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The Debate over Sovereign Risk, Safe Assets, and the Risk-Free Rate: What are the Implications for Sovereign Issuers?[*]

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Abstract

This paper seeks to dispel or at least reduce the confusion surrounding the related key concepts of the risk-free rate, safe assets, and sovereign risk, which are central to policy and academic discussions. This confusion gives rise to a lack of consensus as to how to define, measure, and price "sovereign risk," thus creating a major obstacle to assessing sovereign borrowers' stress.

In this paper, safe assets are considered to be those that are virtually default-free. These so-called safe assets function as "information-insensitive" instruments (they serve as "money" and have the associated basic functions of money, such as collateral and backing of checkable deposits of commercial banks and money-market funds). The return on these assets is the (relatively) risk-free rate.

The pricing of risky assets involves assessing or evaluating the risk dimensions of relative asset safety. A significant complication in carrying this out is the fact that the market is often driven by emotions, or animal spirits. Sometimes these market emotions change rapidly, having a knock-on effect on the (mis)pricing of relatively safe assets and sovereign risk. The track record of

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sovereign-risk pricing is not very impressive, characterized by prolonged periods of risk under-pricing (excessively compressed spreads) followed by risk overpricing (sudden widening of spreads). Market measurements (including ratings) thus seem somewhat unreliable. *One should, therefore, be extremely cautious in concluding that the sovereign debt of an OECD country has indeed lost its "risk-free" status.* At the same time, the overarching strategic objective of debt managers is to raise funds at the lowest possible cost within the boundaries of a preferred risk level. *This implies for the sovereign borrower a two-part goal: issuing (relatively) risk-free sovereign debt and preserving this relatively risk-free status.* Reinforcing government borrowers' focus on this strategic objective is the knowledge that a steady supply of safe sovereign assets is essential for the smooth functioning of the worldwide financial system (for allocating resources, pricing benchmarks, and as a collateral source).

Clarity and consistency are necessary conditions for the proper pricing of sovereign risk. Beyond that, the proper pricing of sovereign risk has implications for the economy as a whole (via the impact on risk-weight rules for capital adequacy of banks, posting sovereign debt as collateral, the pricing of bonds issued by banks and other non-governmental entities). The transition from a (relatively) "risk-free asset" to a (relatively) "risky asset" has therefore major macro and micro financial ramifications.

JEL Codes: E43, E61, E62, F34, G18, H63, H68

Key words: Risk-Free Rate, Safe Assets, Sovereign Risk, Mispricing, Sovereign Issuers

1. Introduction

A lack of consensus arising from widespread confusion as to how to define, measure, and price "sovereign risk" is hobbling current attempts to assess sovereign borrowers' stress[1]. This is doubly unfortunate because it is happening at a time when sovereign stress is occupying centre-stage in the concerns of market participants and policymakers in several OECD countries. Indeed, recent fears of a possible breakup of the entire Euro area resulted in high borrowing rates and fragmentation among sovereign funding markets.

This situation is being further aggravated by confusion about the related key concepts of sovereign risk, safe assets, and the risk-free rate. This confusion, in turn, complicates the correct assessment of changes in the supply of safe public assets.

Since the track record of sovereign-risk pricing is far from impressive, the prevailing market measures of this risk (including ratings) should be regarded with great caution. One should, therefore, be wary of concluding that the sovereign debt of an OECD country has indeed lost its "risk-free" or "ultra-safe" status. Moreover, debt-quality downgrades by the rating agencies for several OECD sovereign borrowers and changes in the interest rates attached to their borrowings may give conflicting signals. Clearly, rating downgrades in and of themselves should not be taken at face value; rather, their implications for the overall supply of safe sovereign assets should be carefully scrutinized.

Against this backdrop, this paper argues that the overarching strategic objective of debt managers should be to raise funds at the lowest possible cost within the boundaries of a preferred risk level. *This implies for the sovereign borrower a two-part goal: issuing (relatively) risk-free sovereign debt and preserving this relatively risk-free status.* Reinforcing government borrowers' focus on this strategic objective is the knowledge that a steady supply of safe sovereign assets is essential for the smooth functioning of the worldwide financial system (for allocating resources, pricing benchmarks, and as a collateral source). Furthermore, the transition from a (relatively) risk-free asset to a (relatively) risky asset brings with it major macro and micro financial ramifications.

2. Concerns about sovereign stress

The slow recovery in the OECD economies is making fiscal adjustment more challenging (in particular within the Euro area). Nonetheless, there has

[1] Blommestein and Ibarlucea Flores (Forthcoming).

been progress in strengthening OECD fiscal balances during the past two years. For the OECD area as a whole, deficits fell by around 1% of GDP in 2011 and 2012 (standing at 6.5% in 2011, while they are estimated to have reached 5.5% in 2012[2], and are projected to fall to 4.6% of GDP in 2013). However, in many countries, deficits and gross borrowing needs are not declining enough to stop the rise in public debt (including in relation to GDP).

As a result, general government gross debt outstanding increased by 5.8% of GDP in 2012 (in 2011, the debt-to-GDP ratio was 102.9% and is estimated to have reached 108.7% in 2012)[3]. In 2014, general government debt as a percentage of GDP is projected to touch 112.5 %, up from 111.4 % in 2013.

Ever since markets became nervous about perceived higher sovereign-risk levels, policymakers have been shifting more of their attention to government debt and deficit figures. While it is welcome, this greater focus on sovereign risk has had a down side: it has amplified the potential for trouble developing in governments' borrowing operations, including (ultra-)high interest rates and auction failures. Roll-over risk has emerged as another main policy concern for debt managers, in particular in countries with (perceived) debt-sustainability problems.

3. Confusion surrounding the concept of sovereign risk

Since 2010, the sovereign-debt crisis in the Euro area has fuelled a debate among rating agencies, policymakers (including public-debt managers, bank regulators, fiscal authorities, and central bankers), and academics that has only added to the existing confusion. At its heart is a fundamental lack of agreement on what exactly sovereign risk is, but equally challenging to all stakeholders is the question of to what extent and in what way related concepts, such as the risk-free rate, safe assets, and sovereign risk, interact with one another.

3.1 How to define sovereign risk?

Sovereign risk can be defined as the absence of safe sovereign assets[4]. The most common and simplest approach is to define relatively safe sovereign assets as being virtually default-free in nominal terms (that is, credit risk is absent). Such relatively safe sovereign assets are part of the universe of safe assets having relatively risk-free interest rates. They are considered to have

[2] OECD (2012).
[3] OECD (2012).
[4] Blommestein and Ibarlucea Flores (Forthcoming).

low (virtually zero) sovereign risk. This universe of safe assets ranges from absolutely safe Arrow-Debreu securities to relatively safe sovereign assets that have (very) low risk in terms of one or more risk dimensions.

The most simplistic definition of sovereign risk can then be stated as follows; sovereign risk is associated with national government borrowers that issue debt that is not (or no longer) viewed as being virtually default-free in nominal terms. These sovereign issuers do not possess (or have lost) the risk-free interest-rate status.

3.2 How to measure sovereign risk?

More complex versions of sovereign risk can be defined in terms of additional risk dimensions[5]. Recent contributors to the ongoing debate have been touting a set of indicators that supposedly capture sovereign risk; these diagnostic criteria range from macroeconomic formulas to financial ones through to credit ratings[6]. All in all, however, despite the presence of both strengths and weaknesses in each of the recommended approaches, no single one has emerged as entirely satisfactory. In particular, those attempting to assess sovereign risk first need to understand what each indicator is actually revealing and realize that certain indicators are influenced by outside factors[7].

3.3 How useful are suggested market measurements of sovereign risk?

Clearly, there is no one-size-fits-all solution to the challenge of pricing sovereign risk in a reliable and comprehensive fashion. For example, while both credit ratings and credit-default swap (CDS) spreads claim to reflect the expected risk of default, the fact that CDS spreads are determined not just by economic fundamentals but also by (at times elusive) market factors of supply and demand like global risk aversion means that there may be times (perhaps quite frequently) when these indicators give contradictory messages. Moreover, research shows that so-called animal spirits dominate fundamentals in explaining CDS spreads, especially during financial crises[8].

Credit rating agencies (CRAs) claim that their pronouncements on countries' creditworthiness represent fundamental assessments of underlying sovereign credit risk. Interestingly, several empirical studies have documented that market indicators of risk, such as credit-default swaps or swap spreads,

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5 Blommestein and Ibarlucea Flores (Forthcoming).
6 Blommestein, Guzzo and Holland (2010).
7 Blommestein, Guzzo and Holland (2010).
8 Blommestein, Eijffinger and Qian (2012).

start to move when credit quality deteriorates and improve well ahead of a sovereign rating action. This implies that the market often leads decisions by rating agencies and calls into question the very value of credit ratings[9]. This has sparked calls for a new focus on market indicators of sovereign risk on the part of debt managers, investors, and policymakers, instead of relying on the traditional credit rating agencies.

However, these market indicators should also be regarded with care. For example, *sovereign interest-rate spreads* have been judged *unreliable*. A study of the link between sovereign bond yield spreads and the risk of debt restructuring supports this point of view, in particular its main conclusion that "markets sounded false alarms in the vast majority of episodes."[10]

CDS spreads are also potentially unreliable predictors of defaults and sovereign debt restructurings. Theoretical research shows that the relationship between CDS spreads and bond yield spreads holds fairly well for corporations[11]. Likewise, empirical studies demonstrate that the link between sovereign CDS spreads and sovereign bond yield spreads is fairly tight[12]. This means that, like sovereign bond yield spreads, *sovereign CDS spreads* have to be considered *unreliable predictors* of (potential) defaults in sovereign debt markets.

Yet, sovereign CDS prices are widely interpreted as probabilities of default[13]. However, these spreads, just like any other asset price, depend on the global level of risk aversion in addition to the actual probability of default of the sovereign[14]. Risk aversion (and other global macroeconomic and financial market risks) constantly fluctuates. Hence, it is very likely that over the past few years, risk-averse investors revised the price they were willing to pay for receiving income in such uncertain and challenging times. Clearly, this development has influenced the price of sovereign protection, without implying any higher or lower default probabilities.

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9 See also Blommestein and Ibarlucea Flores (Forthcoming).

10 Cottarelli, Forni, Gottschalk and Mauro (2010).

11 Hull, Predescu and White (2004).

12 See the estimates using various econometric methodologies in Blommestein and Ibarlucea Flores (Forthcoming).

13 By simply dividing the level of the swap spread by its recovery rate.

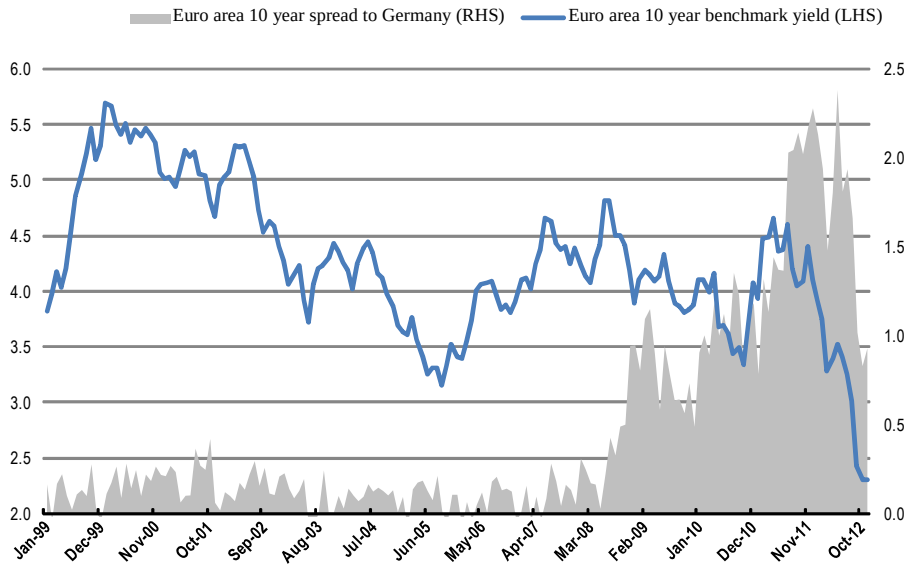
14 The interpretation of what CDS spreads actually convey as information is further complicated by suggestions that there are different potential common sources of global or systemic macroeconomic and financial market risks (i.e. global market factors, investment flows, global risk premiums) in addition to sovereign-specific fundamentals. (See Vilmunen (2011), and Longstaff, Pan, Pedersen and Singleton (2011)). Longstaff and Ang (2011) find that US and European systemic sovereign risk is strongly related to financial market variables (rather than macroeconomic fundamentals).

4. Mispricing of sovereign risk?

Another (and related) reason why analysts should be leery of market measurements of sovereign risk is their lackluster track record. It has been marked by long periods of complacency (or optimism), during which risk premiums and risk perceptions were unusually low, while—in reality—risks were building up. Thus, a prolonged period of risk underpricing, seen in excessively compressed spreads, would be followed by a sudden widening of spreads, reflecting systematic overpricing of sovereign risk[15] (Figures 1 and 2). *One should, therefore, be very cautious before concluding that the sovereign debt of an OECD country has indeed lost its risk-free status.*

Figure 1. Euro area 10-year government bond yield and spread to Bund (1999-2012)

(Percentage)



Note: Cut-off date is 1 December 2012.
Source: ECB, Datastream, and calculations by the author.

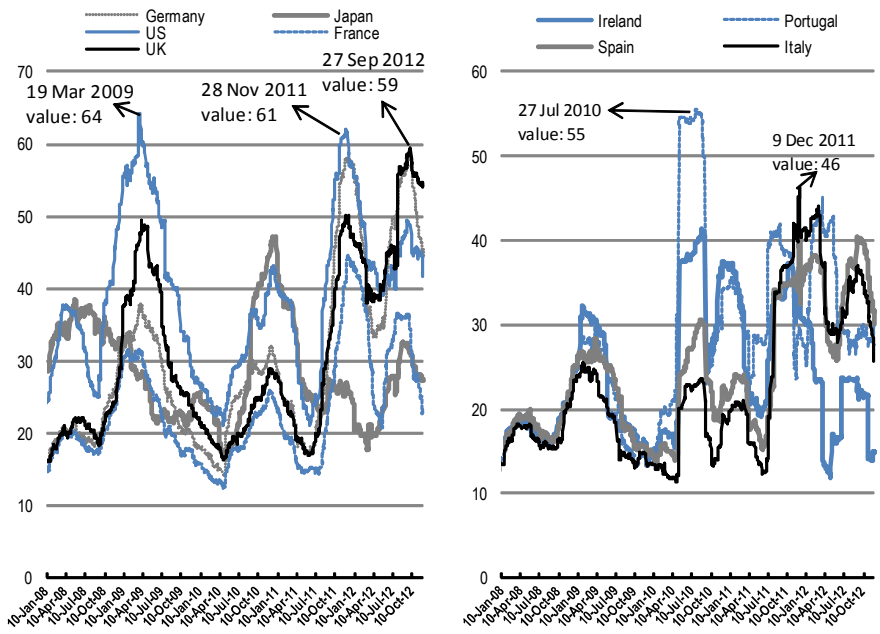
The mispricing of sovereign risk arises from various sources: (i) disagreements (and uncertainty) over how to define and measure the very concept of sovereign risk; (ii) periods marked by dysfunctional debt markets, characterized by high uncertainty (see Figures 2 and 3) and great instability[16]; (iii)

[15] Hannoun (2011).
[16] Bini Smaghi (2011).

sudden market mood swings between optimism and pessimism (aka animal spirits), leading to sustained periods of under- and over-pricing of sovereign risk[17]. As a result, market discipline does not operate consistently but spasmodically[18].

Figure 2. Historical volatility of 10-year benchmark yields (2008-2012)

(Percentages)



Note: Historical volatility is the annualized standard deviation of the change in daily yields of 10-year benchmark government bonds. The calculation uses a 90-day moving standard deviation.

Yield volatility is an indicator of risk arising from movements in interest rates. High volatility suggests less predictability of daily movements in bond yields. A number near zero indicates that daily bond yields are clustered around the average yield.

Source: Datastream and calculations by the author.

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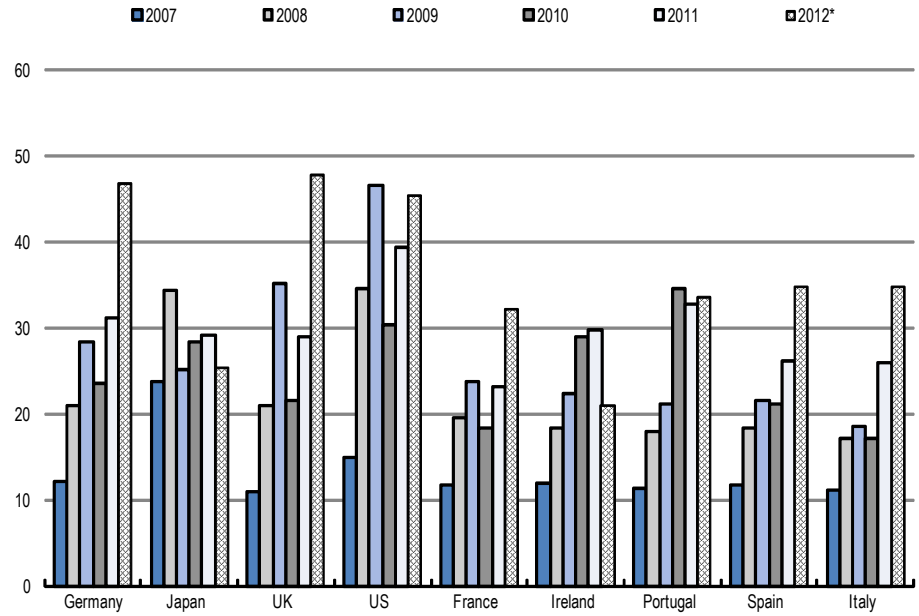
[17] De Grauwe and Ji (2012) found evidence that a large part of the surge in the spreads of the peripheral Euro area countries during 2010-2011 was disconnected from underlying changes in fundamentals (i.e., debt-to-GDP ratios). The authors state that instead, the increase in spreads "was the result of negative market sentiments…"

[18] This also implies that one cannot rely on markets to exert proper policy discipline. For example, "market discipline cannot be relied upon to foster fiscal rectitude." Hannoun, (2011, p. 2).

Figure 3. Historical volatility of 10-year benchmark yields, 2007-2012

(Percentages)



Note: Average of the historical volatility. The calculation of historical volatility uses 90-day moving standard deviation (annualized) of the change in daily yields of 10-year benchmark government bonds.
Yield volatility is an indicator of risk arising from movements in interest rates. High volatility suggests less predictability of daily movements in bond yields. A number near zero indicates that daily bond yields are clustered around the average yield.
* Average as of 30 November 2012
Source: Datastream and calculations by the author.

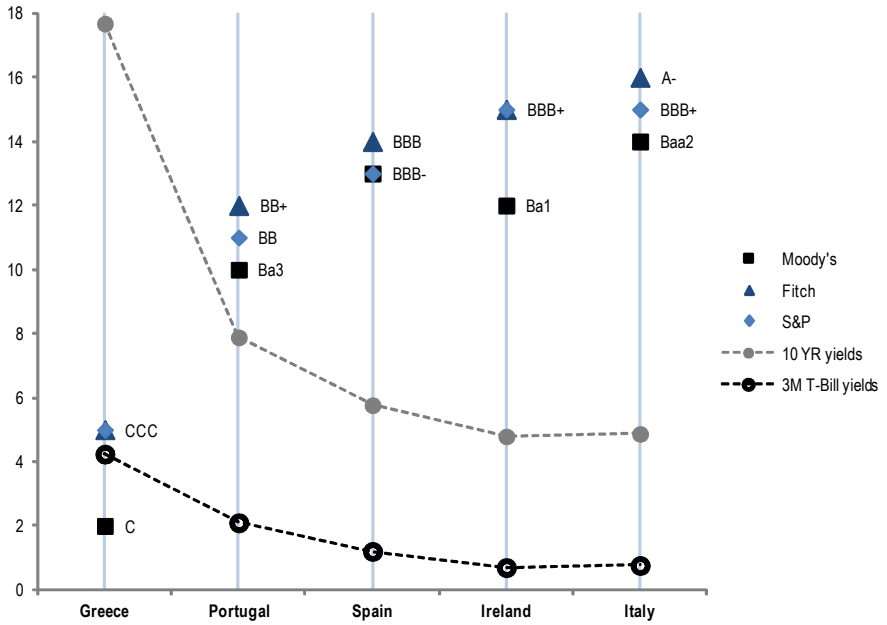
Yet another explanation for the existence of mispricing of soverign-issued debt instruments is abrupt changes in the supply of and demand for safe public assets. Such volatility, where, for example, a perceived shortage of safe assets emerges, could adversely impact market functioning. Nervousness[19] about the safety of assets and the related uncertainty over the correct pricing of a particular risk-free asset could lead to alarming market distortions and misalignments in the pricing of sovereign risk.

[19] This is *Knightian uncertainty*, as it reflects a situation where it is not possible to assign (objective) probabilities to measure risk.

5. Demand for and supply of safe sovereign assets

The demand for safe *sovereign*[20] assets has increased for several reasons: regulatory changes[21], non-conventional balance-sheet policies by central banks, heightened risk aversion (leading to the use of high-grade collateral in support of funding and other transactions), and a build-up of foreign-exchange reserves in certain countries.

Figure 4. Changes in credit ratings and yields



Note: Three-month T-bill rates are based on the latest issuance operations as of 17 October 2012.
Source: Datastream, credit ratings from Moody's, Fitch, and Standard and Poor's, and OECD staff estimates.

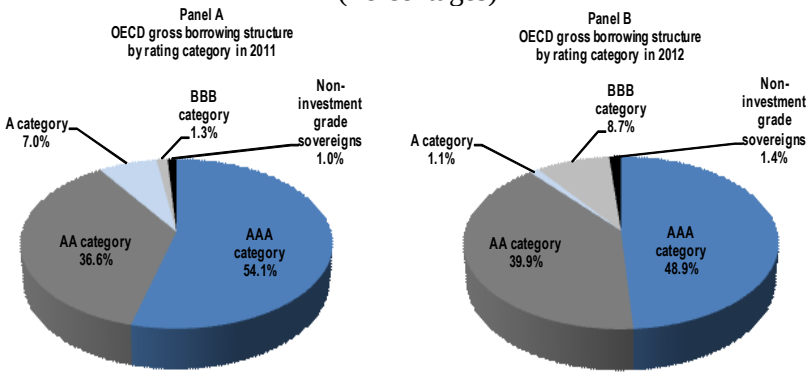
At the same time, the perception has been gaining ground that the supply of safe sovereign assets has fallen. In the wake of the Euro area sovereign-debt

[20] Since the focus is on public assets, this analysis does not take into account so-called safe *private* assets, such as securitized assets and corporate bonds of very high credit quality.

[21] For example, new requirements to change risk weights, set up liquidity buffers (for banks), obtain high- grade collateral, and begin greater use of central counterparties (CCPs) in OTC derivatives markets.

crisis that began in May 2010, the three big credit rating agencies (CRAs) began to downgrade sovereigns. Downgrades for the so-called peripheral countries of the Euro area are shown in Figure 4. This figure also shows that lower sovereign credit ratings are broadly associated with higher borrowing costs[22].

Figure 5. Structure of gross borrowing by rating category
(Percentages)



Note: The data used for the credit rating country groupings are from the three main credit rating agencies: Moody's, Fitch, and Standard and Poor's. The classification of an issuer as AAA is based on two of three best rating grades, that is, if a sovereign issuer has been granted triple-A status by two rating agencies, the country is classified as triple-A. For details, see the table of sovereign ratings in Annex A: Methods and Sources. Credit ratings and other data are as of 30 November 2012.
Source: 2012 Survey of central government marketable debt and borrowing by the OECD Working Party on Debt Management; credit ratings from Moody's, Fitch, and Standard and Poor's, and OECD staff estimates.

The big three CRAs use similar rating scales, with the highest-quality issuers receiving a triple-A grade. On the basis of the rating scales of these three CRAs, we have calculated average ratings as measures of safety (riskiness) of sovereign assets. We presumed that an AAA sovereign rating was a reliable representation of the "safest" sovereign assets. We further established that a sovereign issuer would be one classified as AAA when two out of the three main CRAs assign a triple-A rating (Rule #1) to it. According to our Rule #1, the recent downgrade of France, by two of the three leading CRAs, reduces the triple-A part of total marketable gross issuance by OECD *central* governments in 2012 from almost US$ 5.8 trillion[23] to US$ 5.3 trillion.[24]

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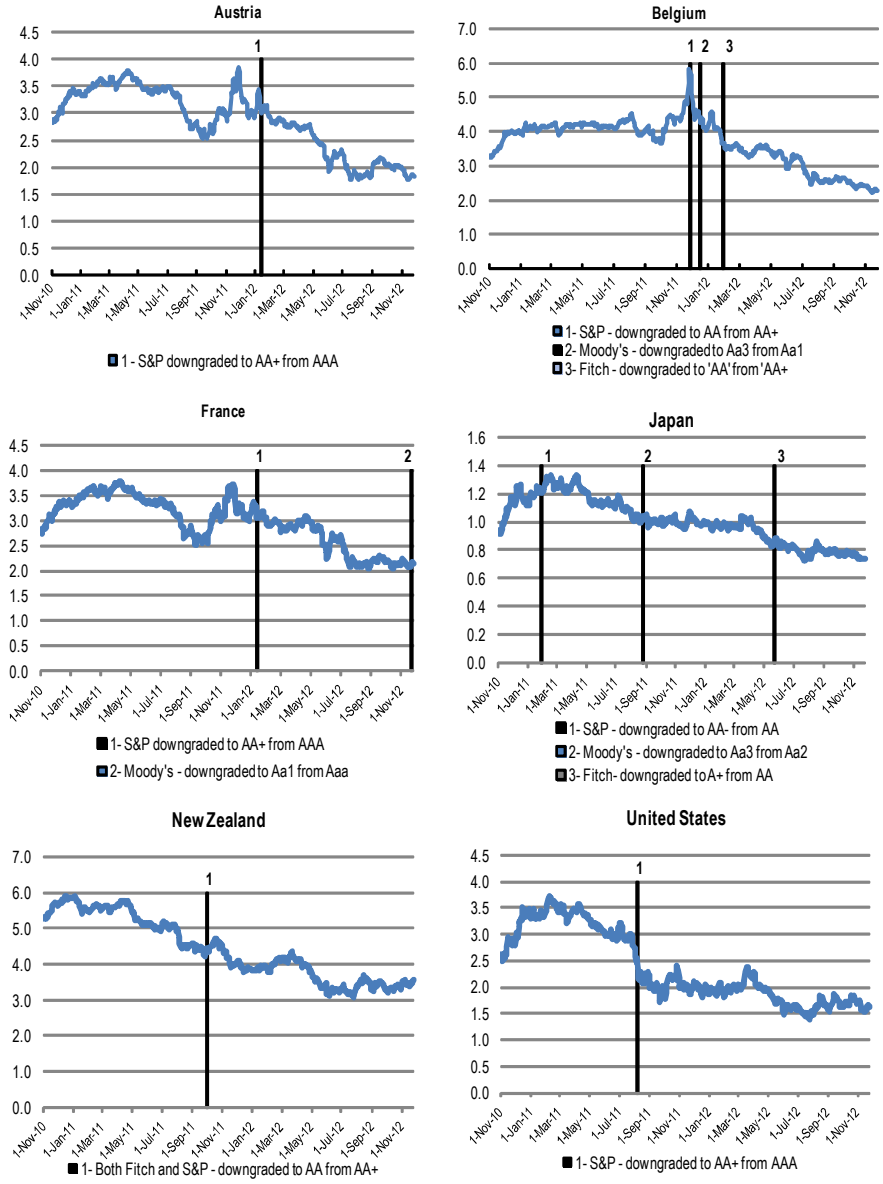
[22] Calculations using different econometric methodologies confirm this broad association.
[23] This amount represents about 54% of total marketable gross borrowing issuance (OECD (2013)).
[24] Or 49% of total marketable gross borrowing issuance by central OECD governments (OECD (2013)).

Figure 6. 10-year benchmark bond yields and credit events for selected OECD sovereigns

(Percentages)



Source: Datastream and credit ratings from Moody's, Fitch, and Standard and Poor's.

As a result of such rating downgrades during 2012, the gross borrowing structure by rating category has been transformed (compare Figure 5, panels A (situation in 2011) and B (new situation in 2012).

However, the market reaction to (many of) these rating downgrades has been quite extraordinary. In fact, many sovereigns experienced *lower* bond yields in the wake of the downgrade. Figure 6 shows the evolution of long-term borrowing costs (using 10-year benchmark bond yields) in response to sovereign rating downgrades. Naturally, these conflicting signals are raising fundamental questions about the inherent worth of sovereign credit-risk ratings.

How are we to reconcile the discrepancy in price signals? A recent report by one of the rating agencies provides some insight into how the CRAs themselves assess the usefulness of market indicators in arriving at a decision on credit ratings:

"Market indicators are useful but imperfect: While Fitch Ratings bases its ratings principally on underlying fundamentals, it also tracks market indicators to provide additional context as to markets' perception of risk and as an indication of future funding costs. However, market indicators need to be viewed cautiously, given the markets' tendency at times to overshoot and undershoot to levels that, in retrospect, may prove to be fundamentally unjustifiable."[25]

To repeat, this rating agency tracks market indicators to "provide additional context as to markets' perception of risk" but also (quite crucially) "as an indication of future funding costs." This means that market information is judged as important. At the same time, however, that same market information "may prove to be fundamentally unjustifiable." It remains, therefore, unclear how rating agencies can integrate into a single consistent framework both "underlying fundamentals" (to justify ratings) and key market indicators (that may prove to be fundamentally unjustifiable).

Against such a backdrop, can (or should) we then fully rely on the triple-A standard to confidently measure the safety of sovereign assets? In view of the contradictory signals coming from the CRAs on the one hand and the market indicators on the other, we re-calculated the change in the supply of safe sovereign assets by relaxing our *two-out-of-three rule*. This new rule—#2—is as follows: *If a sovereign is rated by one of the major agencies AAA or AA, then its issued debt is considered "safe."*

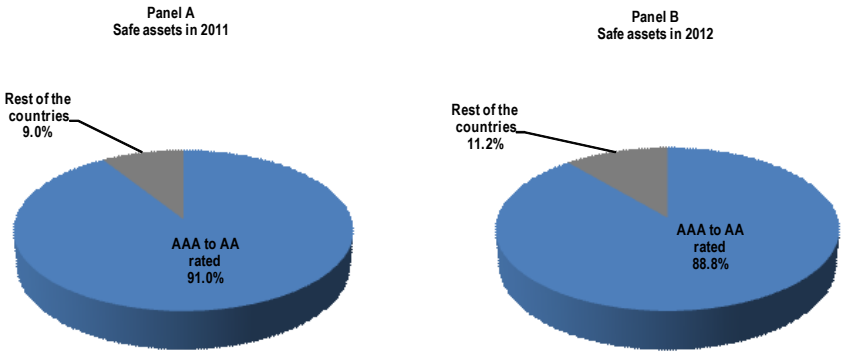
Using Rule #2 yields the following results. Combined AAA- and AA-rated OECD gross borrowing amounts are estimated to have reached US$ 9.6 tril-

[25] Fitch Ratings (2012).

lion at the end of 2012, or 88.8% of the total issuance by OECD governments, down from 91% in 2011 (see panels A and B of Figure 7 on OECD gross borrowing by rating). For 2013, the combined triple-A and double-A borrowing amounts are projected to remain almost the same as in 2012. In other words, according to Rule #2, the supply of relatively safe assets will not change much.

Figure 7. OECD gross borrowing by rating

(Percentages)



Note: The data used for the credit rating country groupings are from the three main credit rating agencies: Moody's, Fitch, and Standard and Poor's. If a sovereign is rated by one of the major agencies AAA or AA, then the asset is considered "safe." For details, see the table of sovereign ratings in Annex A on Methods and Sources. Credit ratings and other data are as of 30 November 2012.
Source: 2012 Survey on central government marketable debt and borrowing by the OECD Working Party on Debt Management; credit ratings are from Moody's, Fitch, and Standard and Poor's, and OECD staff estimates.

6. What are the implications for sovereigns?

Safe sovereign assets play a pivotal role in the financial sector. They function as so-called information-insensitive instruments (they serve as "money" and have the associated basic functions of money, such as collateral and backing of checkable deposits of commercial banks and money-market funds). In effect, relatively risk-free government paper is a core public good (allocating resources, pricing benchmarks, and collateral sources).

We have shown that the track record of sovereign-risk pricing leaves a lot to be desired. Prolonged periods of risk under-pricing (excessively com-

pressed spreads) have been followed by risk overpricing (sudden widening of spreads). We have argued that sovereign-risk mispricing is a natural concomitant of widespread confusion over the very concept of risk; indeed, there is not even agreement among all those concerned on the definition of sovereign risk (with multiple definitions circulating), making the measurement and pricing of this risk highly problematic. Even worse, market measurements of sovereign risk often cancel each other out, making their information value dubious and of little value to policymakers.

One should, therefore, exercise the utmost restraint before concluding, on the basis of such flawed measurements, that the sovereign debt of an OECD country has indeed lost its risk-free status.

What are the implications of these conclusions for the core objective of sovereign issuers or governmental Debt Management Offices (DMOs)? DMOs are in the business of raising funds at the lowest possible cost within the boundaries of a preferred risk level (interest-rate risk and refinancing risk). Clearly, relatively risk-free government instruments will carry a lower yield than riskier government debt. Moreover, as noted, relatively risk-free government paper can be considered a core public-good. Therefore, both the objective of having lower borrowing costs and the commitment to ensuring the wide availability in the markets of relatively risk-free investment instruments support the notion that sovereign governments need to aim to issue *(relatively) risk-free sovereign debt.* In other words, the risk-free status of sovereign debt should be seen as a core objective.

This implies that the sovereign should do everything in its power to *guard this risk-free status*. Announcing (*ex ante*) private-sector involvement (PSI) schemes and other debt-restructuring facilitating features are in principle *inconsistent* with upholding the supply of relatively risk-free debt. Restructuring of outstanding government debt has been compared to shooting oneself in the foot—especially when most sovereign assets are held by domestic institutions, such as pension funds. The evidence is compelling: since the autumn of 2010, "certain Euro area countries have been paying a specific risk premium, which effectively penalizes them."[26] In response, EU leaders decided on 9 December 2011 to dramatically alter their approach to PSI. In sum, investors should not be exposed to arbitrary restructuring actions. Restructuring should therefore only be contemplated in extreme situations caused by traumatic exogenous events.

[26] Bini Smaghi (2011).

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