications of lax fiscal policies in a number of advanced countries. These include large increases in the perceived default probability of a number of highly indebted sovereigns whose bonds were previously thought to be risk-free. These changed perceptions have understandably had a large impact on financial institutions and markets. Nevertheless, Basel II standards provide a framework that allows for an adequate reflection of these risks in banks' capital requirements. However, the way it was implemented across some jurisdictions allowed the sovereign risk exposures of its domestic banks to be underestimated.

88. In this part, this section identifies potential policy options to improve the treatment of sovereign risk. It also analyses the pros and cons on possible regulatory alternatives (increase capital requirements, stress tests, concentration rules, etc.) and assess its likely estimated effects on financial stability, government balance sheets, debt markets, and the rest of the financial markets.

#### 4.2 Sovereign debt role as a “risk free asset” and the zero-risk weight factor

89. After the European debt crisis, the central issue of discussion among regulators and market agents is whether, irrespective of the country's rating, zero weights assigned to claims in national currency should be maintained for the sovereign exposures.



90. To fully understand the possible implications of an increase in the capital requirement applied to those exposures, it's necessary to investigate the main attributes of sovereign debt and their role as "risk-free" assets in the economy. There are (at least) seven different purposes that distinguish those assets and explain their relevance for the economy' dynamics.

91. First, sovereign liabilities can be used as a measure of the cost of borrowing. Interest rates on sovereign debt can be used as a benchmark to measure credit spreads over the government's cost of borrowing. Other rates can be used as benchmark, like LIBOR.

92. Second, sovereign debt interest rates can be used to measure the time value of money – the discount rate that is applied to future cash flows to bring them into present values. We can use sovereign bonds, but also interest-rate swap or corporate credit yield curves to do this.

93. Third, sovereign debt involves the concept of the risk-free rate from the capital-asset pricing model and modern portfolio theory. This is the hypothetical risk-free rate that is used to assess the riskiness of other assets and to build efficient portfolios.

94. Fourth, there is the concept of the benchmark bond that is a reference for value when assessing the risk-reward characteristics of another security or spread relationships more generally.

95. Fifth, sovereign debt instruments are the hedging vehicle of choice, meaning the instrument that banks and investors use to hedge away (or take more of) certain risks, particularly interest rate risk.



96. Sixth, sovereign debt instruments are the base assets or reserve assets of the banking system: the low-volatility, low-credit-risk assets around which bankers and investors build their balance sheets and portfolios.

97. Seventh, sovereign bonds are usually the preferred asset for collateral purposes. Its risk-free status, or, in other words, its negligible counterparty risk profile, relatively low market and liquidity risks, makes them the ideal assets to use as collateral on central cleared or bilateral transactions, including OTC derivatives, repos, and central bank liquidity operations.

#### 4.2.1 Impacts of a risk weight increase

98. The lack of a risk-free rate, or more precisely the sovereign yield curve, can lead to distortions and misalignments in asset prices. In a world without risk-free assets, where do private market participants go when they seek a flight to quality or just to rebalance their portfolios when risk-aversion increases? Where would banks safeguard their liquidity if government debt becomes just another risky asset? How will financial markets respond to any shortage of collateral as haircuts on sovereign debt increases? As risk-free assets are necessary for the proper work of financial systems, this is also a necessary condition to ensure financial stability, and to break at its source the negative feedback loop that could emerge between banks and sovereigns.

99. The implications of the recognition that sovereign bonds contain more risk than previously considered can cause disruptions not only on the interest rate levels for the entire economy but also on the volume of macro-economic financing. Therefore, the decision to adopt



additional capital requirements on banks to compensate for the risk on its sovereign debt portfolio should be taken with extra caution.

100. An eventual increase to, for instance, 20% on the risk weight applying to banks' domestic sovereign debt portfolio can represent, taking into account the magnitude of this class of assets on banks' balance sheets, a significant increase of additional own funds for banks. For example in Brazil, such an increase in requirements would result an estimated additional equity amounting to R\$ 41 billion or an increase of 9.4% in the current level (December 2014) of required capital for Brazilian banks<sup>19</sup>. The additional capital requirements would most likely translate into an extra cost that will be passed over to the real economy in the form of higher spreads and lower funding availability. It should be highlighted that the financial institutions are already required in increase their levels of capital over the next years due to the implementation of the new provisions in the Basel III framework.

#### 4.2.2 Impacts on the repo market

101. The effects of the risk weight increase on sovereigns can also significantly affect central banks liquidity transactions and the repo markets in general. In repo transactions, sovereign bonds are exchanged for cash with an agreement to repurchase it back at a future date. The bonds serve as collateral for what is effectively a cash loan and, conversely, the cash serves as collateral for a securities loan.

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<sup>19</sup> A significant part of this additional capital requirement would not translate to actual equity raise as Brazilian banks usually hold capital levels above the required.



102. Repos are particularly useful to central banks both as a monetary policy instrument and as a source of information on market expectations. They can serve as an effective mechanism for signaling the stance of monetary policy. Repo markets can also provide central banks with information on very short-term interest rate expectations that is relatively accurate since the credit risk premium in repo rates is typically small. Repos are attractive as a monetary policy instrument because they carry a low credit risk while serving as a flexible instrument for liquidity management. Sovereign bonds are the preferred financial instruments for collateral purposes on those transactions in many countries.

103. An eventual change in the zero-risk weight on domestic sovereign debt would make those transactions more costly for banks as they would be required to post additional capital or require a larger haircut to face the credit risk of the sovereign bond received as collateral.

#### **4.2.3 Impacts due to other provisions on the Basel framework**

104. The large exposures and liquidity rules are both sensitive to risk weights. Basel's large exposure rules define that only zero-weighted exposures to governments are exempted from the specific requirements, which stipulate that a single exposure to a client shall not exceed more than 25% of own funds.

105. The same is the case concerning the Liquidity Coverage Ratio proposed by the Basel Committee. Only domestic sovereign bonds assigned a 0% risk-weight under the Basel II



Standardized Approach for credit risk are accepted as Level 1 assets<sup>20</sup> composing the “high-quality liquid assets” (HQLA).

106. Those two examples reinforce the view that a change on the zero-weight risk for domestic sovereigns requires a holistic approach upon all possible consequences when accounting for other provisions on the Basel framework.

#### **4.3 The probability of default of domestic sovereign debt and the zero-weight risk factor**

107. On many countries, banks hold large stakes of their respective domestic government debt. Nevertheless, some analysts still argue that it is not necessary to amend the zero-risk weighting national supervisors’ discretion provided on Basel regulation. Their assumption is based on the fact that a government can generate revenues at any time on account of its power to levy taxes, or, as explained at section 1.5.1, it can influence the money multiplier by way of inflation.

108. However, considering the current level of interconnections in the international capital market, the fact that a sovereign can “print its own money” might not suffice to rule out the possibility of a government to default on its own currency debt. There are many other variables that may come into consideration to define the government’s “willingness to pay”. In other words, in a cost-benefit analysis of policy alternatives, political and macro-economic factors are weighted and the default option may or may not be deemed to be the best solution from their point of view.

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<sup>20</sup> Level 1 assets are not subjected to a haircut under the LCR although the framework allows supervisors to require it.



#### 4.4 Additional Pillar II and III measures

109. The statistical models show that the level of government debt alone does not suffice to explain government default risk. A default risk depends on a broad range of factors. The necessary inputs into risk models are not only quantitative and macro-economic indicators but also qualitative assessments such as political factors. Moreover, data series on sovereign default are often jeopardized by structural breaks.

110. The skepticism about the modellability of sovereign exposures raises important questions upon the use both the standard<sup>21</sup> and IRB approaches for this asset class. Not only is the probability of default (PD) difficult to estimate but also the loss given default (LGD) parameter due to special features of those assets, as explained in section 1.2. Besides, risk-weights are normally calibrated for relatively well-diversified portfolios – as for example, corporates or retail exposures – with much higher default frequencies and lower impact than sovereign debt. Nevertheless, sovereign exposures tend to be highly concentrated, with low default frequency but with huge impacts. All of these aspects help casting doubts on the possibility of calibrating realistic shock-absorbing capital charges for those exposures.

111. However, reverting to a regulatory system in which capital requirements on sovereign exposures would be based on simple debt ratios or macro-economic indicators might represent a step backwards compared to the granularity and greater differentiation of risk established by external ratings (in the standard approach) and internal ratings (IRB approach). Nevertheless,

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<sup>21</sup> CRA ratings can create significant cliff-edge effects in capital requirements. Partly due to the very low frequency of defaults in high quality sovereign portfolios, migrations between grades tend to occur quite abruptly, which translates to sudden jumps in risk-weights and capital requirements.



although far from perfect, both approaches have the virtue of at minimum to motivate bank's management to take appropriate notice of all direct and indirect risks inherent in sovereign exposures.

112. Furthermore, risks that are not fully captured by the Pillar I process might be then particularly suited to treatment under Pillar II. Stress testing, for instance, is an important risk management tool that alerts bank management to adverse unexpected outcomes related to a variety of risks and provides an indication of how much capital might be needed to absorb losses should large shocks occur. It is a tool that supplements other risk management approaches and measures and, in the absence of more satisfactory risk modeling, it should definitely have a more prominent role in assessing sovereign risk.

113. In the same sense, the large exposure Basel framework could be adjusted to better reflect the risk of zero-risk weighted domestic sovereign. It should be done with caution as holding sovereign debt is necessary for prudent risk management of banks. However, simply establishing hard sovereign risk limits could endanger the marketability and liquidity of sovereign debt issues and exacerbate bank problems in sovereign debt crises when the choice of high quality sovereign counterparties presumably will be more limited. It may also go against other regulatory standards, as for example the LCR provision, which require banks to hold larger portfolios of sovereign debt. Therefore, supervisors should close monitor these exposures and promptly take action to calibrate concentration limits while avoiding exacerbating procyclicality or creating unnecessary liquidity constraints.



114. Another appropriate policy response would be to improve sovereign risk disclosures to facilitate effective market discipline. Moreover, during a sovereign crisis, when risk aversion is high, uncertainty about the quality of banks' assets (including sovereign portfolios) can create additional funding pressures for all banks. Authorities should take steps to require banks to provide detailed information on their sovereign exposures.

115. The introduction in Basel III of a leverage ratio backstops the risk-based system of capital requirements and reduces the costs of any modeling of risk in the system of risk-weighted assets. The fact that sovereign exposures are fully included in the denominator of the leverage ratio is an important step away from a zero risk weight for them.

## 5 Conclusion

116. Sovereign debt has special features and is a special class of asset. It affects and is affected by macroeconomic dynamics. It is closely related to fiscal and monetary policy and plays a key role as a risk-free or reference asset for the functioning of financial markets and the economy as a whole.

117. A key objective for governments in advanced economies is to earn back the quasi-risk-free status of their debt. Until then, the sovereign risk incurred by banks will have to be properly measured and covered by adequate capital.

118. However, sovereign risk is a challenging risk to model and therefore not well-suited for both the standard and the IRB approaches for capital requirements defined in the Basel framework. National supervisors' discretion to allow a zero-risk weight for domestic sovereign



debt denominated in domestic currency helps exacerbate the problem and underestimate sovereign risk exposures in banks' balance sheets.

119. Pillar 2 additional measures to deal with sovereign exposures appears as the most suitable way to address sovereign risk and to guide supervisory decisions on the matter. Sovereign risk calls for the need of flexible, adaptable tools able to gauge the extent and timing of regulatory measures to different contexts and circumstances. Stress testing, in the absence of more satisfactory risk modeling, is the tool that can supplement other risk management approaches and measures such as the capital risk charge. The large exposure framework can also be modified to better reflect sovereign risk as long as it does not exacerbates procyclicality and liquidity pressures during crises.

120. At last, regulators should aim at reducing information asymmetries that can compound adverse market reactions during sovereign crises and thus require banks to provide detailed information on their sovereign exposures.

121. To conclude, the above discussed features of sovereign debt coupled with their relevance on banks' balance sheets call for caution on simply imposing additional capital requirements on banks' holdings. Regulators should adopt a holistic view by not only considering the possible impacts in the financial markets, government and the real economy's funding cost, but also taking into account other provisions on the Basel framework, already in place or expected to be implemented. Besides, further analysis should be pursued on how to better measure sovereign risk.



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