

# Risk-free assets in financial markets

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## 1. Introduction

The events of the past two decades have shaken many beliefs commonly held in financial markets: one of those is the faith in government debt as the cornerstone of the financial system. During the 1990s, in a number of countries, the issue of the disappearance of government debt was seriously considered. In the United States, for example, projections indicated the disappearance of federal government debt as early as in the next four decades. This prompted analysts to discuss how the financial system would work without government debt (see eg Fleming (2000)). Some argued that the function of providing benchmark interest rates for the rest of the economy could be performed by other markets, such as the interest rate swap market. Others maintained that government securities are an essential pillar of the financial system, and thus advocated that governments use resources raised through the issuance of debt for investment.

More recently, the opposite problem presented itself: government debt levels exploded as a result of the financial crisis and the extraordinary bailouts engineered by many countries. In Europe, the fragility of government finances generated a harsh repricing of many sovereign issuers, prompting a financial crisis that many feared would precipitate a breakup of European monetary union.

Because of these events, it is fair to say that government debt “is not what it used to be” in the financial system. Once again, observers are asking whether we can conceive of a financial system without risk-free sovereign securities.

This paper discusses the role of sovereign debt in the financial system. Section 2 lays out the problem by describing the way financial systems were thought of as working until a few years ago. This description of the standard model of the financial system helps highlight the magnitude of current problems. Section 3 analyses in more detail the role of safe assets in the financial system. Section 4 discusses the effects on financial markets of the credit deterioration of sovereigns. Section 5 contains some observations and conclusions from the main points discussed in the paper.

## 2. The standard model of the financial system

It is appropriate to start a discussion of the role of sovereign assets in the financial system by recalling what for a long time has been the perception of the basic structure of financial systems and, in them, the role played by government securities. I will call this the standard model.

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In the standard model, sovereign debt is free of repayment risk, in nominal terms. In other words, all future promised currency amounts for coupons and principal are deemed to be certain cash flows. The absence of nominal risk was justified by two arguments. First, the government has taxation and confiscation powers. Second, the government can ask the central bank to provide financing. The central bank has unlimited resources because it can always create money. Recently, this second argument has been de-emphasised by the reforms undertaken in several countries, aimed at establishing the independence of central banks from treasuries. However, it has resurfaced with a vengeance in connection with the euro crisis, as commentators have explained the comparatively high rating and low yields of US federal debt and UK government debt, ie the debt of two countries with strained public finances, by reference to the presence of a central bank capable of bailing out the government.

In a world where cash flows attached to government securities are deemed risk-free, sovereign bills and bonds become the benchmark securities for pricing and discounting: the benchmark risk-free term structure of interest rates, where long-term rates reflect only uncertainty about future short-term rates. Current and expected short-term interest rates, in turn, reflect inflation expectations (Fama (1975)).

In this standard model the perceived risk-free nature of sovereign debt justifies its zero risk weighting in banks' balance sheets. Banks become the default client of sovereigns; they hold sovereign debt as market-makers and (in the short maturities) for transaction purposes. As I will explain below, a very large proportion of the securities-based financial system requires means of transactions, and riskless government securities (those short-term securities that are free of interest rate risk) are the best candidate for this function.

The pillar of sovereign securities, held in comparatively large quantities by bank intermediaries, is one reason why banks' liabilities are also regarded as a close substitute for them. Banks' liabilities are nearly riskless, because deposit insurance and bank supervision are expected to work well. As a result, there is a thriving unsecured interbank market, which redistributes liquidity among this important section of the financial system .

I have taken the time to describe the standard model – the real world a couple of decades ago – because I think this helps highlight how far, currently, financial markets are from it. Currently, strained public finances have raised questions about the ability of governments to repay their debts, because observers do not think their taxation and confiscation powers may be enough (there is always a limit on how much governments can tax) and because there are also limits to the ability of central banks to finance governments, quite apart from the fact that many central banks are prohibited from financing governments directly.

The credit risk now attached to government securities has also spread to the banking system. The unsecured interbank market has collapsed (due only in part to the sovereign crisis, and mostly to the financial crisis, which unexpectedly uncovered very large risk positions held by many banks). Banks' liabilities are regarded as risky.

So, the question now is, can the system work without riskless assets? To answer this question I need explore the value (that is the function) of riskless assets in the current financial system and the potential of alternatives to sovereigns.

### 3. The value of safe assets

Safety is, of course, a relative concept, being determined by human perceptions. In financial markets assets are regarded as safe when their value fluctuates less than that of any of the alternatives. Where does the value of safe assets come from? Safety has value stemming from two functions it attracts.

The first is a price-discovery function. For example, Dunne et al (2007) show that, in a relatively general setting, a security that has no idiosyncratic risk, which can be defined a benchmark security, is co-integrated with all others with the feature that the co-integrating error term has minimal variance. Therefore the security with minimal idiosyncratic risk is the ideal benchmark for pricing all other securities.

In the real world, benchmark securities attract trading volume – typically from index-based investment strategies, as well as relative-value strategies, where the benchmark is used as a hedging security. The liquidity that benchmarks attract has value, and it is reflected in the lower yield they command.

There is another, separate, function that safe assets perform, and that is what I call means of transactions in financial markets. Financial markets have minimised frictions in transactions, far more than in the rest of the economy, through the adoption of standardised transaction contracts and the use of technology which allows high-frequency marking to market, the settlement of changes in value of the contract, so that the two parties do not take on credit risk with the fluctuations of contract values. Yet this has not eliminated the need for collateral. Collateral is needed because marking to market does not occur in continuous time and because, even in the theoretical case where such bilateral settlements occur at very high frequencies, some securities may have discontinuous jumps in their dynamics.

For these reasons, two parties entering into a financial contract (and this includes the case of investors gaining access to exchanges) make use of initial margins, which provide a buffer against price movements that occur between the consecutive settlements of variation margins, as well as the higher-order guarantee of the ability of counterparties to liquidate variation margins. Because collateral is made up of financial assets, it is intuitive that the higher the volatility of the price of the collateral, the higher the initial margin. Hence, safe assets are sought after because they help economise on financial transaction costs.

Thus collateral performs functions that are typical of money. In addition, just like money, collateral can get “multiplied”. The phenomenon of money multipliers is known from economics textbooks: after a central bank operation which increases reserves in the banking system, the latter will create commercial bank money (checkable deposits) which is then redeposited into the banking system as a result of transactions in the economy, and leads to further, albeit smaller, increases in commercial bank money, and so on until excess reserves in every commercial bank equal zero. Similarly, after its creation and its pledge, collateral can get back into circulation through re-pledges creating a phenomenon similar to the money multiplier (Singh (2011), Claessens et al (2012)).

We know from monetary economics that too much money in the economy can produce overheating, inflation and other macro imbalances, while an uncontrolled contraction of money in circulation can cause balance sheet stress and recessions – for this reason central banks have developed as the guardians of the various monetary aggregates. Similarly, too much collateral in circulation may support too

much risk-taking and risk concentration in the financial system, and a sudden contraction in collateral (as was observed in the recent crisis) can cause disruption, just like a sudden contraction in the money stock.

The moneyness of collateral, which makes it valuable, is an incentive for the private sector to create it as well (Stein (2012), Giavazzi and Giovannini (2011)). I have mentioned commercial bank money: it is the first example of privately created collateral, though it is currently not used as such, if anything because the typical feature of deposit insurance, a cap on the size of the deposits insured, makes it unwieldy for the purpose of financial transactions, which tend to have minimum sizes that are many times that cap.

So the private sector has “competed” with governments in the provision of safe assets in other ways: the so-called shadow banking system has become a collateral factory. In order to decrease the riskiness of fixed income securities, special purpose vehicles have been used to tranche the cash flows from the underlying assets, which have ranged from mortgages to bank loans to trade credits. With proper choice and assessment of underlying assets, tranching can achieve the approximate risklessness that is required for these assets to perform the role of collateral.

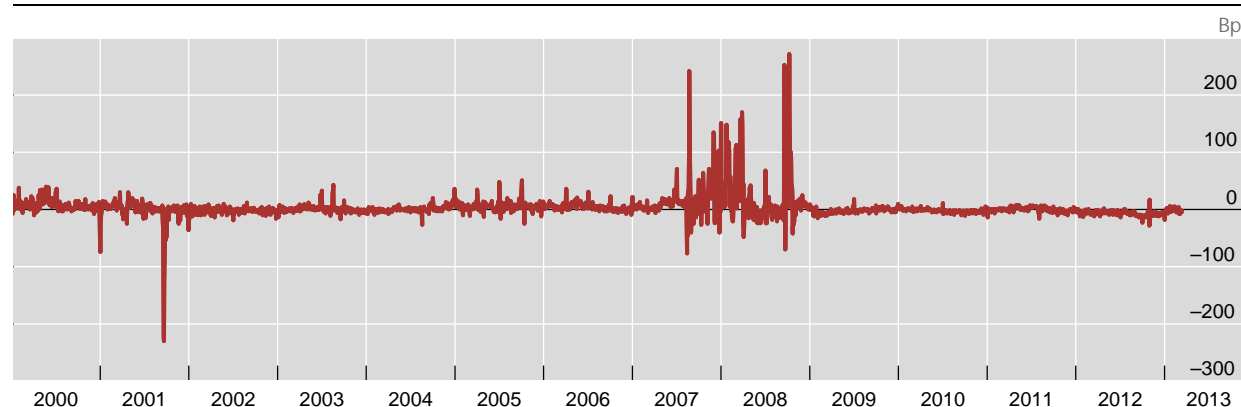
The financial crisis has shown, however, that the boom in collateral creation has come with two fatal weaknesses: errors in the design of the securities, leading to undervaluation of credit risk, and overlooking of liquidity problems. At the height of the financial crisis, even privately created collateral that was safe from a pure credit perspective collapsed in value, due to the absence of liquidity, sometimes with perverse feedbacks into credit risk.

The moneyness of collateral suggests a role for central banks. Because excessive fluctuations of the stock of collateral can produce aggregate distortions, there is a need for some oversight over its growth and distribution. And this argument is supported by the simple observation, which I borrow from Klee and Stebunovs (2011), that central bank money and collateral are imperfect substitutes, as illustrated in the graph below, showing the spread between the fed funds rate and general collateral repo rate.

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Federal funds rate-overnight GC repo spread

Graph 1



Sources: Datastream, ICAP.

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## 4. Where have all the safe assets gone?

The emphatic title of this section only stands to underline the key issue we are currently facing, associated with the worldwide deterioration of sovereign creditworthiness.

Here I want to focus on the events in Europe, which I believe help uncover additional pathologies caused by the dwindling role of sovereigns in the financial system. The development of the sovereign crisis in Europe has shattered a decade of stability since the introduction of the euro. The European financial system has undergone a number of concerted reforms, under the name of the Financial Services Action Plan (FSAP) aimed at eliminating many barriers to integration – though some of the most important structural reforms, those pertaining to the so-called financial market infrastructure, clearing and settlement systems, have been stopped by interested parties.

The explosion of the sovereign crisis has helped highlight the role of sovereign assets in the financial system. The immediate impact of the crisis has been on the banking system, which in many countries is the largest holder of government debt for the reasons described in Section 2: market-making and low balance sheet costs.

And through the bank channel the crisis has spread to the rest of the system. For example:

- Large country factors have re-emerged in equities markets.
- Identical corporate credits in different countries have been priced differently, off the domestic sovereign rates.
- Securities clearing and settlement systems are showing strains, originating from cross-country business.
- Authorities in some countries have mandated financial institutions to match geographically their assets and liabilities.

Hence the sovereign crisis in Europe has stirred a process of disintegration of the financial system. More narrowly, it has demonstrated that a truly integrated system needs one single reference asset. In the absence of full pooling of sovereign risk, which, as Brunnermeier et al (2011) have shown, does not require a system of fiscal transfers across member states, full integration of the financial system in Europe is unlikely to be achieved.

## 5. Concluding remarks: which way forward?

The first concluding observation from my discussion of safe assets and the role of sovereigns is that safe sovereigns are necessary for a properly working financial system. This conclusion stems from two observations. First, frictions in financial markets need efficient means of transactions, ie they need risk-free assets. Short-term government securities are the first candidate for that role.

The second reason why I see a central role for government issuers is based on the general observation that governments have a comparative advantage in the supply of safety in our economies. Governments have a comparative advantage in

risk aggregation and governments have direct and efficient access to allocation of resources through the tax and spending system.

Even the large production of privately issued collateral that characterised the years up to the 2008 financial crisis relied implicitly on a perceived government backstop: indeed, one that materialised through the bailout of the banking system in numerous countries.

These observations lead me to suggest two main areas of analysis and initiatives by authorities in the coming years:

1. Managing the nonlinear dynamics of systemic risk, which has proven to have destructive effects on public finances: this will require careful monitoring – and perhaps in the future targeting – of collateral aggregates.
2. Figuring out ways to revalue the role of governments in the production of safe assets: much as private financial markets have used diversification and tranching to produce safety, governments could use the same tools, more effectively than the private sector.

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