

The Future of Sovereign Borrowing in Europe

THE FUTURE OF SOVEREIGN BORROWING IN EUROPE

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TABLE OF CONTENTS

List of Authors.....	5
1. Key Findings of a Conference Jointly Organized by SUERF, OeNB and BWG on March 8, 2013, in Vienna	7
<i>Ernest Gnan and Johannes Holler</i>	
1.1. Framing the Discussion on the Future of Sovereign Borrowing	7
1.2. Questioning the Conventional Wisdom on Debt Sustainability	8
1.3. Reacting to the Changed Environment	9
1.4. Reviewing the Role of Sovereign Debt for Monetary and Financial Stability	12
1.5. Improving Risk Management and Prudence of Sovereign Borrowing	14
1.6. Conclusions.....	16
2. Opening Address SUERF/OeNB/BWG Conference on ‘The Future of Sovereign Borrowing in Europe’	19
<i>Ewald Nowotny</i>	
2.1. The Future of Sovereign Debt Markets Is Crucial in Many Respects	19
2.2. A Short History of Euro Area Sovereign Debt since the 1990s	20
2.3. The Impact on Monetary Policy Efficiency and Financial Stability.....	21
2.4. Eurosystem and Crisis Resolution Mechanisms Become New Players in European Sovereign Bond Markets	22
2.5. Regulatory Considerations	22
2.6. Sovereign Debt Management.....	23
2.7. Lessons Learned and a Few Conclusions.....	24
3. The Future of Sovereign Borrowing in Europe	27
<i>Alessandro Missale</i>	
3.1. Introduction	27
3.2. Debt Sustainability: the Role of Expectations	29
3.2.1. Market Sentiment and Yield Spreads: The Evidence	30
3.3. Policies for Crisis Prevention.....	33
3.3.1. Public Debt Management	33
3.3.2. Fiscal Rules	35
3.3.3. Fiscal Austerity	36
3.3.4. Money of Last Resort	37
3.4. The ESM-ECB Scheme for Crisis Prevention	40

3.5. Conclusions.....	42
References.....	43
4. Forces Shaping the OECD Sovereign Borrowing Outlook with Emphasis on the Challenges for European Sovereign Issuers.....	45
<i>Hans J. Blommestein</i>	
4.1. Introduction.....	45
4.2. OECD Sovereign Borrowing Outlook with a Closer Look at Issuance by EU Governments.....	46
4.3. The Explosion in Central Government Debt of Advanced Economies.....	48
4.4. Tough Issuance Conditions for Sovereign Issuers, Notably for Several European Ones.....	50
4.5. Loss of Market Access by European Countries and Efforts to Return to (international) Longer-term Markets.....	53
4.6. Game Changing Policy Responses to European Sovereign Debt Markets under Severe Stress.....	53
4.7. Conclusions.....	56
References.....	56
Annex: Country Groupings.....	57
5. European Debt Crisis and Crisis Resolution Policies.....	59
<i>Juha Kilponen</i>	
5.1. Introduction.....	59
5.2. Historical Context.....	59
5.3. Road to Debt Crises.....	61
5.4. European Crises Resolution Policies.....	63
5.5. Effectiveness of European Crises Resolution Policies.....	64
5.6. Conclusions.....	65
6. The Role of Sovereign Debt in Monetary Policy Implementation – An International Comparative Perspective.....	67
<i>Ulrich Bindseil and Nicolas Sauter</i>	
Abstract.....	67
6.1. Introduction.....	67
6.2. Theory.....	68
6.2.1. Outright Holdings of Sovereign Debt.....	69
6.2.2. Collateral Framework – Broad versus Narrow Collateral Set.....	70
6.2.3. Two Fundamental Central Bank Doctrines: the ‘Consolidated State Sector’ versus ‘Central Bank Independence’.....	71

6.3.	Practice and International Comparison	72
6.3.1.	Comparison of Outright Holdings in Normal Times	73
6.3.2.	Comparison of Asset Purchase Programmes in Times of Crisis	74
6.3.3.	Comparison of Collateral Frameworks	79
6.3.4.	Comparison of Outright and Repurchase Operations	83
6.4.	Conclusions	83
	References	85
7.	Risk Management of a Public Debt Portfolio: The Italian Experience	87
	<i>Maria Cannata Bonfrate</i>	
7.1.	Introduction	87
7.2.	The 1980s	87
7.3.	From the 1992 Crisis to the EMU	89
7.4.	The Euro Single Market	92
7.5.	The Current Financial Crisis	94
7.6.	Conclusions	97
	References	97
8.	GDP-Indexed Bonds: A Tool to Reduce Macroeconomic Risk?	101
	<i>Guido Sandleris and Mark L.J. Wright</i>	
	Abstract	101
8.1.	Introduction	101
8.2.	The Experience with Indexed Debt	103
8.2.1.	Indexed Sovereign Debt	103
8.2.2.	Real-indexed Sovereign Debt	105
8.3.	Alternative Forms of Indexation	109
8.4.	Why Don't We Observe More Real Indexed Debt?	111
8.4.1.	The Existence of Substitutes for Real-Indexed Debt	111
8.4.2.	Fixed Costs of Market Set-Up	112
8.4.3.	Moral Hazard and Incentives to Misrepresent Data	113
8.4.4.	Political Costs	115
8.5.	Conclusions	116
	References	116

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1. KEY FINDINGS OF A CONFERENCE JOINTLY ORGANIZED BY SUERF, OeNB AND BWG ON MARCH 8, 2013, IN VIENNA

Ernest Gnan and Johannes Holler

In March 2013 around 130 participants from academia, banking and finance, governments and central banking gathered at the premises of the OeNB in Vienna for a conference jointly organized by the European Money and Finance Forum SUERF, the OeNB and the Austrian Society for Bank Research to discuss “The Future of Sovereign Borrowing.” The financial, economic and sovereign debt crisis has fundamentally changed the rules of the game in sovereign debt markets, particularly in the euro area, but also beyond its borders. Sovereign bonds are no longer widely perceived as ‘risk-free’ assets. Even the sovereign bonds of safe-haven countries have come under close scrutiny or lost some of their prime ratings. Yet crisis countries have seen dramatic downgrades of their sovereign debt ratings so that they face soaring risk spreads and unsustainably high financing costs (or even a loss of access to bond market financing), pushing them towards shorter financing or forcing them to rely on financial support from other countries and the international community or massive intervention by central banks. Against this backdrop, the conference focused on three aspects: first, issuers and lenders reaction to the changed environment (session 1); second, implications of the current and likely future state of public finances and debt markets for financial stability, monetary policy and central banks (session 2); and third, ways to improve risk management and foster caution in future sovereign borrowing (session 3).

1.1. FRAMING THE DISCUSSION ON THE FUTURE OF SOVEREIGN BORROWING

In opening the conference, OeNB Governor Ewald Nowotny emphasized the importance of the topic, given that the ability to borrow centrally affects governments’ ability to conduct countercyclical policies, with direct operational and strategic ramifications for monetary policy, particularly in a monetary union. Dysfunctional sovereign debt markets hamper the monetary policy transmission mechanism and may seriously threaten financial and banking system stability. While the virtually zero sovereign risk premiums among euro area countries in the years up to the crisis did not properly reflect true risks, the very large spreads over the past two years were exaggerated, too – and both conditions are signs of market failure. The Eurosystem’s decisive measures to break the vicious circle

between sovereign bond market runs, financial system instability, dysfunctional monetary policy transmission and deep real economic impacts, together with the reform measures taken by EU governments, managed to calm the situation. While central bank independence is crucial for credibility, crisis management at the same time requires close coordination between the various legs of economic policies. Accordingly, the Eurosystem's readiness to undertake Outright Monetary Transactions (OMT) in secondary sovereign bond markets is firmly linked to economic reform programs agreed by recipient countries and approved by political authorities. At the same time, many open issues are yet to be evaluated, such as lessons from the debt crisis for debt management, the future perception of risk associated with sovereign bonds and, related to that, the optimal treatment of sovereign debt in banking supervision and regulation. Clearly, the fact that some economics textbooks bemoan the loss of a risk-free asset should not prompt us to ever again succumb to such an illusion.

1.2. QUESTIONING THE CONVENTIONAL WISDOM ON DEBT SUSTAINABILITY

The Keynote Address on “The Future of Sovereign Borrowing,” chaired by **Ernest Gnan**, SUERF Secretary General, was given by **Alessandro Missale**, Debt and Development Finance branch (UNCTAD) and University of Milan. He addressed three issues. First, he questioned the conventional wisdom on sovereign debt sustainability, based on the view that sovereign debt is sustainable as long as creditors are prepared to buy and hold it. Creditors are not concerned with debt levels as such but with debtors' perceived ability to pay. This is confirmed by financial markets' assessment of Japanese, U.S. or U.K. government debt as opposed to their assessment of Italian or Spanish government debt. Debt sustainability cannot be adequately captured by a single debt ratio as it depends on a mix of expectations about future fiscal surpluses, economic growth, interest rates and their interactions. This introduces an important self-fulfilling element: market panics can lead to self-fulfilling debt runs. Hence, sustainability is ultimately a matter of market sentiment. Using an indicator of ‘fiscal proximity’ (which captures the similarity among countries in terms of deficit and debt ratios), Favero and Missale (2012)¹ show that the impact of fiscal fundamentals on Italian and Spanish bond yields reflects the significant volatility of global market sentiment over time. When global market participants consider risks to be low, fundamentals have no effect on yield spreads; yet in periods of high risk aversion, market overreaction may itself become a source of instability.

¹ C. FAVERO and A. MISSALE, 2012, “Sovereign spreads in the Eurozone: which prospects for a Eurobond?”, *Economic Policy* 27(79), 231-273.

Second, Missale argued that, in order to prevent debt runs, debt management should aim to match fiscal surpluses with maturing debt, and that debt with longer maturities reduces default risk and risk premiums. Therefore, debt maturities are important fiscal fundamentals and should be taken into account as such in sustainability analysis. Swap contracts may conceal the ‘true’ maturity and should therefore be subject to greater transparency. The reinforced EU fiscal rules had failed to trigger positive market reactions, indicating low credibility. Fiscal austerity may become self-defeating but is unavoidable in crisis; to reduce its negative growth impact, fiscal consolidation should be pursued softly. Fiscal surpluses benefit sustainability more through expectations than through direct debt reduction effects. Growing out of debt is a very long process.

Third, Missale argued in favor of central banks acting as lender of last resort for governments in order to provide insurance to markets. EMU is special in that the Eurosystem is more clearly separated from national fiscal authorities than the central bank of a single nation state. The ECB’s OMT program reduces the likelihood of a panic equilibrium, but the conditionality attached to it reduces its effectiveness as a deterrent against market runs, and its use comes with a stigma.

1.3. REACTING TO THE CHANGED ENVIRONMENT

Session 1, chaired by **Ernest Gnan** and entitled “*Sovereign Borrowing – Adjusting to the New Environment*,” brought together the three perspectives of investors, issuers and policymakers. **Christopher Marks**, BNP Paribas, provided the market perspective with his presentation entitled “From the Sacred to the Profane”². Markets are well aware that the crisis has initiated a structural change in financial markets. Despite low yields and even negative real interest rates, funds continue to flow into global bond markets. The increase in stock prices over the past couple of months (the ‘Great Rotation’) does not reflect an outflow of funds from bond markets. In a very long-term perspective spanning three centuries, going back to 1700, nominal long-term bond yields moreover appear to be at normal levels. Currently, the European Union is undergoing a major reform process, which is very fast and far-reaching by historical standards. Given their complexity, the sum of these developments is difficult to price for financial markets, which is also why these developments have not been priced in in full as yet. Marks argued that European politicians had a poor understanding of bond markets, with the exception of ECB President Draghi and Italy’s former Prime Minister Mario Monti, who are very much aware of the fact that small pieces of information can make a big difference. Draghi’s announcement in July 2012

² No written paper is available for this intervention.

made the rules of the game very clear, namely that it is pointless to bet against the euro because the euro is here to stay. This has paved the way for stabilizing the markets, and is also the reason why recent political uncertainties in Italy have had very minor effects on Italian bond yields. Government investors clearly group euro area countries by liquidity and credit risk, which currently yields four groups: core, sub-core, peripherals, and distressed peripherals. When investing in euro area bonds, they consider commingled European sovereign risk, reflecting rescue mechanisms (ESM, EFSF, SMP, OMT), the limits of these mechanisms (conditionality), individual countries' political risk and contingent liabilities due to ailing banking systems or large industrial firms, and market liquidity and functioning more generally. Bond market developments have led to strongly diverging developments in the duration of euro area countries' bond issuance: While the core countries (Netherlands, Belgium and Germany) used their prevailing low yields to also issue long-term debt, Italy and Spain were forced to shorten durations dramatically. The financial transactions tax will sharply increase borrowing costs for European sovereign issuers (one debt management agency estimated that this tax would raise annual borrowing costs by 20 basis points). Some hedge funds consider banning trading euro area government bonds with European counterparties. Tighter provisioning rules may increase the cost of holding sovereign bonds for financial institutions. The broader definition of high quality liquid assets in the new Basel framework reduces the relative advantage of holding government bonds. Multi-asset funds increasingly take the place of old-style pure sovereign bond funds. Current public finance problems will take a whole generation to solve. Central banks will in one way or another (have to) play a role in this and will have to manage their independence very prudently.

Hans Blommestein, OECD, offered key insights from the OECD's "Sovereign Borrowing Outlook 2013" published a few days prior to the conference. In general, the sovereign debt crisis has emphasized rollover risk and brought a return of the home bias. Nowadays many sovereign debt management agencies try to reduce rollover risk, but not at all costs. Highly indebted countries in Europe and elsewhere should indeed lengthen the maturity of their sovereign debt. That said, they should not switch opportunistically between markets and maturities for short-term motifs. Between 2007 and 2012, many European countries have actually increased the average term to maturity of outstanding debt. In Italy and Spain the average term to maturity has dropped only slightly. Non-resident holdings of Spanish and Italian sovereign bond holdings have gone down markedly over the past two years. On the aggregate level, central government marketable debt as a fraction of GDP, while having increased substantially since 2007, is not exceptionally high in the euro area countries compared to G7 countries. Nevertheless sovereign debt levels are historically elevated. As a reaction to the European debt crisis the implementation of the

OMT program implied substantial changes for the European sovereign debt markets. ECB President Draghi's announcement of the OMT program brought Spanish and Italian yields down considerably across the entire yield curve, particularly at the short end. Finally, the crisis has also highlighted the difficulties associated with measuring sovereign risk. Market mispricing is linked to various sources: disagreement and uncertainty on how to define and measure sovereign risk, dysfunctional debt markets, and animal spirits. Therefore, market discipline does not work consistently but spasmodically.

Juha Kilponen, Bank of Finland, gave a presentation on the "European Debt Crisis and European Crisis Resolution Policies." He started out by recalling that the Werner Report of 1970 for the creation of a monetary union had, for good reason, envisaged a parallel creation of fiscal and monetary union, with full centralization of fiscal policy at the community level, including decision-making on budget size, fiscal balances, methods of financing and utilization of funds. By contrast, in the Delors Report of 1989 monetary union was designed to discipline other areas of economic decision-making. The outcome was a monetary union without a centralized fiscal policy. The current crisis was the result of several developments, including unified interest rates causing exuberance and credit bubbles, lax fiscal policies in several countries, strong private capital flows from core to peripheral countries (reflecting underpriced risks and the global savings and liquidity glut), a lack of incentives for deep economic reform, and the failure of both market and political disciplinary mechanisms. The crisis triggered a number of policy reforms, extending to fiscal policy, financial regulation and supervision, as well as monetary policy. An empirical analysis showed that the results of these policy measures on bond yields were significant for SMP and OMT programs, mixed for the EFSF and ESM, and negligible for the reforms of EU economic governance. Recent developments are encouraging: Ireland and Portugal are returning to capital markets, and investor sentiment towards Spain has also improved markedly over recent months, the EFSF and ESM have established themselves as supranational issuers able to refinance themselves at low rates, and the ECB's OMT announcement has successfully removed redenomination risk. In the post-crisis new market environment, increased market sensitivity should be good for fiscal discipline. By contrast, fiscal rules lack credibility given that they are constantly subject to renegotiation, and fiscal decision-making remains largely decentralized. The increasing home bias implies market fragmentation detrimental for the smooth functioning of the single monetary policy, possible crowding out of private investment and increasing real economic divergence. The environment for sovereign borrowing remains challenging. Monetary policy currently bears too large a share of the burden to cope with the crisis.

1.4. REVIEWING THE ROLE OF SOVEREIGN DEBT FOR MONETARY AND FINANCIAL STABILITY

Session 2, chaired by OeNB chief economist **Peter Mooslechner**, addressed the interlinkages between “*Sovereign Debt, Monetary and Financial Stability*.” The session’s first contribution, “The Role of Sovereign Debt in Monetary Policy Implementation – An International Comparative Perspective” by **Ulrich Bindseil**, European Central Bank, discussed the importance of sovereign debt for central banks’ outright holdings and repo operations. Central banks hold sovereign debt outright for several reasons. In normal times, sovereign debt holdings aim to secure low credit and liquidity risk for the central bank and a slim aggregate balance sheet for the state sector. In addition outright holdings offer the potential to increase the duration of the central bank balance sheet and reduce the volume of asset turnovers. In crisis times, sovereign debt is additionally held to influence asset prices, sovereign yields and long-term rates at large. Besides actively selecting the composition and size of outright holdings, central banks can steer the influence of sovereign bonds in monetary policy implementation by choosing the eligible collateral framework for repo operations. A broad collateral framework has the advantage of supporting high liquidity of the financial system while a narrow approach reduces risk-taking by central banks and prevents moral hazard in the sense of an undue reliance of commercial banks on central bank credit. The different treatment and use of sovereign debt in monetary policy implementation by the major central banks may reflect two different doctrines. Considering outright holdings, the Bank of England, the U.S. Fed and the Bank of Japan seem to follow a “consolidated state sector doctrine,” which views the central bank and government balance sheet in tandem; thus they do not see a major problem in buying large amounts of sovereign debt. By contrast, the ECB may be seen to follow a “central bank independence doctrine,” which sees the balances sheets of currently 17 euro area member states and the Eurosystem as distinct, and views central bank purchases of government debt as a potential risk to price stability; thus, the Eurosystem buys relatively small amounts of sovereign debt, even in the event of crisis, with these purchases being strictly limited to secondary market transactions and, in the case of the OMT program, subject to strict conditionality.

Martin Hellwig, Max Planck Institute for Research on Collective Goods, started his contribution “On the Treatment of Sovereign Borrowing in Banking Supervision and Regulation”³ with a review of the developments and origins of the sovereign debt crisis, where he focused on the lack of credible commitments by EU institutions and EU governments towards sustainable, stability-oriented

³ No written paper is available for this intervention.

policies, with a special reference to the violated SGP targets and no-bail out clause. Banking supervision and regulation played a key role in the evolution of the sovereign debt and financial crisis through the zero-risk treatment of sovereign bonds. The risk-free treatment of sovereign assets induced banks such as DEXIA and HRE to blow up their balance sheets, which implied extensive vulnerability to sovereign risk. While Basel II principles had already demanded sovereign debt to be backed by capital as well, the room for discretion left to national regulators by the EU Capital Requirements Directive supported the zero-risk treatment of sovereign debt. Treating sovereign debt as risk free also implied that the existing exposure rules for single assets were not applied to sovereigns, an issue that has been explicitly addressed by the Basel III principles but experiences strong opposition. The existing link between banks and sovereigns makes the current problems hard to solve for central banks, forcing them to fund governments to secure financial stability. Therefore, in addition to the two doctrines identified by Bindseil, Hellwig sees a potential third doctrine which includes not only the consolidated state sector but also the banking sector. The insufficient loss-absorption capacity of banks and the missing account for correlated risks call for an adjustment of the capital requirements framework. According to Hellwig, the paramount precondition for reversing capital outflows from peripheral countries would be to regulate large sovereign asset exposure. Furthermore, a banking union should by all means include a banking resolution authority.

Eric Leeper, Indiana University, who was prevented from attending the conference in person due to weather-induced flight cancellations, transmitted a video of his presentation entitled “Thinking about Fiscal Sustainability”⁴, which focused on the definition and implications of fiscal limits, the point at which countries’ surpluses can no longer adjust to stabilize government debt. At the fiscal limit, countries that lack control over the debt-denomination currency – which is also the case for euro area member states – have no other option than to default. Sample calculations for the probability distribution of the fiscal limit for Greece showed that higher productivity, stable growth in transfers and credibility of consolidation efforts lower the probability of reaching the fiscal limit at a given debt ratio. Regarding the current situation in the United States, this time *is* different. In the past, society was willing to accept shared sacrifices, *e.g.* to reduce a very high public debt burden. With political polarization being at all-time highs, the costs connected to the aging of the society imply increases of the future debt burden. Therefore the fiscal limit of the United States, which is ultimately always a political decision variable, might be lower than in the past. At the fiscal limit, countries controlling the currency of their issued debt have the additional policy

⁴ No written paper is available for this intervention. Some of the covered issues are addressed in B. HUIXIN and E. LEEPER, 2013, *Analyzing Fiscal Sustainability*, Bank of Canada Working Paper 2013-27.

option of devaluing real debt by means of inflation. At the fiscal limit monetary policy has to prevent the debt service from exploding by keeping real interest rates low. It therefore loses its ability to prevent ‘fiscal inflation’. The tradition of assigning inflation control and short-run stabilization to monetary policy rests on the assumption that fiscal policy fulfils the task of ensuring solvency at all times. These assignments are currently questioned by the fact that political outcomes might no longer support fiscal policies that can keep the economy sufficiently far from its fiscal limits. Recent research has already picked up this idea and shown that reversing the assignments can generate welfare nearly equivalent to consensus assignment.

1.5. IMPROVING RISK MANAGEMENT AND PRUDENCE OF SOVEREIGN BORROWING

Session 3, chaired by **Martha Oberndorfer**, Federal Financing Agency of Austria, focused on potential steps “*Towards More Prudent Sovereign Borrowing.*” By reviewing the strategies of Italian debt management over the last three decades in her presentation “Risk Management of Debt Portfolios,” **Maria Cannata Bonfrate**, Italian Treasury, identified various forms of risk associated with the extensive reliance on certain debt management instruments and argued for a medium- to long-term perspective which protects against the temptation to make use of short-term market developments. Past experience, such as the excessive reliance on T-bills which led to soaring funding costs in the 1980s or the increased reliance on long dated floaters implying high levels of interest rate risk which materialized after the monetary crisis in 1992, highlight the potential of debt management strategies to cause severe problems. As a reaction to these problems the Italian Treasury constantly increased the average life and the duration of the debt portfolio over time while allowing for a temporary shortening of maturities in difficult times (e.g. second half 2011 and 2012). Yet sovereign debt issuance strategies face trade-offs. A strategy that minimizes rollover risk by smooth redemption profiles is challenged by markets’ preference for concentration in coupon cycles and common expiring dates for nominal debt and inflation linkers. Despite the fact that the debt manager can make use of buy-backs and exchange operations (e.g. EUR 5 billion in 2011) debt redemption pikes cannot always be prevented. For 2013 the Italian Treasury has scheduled a further lengthening of the average life and duration of Italian debt. Moreover, following the successful launch of inflation-linked bonds in 2012, a new 30-year government bond indexed to Italian inflation (‘BTP Italia’) will be issued when market conditions appear to be favourable. The usual hedge of currency risk via currency swaps will be continued.

The presentation entitled “GDP-Indexed Bonds: A Tool to Reduce Macro Risk?” by **Guido Sandleris**, Universidad Torcuato di Tella (Buenos Aires), focused on the benefits and design of indexed debt contracts. Besides collective action clauses and seniority clauses, debt indexation can be seen as a possibility to reduce the cost of sovereign debt renegotiations. Real-indexed debt contracts further make debt crises less likely, allow for better risk-sharing and counteract procyclical fiscal policy. In the past only a few countries have issued indexed debt, either in the form of GDP indexation (Costa Rica, Bosnia-Herzegovina, Bulgaria, Argentina and Greece), commodity price indexation (United States, France, Mexico, Nigeria and Venezuela) or fiscal revenue indexation (Spain). Index variables that are under the control of the issuer, such as government revenues or expenditures which would provide the best insurance, may give rise to moral hazard problems. Variables that are harder to manipulate but still correlate with revenues or expenditures are therefore preferable (GDP or commodity price indexation). A simulation of debt servicing costs for Argentina showed that, with reliance on GDP-indexed bonds, debt servicing costs would have been much lower than actually observed before the crisis, but substantially higher following the crisis, from 2003 onwards. So if GDP-indexed bonds are conceptually so appealing, why do we not see widespread use of the instrument? Possible answers include large fixed costs of market set-up, incentives to misrepresent data, unattractiveness during good times and alternative hedging options that already exist, such as simple variable interest rate bonds.

Representing UNCTAD, which launched an initiative to promote responsible sovereign lending and borrowing practices in 2009, **Juan Pablo Bohoslavsky** presented the current status of the “UNCTAD Principles of Sovereign Lending and Borrowing”⁵. These principles, which emerged from contributions of a group of experts in law and economics and which are still open for discussion, highlight that both the borrower and the lender have responsibilities and duties. Lenders should be obliged to provide all necessary information to allow for a proper evaluation of the risks and benefits of the financial products they offer. Lenders also have to evaluate the capacity of borrowers to repay a given credit and have to comply with UN sanctions imposed against a governmental regime. In case of debt restructurings all lenders must behave in good faith and with cooperative spirit to reach a consensual rearrangement of obligations. In the context of project financing, sovereign borrowers should also conduct ex ante investigations into the financial, operational, civil, social, cultural and environmental implications of the project and its funding. Borrowers have to act in the interest of their citizens and honour binding obligations. Further principles include transparency,

⁵ No written paper is available for this intervention. The current version of the UNCTAD principles can be found at www.unctad.info/en/Debt-Portal/Project-Promoting-Responsible-Sovereign-Lending-and-Borrowing/About-the-Project/Principles-on-Responsible-Sovereign-Lending-and-Borrowing/.

disclosure and publication of debt obligations and liabilities as well as adequate management and monitoring of debt portfolios. Governments further have a responsibility to perform a cost-benefit analysis for their investments financed by liabilities. If restructuring is unavoidable, it should be undertaken promptly, efficiently and fairly.

1.6. CONCLUSIONS

In sum, the conference on “The Future of Sovereign Borrowing” established the view that European sovereign debt markets have indeed undergone, and are still undergoing, substantial and lasting changes as a result of the crisis, with important consequences for governments’ fiscal scope and debt management, for monetary policy and for financial stability.

There is no uniform definition of fiscal sustainability, which in turn has implications for adequate crisis management measures. Some economists emphasize the possible self-fulfilling nature of market forces impacting on debt sustainability and consequently call for massive intervention in the event of sovereign debt runs, in particular by central banks. Others emphasize that governments share a substantial part of the blame for the sovereign debt crisis, having neglected principles of good fiscal governance and provoked banking system vulnerability through prudential rules that encouraged large exposures to individual sovereign borrowers. Hence, they call for a stricter enforcement of fiscal rules and for non-preferential treatment of government debt in bank regulation.

That sovereign debt is not a risk-free asset was in principle already reflected in the Basel II framework; however, the room for discretion left to national supervision and regulation by the EU Capital Requirements Directive prevented an enforced treatment of sovereign debt as a risky asset. The application of risk weights and of a leverage ratio for sovereign assets were identified as necessary conditions for breaking the adverse feedback loop between banks and sovereigns.

Central banks’ interventions in sovereign debt markets may reflect different doctrines (possibly related to the difference between single states with a currency of their own and the euro area, where a ‘consolidated view’ of central bank and government balance sheets is difficult or impossible) or different aims (influencing risk-free long-term rates versus correcting for excessive risk premiums in some bond market segments). In terms of effectiveness to counter the crisis, the SMP and OMT programs were generally seen as most successful, while the reformed EU fiscal rules framework was not found to have gained credibility so far.

Given the problems to secure political majorities for painful but necessary fiscal adjustments, including substantial reductions of debt ratios even over the medium to long term, the consensus division of tasks between fiscal policy and monetary policy is currently challenged. Central banks may come to feel substantial pressures in coming years to facilitate debt reduction in one or the other way.

There was general agreement that markets have generally failed to fulfil their signalling and disciplinary function by ignoring sovereign risk in the run-up to the crisis, while subsequently over-reacting with panic during the crisis. It is not enough, however, to criticize markets' herd behavior. Instead, on the one hand, issuers should learn to take possible nonlinear behavior of markets as a given and stay safely clear of the limits to fiscal sustainability. Prudent fiscal behavior should go beyond a narrow view of current (headline) fiscal balances and debt levels, but must take due account of contingent liabilities from the financial system and the economy at large. On the other hand, markets in their investment behavior and risk evaluation should take into account nonlinear behavior of electorates in democratic societies as an integral and normal part of democratic decision-making processes, both at the level of single countries and the European Union or euro area.

The crisis induced changes in issuing techniques and funding strategies. Several European sovereign debt managers engaged in short-term debt issuance, for cost advantages or due to problems of access to longer maturities. This stands against the notion that longer-term financing would render public finances more robust against sovereign bond runs. Hedging strategies such as linking interest to real economic variables such as GDP growth have so far rarely been employed, not least because it may be difficult to newly introduce such new instruments to the markets, or because of their higher financing costs in good times.

2. OPENING ADDRESS SUERF/OENB/BWG CONFERENCE ON ‘THE FUTURE OF SOVEREIGN BORROWING IN EUROPE’

Ewald Nowotny

On behalf of the Oesterreichische Nationalbank it is a great pleasure to welcome you to this SUERF/OeNB/BWG conference on ‘The Future of Sovereign Borrowing in Europe’. In particular, I would like to welcome the distinguished speakers of the conference, senior representatives from academia, finance and international organisations.

2.1. THE FUTURE OF SOVEREIGN DEBT MARKETS IS CRUCIAL IN MANY RESPECTS

The topic of today’s conference, “The Future of Sovereign Borrowing in Europe”, is crucial in many respects:

- The ability to borrow centrally affects governments’ ability to conduct counter-cyclical fiscal policy and, given existing outstanding debt and its rescheduling requirements, to fulfil their various vital functions. If states become subject to the same fluctuations in investors’ moods as private borrowers, for instance depending on the economic outlook, countercyclical fiscal policy becomes more expensive and even risky, to the extent that it is believed to threaten a government’s creditworthiness.
- The ability of governments to borrow during recessions or crisis also affects how far monetary policy can rely on fiscal policy to help in cushioning economic fluctuations.
- This is all the more crucial in a monetary union, whose participating countries may still be subject to asymmetric economic shocks, and which therefore need an economic tool to cushion them above and beyond what the single monetary policy can do for the area as a whole.
- It also centrally affects monetary policy if, as has been the case over the past 3 years, segments of sovereign bond markets become dysfunctional, thus negatively affecting the transmission of in the current case expansionary monetary policy impulses on the economies in the various Euro Area countries.
- To the extent that sovereign debt markets become entangled or even a source of financial system instability, they also affect central banks’ and other financial supervisors’ task to ensure financial stability, be it through

the need to act as lender of last resort, be it through all kinds of other measures that become necessary in order to restore financial stability.

- In a longer term perspective, the future of sovereign debt markets also crucially influences central banks operational implementation of monetary policy, the structure of their balance sheets, in particular the weight of sovereign bonds among their assets, their risk position, and potentially, their credibility regarding their ability to achieve their statutory mandate.

2.2. A SHORT HISTORY OF EURO AREA SOVEREIGN DEBT SINCE THE 1990S

Over the past few decades, European sovereign debt markets were exposed to substantial institutional and political changes. Let us recall how Euro Area sovereign bond markets evolved since the early 90s, when the project of EMU took shape.

- Until the early 1990s European sovereign bond risk premiums substantially differed among Euro Area countries, since their assets were exposed to *different levels of inflation risk and exchange rate risk*.
- Due to the *long track record of stability and reliability* (no default on sovereign debt had been seen since WWII) *credit risk* for most European sovereigns was perceived as a relatively *small component of sovereign yields*.
- *In the run-up to EMU* sovereign bond premiums narrowed rapidly. Expectation of EMU participation led financial markets to conduct “*convergence plays*”, reflecting the expectation that inflation in prospective EMU countries would be tightly guarded by the ECB and that exchange rate devaluations among EMU countries are a thing of the past.
- *Fiscal adjustment needed to qualify for the common currency area* supported the convergence of Euro Area bond yields through the elimination of sovereign credit risk spreads. Obviously, in the perceptions of financial markets, the Euro Area’s framework for fiscal governance was deemed credible (and/or the no-bail-out rule was not).
- With the benefit of hindsight, the virtually complete elimination of sovereign credit risk spreads in the years prior to the crisis may seem *astonishing, given that large and persistent differences in economic fundamentals have always been present*.
- *The start of Stage III of EMU completely eliminated exchange rate risk premiums* for the member states. Euro Area *sovereign bond yields* only slightly *deviated* from each other, *mainly reflecting differences in liquidity premiums* resulting from heterogeneity in the market size and the investor base.

- The *sovereign debt crisis* has abruptly and vigorously brought *sovereign credit risk back*. Banking rescue packages together with the various fiscal effects from the Great Recession created the *need for governments to raise additional funds on short notice and substantially increased government debt levels within very short time-spans*.
- In the resulting new regime, *Euro Area government debt lost its generalised risk-free status*. Economic *fundamentals* that influence the position and outlook of public finance sustainability *have again come to be reflected in sovereign risk premiums*, causing strong heterogeneity of sovereign bond yields inside the Euro Area. The *large uncertainties and the increase in overall risk aversion* triggered a *'flight to quality'* to 'core countries'. Germany, the Netherlands, Finland, France and Austria with relatively low credit risk, enjoyed large demand for their sovereign debt, driving their bond yields down to historical lows. But let's not be fooled: no honeymoon lasts forever – even in the 'core countries' slight deteriorations and risks to the economic and fiscal outlook may trigger rating downgrades and violent market reactions.

2.3. THE IMPACT ON MONETARY POLICY EFFICIENCY AND FINANCIAL STABILITY

- The emergence of substantial *sovereign credit risk* spreads for several Euro Area member states led to a situation where the effect of changes to the Eurosystem's official interest rates was dominated by changes in credit risk premiums. *Monetary policy became less efficient*.
- Moreover, the heterogeneity of *sovereign credit risk* caused *large differences among retail lending rates within the Euro Area*, implying *severe, asymmetric disturbances for monetary transmission*.
- Speculation about a possible Euro Area break up and the devaluation expectations about future national currencies caused the re-emergence of exchange rate risk premiums in the form of *redenomination risk premiums*.
- Furthermore, the emergence of credit risk of Euro Area sovereigns additionally weakened the *confidence in explicit and implicit state guarantees for MFIs* (e.g. for deposits). The *reduced collateral base* and the *negative impact* of reduced market prices of sovereign debt *on banks' assets* further led to substantial refinancing problems in the inter-banking market causing *severe tensions for financial stability*, which in turn further increased *sovereign credit risk*.

2.4. EUROSYSTEM AND CRISIS RESOLUTION MECHANISMS BECOME NEW PLAYERS IN EUROPEAN SOVEREIGN BOND MARKETS

- The Eurosystem took several decisive measures to break the vicious circle between sovereign risk, financial instability, dysfunctional monetary policy transmission and deep real economic impacts, by (1) providing unlimited refinancing to banks, with collateral requirements being pragmatically adjusted to the crisis situation; (2) directly intervening in distressed secondary sovereign bond markets.
- To ensure the transmission of the expansionary monetary policy impulses, in 2010 the Eurosystem started to conduct secondary market purchases of Euro Area sovereign debt via the *Securities Markets Programme* (SMP).
- In 2012, in the context of the announcement of the *Outright Monetary Transaction Programme*, SMP purchases were suspended. Despite the fact that up to now no OMT transactions have been conducted, its unlimited character substantially contributed to the calming of European sovereign debt markets between the summer of 2012 and mid-February 2013.
- The Euro Area member states reacted by the implementation of temporary (EFSF) and permanent (ESM) *crisis resolution mechanisms*. The corresponding institutions have meanwhile become active players on Euro Area sovereign debt markets.

2.5. REGULATORY CONSIDERATIONS

- The treatment of sovereign bonds in bank and other financial intermediaries balance sheets and the respective regulation are an important aspect in explaining crisis dynamics so far and in any future framework aimed to reduce the likelihood of future vicious sovereign-financial system risk cycles.
- On the one hand, it can be argued that sovereign assets should be treated the same way as private assets. If they enjoy a preferential status, the resulting accumulation in bank balance sheets can make bank balance sheets overly vulnerable to sovereign debt crises. Furthermore, preferential treatment may also be regarded as countering the intentions of the EU Treaty to prevent preferential access of sovereigns to financing from banks.
- On the other hand, in a crisis situation, when investors panic and sell or avoid certain sovereign assets, banks could act as ‘steady hands’, which are able to ‘look through’ short-term fluctuations in risk-attitudes and assessments. Once in a crisis, changes in regulatory rules must be made very cautiously, with the aim of avoiding additional pressures or uncertainties, so good timing and sequencing is at a premium.

- Under the existing *CRD (Capital Requirement Directive)* framework for banking supervision and regulation, sovereign credit risk is, in principle, addressed through the risk weighting of the exposure class ‘sovereigns’ in the banking book as well as in the trading book. However, a specific exemption regarding exposures to EEA sovereign exposures cancels out any own funds requirement relating to such exposures if approved by supervising authorities.
- In addition, a *leverage ratio requirement* which also applies a non-zero capital charge treatment of sovereign assets will be introduced in the regulatory framework.
- The treatment of sovereign debt as a zero-risk weight asset in banking regulation and supervision implies substantial distortions and contagion risk between the sovereign and financial sectors in the event of crises. Despite being countered by some supervising authorities through pillar 2 measures, this treatment was partially driven by an approach that looked at the government yield curve as the ‘risk free’ interest rate, which in turn was used for different modelling purposes starting with the Capital Asset and Pricing Model (CAPM). However, recent history shows the vulnerability of that assumption.

2.6. SOVEREIGN DEBT MANAGEMENT

The conference topic is also of direct concern for sovereign debt managers.

- *Due to the emerging Euro Area country heterogeneity of sovereign debt markets, Euro Area member states’ debt management funding strategies faced different challenges.*
 - *Low credit risk countries mainly focused on cost minimization and increased their reliance on short-term debt issuance in order to realize relative cost advantages that arose due to the initial strong steepening of the yield curve.*
 - *High credit risk countries had to issue short-term instruments since they lost access to medium and long-term financing.*
 - Overall, the share of the aggregate Euro Area short-term debt substantially increased reaching peaks around 16.5% of total debt in the second quarter of 2009.
- In addition to changes in debt management funding strategy, the majority of debt management agencies (DMAs) across the EU *increased flexibility in the issuance calendar* and, to some extent, also in the *range of instruments and issuance techniques*. *Syndicated bond issuances became more popular*, as they facilitated the issuance of large debt tranches and tended to reduce government dependence on highly volatile markets.

- In terms of debt instruments, the crisis triggered the implementation of new products. Sovereign CDS markets were confronted with weakened supply. The lack of security sellers caused a reduction of products available to hedge portfolios. To fill the gap, several countries (Italy and France) launched sovereign futures products. *The introduction of the new instruments aimed to increase the investor base for sovereign debt by providing additional hedging possibilities.*
- In addition, the recent restructuring of the Greek sovereign debt introduced a new form of state-contingent bonds to the European debt markets. The Greek debt exchange made use of *GDP-indexed bonds*, an instrument extensively discussed in the theoretical literature. It remains to be seen whether a functioning market for such GDP-indexed bonds, which would allow sovereigns to issue such bonds in ‘normal’ times, can be established.

2.7. LESSONS LEARNED AND A FEW CONCLUSIONS

The lessons to be learned from the crisis will take many years if not decades to be extracted, and I am certain that there will remain differences of views. Let me just sketch a few potential lessons:

- Over the last decades, sovereign bond market yields – which were strongly driven by country ratings – did not fully reflect country fundamentals and showed periods of undershooting and overshooting. Both the mispricing of sovereign debt and adverse feedback loop between sovereign risk and the instability of financial markets were accompanied or even reinforced by the development of sovereign credit ratings. *Therefore, more transparent rating criteria which can objectively be assessed by other market players are needed.*
- The treatment of sovereign debt as a zero-risk weight asset in banking regulation and supervision implies substantial distortions and contagion risk between the sovereign and financial sectors in the event of crises. *The new criteria defined under Basel III address this fact by recognising sovereign credit risk in the trading and banking book. However, the timing and sequencing for applying the new rules is important in order to avoid undesired side-effects.*
- The implementation of the *SMP and ESM and the announcement of the OMT and of banking union* have made important contributions to restoring financial stability by breaking the adverse feedback loop between sovereigns and banks. *Nevertheless political systems in Euro Area member countries also need to make their contribution to stabilise expectations.*
- Given the multitude of issuers in the Euro Area, a *strengthened coordination of issuing activity* might be useful, an issue recently addressed by Herman

Van Rompuy, President of the European Council. This issue has been further accentuated by the entry of the ESM and the Eurosystem in Euro Area sovereign bond markets.

- This conference raises several important issues, such as:
 - *Crisis induced reaction of market players*: How have sovereign issuers and investors in sovereign bonds adjusted to the rapidly changing environment?
 - *Future developments and perception of risk*: What will be the likely new normal for issuers and investors in the medium term? Will we face a prolonged period of market segmentation and widened risk spreads? Will ‘risk free’ bonds offer zero or negative real interest rates over an extended period of time and what does that imply for banks’ and investors’ business models?
 - *Implementation of monetary policy and interaction with fiscal policy*: What do large-scale sovereign bond purchases by central banks imply for monetary policy implementation and the interaction of fiscal and monetary policy? Is the narrow focus of central banks operational target on the short-term money market interest rate a thing of the past and the aim to steer medium-term to long-term interest rates here to stay?
 - *Treatment of sovereign debt in banking supervision and regulation*: How should sovereign debt be treated adequately in banking supervision and regulation? Is a preferred status justifiable/useful/harmful?
 - *Debt management strategy*: Which lessons should sovereign debt management agencies derive from the recent crisis? What are the new standards for a sound funding strategy? Which potentially new tools and instruments might be promising to ensure smoother sovereign borrowing in the future?
- I am well aware that those are very difficult issues. So, of course we cannot expect final definitive answers to all of them.
- Nevertheless the expertise of the speakers of the conference raises high expectations. I am confident that SUERF will live up to those high expectations, not least by combining, as usual, the expertise and experience of academics, practitioners and policy makers.

Ladies and gentlemen, it is a great pleasure to have you here. I wish you a very successful and stimulating conference. Enjoy the programme!

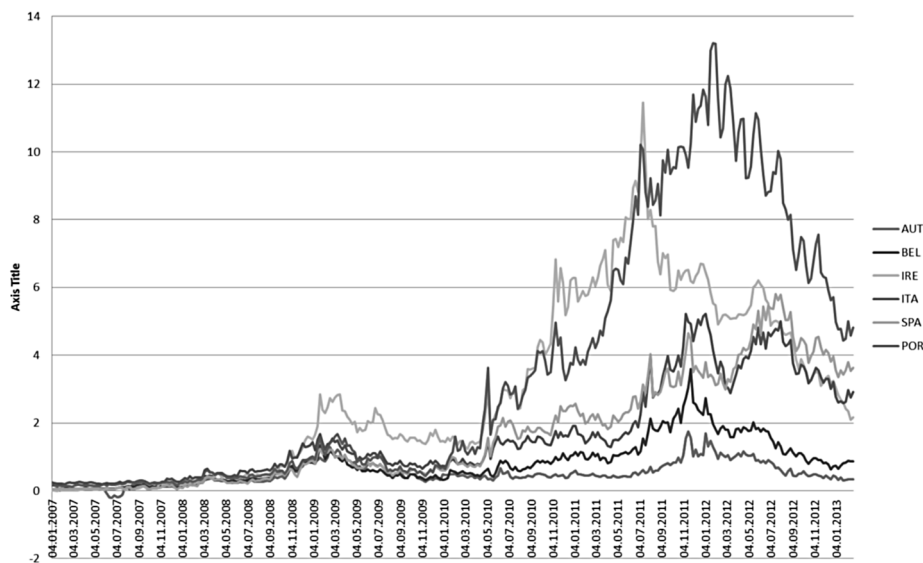
3. THE FUTURE OF SOVEREIGN BORROWING IN EUROPE

*Alessandro Missale*¹

3.1. INTRODUCTION

After reaching a peak in November 2011 and again in the spring of 2012, sovereign yield spreads in the euro area have finally displayed a downward trend reviving hopes that the worst of euro debt crisis is over and that the future will see a gradual consolidation of financial and credit markets and a slight recovery of the real economy (see Figure 1). But, is sovereign borrowing in Europe really back to normal? Or is uncertainty still dominating the scene to the point that a new deterioration of financial conditions cannot be excluded, opening gloomy prospects for future sovereign borrowing? Answering these questions is not an easy task.

Figure 1: Yield Spreads – 10 year bond yields on German Bunds



In this paper we argue that market sentiment has played and will play a crucial role in the euro debt crisis and its solution will depend on investors' expectations,

¹ The views expressed in this paper are the author's only and need not reflect, and should not be represented as, the views of the United Nations.

on their confidence in the precautionary scheme based on the joint intervention by the European Stability Mechanism (ESM) and the European Central Bank (ECB). More precisely, the future of sovereign borrowing lies in the market confidence in the ability of the ECB to buy the bonds of the member States needing assistance without too much conditionality imposed by the ESM.

The possibility for the ECB to intervene in the bond market to sustain the price bonds of the States needing assistance makes the demand of each investor independent of other investors' expectations and thus avoids a self-fulfilling debt run. If credible, the commitment to purchase unlimited bonds, by removing the risk of a liquidity crisis, works by stabilizing investors' expectations with no need for liquidity injections. A role for the ECB as a lender of last resort is supported by evidence on yield spreads of Italian and Spanish bonds which points to a significant component of such spreads due to market sentiment.

The ESM-ECB intervention scheme has the merit of making it possible for the ECB to intervene with purchases of government bonds through Outright Monetary Transactions (OMT). However, for OMT to be activated, member States must first request financial assistance from the ESM which is subject to both eligibility criteria (*ex-ante* conditionality) and fiscal/policy adjustment (*ex-post* conditionality). *Ex-post* conditionality prevents the ECB from acting as a lender of last resort and appears ill-designed. First, because of stigma, it makes countries reluctant to ask for assistance even in the midst of a liquidity crisis when timely intervention by the ECB would be crucial. Secondly and more importantly, conditioning ECB intervention to fiscal and policy adjustment appears unnecessary when a country already meets the eligibility requirements of a sustainable public debt, sustainable external position and a sound financial system. If the *ex-ante* conditionality is met, the crisis is one of liquidity and ECB intervention should not be restricted further since its role as a lender of last resort is economically justified.

Despite its weaknesses, the ESM-ECB precautionary scheme has been successful in restoring market's confidence in the ability of the EU authorities to manage the crisis. While financial markets remain vulnerable to shifts in sentiment, as long as the ESM-ECB scheme is expected to provide enough room for the ECB to ensure financial stability, the future of sovereign borrowing is safe.

The paper is organized as follows. Following this Introduction, in Section 3.2. we discuss the role of fiscal fundamentals and investors' expectations in ensuring debt sustainability and presents evidence of changes in market sentiment and its effect on the yield spreads on Italian and Spanish bonds. Policy measures proposed or undertaken to withstand the euro debt crisis are examined in Section 3.3. We discuss debt management, fiscal rules and austerity to focus on the role

of the ECB as a lender of last resort and on the effectiveness of the precautionary intervention scheme of the ESM and the ECB. Section 3.4. concludes.

3.2. DEBT SUSTAINABILITY: THE ROLE OF EXPECTATIONS

To evaluate the merit of policy solutions and their effectiveness we must first understand the causes of the euro debt crisis. In particular, why in the summer of 2011 did the Italian and Spanish debts appear no longer sustainable? Were investors concerned with the huge Italian debt and the rapidly growing debt-to-GDP ratio in Spain? In fact, by the end of 2011 the Italian debt ratio had reached 120% of GDP and the yield spread of Italian BTPs on Bunds was at a record high of 559 basis points while the Spanish debt had reached 70% of GDP almost doubling over the past four years. These levels of debt are not unprecedented, however, and compare well with the history of UK national debt which reached 260% of GDP after the Napoleonic Wars and WWII without raising particular concerns. And even if we tend to think of episodes from the past as not being relevant for the situation today, we cannot say the same of the gigantic Japanese debt, well above 200% of GDP, which does not seem to worry investors worldwide. In fact, investors are little concerned with the level of the debt but with the country's ability to pay, which depends on future variables besides the burden of the debt. Indeed, debt sustainability does not depend on a specific number for the debt ratio but on future growth, budget surpluses, interest rates and their interactions. Actually, it is even more complicated than that because debt sustainability hinges on investors' expectations of such variables. The role of expectations is evident from the familiar intertemporal budget constraint that follows from the transversality condition of private agents' maximization problem:

$$B_{t-1}^M = S_t + E_t \sum_{j=1}^{\infty} [m_t(t+j)S_{t+j}] \quad \text{IBC} \quad (3.1.)$$

where B_{t-1}^M is the real market value of the debt, S_{t+j} is the primary surplus at time $t+j$, and $m_t(t+j)$ is the relevant discount factors (the marginal rate of substitution between time t and $(t+j)$). Finally, E_t denote expectations conditional on information at time t .

Although the intertemporal budget constraint is not operationally useful, it clearly shows that investors' willingness to hold the debt, and thus its real value, depends on expected future primary surpluses and discount factors, as determined by output growth and interest rates. Unfortunately, budget surpluses are extremely difficult to predict as they depend on future growth and uncertain

policy decisions regarding tax rates, government expenditures, the emergence of contingent liabilities, etc. This suggests that solvency is inherently difficult to evaluate and thus more a matter of faith than economic forecasting, which opens the possibility for multiple equilibria driven by self-fulfilling beliefs. Take, for instance, future GDP growth. Its value is not only uncertain; it depends on investors' expectations. The expectations of a fall in output may lead to a debt crisis and, thus, can be validated *ex post*. Furthermore, in a market with many uncoordinated investors, the behavior of each of them, and her willingness to hold the debt, will depend on what she thinks the other investors will do. This coordination problem which is the essence of banking panics and runs on deposits, can easily give rise to a panic equilibrium with a self-fulfilling debt run. Hence, the intertemporal budget constraint in equation (3.1.) teaches an important lesson: debt sustainability depends on market sentiment!

3.2.1. Market Sentiment and Yield Spreads: The Evidence

Evidence of significant changes in market sentiment for eurozone government bonds and their role in propagating the debt crisis is provided by Favero and Missale (2012). In that paper we show that the yield spreads of member States' bonds on German Bunds depend on the global risk that the market perceives and its interaction with fiscal fundamentals, that we capture with the expected debt-to-GDP ratio and the expected deficit-to-GDP ratio. For each member State we measure global risk using the other member States' yield spreads. Specifically, for each country we compute what we call the 'global spread' by interacting its fiscal fundamentals with the spreads of the other countries. The global spread is thus country specific and is obtained as the weighted average of other States' spreads with weights reflecting fiscal proximity, that is, the distance between their debt-to-GDP and deficit-to-GDP ratios with the same variables of the country considered. The closer the debt and the deficit ratios of the latter to those of another State, the greater the weight assigned to the yield spread on Bunds of that State. This makes the exposure of each country to the spreads of the other countries in the eurozone depend on the 'distance' between their fiscal fundamentals. Hence, we construct country-specific global spreads applying the procedure which is familiar from Global Vector Autoregression (GVAR) models but replacing trade shares with the above measure of fiscal proximity.

We estimate a 10-equations (countries) GVAR for the 10-year yield spreads on German Bunds for Austria, Belgium, Finland, France, Greece, Ireland, Italy, the Netherlands, Portugal and Spain, using weekly data over the period from June 2006 to August 2011. The model relates yield spreads on Bunds to the global spreads as previously defined, a common factor and local fiscal fundamentals. The US corporate Baa-Aaa spread is taken as the international factor. Fiscal

fundamentals are measured by the expected debt-to-GDP and deficit-to-GDP ratios relative to German ones. Results show that global spreads are highly significant for all countries considered while fiscal fundamentals, if taken per se, have no effect at any conventional significance level. Hence fiscal fundamentals (and fiscal proximity) matter in the pricing of default risk but only as they interact with other countries spreads, that is, with the global risk that the market perceives. When global risk factors are muted, fiscal fundamentals have no effect on yield spreads. This evidence suggests that markets do set incentives for fiscal discipline but they do it discontinuously, only when global, systemic risk is perceived.

The relevant issue is whether the market's assessment of the relation between sovereign risk and fundamentals is constant, and thus reliable, or subject to shifts in sentiment; in other words, whether the impact of the global spread variable is stable or changing over time. To address this issue we look at the structural stability of the coefficients on the global spread variables. This is crucial to assess the presence of contagion. Indeed, instability (i.e. time variation) of the impact of the global spread variable on domestic yield spreads would imply that shifts in market sentiment dominate the fundamentals-driven interdependence across countries.

To measure the effect of contagion we consider a case study for Italy and Spain and estimate a Multivariate GARCH model of two equations for the yield spread of each country and the associated global spread. This specification allows for a time varying conditional variance-covariance between the yield spread of domestic bonds on Bunds and the global spread relevant for each country, and it can be used to generate a time-varying estimate of the impact of the global spread on the Italian (and Spanish) yield spread².

Figure 2 displays the time-varying estimated coefficient of the global spread and compares it with the constant coefficient obtained from SUR estimation. The impact of the global spread on Italian and Spanish yield spreads varies significantly overtime; a clear sign of changes in market sentiment. During the eurozone crisis the exposure of Italy and Spain to their global spread variables becomes much higher than it would be in the case of a constant market's reaction to global risk. The impact of the global spread on the domestic yield spreads is also very strongly correlated across the two countries.

² The identification of the structural parameters is based on a triangularization of the variance-covariance matrix of the residuals based on the idea that the domestic spread is contemporaneously caused by the global spread but not vice versa. The covariance matrix is allowed to vary over time and is modeled as a diagonal BEKK (Engle and Kroner, 1995) system.

Figure 2: Global VAR – SURE vs. MGARCH Estimates – Italy and Spain

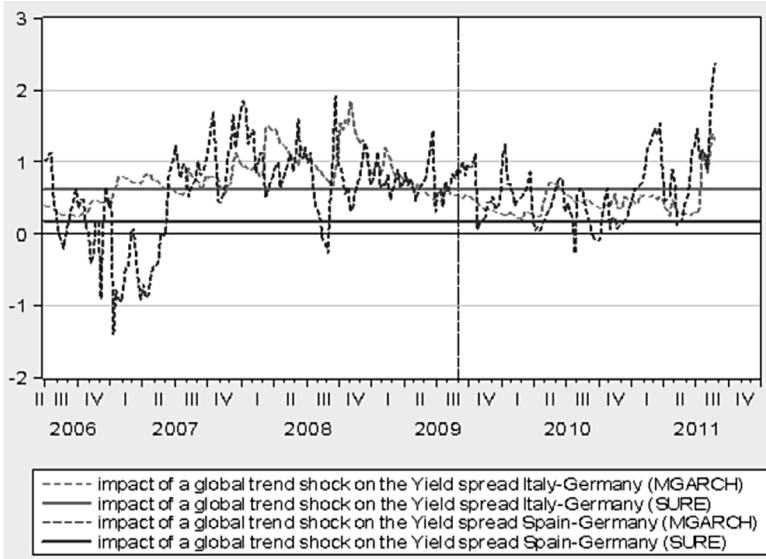
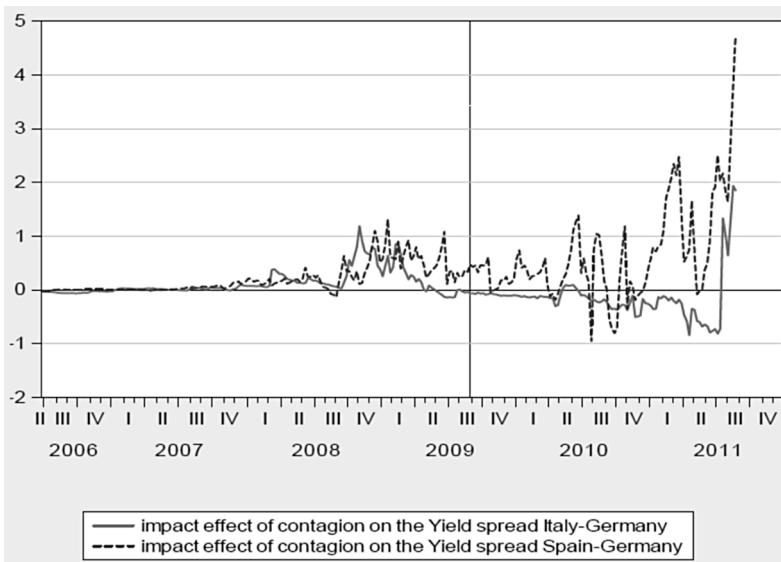


Figure 3 shows the difference between the fitted yield spread using the Multivariate GARCH model and that obtained from SUR estimation. In the summer of 2011 this difference becomes sizeable, pointing to an increase in the Italian yield spread of about 200 basis points due to the shift in market sentiment, and to an even greater effect in the case of Spain.

Figure 3: Spread Component Unexplained by Fundamentals – Italy and Spain



Hence, not only financial markets exert their disciplinary role discontinuously, but their overreaction to global risk factors is itself an important source of instability and crisis propagation. Our evidence suggests that yield spreads are significantly driven by market sentiment and that relying only on financial markets to halt a crisis is dangerous. As market irrationality and contagion play an important role in the pricing of default risk, ‘a lender of last resort’ would be needed to halt the debt crisis in Italy and Spain and its spreading to safer member States.

3.3. POLICIES FOR CRISIS PREVENTION

We have seen that debt sustainability hinges critically on investors’ expectations and that a debt crisis can be triggered by a sudden shift in market sentiment. It is however important to realize that the debt must be relatively high and other fundamentals sufficiently weak for pessimistic expectations to arise; if the level of debt is low and the economy is growing, debt sustainability is hardly an issue. This immediately suggests that a responsible fiscal policy that keeps the dynamic of the debt under control is the best strategy to prevent a debt crisis. The interesting issue to address is what other actions can be implemented to reduce the probability that a crisis breaks up. In this section we examine other policies to prevent and withstand a debt crisis starting with debt management.

3.3.1. Public Debt Management

A debt management aimed at minimizing the amount of debt to be rolled over each period is an effective self-insurance strategy against the risk of a self-fulfilling debt run. Indeed, debt management can be (almost) as important as fiscal policy in ensuring debt sustainability. This conclusion is obvious in case of currency denomination since a depreciation of the exchange rate can have a severe balance sheet effect if the debt is in foreign currencies. A short maturity structure may also make a liquidity crisis possible if investors refuse to roll over the maturing debt (or ask for interest rates that the government cannot afford to pay). In fact, the government, very much like a bank, is inherently illiquid. This can be seen by rewriting the intertemporal budget constraint in equation (3.1.) so as to highlight that the value of the debt is equal to the sum future debt payments evaluated at their current prices, q_t , as follows:

$$B_{t-1}(t) + \sum_{j=1}^{M-1} q_t(t+j)B_{t-1}(t+j) = B_{t-1}^M = S_t + \sum_{j=1}^{\infty} E_t[m_t(t+j)S_{t+j}] \quad (3.2.)$$

where $q_t(t+j)$ are the prices associated with the term structure of interest rates.

Since the maturing debt is greater than the current surplus, $B_{t-1}(t) > S_t$, and the longest maturity is finite, $M < \infty$, the intertemporal budget constraint in equation (3.2.) shows the maturity mismatch in the government balance sheet. On the assets side of the balance sheet (on the r.h.s of equation (3.2.)) we have the present value of future primary surpluses and, on the liability side, future debt payments with a much shorter maturity. If investors fear a debt crisis, or believe other investors will panic, then they will not renew the maturing debt and a crisis will materialize. Unlike in a bank run, debt holders do not even need to line up to withdraw their deposits. But, even though debt holders need not run, the analogy with a bank panic is clear.

That long maturity bonds provide an insurance against the risk of a crisis break up is a well-known result in the debt management literature. Indeed, it has long been known that a long maturity structure enhances debt sustainability as it minimizes the risk of having to roll over a large share of debt when interest rates are too high or market access is denied (Calvo 1988, Alesina, Prati and Tabellini 1990). However, as discussed by Missale (2012), focusing on the intertemporal budget constraint offers new insights in the insurance provided by long maturity debt and in the analogy of the government's problem with the bank's problem.

Equation (3.2.) shows that long-term debt is a natural hedge against a sudden change in market sentiment because its market value falls following a revision in investors' expectations about future primary surpluses. This happens because bond prices, $q_t(t+j)$, decrease due to the emergence of a default-risk component in interest rates. Interestingly, the fall in a bond price is greater the longer the maturity of the bond, j , because the unconditional probability of a default occurring at any future date increases with the horizon considered. As the impact of the probability of default on the value of the debt increases with its duration, the longer the maturity of the debt the lower the default-risk premium that is needed to match the fall in the expected value of future primary surpluses³. Therefore, a long (and balanced) maturity structure minimizes the default risk that the market prices in.

The maturity of the debt is crucial for debt sustainability and should be considered as important as other fiscal fundamentals. It follows that the analysis of fiscal sustainability should not be restricted to the dynamics of budget deficits and the debt-to-GDP ratio (especially if the debt is measured at face value) as it currently happens within the Stability and Growth Pact framework, but it should also consider and monitor the duration of the debt. To this end, swaps contracts

³ In other words, since the reduction in the value of the debt (that is needed match the fall in the expected primary surpluses) is independent of its maturity, the fall in the price of a short maturity debt must be the same as that of a long maturity debt. This implies a lower yield to maturity (and default risk premium) on long maturity debt.

that modify the duration of the debt should be given full transparency, not to speak of “unconventional swaps” that are used as accounting tricks.

3.3.2. Fiscal Rules

Bohn (1998, 2008) has shown that a positive reaction of the primary surplus to the debt ratio is a sufficient condition for debt sustainability. More precisely, if the surplus-to-GDP ratio, S_t , is a positive linear function of the initial debt-to-GDP ratio, B_{t-1} , after controlling for cyclical determinants, μ_t , of primary surpluses so that:

$$S_t = \mu_t + \rho B_{t-1} \quad \text{with } \rho > 0 \quad (3.3.)$$

where μ_t is a bounded stochastic process, and provided that the stream of GDP has a finite present value, then the no-Ponzi game condition is satisfied and the intertemporal budget constraint holds. The intuition behind this result follows from substituting equation (3.3.) for S_t in the flow budget constraint, $B_t = (1 + r_t)B_{t-1} - S_t$, to obtain:

$$B_t = (1 + r_t)(1 - \rho)B_{t-1} - (1 + r_t)\mu_t \quad (3.4.)$$

where r_t is the growth-adjusted real interest rate.

Equation (3.4.) shows that a systematic positive reaction of the primary surplus to the debt ratio makes the debt grow asymptotically at a slower rate than the (growth-adjusted) real interest rate, r_t , and thus ensures that the no-Ponzi game condition is satisfied. The systematic reaction of the primary surplus to the debt ratio introduces an error correction mechanism in the dynamics of the debt that ensures its sustainability in the long run.

The ‘fiscal rule approach’ to debt sustainability is important in the context of the euro sovereign debt crisis because it has been the favorite approach of EU governments to ensure fiscal sustainability and counter the crisis, at least until the Fiscal Compact was signed on 2 March 2012⁴. Loosely speaking, the Compact is a stricter version of the Stability and Growth Pact (SGP) that requires the general government budget be balanced over the medium term, meaning a structural deficit no greater than 0.5% of GDP (if the debt-to-GDP ratio exceeds 60%). The Treaty also re-states the ‘debt reduction’ criterion outlined in the SGP, which defines the rate at which debt levels above the limit of 60% of GDP must decrease. The analogy with the Bohn’s rule is evident in the attempt to establish a self-correcting mechanism which should guarantee fiscal solvency. In the case of a balanced budget rule, for simplicity a zero structural deficit, the

⁴ The Fiscal Compact is the Title III of the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union (TSCG).

cyclically-adjusted primary surplus should cover interest payments and the debt-to-GDP ratio should fall over time at a rate equal to the nominal growth of GDP.

Unfortunately, financial markets had showed no reaction to the member States' efforts to enact fiscal rules which were increasingly stricter. This is even more surprising once we consider that some countries, like Italy, even enshrined the balanced budget medium-term objective into constitutional law.

Although an analysis of the reasons why changes in EU fiscal governance were not effective is not the focus of this paper, it is worth noting that credibility is essential for fiscal rules to help ensure debt sustainability. Fiscal rules must be credible in order to favorably affect investors' expectations of future surpluses and thus ensure that the intertemporal budget constraint in equation (3.2.) is satisfied. In this respect the disastrous track record of the SGP in binding member States' fiscal policies did not help and proposing a tougher version of it was not enough to restore market confidence. The adoption of an incremental approach of successive minor changes to EU fiscal governance, always falling short of expectations, did not help either. The lesson we have learned from this experience is always the same: debt sustainability depends on investors' expectations.

3.3.3. Fiscal Austerity

The insurance that a long maturity debt can provide is limited and a liquidity crisis can nevertheless take place as maturing obligations exceed primary surpluses. Then, a fiscal contraction is unavoidable; higher taxes and budget cuts are needed to withstand the crisis. Although the adjustment cannot provide enough resources to meet maturing obligations⁵, a correction is needed to show the government commitment and determination to repay the debt and thus to affect investors' expectations of future primary surpluses.

Fiscal austerity can however be self-defeating. Despite a literature on their expansionary effects, sudden fiscal contractions have, at least in the short run, a negative impact on revenues and economic growth which negatively affect the debt-to-GDP ratio and impair debt sustainability. The announcement effect of fiscal consolidation may soon vanish in investors' minds to leave space to growth concerns.

In principle, fiscal policies to grow out of debt can be envisaged, for example, by shifting government resources away from unproductive uses to growth promoting expenditures. However, despite their appeal such policies take time to be implemented and to produce the desired growth results, and are not an option

⁵ Even with an average maturity of debt as long as 5 years, refinancing needs exceeds 10% of GDP as the debt approaches 100% of GDP.

in the midst of a debt crisis. Summing up fiscal austerity is unavoidable but is not the best solution.

A positive role for fiscal policy would emerge from coordination at the EU level where member States with greater fiscal space could partly offset the negative impact of fiscal austerity in crisis States. Unfortunately, the Fiscal Compact seems just to contemplate fiscal retrenchment across the board, as in most countries government debt exceeds 60% of GDP.

3.3.4. Money of Last Resort

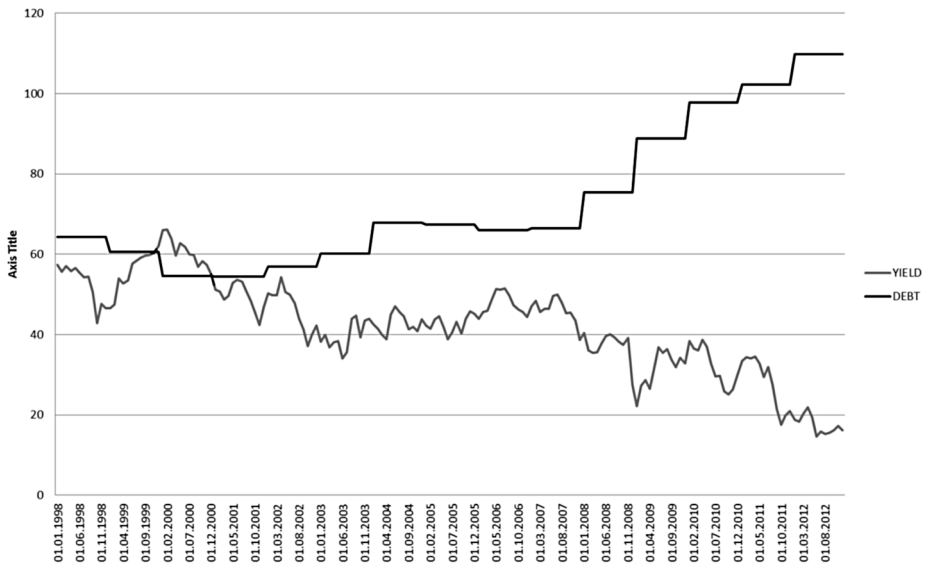
Access to Central Bank's liquidity can halt a liquidity crisis. In the case of a commercial bank, the existence of a lender of last resort reduces the incentive of investors to run on deposits and thus the likelihood that a crisis breaks up. The insurance that Central Bank's liquidity provides against an excessive withdrawal of deposits avoids panic and rules out the run equilibrium. In case of a sovereign debt crisis, the possibility for the Central Bank to buy the sovereign's bonds can also prevent a run. The existence of a 'buyer of last resort' makes the demand of each investor independent of other investors' expectations and thus avoids a self-fulfilling debt run. If credible, the commitment to purchase unlimited bonds, by removing the risk of a liquidity crisis, works by stabilizing investors' expectations with no need for actual liquidity injections.

More generally, if debt obligations are claims on domestic currency, they can always be honored through money creation by the Central Bank. In other words, domestic currency debt can always be repaid by a dependable Central Bank so that explicit-technical default is ruled out. Of course, to the extent that money creation leads to an increase in the price level, the debt is repudiated in real terms through inflation but this does not imply any contractual violation, that is, no explicit default occurs. It is worth recalling that Central Bank intervention is justified if the debt crisis is one of liquidity but not if it is one of solvency. Distinguishing between the two types of crisis is always difficult since solvency is inherently difficult to evaluate and solvency and liquidity aspects are usually present at the same time. Regarding to the euro sovereign debt crisis, the analysis in Section 3.2. suggests that in the summer of 2011 a substantial component of the default risk premia of Italy and Spain, 200 basis points for Italy and even more for Spain, was explained by a deviation from the fundamentals-based default risk due to market sentiment.

De Grauwe (2011) argues that the euro debt crisis is caused by the absence of a lender of last resort. He observes that euro area member States have their debts denominated in a currency that they cannot control since its supply is decided by the European Central Bank (ECB). Unlike in countries such as the UK or the US

where debt obligations are backed by the money of the Bank England or the Federal Reserve, euro-area member States have debt obligations that they cannot repay since they have no control of the euro. Because of foreign currency denominated debt and the independence of the ECB, euro area member States are prone to crises as much as developing countries were in the past, before they turned their external debts into domestic debts denominated in local currencies. To make his point, De Grauwe compares the movements of 10-year interest rates in Spain and UK with their debt-to-GDP ratios. While the dynamics of interest rates is similar until 2010, with the start of the euro crisis their paths diverge; while the Spanish interest rate rises to reflect an increasing default risk, the UK rate falls despite the rapid increase in the debt ratio which reaches a level higher than the Spanish one. Further evidence that a lender of last resort reduces the default risk that investors price in interest rates is shown in Figure 4 where the steady increase in the US debt ratio goes along with a decreasing 10-year interest rate. Although some economists would contend that the decline of the interest rate just reflects the increasing demand for the safety and liquidity of US Treasuries, we cannot dismiss the role of expansionary monetary policy. If anything, Figure 4 suggests that financial markets fail to exert a disciplinary role.

Figure 4: US= Debt-to-GDP ratio and Yield on 10-year Treasury Bonds



But the more compelling evidence of the insurance that a lender of last resort can provide against a liquidity crisis, i.e. a self-fulfilling debt run, is the market reaction to the ECB Governing Council's announcement on 2 August 2012 that the ECB would undertake Outright Monetary Transactions (OMT) in the

secondary bond market⁶. The announcement of OMT, that is, of open market purchases of government bonds by the ECB, gave content to Mario Draghi's statement that he would do 'whatever it takes' to defend the euro, and it triggered a rapid decline in yield spreads of Italian and Spanish bonds on German Bunds. Figure 5 shows that, following the OMT announcement, the Italian BTP-Bund spread fell from about 500 to 300 basis points in less than three months. The possibility for the ECB to buy member States' government bonds appears to have reduced the likelihood, as perceived by the market, of a panic equilibrium with a self-fulfilling debt run.

Figure 5: Yield Spread of Italian BTP vs. German Bunds



The strong effect that the OMT announcement had on investors' expectations and interest rates shows how reassuring is the ability of the Central Bank to buy debt. However, if a lender of last resort is what the market wants to solve the coordination problem and avoid a debt run, it is worth noting that the OMT program does not make the ECB a genuine lender of last resort. In fact, for OMT to be activated, the member State in difficulty must first request financial assistance from the European Stability Mechanism (ESM) which is subject to strict conditionality. But, how does ESM conditionality limit the 'deterrent' role of ECB intervention? To answer this question, in what follows we examine the crisis prevention scheme based on the joint intervention of the ESM and the ECB.

⁶ The technical framework of these operations was formulated on 6 September 2012.

3.4. THE ESM-ECB SCHEME FOR CRISIS PREVENTION

The solution of euro debt crisis lies in the prevention scheme of ESM and ECB intervention, on how effective such scheme is and is perceived by the market.

The ESM-ECB precautionary intervention scheme can be described as follows⁷. Precautionary financial assistance from the ESM is subject to the fulfillment of eligibility criteria, i.e. ex-ante conditionality, and the subscription of a memorandum of understanding, i.e. ex-post conditionality. Eligibility criteria include a sustainable public debt, a sustainable external position and a sound financial system. Ex-post conditionality refers to specific policy actions to achieve the objectives indicated in the memorandum of understanding. Provided that conditionality is accepted, a Primary Market Support Facility, i.e. an ESM credit line, is activated in favor of the country asking for assistance, for primary market purchases of its bonds. The activation of the Primary Market Support Facility is needed for the ECB to intervene with bond purchases on the secondary market. Further details of the precautionary scheme are that: primary market purchases through the ESM facility cannot exceed the 50% of the issued amount; ECB purchases through OMT are unlimited but confined to the maturity segment up to three years.

The design of the ESM-ECB precautionary scheme raises a number of issues. A first fundamental criticism concerns the conditionality required by the ESM program and thus the conditionality required for ECB intervention. If the ex-ante conditionality implied in the eligibility criteria is fully justified for ECB intervention, since sustainable public and external debts would clearly point to a liquidity crisis, conditioning the program to fiscal and policy adjustment makes little economic sense when eligibility criteria are satisfied. Ex-post conditionality contained in the Memorandum of Understanding would be economically justified only if the country did not meet the ex-ante conditionality. In other words, if the public debt and external position are sustainable, the crisis is one of liquidity, due to investors' expectations, and thus it would be optimal for the ECB to act as a lender of last resort. Conditioning its intervention on fiscal and policy adjustment only increases the risk that the market perceives. More generally, one should wonder why fiscal and policy adjustment is needed if the public debt and the external position are sustainable, and the financial sector is sound. Little rationale can also be found in the decision to limit primary market purchases to 50% of the issue amount and to restrict OMT to bonds with a maturity shorter than three years.

A second important issue concerns the uncertainty surrounding the eligibility criteria for ESM financial assistance. In fact, debt and external sustainability are

⁷ The discussion follows Vanden Bosch (2012).

vaguely stated with no reference to indicators that can be operationally verified. Although some degree of discretion is certainly needed to assess debt sustainability because of its forward looking nature, there is also a quest for certainty: a country should know whether it meets the eligibility criteria before asking for financial assistance. Hence, no matter how discretionarily assessed, a country's eligibility for assistance should be verified in advance. Unresolved uncertainty increases the risk that the market perceives and, more importantly, it may lead a country to postpone its request for assistance.

The risk of delays in a country's resolve to ask for financial assistance, and thus the risk of an aggravation of the crisis, is even greater as we consider the political and economic stigma that derives to a country which accepts to undertake the fiscal and policy adjustments of an ESM program (Vanden Bosch 2012). Because of ex-post conditionality, ESM financial assistance comes with stigma which makes a country reluctant to ask the ESM for help and the ECB unable to intervene. It follows that ESM precautionary financial assistance can be unnecessarily delayed: though called precautionary, it may arrive too late!

We should now be able to answer the question that motivated our analysis: whether the ESM-ECB intervention scheme is effective and can provide a durable solution to euro sovereigns' borrowing problems.

While the scheme is clearly the result of a political compromise, its design is cumbersome and unnecessarily complicated, nevertheless it has the merit of making it possible for the ECB to intervene with purchases of government bonds through OMT. However, the ex-post conditionality, to which ESM assistance is subject, prevents the ECB from acting as a lender of last resort. Introducing ex-post conditionality (in addition to eligibility criteria) has been necessary to overcome political resistance against ECB intervention, but has two negative consequences. First, because of stigma, it makes countries reluctant to ask for assistance even in the midst of a liquidity crisis when timely intervention by the Central Bank is crucial. Secondly and more importantly, conditioning ECB intervention to fiscal and policy adjustment appears unnecessary when a country already satisfies the eligibility requirements of a sustainable public debt and external position and of a sound financial system. If the ex-ante conditionality is met, the crisis is one of liquidity and ECB intervention should not be restricted further since its role as a lender of last resort is justified.

Despite its weaknesses, the ESM-ECB precautionary scheme has been successful in restoring market's confidence in the ability of the EU authorities to manage the crisis. Investors' confidence will indeed be crucial for the future of sovereign borrowing. While financial markets remain vulnerable to shifts in sentiment, as long as the ESM-ECB scheme is expected to provide enough room for the ECB to ensure financial stability, the future of sovereign borrowing is safe.

3.5. CONCLUSIONS

In this paper we have examined the reason of the euro sovereign debt crisis and discussed policy solutions on which the future of sovereign borrowing depends. We have reported evidence on yield spreads of Italian and Spanish bonds on Bunds that points to a significant component of such spreads due to a change in market sentiment unrelated to fiscal fundamentals before the summer of 2012. This finding, together with the dramatic fall in Italian and Spanish spreads following the ECB announcement of OMT, supports the view of De Grauwe (2011) that the lack of a lender of last resort is what the market feared the most. A role for the ECB to intervene in the market for government bonds is needed to sustain the demand and stabilize the price of bonds. This makes the demand of each investor independent of other investors' expectations and thus avoids a self-fulfilling debt run. If credible, the commitment to purchase unlimited bonds, by removing the risk of a liquidity crisis, works by stabilizing investors' expectations with no need for liquidity injections by the ECB.

This discussion raises two issues. The first is whether the same result could be achieved by a fiscal union able to address the debt crisis, and the underlying macroeconomic imbalances, with a common policy. While there is certainly scope for greater coordination among euro area member States to support aggregate demand, the market reaction to the Fiscal Compact does not bode well for a fiscal union that only aims to impose further restraint. More importantly, while a reform of EU fiscal governance takes time to be designed and adopted, the debt crisis calls for a fast solution. The second issue is whether OMT may weaken fiscal discipline and encourage moral hazard on the part of the governments. While moral hazard is always a risk, the conditionality attached to ESM precautionary financial assistance rules out any possibility of opportunistic behavior and strongly limits discretion in ECB intervention. In fact, ESM assistance is conditional on both eligibility criteria and fiscal/policy adjustment which appears unduly restrictive. As in the case of the IMF Flexible Credit Line, the fulfillment of ex-ante criteria, that is, a sustainable public debt, external position and a sound financial system, is what should define a liquidity crisis and thus justify ECB intervention as a lender of last resort. Whether a country meets ex-ante conditionality should be known in advance, before it asks for financial assistance and, if eligible, it should not be subject to ex-post conditionality. This would reduce uncertainty, minimize stigma and allows for timely intervention by the ECB.

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4. FORCES SHAPING THE OECD SOVEREIGN BORROWING OUTLOOK WITH EMPHASIS ON THE CHALLENGES FOR EUROPEAN SOVEREIGN ISSUERS

*Hans J. Blommestein*¹

4.1. INTRODUCTION

The OECD Sovereign Borrowing Outlook provides an update of trends and developments associated with sovereign borrowing requirements, funding strategies, market infrastructure and debt levels from the perspective of public debt managers. The Outlook makes a policy distinction between funding strategy and borrowing requirements.

The central government marketable gross borrowing needs are calculated on the basis of budget deficits and redemptions largely based on a survey on the borrowing needs of OECD member governments. The funding strategy entails decisions on how borrowing needs are going to be financed using different instruments (e.g. long-term, short-term, nominal, indexed, etc.) and which distribution channels (auctions, tap, syndication, etc.) are being used.

The paper is based on the OECD Sovereign Borrowing Outlook 2013. I will provide data, information and background on sovereign borrowing needs and discusses funding strategies and debt management policies. The paper analyses the key forces shaping this outlook for the OECD area and country groupings, notably the euro area. In addition, the paper focuses on the challenges faced by European and other OECD sovereign issuers, while highlighting the policy response to the extraordinary stress in European sovereign debt markets in 2011 and 2012.

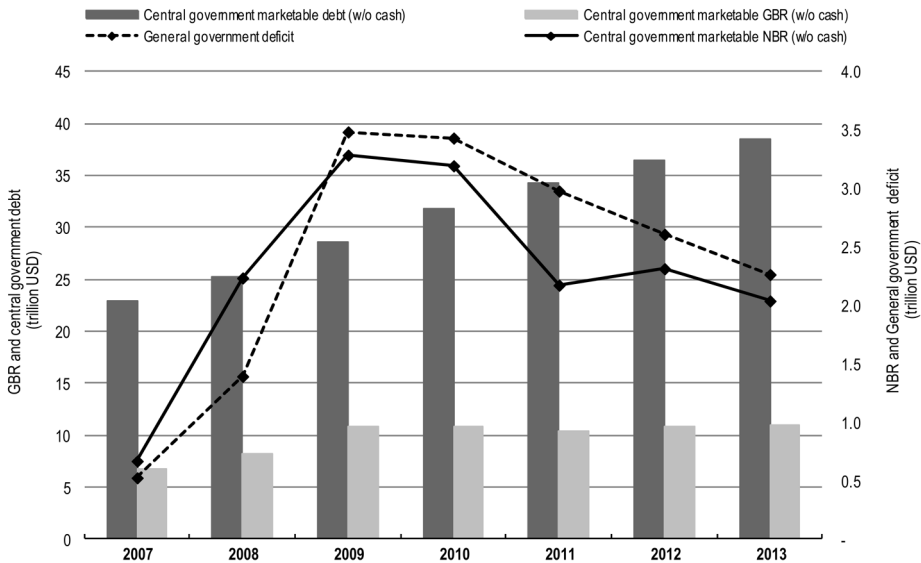
The paper is structured as follows. Section 4.2. provides the OECD sovereign borrowing outlook with a closer look at data and trends on issuance by EU governments. The explosion in central government debt of advanced economies is analysed in section 4.3. An overview is given of the tough issuance conditions for sovereign issuers, notably for several European ones, in section 4.4. Section 4.5. describes market access problems for several European sovereigns. Finally, game-changing policy responses to European sovereign debt markets under severe stress are discussed in section 4.6. The final section concludes.

¹ The views expressed are personal ones and do not represent those of the OECD and Member Countries. All errors are mine. I am indebted to Hakan Bingol for statistical support.

4.2. OECD SOVEREIGN BORROWING OUTLOOK WITH A CLOSER LOOK AT ISSUANCE BY EU GOVERNMENTS

The latest OECD Sovereign Borrowing Outlook provides estimates of borrowing needs for 2012 and projections for 2013. In comparison to pre-crisis levels, gross borrowing by OECD governments is expected to remain at the elevated level of USD 10.8 trillion in 2012 (Chart 1). In 2013, the borrowing needs of OECD sovereigns are projected to increase slightly to around USD 10.9 trillion, with a relatively high level of longer-term redemptions in 2013.

Chart 1. Fiscal and Borrowing Outlook in OECD Countries for the Period 2007-2013



Note: GBR= gross borrowing requirement, NBR= net borrowing requirement.

Source: OECD Sovereign Borrowing Outlook 2013.

The general government deficit for the OECD area as a whole is estimated to reach 5.5% of GDP in 2012 (the equivalent of approximately USD 2.5 trillion), with a projected decrease to nearly 4.6% of GDP in 2013 (the equivalent of around USD 2.1 trillion) – see Chart 1.

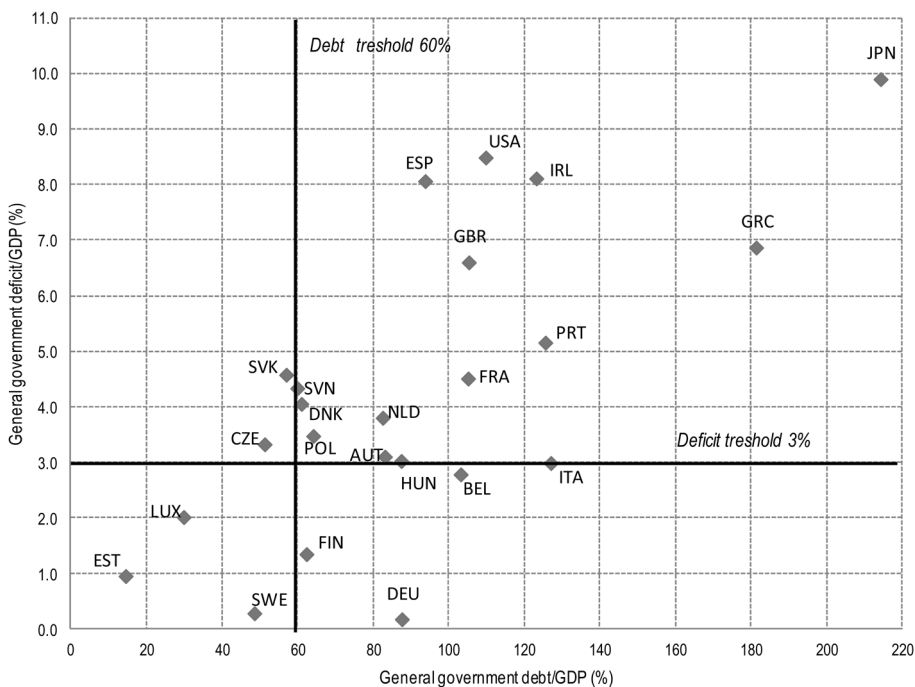
However, in spite of these (projected) improvements², deficits are still standing at near historical record levels. Central government marketable net borrowing requirements are estimated to fall from nearly USD 2.3 trillion in 2012 to around USD 2.0 trillion in 2013 (Chart 1). This amounts to a decrease from around 4.8% of GDP in 2012 to 4.1% in 2013.

² OECD Economic Outlook 92, November 2012.

Government liabilities were initially driven largely by the recessionary impact of the unprecedented 2007-2008 global liquidity and credit crisis, including government expenditures due to fiscal stimulus programmes and later by the influence of recession-induced negative growth dynamics. Because of this, and despite falling interest rates during 2008-2012, general and central government gross debt-to-GDP ratios for the OECD as a whole are expected to continue to increase.

For the OECD area as a whole, the outstanding central government marketable debt is expected to increase from USD 36.4 trillion (75.9 % of GDP) in 2012, to around USD 38.4 trillion at the end of 2013 in OECD countries (77.9% of GDP). General government debt-to-GDP is projected to reach 109.3% in 2013. However, a closer look at individual countries (and different country groupings; see Annex for definitions) shows of course a more differentiated picture (Charts 2, 3, 4 and 5).

Chart 2. General Government Gross Debt and Deficits in Selected EU Countries (2012)



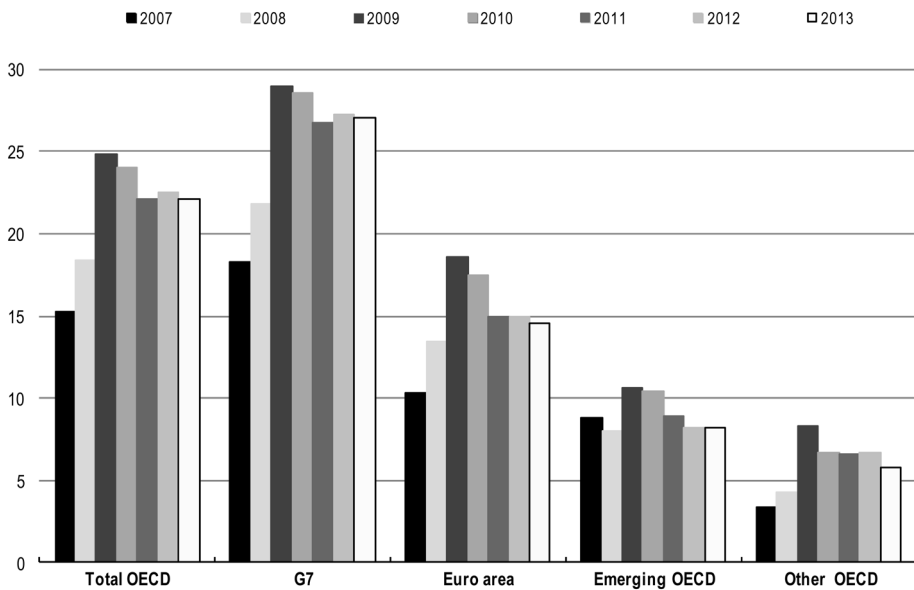
Source: OECD Sovereign Borrowing Outlook 2013.

In all OECD country groupings considered in the OECD Borrowing Outlook, general government financial balances improved. For the OECD as a whole (Chart 1) and the various groupings, deficits peaked in 2009.

Gross marketable borrowing requirements are projected to remain elevated for 2013. However, the decrease in estimated net marketable borrowing is striking (Chart 1), reflecting relatively high redemptions. Chart 3 shows estimates and projections of central government marketable gross borrowing requirements as a percentage of GDP for the various country groupings. Although G7 gross borrowing requirements of the central government as a percentage of GDP continues to decline (by a projected 2.0% in 2013), after having peaked in 2009, borrowing needs remain at elevated levels in comparison to pre-crisis levels (Chart 3).

In contrast, the average gross borrowing ratio to GDP of the OECD countries in the *euro area*, after having peaked in 2009 (reaching 18.6 as a percentage of the GDP), strongly declined since then (by an estimated 4.1%), and is projected to fall to around 15% in 2012 and approximately 14.5% in 2013.

Chart 3. Central Government Marketable Gross Borrowing in OECD Countries (Percentage of GDP)



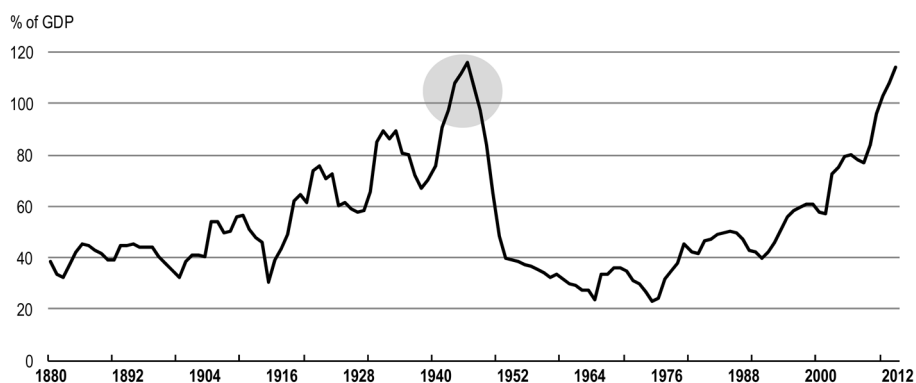
Source: OECD Sovereign Borrowing Outlook 2013.

4.3. THE EXPLOSION IN CENTRAL GOVERNMENT DEBT OF ADVANCED ECONOMIES

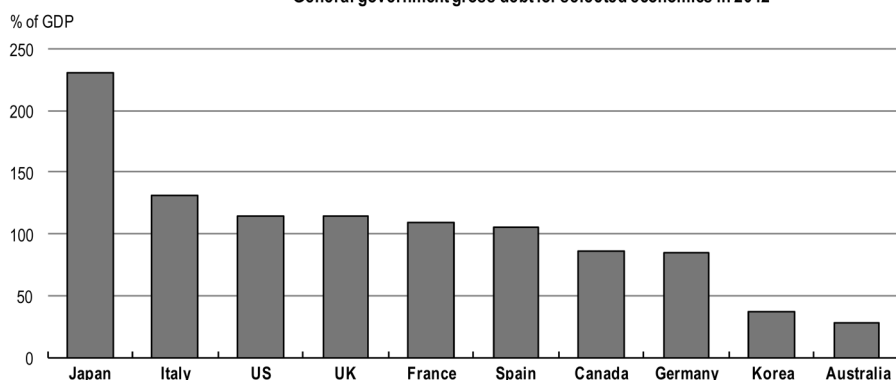
Fiscal accounts deteriorated sharply in the wake of the global financial crisis. In fact, the direct fallout of this crisis explains roughly two-thirds of the rise in the

debt ratio among the advanced economies markets³. As a result, government debt levels in many OECD countries increased to close to the historical peak in the 1940s. Chart 4 gives the development of gross public debt since 1880 for selected OECD economies. The peak of general government debt as a percentage of GDP for these countries is linked to World War II (1941-45), the latter event taking the GD PPP-weighted average debt ratio to around 116 percent of GDP⁴. The fall-out of the 2007-2009 global financial crisis (the most serious financial crisis on record) has put such pressure on the increase in government debt ratios in the OECD area that the WW II peak is being nearly scaled.

Chart 4. Gross Public Debt of Selected* Advanced Economies: 1880-2012



General government gross debt for selected economies in 2012



* Includes Australia, Canada, France, Germany, Italy, Japan, Korea, Spain, UK and US

Notes: Historical debt levels, GDP-weighted average.

Source: OECD Sovereign Borrowing Outlook 2013.

³ C. LAGARDE, Banque de France Financial Stability Review on Public Debt – Special Address to Panel Discussion, IMF, Washington D.C., April 21, 2012.

⁴ S.A. ABBAS and others (2010), *Strategies for Fiscal Consolidation in the Post-Crisis World*, IMF Fiscal Affairs Working Paper 10/04.

The 2007-2009 global financial crisis as the most serious crisis on record set the stage for a surge in government deficits and liabilities caused by the decisive actions of governments to avert a total collapse of the private financial intermediary system. However, the global financial crisis led to a serious collapse of confidence. “A near-seizure of the international financial system after the collapse of Lehman Brothers administered a particularly large adverse shock to animal spirits”⁵. This shock initiated a period of weak activity, although a much more serious collapse in demand was avoided by governments supporting major banks and other financial institutions. In addition, the rapid acceleration in sovereign borrowing needs was further boosted by the massive fiscal response to concerns about the possibility of a severe economic slump.

However, a prolonged period of subdued activity is difficult to avoid, because the process of balance sheet repair by financial institutions, businesses and households inevitably takes considerable time⁶. Moreover, the mutation from an imminent Great Crash of the private financial intermediary system into market concerns about imminent or actual local sovereign debt crises, added to a further decline in confidence among investors, financial intermediaries and households thereby putting downward pressure on economic growth.

Weak economic activity, in turn, is putting pressure on government balances and a further increase in government debt. Ratios of gross government debt-to-gross domestic product are expected to increase further in 2013. Chart 5 shows that the ratios of *central* government debt-to-gross domestic product of all country groupings considered there have increased since 2007. The G7 central government marketable debt-to-GDP ratio is projected to reach nearly 92.1% in 2013. By comparison, the debt ratio of total OECD is expected to reach nearly 77.9% in 2013. For euro area countries, this ratio is estimated to be slightly higher than 65%.

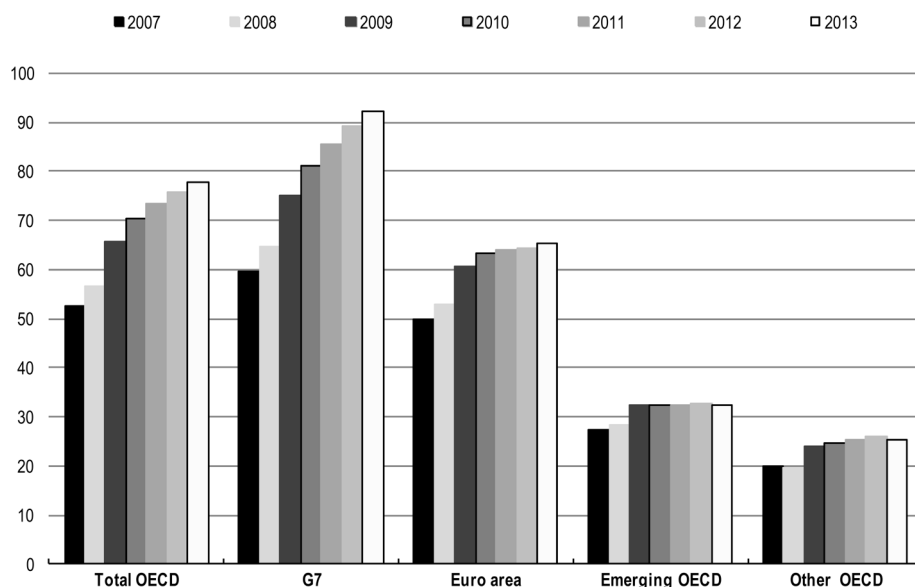
4.4. TOUGH ISSUANCE CONDITIONS FOR SOVEREIGN ISSUERS, NOTABLY FOR SEVERAL EUROPEAN ONES

Raising large volumes of funds at lowest cost, with acceptable roll-over risk, remains therefore a great challenge for a wide range of governments, especially for many European ones. Most OECD debt managers continue to rebalance the profile of debt portfolios by issuing more long-term instruments and moderating bill issuance.

⁵ C. BEAN (2012), “Central banking in boom and slump”, *JSG Wilson Lecture in Economics*, Hull, University of Hull, 31 October 2012.

⁶ C. BEAN (2012), *ibid.*

Chart 5. Central Government Marketable Debt in OECD Countries



Source: OECD Sovereign Borrowing Outlook 2013.

Additional challenges for government (and corporate) issuers are the complications generated by the pressures of a rapid increase in sovereign risk, whereby ‘the market’ suddenly perceives the debt of some sovereigns as ‘risky’. A lack of consensus on what exactly constitutes sovereign risk, and how this is related to concepts such as safe assets and the risk-free rate, is an important complication to properly measure and price this risk. Since the track-record of ‘sovereign risk pricing’ is not very impressive, suggested market measures of this risk (including sovereign ratings) should be treated with great caution. One should, therefore, be very cautious in concluding that the sovereign debt of an OECD country has indeed lost its ‘risk-free’ status using these measures⁷.

Issuers had to deal with euro area-induced contagion effects. Although direct contagion effects (including losses from balance sheets and off-balance sheet exposures via CDS markets) are easier to quantify, indirect channels could prove to be more damaging. Indirect channels of contagion include a re-pricing of both sovereign risk and counter-party risk among financial intermediaries. This, in turn, may lead to higher funding costs and roll-over risk for sovereigns and

⁷ H.J. BLOMMESTEIN (2012), “The Debate on Sovereign Risk, Safe Assets and the Risk-Free Rate: What are Possible Implications for Sovereign Issuers?”, *Ekonomi-tek*, Vol. 1, No. 3, September, pp. 55-70; H.J. BLOMMESTEIN (2013), “Redefining Safe Sovereign Assets in OECD Area May Give Less Gloomy Outlook”, *Bloomberg Brief* (Economics, European Edition) 1 March.

financial institutions, impaired ability to pledge sovereign securities as collateral and flight-to-safety by investors.

Issuing sovereign debt took place in an environment still being shaped by crisis (or non-conventional) conditions, including

- a) unconventional monetary policies leading to unusual market conditions with lower (long term) interest rates, distorted yield curves and high liquidity;
- b) flight to safety and, at the same time (and as a result of unconventional monetary conditions), an increase in the search for higher yields by international investors willing to invest in new asset classes, including frontier market debt (it was noted that the recent issuance of sovereign bonds by some low income countries was oversubscribed). This by itself beneficial development for LICs also raises renewed risks in terms of longer-term debt sustainability (notably via an increase in debt and foreign currency exposure by companies in several emerging markets);
- c) banks are accumulating sovereign bonds in part driven by Basel III regulations: this is an important policy issue as banks are keeping these bonds on their balance-sheet, thereby potentially hampering their financial intermediation role;
- d) challenging issuance conditions for governments (but also banks) may have been compounded by the possibility that sovereign risk is being mispriced (including by rating agencies). This problem is related to the debate on the change in so-called risk free assets⁸;
- e) the OECD working party on public debt management has discussed on several occasions the more difficult conditions for primary dealers and market makers in government debt, in part associated with higher costs in placing debt with end investors⁹;
- f) new and more complex interactions between public debt management and monetary policy (with evidence of policy conflicts), the blurring of monetary policy and fiscal policy and the implications of fiscal dominance¹⁰.

In addition, European issuers saw increased fragmentation of the financial system in the euro area, with indications of an increase in home bias in several public debt markets, notably in countries facing financial stress (such as peripheral European countries). European issuers have also been faced with adverse

⁸ H.J. BLOMMESTEIN (2012), "The Debate on Sovereign Risk, Safe Assets and the Risk-Free Rate: What are Possible Implications for Sovereign Issuers?", *Ekonomi-tek*, Vol. 1, No. 3, September, pp. 55-70; H. J. BLOMMESTEIN (2013), "Redefining Safe Sovereign Assets in OECD Area May Give Less Gloomy Outlook", *Bloomberg Brief* (Economics, European Edition) 1 March.

⁹ *OECD Sovereign Borrowing Outlook* 2013.

¹⁰ H.J. BLOMMESTEIN and P. TURNER (2012), *Interactions Between Sovereign Debt Management and Monetary Policy Under Fiscal Dominance and Financial Instability*, OECD Working Papers on Sovereign Borrowing and Public Debt Management, No. 3, OECD Publishing; H.J. BLOMMESTEIN and P. TURNER (2012) (eds.), *Threat of Fiscal Dominance?*, BIS Papers No. 65, BIS-OECD Publishing.

feedback loops between sovereign debt and the consequences of banking crises (and more generally the problem of unsustainable private debt ending up on sovereign balance-sheets). These forces have put European sovereign debt markets under heavy stress at times with peripheral issuers facing ultra-high yields prior to game-changing policy responses, in particular by the ECB.

4.5. LOSS OF MARKET ACCESS BY EUROPEAN COUNTRIES AND EFFORTS TO RETURN TO (INTERNATIONAL) LONGER-TERM MARKETS

The global financial and economic crisis mutated into a sovereign debt crisis in a number of countries, leading to the loss of market access for some sovereign borrowers. Five European countries lost access to the longer-term (international/domestic) funding market. Iceland, Ireland and Portugal regained (partial) access. The re-entry of Iceland in the international capital markets was in June 2011 (after approximately 56 months of absence), while Ireland regained access to borrowing in longer-term instruments in July 2012 (after approximately 22 months of absence). However, Ireland is facing a huge market access challenge because the country needs to refinance around EUR 20 billion per year from 2016-2020¹¹. Portugal has made significant progress during 2012, but, as of April 2013, has not managed to regain complete market access. (Access was characterised at that time as limited and opportunistic¹².) Eurogroup ministers approved on April 12, 2013 an extension of the average maturity of the bailout loans for Portugal and Ireland by seven years. This measure eases the way for these two countries to fully re-enter (international) longer-term debt markets. Greece has been frozen out of the longer term funding market since May 2010. The latest European casualty is Cyprus. In March 2013, Cyprus suffered a banking crisis that led to loss of market access by the government.

4.6. GAME CHANGING POLICY RESPONSES TO EUROPEAN SOVEREIGN DEBT MARKETS UNDER SEVERE STRESS

Developments in European sovereign bond markets during 2011 and 2012 reflected financial contagion as several euro area countries seem to have been affected by market turmoil. Balance sheet losses from government debt holdings act as a *direct* channel affecting future sovereign funding operations¹³. *Indirect*

¹¹ P. SPIEGEL, Q. PEEL and J. SMYTH (2013), "Lisbon struggles to avoid second bailout", *Financial Times* 11 April.

¹² P. SPIEGEL, Q. PEEL and J. SMYTH (2013), *ibid.*

¹³ *OECD Borrowing Outlook* 2012 (Chapter 3).

channels of contagion include a re-pricing of both sovereign risk and also counter-party risk among financial intermediaries. This, in turn, will lead to higher funding costs and roll-over risk for *other* sovereigns and financial institutions, impaired ability to pledge sovereign securities as collateral, flight-to-safety by investors, and rating downgrades of governments and financial institutions. Indeed, various other EU countries (in particular those with large fiscal deficits and/or outstanding debt) experienced severe market pressures¹⁴.

The increasing stress among sovereigns and banks was reflected in upward pressure on funding costs and roll-over risk as well as in higher levels of market volatility. In response, the ECB made available three-year LTROs (longer-term refinancing operations); the first one in December 2011, and the second one in February 2012. This policy measure eased significantly bank funding strains¹⁵. The LTROs may also have helped to contain spillovers from the sovereign debt crisis to broader financial markets.

However, the LTROs afforded only a brief pause from the direct funding stress of periphery banks and sovereigns. Renewed deleveraging pressures amid an economic downturn worsened funding conditions for both banks and sovereigns¹⁶. During the summer of 2012, strong upward pressure on the yields of Italian bonds, but especially Spanish bonds, returned (Chart 6). Also financial fragmentation strongly increased with increasing fears of a possible euro breakup.

In the context of increasing stress among sovereigns and banks in the euro area, it has been noted that euro area issuers are more vulnerable to liquidity squeezes (that may mutate into solvency pressures) than issuers from elsewhere such as the USA, UK and Japan. It is alleged that for issuers from the latter jurisdictions it is easier to rely on their central bank to support the servicing of nominal local currency sovereign debt (by ‘printing money’ to service the public debt during stressful periods). More precisely, an important reason for public policy action within a monetary union is its potential for co-ordination failures where financial markets drive union countries into a bad equilibrium in circumstances where prices do not necessarily reflect economic fundamentals¹⁷. In this kind of situations there is a risk of ‘multiple equilibria’. This potential is to some degree driven by the extraordinary susceptibility of monetary union members to liquidity movements triggered by changing market sentiments¹⁸ (including animal spirits). It has been argued that monetary union sovereigns are in

¹⁴ OECD *Sovereign Borrowing Outlook* 2012.

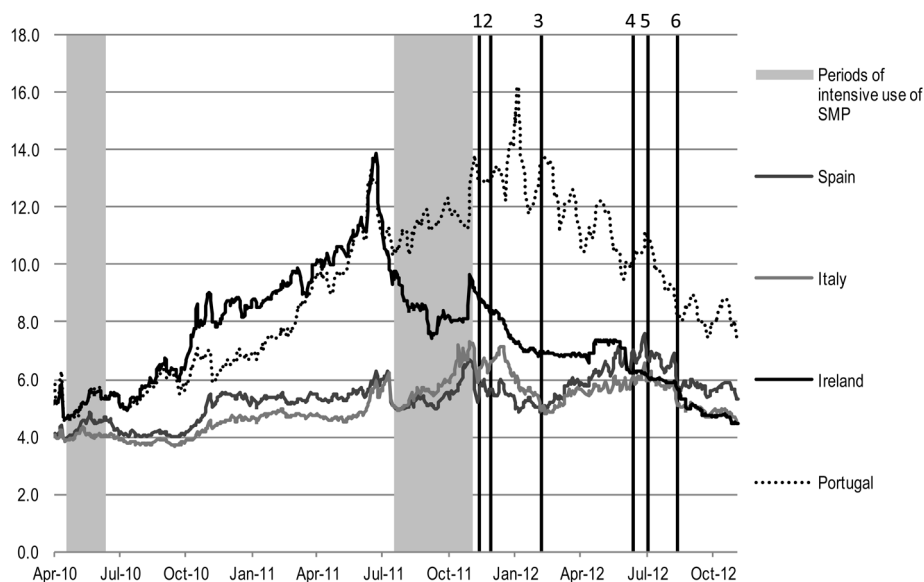
¹⁵ On 21 December 2011, the ECB provided EUR 489.2 billion to 523 credit institutions, while the second operation on 29 February 2012 saw an allotment of EUR 529.5 billion to 800 credit institutions [ECB (2012), *Monthly Bulletin*, March 2012].

¹⁶ IMF (2012), *Global Financial Stability Assessment*, October 2012.

¹⁷ This structural feature of a monetary union is in part related to the first structural characteristic on contagion.

¹⁸ P. DE GRAUWE (2011), *Managing a Fragile Eurozone*, CESifo Forum 2/2011.

Chart 6. Ten-year Benchmark Bond Yields (Peripheral Countries) Percentages



Source: OECD Sovereign Borrowing Outlook 2013.

Notes:

1. LTRO announcement (8 December 2011)
2. First LTRO (21 December 2011)
3. Second LTRO (29 February 2012)
4. ECB sets interest rate on the deposit facility to zero percent (5 July 2012)
5. Draghi's pledge to do "whatever it takes to preserve the euro..." (26 July 2012)
6. OMT announcement (6 September 2012)

particular vulnerable for liquidity crises leading to situations where they cannot (easily) obtain funds to roll over their debt at 'reasonable' interest rates¹⁹. Instead, the liquidity crisis pushes-up strongly interest rates that may mutate the liquidity panic into a solvency crisis. Since liquidity crises are triggered by market sentiments, this chain of events can be akin to a self-fulfilling prophecy: "[T]he country has become insolvent because investors fear insolvency"²⁰. As is well-known from the experience with banking runs, only decisive public policy actions can put a liquidity panic to rest²¹.

This is exactly how and why the ECB responded. Investors and policymakers were facing an alarming increase in financial fragmentation together with escalating fears of a possible euro breakup. In that tense situation the ECB announced on 6 September 2012 its new game-changing OMT (Outright

¹⁹ P. DE GRAUWE (2011), *ibid.*

²⁰ P. DE GRAUWE (2011), *ibid.*

²¹ L. BINI SMAGHI (2011), *Policy rules and institutions in times of crisis*, Speech at the Forum for EU-US Legal-Economic Affairs, organised by the Mentor Group, Rome, 15 September.

Monetary Transactions) programme, involving unlimited interventions in (dysfunctional) secondary government debt markets with serious liquidity problems²². As a result, convertibility risk (redenomination risk) associated with fears of a possible euro breakup was diminished, while bond yields in most periphery government debt markets fell (Chart 6).

Together with conditional financial support from the European Stability Mechanism (ESM) in primary markets²³, the capacity to contain excessively high sovereign yields in dysfunctional government bond markets with liquidity stress was strengthened significantly.

4.7. CONCLUSIONS

OECD sovereign issuers (euro area governments in particular) continue to face major challenges in raising significant volumes of funds amid a highly uncertain environment with very high borrowing costs in several sovereign debt markets and negative yields in others. Both ultra-high rates and negative yields reflect crisis-like conditions. Raising large volumes of funds at lowest cost, with acceptable roll-over risk, remains a great challenge for a wide range of governments, with most OECD debt managers continuing to rebalance the profile of debt portfolios by issuing more long-term instruments and moderating bill issuance.

Government debt ratios for the OECD as a whole are expected to grow or remain at high levels. The central government debt-to-GDP ratio for the euro area is expected to reach around 65% in 2013. In countries where public deficits and debt ratios have not yet begun to decline, the legacy of public debt exposes governments to shifts in confidence, thereby complicating the implementation of issuance programmes by sovereigns. The huge (overall still growing) stock of public debt has therefore put the spotlight on the urgency of fiscal consolidation. This is in particular pressing for European sovereign that have lost (in part or completely) access to longer-term markets.

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²² Interventions are at the short-end (1 to 3 years) of government debt markets and are subject to conditionality.

²³ The ESM was formally inaugurated on 8 October 2012.

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ANNEX: COUNTRY GROUPINGS

- Total OECD denotes in this Outlook the following 34 countries: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.
- The G7 includes 7 countries: Canada, France, Germany, Italy, Japan, United Kingdom and the United States.
- The OECD euro area includes 15 OECD countries: Austria, Belgium, Estonia (included after 2010), Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Slovak Republic (included after 2008), Slovenia and Spain.

- The Emerging OECD group includes 8 countries: Chile, Czech Republic, Hungary, Mexico, Poland, Slovak Republic, Slovenia and Turkey.
- The Other OECD countries aggregation includes 9 countries: Australia, Denmark, Iceland, Israel, Korea, New Zealand, Norway, Sweden and Switzerland.

5. EUROPEAN DEBT CRISIS AND CRISIS RESOLUTION POLICIES

*Juha Kilponen*¹

5.1. INTRODUCTION

This article on European debt crises and crises resolution policies builds loosely on my research paper on sovereign risk, European crises resolution policies and bond yields, which I wrote together with two of my colleagues from the Bank of Finland². But instead of simply discussing the paper, I will first provide some background to where we are now in Europe by reminding you briefly about the discussion that preceded the creation of European Monetary Union. I will do this in order to put the crises resolution policies that have been implemented during the midst of the debt crisis into historical perspective. I will then move on to discuss more detailed on the policies that have been adapted and then quickly summarize some of the findings from our paper. To conclude, I will say few words how the future and the new sovereign borrowing environment looks like.

5.2. HISTORICAL CONTEXT

The proposal of how to develop a genuine European Monetary Union was laid down in the so called Werner Report³ which was written in 1970. The report contained the work of the group set up under Mr. Pierre Werner, the Prime Minister and Minister of Finance of the Luxembourg Government at the time, to evaluate the necessary stages towards the realization of economic and monetary union in the Community.

The report discussed a number of important factors that were seen essential for the creation of the Monetary Union. Reflecting the views of many economists at the time, it was believed that the realization of genuine monetary union requires that economies must be open, factors of production must run freely between the countries, and very importantly, a certain degree of real and nominal convergence must be achieved prior to the establishment of the monetary union. Moreover, the

¹ The views expressed in this article are those of the author and do not necessarily reflect the views of the Bank of Finland or the European Central Bank System.

² J. KILPONEN, H. LAAKKONEN and J. VILMUNEN (2012), *Sovereign risk, European crisis resolution policies and bond yields*, Bank of Finland Research Discussion Paper 22/2012.

³ COUNCIL-COMMISSION OF THE EUROPEAN COMMUNITIES: Report to the Council and the Commission on the realization by stages of economic and monetary union in the Community, Luxembourg, 1970.

Werner Report argued that “to ensure cohesion of economic and monetary union, transfer of responsibility from national to a community plane is essential.”

Consequently, the plan in the Werner Report was not only to centralize the monetary decision making but also fiscal decision making with a power of community to influence on national budgets of its members.

In order to make the vision in the Werner Report more concrete from the fiscal perspective, below is a quote from the report:

“The essential features of the whole of the public budgets, and in particular variations in their volume, the size of balances and the methods of financing or utilizing them, will be decided at the Community level.”

Werner Report, 1970, p. 12.

Market discipline would complement the existence of the Maastricht criteria and prevent excessive creation of imbalances within the monetary union.

This reflects a rather radical view to that of how fiscal decision making has been conducted during the last decade or so in the union.

Rather radical and optimistic was also the timeline. It was believed that it would take about a decade to establish such genuine monetary union. Several important institutional steps towards creation of monetary union were taken in the 1970s. The ‘snake’ was created in 1972, the European Monetary Cooperation Fund (EMCF) was set up in 1973 and the Directive on stability, growth and full employment was adopted in 1974. The European Monetary System (EMS) and the European Currency Unit (ECU) was created in 1979. At the same time there were no important steps taken towards a creation of fiscal union as foreseen in the Werner report.

The decision not to progress in parallel with fiscal union certainly reflected the political realities and constraints, but as the time passed, there was also a change in the attitude towards the monetary integration. The view that the creation of a monetary union reflects a systemic change and disciplines, the other areas of economic decision making gained a widespread acceptance in the policy circles in the 1990s: Monetary union could be established without a full fiscal union and fiscal discipline could be enforced at the national level by binding fiscal rules and policy coordination. This view was prevalent also in the Delors report, presented to The Heads of State or Government in April 17, 1989⁴.

⁴ The complete Report on Economic and Monetary Union in the European Community, produced by the Committee for the Study of Economic and Monetary Union, was published under ISBN 92-826-0655-4, catalogue number CB-56-89-401-EN-C. Following the European Council meeting in Hanover on 27 and 28 June 1988 the European Council, The Heads of State or Government decided to entrust to a Committee, chaired by Mr Jacques Delors, President of the European Commission at the time the task of studying and proposing concrete stages leading towards economic and monetary union.

Many held the view that the EU with its free mobility of goods, capital and labor would ensure sustainable growth and economic convergence in the euro area, even though cross-country structural differences still prevailed at the start of the euro. The essential initial steps needed to create the Monetary Union emphasized in the Werner Report were clearly undermined.

The Delors report also realized that monetary union could operate only on the basis of mutually consistent policies by governments and other economic agents of the member countries, yet the role of Community in the fiscal policy field could be clearly weaker than foreseen in the Werner Report. This is evident from the quotation of the Delors' report given below:

“In the general macroeconomic field, a common overall assessment of the short-term and medium-term economic developments in the Community would need to be agreed periodically and would constitute the framework for a better coordination of national economic policies. The Community would need to be in a position to monitor its overall economic situation, to assess the consistency of developments in individual countries with regard to common objectives and to formulate guidelines for policy.”

Delors Report, p. 20

Nevertheless, in order to smooth the transition to the euro and realize a risk of free riding, convergence criteria for the interest rates, inflation and fiscal positions were established. The Delors' report suggested effective upper limits on budget deficits and exclusion of access to direct central bank credit and other forms of monetary financing. As a result, the Maastricht Treaty and the first version of the Stability and Growth Pact were designed to foster the fiscal discipline and coordination.

Consequently, the European Monetary Union was created without a centralized fiscal decision making. As we can read from the Werner Report, this was not the original plan.

And as we have learned, this construction has failed rather badly with very costly economic, political and social consequences. It failed even if the Stability and Growth pact was improved first time already in 2005 when its preventive arm was strengthened.

5.3. ROAD TO DEBT CRISES

Following the creation of the monetary union in 1999, yields on euro area sovereign bonds began to converge rapidly, reflecting the elimination of inflation and exchange rate risks from the sovereign bonds of the euro area countries. The

convergence in sovereign bond yields was supported also by the zero risk weights assigned to government bonds in capital adequacy regulation and the European Central Bank's practice of valuing all euro area countries' bonds on the same terms as collateral for central bank credit to banks. The period of convergence was followed by a few-year phase when sovereign bond yields remained stable and low despite divergent macroeconomic and fiscal developments in the euro area countries. Leveling of the capital markets since the introduction of euro led to rapid convergence of borrowing costs within the euro area, leading to exuberance and private credit led boom in many euro area countries. The Euro Area experienced also strong capital outflows from North to South. These capital flows may have been affected by global savings or liquidity glut as well as missing investment opportunities, especially in Germany⁵.

Investors' focus turned back to sovereign risks soon after the collapse of Lehman Brothers in September 2008.

As the financial crisis intensified and spread to the real economy, European governments had to provide support to their banking sectors and use fiscal stimulus measures to support their economies. Macroeconomic fundamentals deteriorated faster in some countries than others. Deficits accumulated during the apparently tranquil phase prior to the crisis rapidly became a problem for those countries which had a limited room to manoeuvre their fiscal policy. Sovereign bond yields began to increase rapidly in countries with a weakened macroeconomic situation and fiscal position or otherwise had the banking sector that was particularly vulnerable to international financial crises (Greece, Ireland, Portugal and most recently Cyprus). In contrast, in countries with stronger economic fundamentals (e.g. Germany, the Netherlands and Finland), long-term interest rates declined as a result of flight-to-quality. In mid-May 2010 the Greek sovereign debt markets fell into severe stress and the crisis began to spread to other European countries. Market-based funding dried up for Greece, Ireland and Portugal, forcing these countries, one after another, to seek financial support in the European crisis mechanisms and the International Monetary Fund. Sovereign debt crises spread also to the banking system, caused interbank markets to dry up and revealed the vulnerability of the European banking system to the sovereign risk.

The fiscal rules of the Maastricht Treaty and the Stability Pact were clearly inadequate for preventing the creation of macroeconomic imbalances within the euro area. Many countries were growing seemingly faster than their actually should have, or would have grown, without the introduction of the euro. This probably reduced the incentives for economic reforms which were a prerequisite

⁵ O. LANDMANN (2011), *On the Macroeconomics of European Divergence*, CESifo Forum 2/2011, pp. 19-25.

for the functioning of the monetary union. Neither the market nor political discipline worked the way it was expected.

5.4. EUROPEAN CRISES RESOLUTION POLICIES

Europe and the euro area are learning the lesson. Various long-term policy decisions are geared towards reinforcing the fiscal, financial and political discipline. New institutions have been created to foster management of crisis.

On a fiscal policy front, the plan is to strengthen fiscal rules, again. Europe has agreed on the so called ‘fiscal compact’ which will strengthen coordination of fiscal and economic policy.

The European Semester enables Commission to view Member States budgetary and structural policies before their implementation. The Excessive macro-economic imbalances procedure aims at detecting excessive macroeconomic imbalances. The EFSF and ESM were designed as firewalls and crises resolution mechanisms to provide bridge financing and buy time to the euro area Member States in financial difficulty.

Europe has also taken a note on a danger of excessive risk taking by the private sector and financial institutions and the difficulty of winding down systemically important banks. Financial regulation is strengthened and the banking union is under construction. Moreover, macro prudential tools are being developed in many countries to improve the arsenal of preventive measures.

During the Crisis, the European Central Bank has been concentrating on providing liquidity to the banking system, but it is also prepared to support the sovereign bond prices through its OMT program, on the condition that the country takes part in the ESM program and fulfills the program requirements. OMT is part of the promise by Mario Draghi to do ‘whatever it takes’ to prevent break-up of euro and foster the irreversible nature of euro.

From an institutional perspective, all these policies have a common goal of enforcing commitment to common rules and improve surveillance power in economic and financial matters by the union. The ‘fiscal compact’ aims to bring the balanced budget rules to Europe in the same way as in the U.S. where many federal states and local communities are subject to balanced budget rules.

This will take Europe somewhat closer to the vision in the Werner report, but certainly there is a long way to full fiscal union.

5.5. EFFECTIVENESS OF EUROPEAN CRISES RESOLUTION POLICIES

But have these policy initiatives been effective? One way to look at it is to analyze the impact of different policy announcements on sovereign bond yields. This is what we have tried to do in the research paper on Sovereign risk and crises resolution policies with my colleagues. In the paper, we study the impact of these European wide policy decisions on the long term sovereign bond yields of seven euro area countries: Germany, France, Spain, Italy, Portugal, Greece and Ireland. We study the policy effects with an empirical model, where the explanatory variable is the change in the spread between the 10-year government bond yield and the 10 year euro swap rate. Our daily data runs from 1 January 2007 to 21 March 2012. We look for the effect of credit risk, liquidity risk and the general risk appetite, as they have been found to be the main risk factors determining the yields of the European sovereign bonds.

Our results suggest that in general many policy decisions have had a significant short term effect in the European bond market. The announcement of ECB's securities market program (SMP) has had a significant negative effect on yield changes in all the seven euro area countries considered in this study⁶. At the same time, we do not find a lasting impact of the liquidity support decision on sovereign bond yields and the same applies for the ECB's covered bond purchase program (CBPP). The latter is understandable, given that the CBPP was directed to support the banking system in the early phase of the crisis. The ECB interest rate decisions have been mainly anticipated in the markets, but we find that in some cases, lowering of the policy rate has led to a decline in the long term rate. News on financial support package requests and decisions has had some mixed impacts. The decisions on support packages have decreased yields in Greece, Ireland and Portugal, but increased the yields in Spain and Italy, suggesting possible policy contagion effects.

On the one hand, the decisions related to European Stability Mechanism (ESM) have caused an increase in the yields in Germany, Ireland and Greece and no effect in other countries. On the other hand, the decisions regarding the EFSF seem to have decreased the yield changes significantly in most of the countries. Other policy decisions, mainly related to strengthening of the Stability and Growth Pact and improving of fiscal discipline have not had a lasting impact on bond yields.

⁶ In the updated version of the paper, we have found similar results for the announcement of the ECB's OMT program.

5.6. CONCLUSIONS

Europe has done a lot to improve economic and monetary union as a result of the sovereign debt crisis. Some of these policies have been clearly successful. Policies which have addressed immediate issues in the markets have been rather effective. Ireland and Portugal are returning to the capital markets and have been pretty well on track in the macroeconomic adjustment programs. Investor sentiment to Spain, which has been considered for quite some time as a key country in the crisis, has improved markedly, and the same applies to Italy. EFSF and ESM have established themselves as supranational issuers that are able to provide bridge financing at low rates. OMT has been effective, economic reforms have been implemented and urgency and need for reforms is generally recognized.

The effectiveness of policies that have longer term goals such as improving the fiscal and political discipline in the long run are more difficult to assess, perhaps it is too early.

The new environment is however still challenging. The market sensitivity to the countries' macroeconomic and fiscal position has increased and this is a positive development. However, excessive market sensitivity combined with contagion channels is problematic. Some evidence suggests that the home bias in sovereign debt markets is still rather large. For instance, in the case of Spain about 40 percent of sovereign debt is held by domestic banks and this is not very healthy. Fragmentation of financial markets like this can have a number of problems such as making the task of monetary policy increasingly more difficult. Debt overhang and localization of the financial markets can lead to crowding out of financing of private investments which in turn can lead to further divergence of economic development in different corners of Europe. Such a development is undesirable and works against the logic of genuine monetary union.

6. THE ROLE OF SOVEREIGN DEBT IN MONETARY POLICY IMPLEMENTATION – AN INTERNATIONAL COMPARATIVE PERSPECTIVE

Ulrich Bindseil and Nicolas Sauter

Abstract

This paper compares the role of sovereign debt in monetary policy implementation at the Eurosystem, the Federal Reserve, the Bank of England, and the Bank of Japan. Central banks have traditionally preferred sovereign debt in their operations due to its low credit and liquidity risk. Two fundamental policy doctrines on this subject seem to have emerged amongst the major central banks. According to the first, this approach is appropriate also because the central bank may be considered a part of the state sector, and therefore exposure of the central bank to government can be netted out and contributes to a lean state balance sheet. According to the second view, it is essential that central banks are independent of the government, and a favourable treatment of sovereign paper could unduly lower government bond yields relative to yields of private securities and in this sense distort markets and may even lower market discipline against fiscally irresponsible behaviour of governments. Differences in doctrines are not only mirrored in monetary policy, but also in the composition of central bank balance sheets. This became particularly evident during the recent financial crisis, when some central banks embarked on large scale purchases of sovereign debt.

6.1. INTRODUCTION

Central banks have a number of degrees of freedom regarding how to achieve their operational target of monetary policy, which usually is the short-term money market interest rate. Or, as Borio (2000) puts it, there are “*a hundred ways how to skin a cat*” in terms of details of monetary policy implementation. This paper explores the options for the treatment of sovereign debt in these ‘*hundred ways*’. For example, some central banks provide structural liquidity to the banking system by holding large stocks of sovereign debt, while others don’t. Almost all central banks implement monetary policy at the margin through collateralised credit operations with banks, but the collateral sets they accept are very different as some only accept sovereign debt as collateral, while others almost accept any security or even bank loans (although with differentiated haircut). While these choices may have limited effects on central banks’ ability to steer short term interest rates, the chosen setup will not only affect the relative price of sovereign debt compared to other assets in the economy, but it will also affect systemic properties of the financial system, and in particular funding

liquidity risk of issuers and banks. While the effects of these differences in monetary policy implementation may be relatively limited during normal periods, they will come to the fore in times of financial stress.

This paper contributes to a better understanding of the role of sovereign debt in monetary policy implementation by analysing differences in monetary policy frameworks and comparing their actual implementation in the euro area, the United States, the United Kingdom and Japan. Section 6.2. revisits the motivations and potential economic effects of a different treatment of sovereign debt in monetary policy implementation from a theoretical perspective. We argue that central banks have traditionally preferred sovereign debt in their operations due to its low credit and liquidity risk. However, the implication of such favourable treatment in terms of lowering government bond yields relative to yields of private securities, may constitute a distortion and may even lower market discipline against fiscally irresponsible behaviour of governments. Two fundamental policy doctrines on this subject have emerged amongst the major central banks. In Section 6.3., the actual use of sovereign debt in monetary policy implementation at the four major central banks compared. Differences in doctrines are not only mirrored in monetary policy frameworks, but also in the composition of central bank balance sheets. This became particularly evident during the recent financial crisis, when only some central banks embarked on large scale purchases of sovereign debt. At the same time, some convergence in the role of sovereign debt in collateral frameworks across central banks can be observed. Section 6.4. concludes and provides some tentative outlook on the future treatment of sovereign debt in monetary policy implementation.

6.2. THEORY

The treatment of sovereign debt in monetary policy implementation should depend on its merits relative to other debt instruments. As a starting point, it is therefore important to recall that more than two-thirds of the global universe of debt instruments consists of sovereign or sovereign-linked debt (e.g. bonds issued by government agencies), whereas corporate and securitised debt account roughly equally for the remaining third (see Barclays, 2012). The share of government debt is even higher for better credit qualities. As a consequence of its high liquidity and low credit risk compared to other debt instruments, sovereign debt has traditionally been preferred by central banks.

This section reviews the advantages and disadvantages of a favourable treatment of sovereign debt relative to other assets in outright monetary policy operations and as collateral in credit operations. Based on these considerations, two doctrines for the reference balance sheet of a central bank will be contrasted that

have evolved over time, which we call the doctrine of the ‘consolidated state sector’ and the doctrine of ‘central bank independence’.

6.2.1. Outright Holdings of Sovereign Debt

In an efficient market economy, the neutral interest rate structure should follow naturally from the expectations hypothesis as well as the relative credit and liquidity risk properties of different assets. However, in view of an imperfect substitutability of assets (‘preferred habitats’ of investors), portfolio allocation decisions of large investor (classes) will influence relative asset prices (and yield spreads) and thereby also the allocation of resources in society. In this sense, outright securities holdings of central banks could generally be seen as potentially more distortive to asset prices than repurchase arrangements, unless the central bank replicates in its outright holdings the market portfolio. Replicating the market portfolio may however be wrong for a central bank in view of the implied needs to build up and maintain expertise in various complex asset classes, an activity in which the central bank is unlikely to have comparative advantages.

So why should central banks not solve this tension by having no outright holdings at all, i.e. having their entire asset side in the form of central bank credit operations? In general, outright holdings tend to have a longer duration than credit operations, which reduces the asset turnover and lengthens the overall duration of the central bank balance sheet. This may be more efficient as (i) economic projects tend to have a long maturity relative to liquidity desires of investors and households, (ii) as the banking system’s ability to deliver on asset maturity transformation is limited, as the financial crisis has shown, and (iii) the key liability of the central bank, banknotes in circulation, is broadly stable. If one accepts the merits of the central bank holding long term financial assets outright, government bonds may be particularly well-suited for that purpose, as they tend to bear low credit risk and may therefore limit the central bank’s overall risk exposure and need to enter businesses for which it has no comparative advantage (management of more information intense financial assets).

Beyond their role in normal times, sovereign debt purchases can be a crucial monetary policy instrument under non-standard circumstances, for instance, when policy rates approach the zero lower bound or in times of severe financial stress. Under these circumstances, outright purchases of government bonds can be used for several purposes. Purchases of (risk free) financial assets create excess reserves of banks with the central bank, which may allow the central bank to rely on the money multiplier in the sense that excess reserves ease banks’ liquidity constraints and, at the margin, encourage lending to the private sector and thus stimulate investment. Apart from older academic literature (e.g. Friedman and

Schwartz, 1963), this argument has been given prominence in particular by the Bank of Japan in 2001-2006 (see Udai, 2007), and again in April 2013, when its operating target for money market operations was changed from the uncollateralized overnight call rate to the monetary base.

Second, buying sovereign debt enables the central bank to take interest rate risk into its balance sheet and to reduce the long-term risk free yield (see e.g. Gagnon et al, 2010). In the euro area, where government debt markets were fragmented, targeted sovereign debt purchases could furthermore compress spreads between different jurisdictions, if spreads were considered to reflect undue elements which interfere with the transmission of monetary policy.

6.2.2. Collateral Framework – Broad versus Narrow Collateral Set

Monetary policy is, at least at the margin, implemented through repurchase operations that provide banks with credit against adequate collateral, such as to steer short-term rates towards the operational target. The eligible collateral in these operations is usually composed of either a narrow set of collateral, i.e. sovereign debt, or broad collateral, which can also comprise bank bonds, corporate bonds, covered bonds, asset-backed securities, credit claims and equity.

The central bank's choice of the set of eligible collateral will also affect the relative price of different assets, since banks will pay a premium for eligible assets if they can be hit by funding shocks with the associated risks of having to conduct expensive asset fire sales. The most neutral choice for the central bank to avoid distorting relative asset prices is thus to accept a broad set of collateral, ideally comprising the entire universe of assets. However, a broad collateral set also causes a number of challenges. First, also to avoid that bad collateral drives out good collateral, so-called 'ex post risk equivalence' between different assets must be maintained. Ex post risk equivalence means that through the application of different haircuts on assets, depending on their credit and liquidity risk characteristics, the riskiness post haircut of different collateral types is equal from the central bank perspective. However, in practice it may be difficult to achieve risk equivalence across all assets, so that haircuts could distort market liquidity premia, particularly if the central bank differentiates less in terms of haircuts than is done in private interbank repo markets. Second, accepting information intense and more complex assets requires the central bank to understand these assets sufficiently, which again may not be an area of comparative advantage of the central bank. Many central banks have therefore traditionally preferred a narrow collateral set in their credit operations, and sovereign debt in particular. The

sovereign debt market is usually the deepest and most liquid securities market in a country.

Further reasons in favour of a narrow collateral set may be perceived. Narrow collateral constrains banks' ability to access monetary policy operations and thereby prevents undue reliance of banks on the elasticity of central bank credit. Moreover, a narrow collateral set reduces risk on the central bank balance sheet, as changes in market valuation of collateral between the time of default of a counterparty and the realisation of collateral should be limited. The high liquidity of sovereign debt markets should also ensure that bond prices remain largely unaffected by the sale of the collateral. At the same time, a central bank can only impose narrow collateral if the overall liquidity deficit of the banking system towards the central bank is relatively small compared with sovereign debt held by banks. Otherwise, collateral would become scarce, pushing up the price for government securities.

By contrast, a broad collateral set is advantageous if the liquidity deficit of the banking sector is large relative to the sovereign debt held by banks. Broader collateral eligibility rules also increase the overall liquidity in the financial system, which strengthens its resilience to funding shocks and facilitates the financing of less liquid but more productive projects. As the central bank is not liquidity constrained, it can bear liquidity risk resulting from non-liquid collateral.

6.2.3. Two Fundamental Central Bank Doctrines: the 'Consolidated State Sector' versus 'Central Bank Independence'

The relative importance central banks attach to outright versus repurchase operations and the role of sovereign debt relative to other assets varies considerably and in fact two fundamental central bank doctrines seem to have emerged – the doctrine of the 'consolidated state sector' (CSS) and the doctrine of 'central bank independence' (CBI). Both doctrines claim to lead to 'neutral' central bank balance sheets, but in fact lead to significant differences in terms of central bank asset composition and relative asset prices.

According to the *CSS doctrine*, the central bank is part of the aggregate state sector, since money is legal tender that eventually allows you to pay taxes (as already noted by Knapp, 1924). As the public sector is seen as less efficient than the private sector, state interference with the private sector should be minimised and the consolidated state balance sheet should be kept lean. This can be achieved if the central bank holds to the extent possible government liabilities as assets, which minimises the length of the overall state balance sheet after consolidation (also see Filardo et al, 2013). Sovereign debt holdings should be equally

distributed along the yield curve (in terms of market capitalisation) to avoid price distortions. Proponents of this doctrine argue that treating other assets on equal footing with sovereign debt will not be neutral with regard to relative asset prices, given that sovereign debt is by definition the risk free and most liquid asset.

By contrast, the *CBI doctrine* starts from the view that central bank independence is the most important ingredient of successful central banking, and insists that any over-proportional exposure of the central bank towards the government will undermine central bank independence and, via political pressure, may lead to higher than optimal inflation and moral hazard on the side of the government in the sense of excessive spending. Accordingly, a central bank must minimise its interaction or at least not privilege the sovereign in any way. In its collateral framework, the central bank would not discriminate private assets and is comfortable with accepting a broad range of assets with sufficient haircuts that achieve ex post risk equivalence. Similarly, in its outright portfolio, the central bank would aim at market capitalisation to avoid distorting asset markets.

Despite their differences as regards privileged treatment of sovereign debt, both doctrines perceive themselves as conservative and market-oriented, as they aim at a 'neutral' reference balance sheet that would limit distortions in relative asset prices. However, the CSS doctrine appears to generally trust the government, whereas the CBI doctrine seems sceptic about the fiscal responsibility of democratically elected governments due to time inconsistency between the electoral cycle and the effects of public debt accumulation.

This effect will obviously be even more pronounced in crisis times when the monetary policy toolbox is expanded toward large outright asset purchases of sovereign debt. A central bank following the CSS doctrine will embark on large scale asset purchase programmes of sovereign debt even to the extent of lengthening the central bank balance sheet and injecting excess liquidity. In fact, large purchases of sovereign debt are neutral in terms of the length of the balance sheet of the consolidated state sector. In contrast, monetary policy implementation influenced by the CBI doctrine will hesitate to purchase large amounts of sovereign debt, as it fears moral hazard of governments who, according to this view, will use any leeway they have to avoid taking painful but necessary measures of fiscal consolidation.

6.3. PRACTICE AND INTERNATIONAL COMPARISON

In the following, the practices regarding the role of sovereign debt in (i) outright monetary policy portfolios, (ii) asset purchase programmes during the recent financial crisis, (iii) collateral eligibility rules, and (iv) the relative importance of

outright and credit operations are compared across the Eurosystem, the Federal Reserve, the Bank of England and the Bank of Japan.

6.3.1. Comparison of Outright Holdings in Normal Times

Outright sovereign debt holdings are part of the regular instruments of monetary policy implementation of most central banks. Before the start of the global financial turmoil, the Eurosystem was the only of the four central banks that did not use outright operations as a regular monetary policy tool. By contrast, the Bank of Japan purchased sovereign paper regularly in its monetary policy operations, and also the Federal Reserve and the Bank of England tried to mirror the volume of banknotes in circulation with their outright sovereign debt portfolios (see Table 1). The Federal Reserve even applies limits since the early 2000s on the volume of individual Treasury securities that it can purchase in order to minimise price distortions from supply constraints or potential illiquidity of individual securities in different maturity buckets.

Table 1: Pre-crisis Frameworks for Outright Monetary Policy Operations

	Eurosystem	Federal Reserve	Bank of England	Bank of Japan
Used before crisis	No	Yes	Yes	Yes
Function	-	Traditionally, the outright portfolio mirrored the volume of banknotes in circulation, and was the main refinancing source of the banking sector.	To mirror the volume of banknotes in circulation.	Provision or absorption of long-term and short-term liquidity in the banking sector.
Type of assets	-	Domestic government securities	Domestic government securities	Long-term: JGBs Short-term: JGBs, commercial paper and asset-backed commercial paper.
Legal restrictions on sovereign debt purchases by the central bank	Prohibition of primary market purchases and monetary financing	No	Prohibition of primary market purchases and monetary financing	Limits on the overall volume of primary purchases of sovereign debt are subject to annual approval by the parliament

Source: Amended from BIS (2007), BIS (2009), and Cheun, von Köppen-Mertes, and Weller (2009).

From a legal perspective, the Federal Reserve is in principle unconstrained in buying government bonds or providing overdraft facilities to the central government, whereas outright operations of the Eurosystem, the Bank of England

and the Bank of Japan are subject to legal restrictions concerning the prohibition/limitation of monetary financing. During the Second World War, the Federal Reserve was even obliged to monetise Treasury debt at a fixed rate; an obligation that was only eliminated with the Treasury-Fed Accord in 1951, which restored the Fed's independence in deciding on outright purchases of US government debt. By contrast, Article 123 of the Lisbon Treaty prohibits the provision of overdrafts to the government as well as the purchase of government debt on the primary market. In Japan, the parliament sets limits on the Bank of Japan's subscription and underwriting of government bonds as well as on the provision of uncollateralised to credit the central government according to Article 5 of the Fiscal Act.

The pre-crisis central bank balance sheets differ in terms of size and composition, revealing some differences in monetary policy implementation practices. The central bank balance sheets in the bank-based financial systems of the euro area and Japan are larger compared with those in the United States and the United Kingdom, where corporations often access financial markets directly (see Table 2). At the same time, the pre-crisis reference balance sheets of the Bank of Japan and the Federal Reserve are strongly geared towards outright sovereign bond holdings, whereas the monetary policy operations of the Eurosystem and the Bank of England largely consist of collateralised credit operations or repurchase arrangements. On the liability-side, all balance-sheets are largely composed of banknotes in circulation, with the size of the Federal Reserve's banknote liabilities closely resembling its sovereign debt holdings.

At the outbreak of global financial turmoil following the breakdown of the market for asset-backed securities in August 2007 and the collapse of Lehman Brothers in August 2008, all four central banks reacted flexibly to the crisis by expanding their balance sheets (see Bindseil and Winkler, 2012). Due to increasing risk aversion among banks, liquidity was increasingly parked at central banks. Central banks accommodated the implied increase of credit demand largely through temporary repurchase or collateralised credit operations and, in the case of the Federal Reserve, also several specialised lending facilities that were created during the crisis.

6.3.2. Comparison of Asset Purchase Programmes in Times of Crisis

Since the outbreak of the global financial turmoil in August 2007, all major central banks have used outright purchases of sovereign debt as part of their operational tools, albeit with varying monetary policy objectives. Table 3 provides an overview of those purchase programmes that directly targeted

Table 2: Comparison of Central Bank Balance Sheets (as a percentage of total balance sheet)

Pre-crisis (July 2007)									
Assets	ECB	FED	BOE	BOJ	Liabilities	ECB	FED	BOE	BOJ
Government bond holdings	0%	94%	10%	67%	Banknotes	69%	92%	50%	90%
Collateralised refinancing operations	51%	2%	60%	24%	Reserves	20%	2%	25%	12%
Other	49%	4%	31%	9%	Other	11%	6%	25%	-2%
Total (billion NC)	913	845	80	83,840	Total (billion NC)	913	845	80	83,840
Total (% GDP)	10%	6%	6%	16%	Total (% GDP)	10%	6%	6%	16%
Post-Lehman (January 2009)									
Assets	ECB	FED	BOE	BOJ	Liabilities	ECB	FED	BOE	BOJ
Government bond holdings	0%	23%	5%	49%	Banknotes	43%	41%	17%	73%
Collateralised refinancing operations	60%	28%	83%	44%	Reserves	29%	41%	61%	10%
Other	40%	49%	13%	7%	Other	28%	18%	22%	17%
Total (billion NC)	1,763	2,063	258	105,765	Total (billion NC)	1,763	2,063	258	105,765
Total (% GDP)	20%	15%	18%	21%	Total (% GDP)	20%	15%	18%	21%
Recent (April 2013)									
Assets	ECB	FED	BOE	BOJ	Liabilities	ECB	FED	BOE	BOJ
Government bond holdings	9%	56%	96%	75%	Banknotes	42%	34%	15%	54%
Collateralised refinancing operations	40%	0%	0%	17%	Reserves	29%	55%	72%	42%
Other	51%	44%	4%	8%	Other	29%	11%	14%	4%
Total (billion NC)	2,142	3,317	403	157,046	Total (billion NC)	2,142	3,317	403	157,046
Total (% GDP)	23%	21%	26%	33%	Total (% GDP)	23%	21%	26%	33%

Source: ECB, Federal Reserve Board of Governors, Bank of England, and Bank of Japan.

Notes: 'Other' portfolios of the Fed include outright holdings of non-government securities and lending to specific institutions (Maiden Lane I, II, III). Bank of England holdings of government bonds comprise 'bonds and other securities acquired via market transactions' and gilts purchased under the APP. Collateralised refinancing operations include borrowing through the standing facility/discount window.

sovereign debt. The overview does not account for quasi-public sector debt issued by government-owned banks or government agencies like Fannie Mae or Freddie Mac.

Overall, The Bank of Japan's purchases were the largest as a percentage of domestic output or total sovereign debt outstanding, followed by the Bank of England, and the Federal Reserve. However, the Federal Reserve's purchases were the largest in absolute terms. The Eurosystem has so far bought fewer government securities compared to the other three central banks, and followed more specific monetary policy objectives.

Table 3: Sovereign Debt Purchase Programmes by Major Central Banks

Central bank	Programme	Assets purchased	Peak size (billion NC)	Share of 2008 GDP (%)	Share of outstanding sovereign debt (2012 Q4, %)
ECB	SMP	Euro area	219 EUR	2	4
	OMT	sovereign debt	0 EUR	0	0
FED	QE 1	Treasuries	300 USD	2	3
	QE 2	Treasuries	600 USD	4	5
	Operation twist	Treasuries	667 USD	5	6
	QE 3	Treasuries	192 USD	1	2
BOE	APF	Gilts	375 GBP	26	28
BOJ	Outright purchases	JGBs	106,800 JPY	21	16
	APP	JGBs	28,134 JPY	6	4
	APP	Treasury bills	16,449 JPY	3	9
	QQME	JGBs	-	-	-
ECB			219 EUR	2	4
FED			1,374 EUR	12	15
BOE			443 EUR	26	28
BOJ			1,252 EUR	30	18

Source: ECB, EFC Sub-Committee on EU Government Bonds and Bills Markets, Federal Reserve Board, Bank of England, UK Debt Management Office, Bank of Japan, and Fauley and Neely (2013).

Notes: Sovereign debt data for the euro area refers to eligible central government collateral. The BOJ aggregate is calculated over the sum of outstanding JGBs and treasury bills. APF and APP stand for Asset Purchase Facility and Asset Purchase Program respectively. QQME refers to the 'Quantitative and Qualitative Monetary Easing' programme announced by the Bank of Japan on 4 April 2013.

Looking at the objectives of the purchase programmes, it is remarkable that only very few, if any of the 2009-2013 outright purchase programs were explicitly motivated by pure ‘quantitative easing’ with the aim of creating excess reserves in the central bank balance sheet. The Bank of England publicly referred to this function, at least as a communication device. The aim of lowering the yield curve was assumed in research papers (see Benford *et al.*, 2009; Joyce *et al.*, 2011; Bridges and Thomas, 2011). The Bank of England pursued outright purchases between March 2009 and November 2009 and re-activated its Asset Purchase Facility in October 2011, which is indemnified by HM Treasury. The purchases largely consisted of public securities (gilts), while commercial paper and corporate bond holdings never exceeded GBP 3 billion. Given the large size of the portfolio relative to total outstanding gilts (28%), the Bank of England bought also gilts with long maturities and even initiated an arrangement with the United Kingdom’s Debt Management Office for on-lending to the market of the purchased gilts through repurchase transactions. The close interaction between the central bank and fiscal authorities was spelled out plainly by Governor King in his letter to the Chancellor of the Exchequer from 9 November 2012, which announced arrangements to transfer gilt coupon payments received by the Asset Purchase Facility, net of interest costs and other expenses, to the Exchequer. He explained that “*gilt payments received by the Asset Purchase Facility amount to payments from one part of the public sector to another*”, which can be interpreted as a direct reference to the CSS doctrine.

Rather than creating excess reserves, the Federal Reserve’s explicit objective with sovereign debt purchases was to lower long-term risk-free interest rates and support lending conditions through the effect on term premia via the portfolio rebalancing channel. The Federal Reserve substantially expanded its purchases of agency-related securities to longer-term Treasury securities in March 2009, with the goal to “*help improve conditions in private credit markets.*” The purchases of Treasury securities were further expanded in November 2010. Like the Bank of England, the Federal Reserve maintained the size of its balance sheet by reinvesting principal payments from maturing assets. The Maturity Extension Program, announced on 21 September 2011, allowed putting further “*downward pressure on longer-term interest rates and help make broader financial conditions more accommodative*” without further expanding the balance sheet. With this “Operation Twist”, the Federal Reserve purchased USD 400 billion in par value of Treasury securities with remaining maturities of 6 to 30 years and sold an equal par value of Treasury securities with remaining maturities of 3 years or less. The Maturity Extension Program was extended on 12 December 2012 to continue purchases of USD 45 billion per month, although without any sterilisation through the sale of short-term Treasuries.

Similar to the Federal Reserve, also the Bank of Japan initially aimed at reducing long-term interest rates with its sovereign debt purchases, but switched to a reserve balance target in April 2013. While the first increases in outright purchases of government bonds in December 2008 and March 2009 aimed at supporting liquidity conditions and financial market stability in general, the Bank of Japan announced a Comprehensive Monetary Easing programme on 5 October 2010 to “*encourage the decline in longer-term interest rates and various risk premiums*”. This asset purchase programme was expanded several times subsequently¹. Despite the considerable size of sovereign debt purchases (18% of outstanding sovereign debt), it can be argued that the Bank of Japan tried to adhere to the CBI doctrine, e.g. by concentrating its purchases at the short-end of the yield curve. However, the asset purchase programme has eventually been replaced by the ‘Quantitative and Qualitative Monetary Easing’ on 4 April 2013 amid growing concerns about persistent deflationary pressures. The new strategy aims at extending the average remaining maturity of sovereign debt held by the Bank of Japan from slightly less than three years at present to about seven years, which would correspond to the average maturity of total issued Japanese government debt. In that sense, the new purchase programme can be seen as closer to the CSS doctrine, also since it was announced jointly with the temporary suspension of the so-called ‘banknote principle’, which says that outright debt purchases should be aligned with the growth in the demand for banknotes. Moreover, the “*operating target for money market operations is changed from the uncollateralized overnight call rate to the monetary base*”. As in 2001 to 2006, the Bank of Japan is thus again targeting excess reserves.

The Eurosystem’s purchase programmes for sovereign debt are somewhat idiosyncratic compared to other sovereign debt purchase programmes, as their objective is probably closer to that of private debt purchases by other major central banks. The Securities Market Programme (SMP) aimed at reducing, for monetary reasons, the spreads of government bonds, which represent in principle the risk free benchmark. The undue components of spreads hindered the appropriate transmission of monetary policy to the real economy in the euro area. In its decision, the Eurosystem underlined the importance of central bank independence by explicitly referring to Member States’ announcement to honour their fiscal obligations under the excessive deficit procedures and to accelerate fiscal consolidation where necessary. Moreover, SMP purchases remained limited to the strictly necessary volume, which is reflected in the small share of SMP holdings in total euro area sovereign debt outstanding². The SMP was terminated

¹ The asset purchase programme was increased on 14 March 2011, 27 October 2011, 14 February 2012, 12 July 2012, 19 September 2012, and 20 December 2012.

² At the same time, SMP purchases represent a more significant share of outstanding sovereign debt in the targeted markets.

with the announcement of the technical features of the Outright Monetary Transactions (OMTs) on 6 September 2012.

The OMTs further underline the SMP principle of strict separation between the government and the central bank by making OMTs strictly conditional on compliance with an appropriate European Financial Stability Facility/European Stability Mechanism programme or the regaining of bond market access by a Member State that is already under a macroeconomic adjustment programme. OMTs would not take place while a given programme is under review and would only resume after the review period once programme compliance has been assured. Moreover, transactions would be focused on the shorter end of the yield curve, in particular on sovereign bonds with a maturity of between one and three years, and the liquidity created through the OMTs would be fully sterilised. Hence, in all aspects the SMP and OMT stand out from other sovereign debt purchase programmes, as they aim at safeguarding an appropriate monetary policy transmission, while maintaining independence of the central bank from governments.

6.3.3. Comparison of Collateral Frameworks

The relative importance of sovereign debt differed considerably across the collateral frameworks of major central banks before the recent financial crisis. All central banks accepted domestic government securities as collateral in their standard credit operations and at their standing facility/discount window. However, their collateral frameworks diverged with regard to (i) the acceptance of other types of collateral in credit operations, and (ii) the treatment of foreign government debt.

The Eurosystem and the Bank of Japan seem to traditionally follow the CBI doctrine, accepting a broad range of collateral from the public and private sector in both their collateralised open market operations as well as at their standing facilities, after the application of adequate risk control measures (see Table 4). In the euro area this practice was seen as a necessity from the start, given the lack of consolidation of banking sectors, the fragmentation of sovereign debt markets in the euro area, and the prohibition to treat public sector issuers more favourably than private sector issuers. Similarly, the Bank of Japan maintains a single collateral list with a broad set of eligible securities for its funds-supplying operations against pooled collateral and its standing facility.³ The Bank of England also had a single list of eligible collateral, but accepted only a narrow set

³ However, the Bank of Japan's repurchase operations are limited to Japanese government bonds (JGBs), treasury bills, and (asset-backed) commercial paper. Currently, the Bank of Japan mainly provides liquidity through large scale asset purchases though, so that repurchase operations have become irrelevant.

of high quality sovereign debt. In doing so, it was closer to the CSS. At the same time, it considered itself to act as a normal market player in terms collateral requirements and risk management with a view to have neutral effects on the relative prices between private assets (see Cheun, von Köppen-Mertes, and Weller, 2009).

Table 4: Eligible Collateral Framework for Credit Operations

	Eurosystem		Federal Reserve		Bank of England		Bank of Japan	
	OMOs	Standing facility	OMOs	Standing facility	OMOs	Standing facility	OMOs	Standing facility
Government debt	✓	✓	✓	✓	✓	✓	✓	✓
Foreign government debt	if issued in euro and in the EEA by an issuer from the EEA or a G10 country		-	✓	EEA and US Treasuries		if issued in yen and in Japan	
Broad collateral*	✓	✓	-	✓	<i>(segregated pools introduced in 2008 also within OMOs)</i>		✓	✓

Source: Amended from BIS (2007) and Bank of Japan Reports and Research Papers (2009).

Notes: * Broad collateral comprises a broad set of marketable as well as non-marketable collateral: municipal bonds, corporate bonds, commercial paper, ABSs, MBSs, asset-backed commercial paper, and loans. OMOs stand for open market credit operations that are either collateralised via pledged assets or repos.

The Federal Reserve applied different eligibility criteria for the collateral accepted in its short-term credit operations, at its discount window facility and for intraday credit. In its temporary open market operations, the Federal Reserve only accepted securities issued by the central government, Federal agencies and mortgage backed securities guaranteed by Federal agencies. Similar to the Bank of England, the Fed's temporary operations thus had a strong focus on avoiding distortions in relative asset values and credit allocation in the private sector. However, at its discount window facility, which serves as an emergency liquidity backstop, the Federal Reserve accepts a broader set of collateral, including private debt. For intraday credit, the Fed even provides uncollateralised access up to a bank-specific limit.

As regards the treatment of foreign government debt, the Eurosystem and the Bank of England have historically been more flexible to accept foreign debt issued outside their jurisdiction as collateral in their temporary credit operations. By contrast, the Bank of Japan requires foreign government securities to be issued in Japan and denominated in Japanese yen, while the Federal Reserve accepts foreign debt only in its discount window operations.

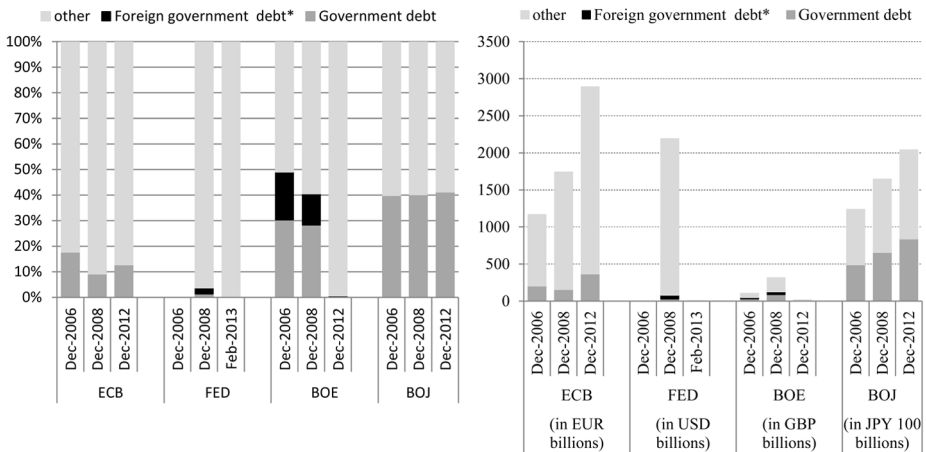
During the run on wholesale funding markets between 2007 and 2009, all major central banks provided credit against less liquid collateral in order to prevent a systemic crisis. The Federal Reserve and the Bank of England, which both entered the crisis with a narrower collateral set than the Eurosystem and the Bank of Japan, expanded their eligibility criteria substantially to ease strains in collateral availability that emerged after asset-backed securities markets broke down and these instruments became highly illiquid. The Federal Reserve introduced the Term Auction Facility in December 2007, which was accessible by all depository institutions against a broad set of collateral. It also created specific facilities for providing liquidity directly to borrowers in specific credit market segments, particularly the commercial paper and asset-backed securities market. Likewise, the Bank of England expanded the collateral list for its three-month repurchases operations to high quality mortgage and corporate bonds, including issues denominated in major foreign currencies. In addition, both central banks introduced new facilities to improve the functioning of the repo market in which less liquid securities could be exchanged against government securities.

The temporary changes introduced by the Bank of England eventually resulted in a complete revamp of its operational framework in October 2008, which made broad collateral a permanent feature of its framework. While narrow collateral can be repoed in intraday, short-term market operations and its normal borrowing facility, the Bank of England now provides credit against segregated collateral pools in its indexed long-term operations. It also lends gilts in exchange for eligible but less liquid collateral in its Discount Window operations. In the indexed long-term operations, banks bid for funds against a narrow and a wider collateral set which consists of high-quality securities, including private sector securities. When the bid-spread between the two collateral sets widens, the share of lending against broader collateral is raised. The Bank of England (2012) views the higher interest rate paid on borrowing against broad collateral as a protection against moral hazard.

The collateral frameworks of the Eurosystem and the Bank of Japan proved generally sufficient to accommodate the increased liquidity need of banks during the recent financial crisis and were only amended marginally. The Eurosystem suspended the application of a minimum credit rating threshold of 'triple B' for government-linked debt of some countries under an EU/IMF programme. Furthermore, its collateral framework was widened in favour of asset-backed securities with medium credit quality, additional credit claims, and in favour of marketable debt instruments issued in the euro area but denominated in a major foreign currency. The Bank of Japan also started to accept foreign-currency denominated securities as collateral in its operations and included securities issued by real estate investment corporations and loans to municipal governments in its list of eligible collateral.

The changes in collateral frameworks are also reflected in the actual usage of sovereign debt as collateral in credit operations since 2006. At the peak of turmoil in interbank markets, the composition of the collateral pool at the Federal Reserve and the Bank of England became increasingly mixed, reflecting the broadening of the collateral eligibility (see Figure 1). However, current credit operations by the two central banks are close to zero due to the sharp increase in their outright portfolios. In the Eurosystem, the composition of pledged collateral was largely driven by declines in asset prices, rating downgrades (including sovereign ratings), and a difficult environment for issuing unsecured debt in some euro area countries. This led to greater usage of covered bonds and government guaranteed bank bonds as collateral (see BIS, 2013). In contrast to the other three central banks and although it maintains a broad collateral framework, the Bank of Japan is an example showing that banks do not always pledge the least liquid assets in central bank operations. The share of sovereign debt in the Bank of Japan’s total collateral pool has remained relatively stable and higher than at other central banks, which may partly be due to the relative abundance of government securities in Japan.

Figure 1: Breakdown of Used Collateral
(percentages) (in national currency)



Source: ECB, Federal Reserve System Monthly Reports on Credit and Liquidity Programs and the Balance Sheet, Quarterly Reports on Federal Reserve Balance Sheet Developments, Bank of England, and Bank of Japan.

Notes: Collateral is reported after valuation and haircuts and comprises also over-collateralisation, which in total accounts for more than half of the collateral pledged with the Eurosystem and the Bank of Japan. ‘Other’ collateral comprises municipal and regional government bonds, uncovered bank bonds, covered bank bonds, corporate bonds, asset-backed securities, other marketable securities, and non-marketable securities.

* The Federal Reserve reports foreign collateral as aggregate securities issued by sovereign, agency, municipal, and corporate issuers.

6.3.4. Comparison of Outright and Repurchase Operations

Differences in the role of sovereign debt across central banks should become evident by comparing sovereign outright holdings and used collateral in terms of key economic indicators such as total outstanding government debt, total central bank assets, and nominal GDP. Looking at these measures, the role of sovereign debt in monetary policy implementation is not clear-cut and has changed during the financial crisis. All central banks favour sovereign debt in their operations, particularly in their outright operations. However, some attention has shifted towards quasi-public sector and private sector debt in outright operations during the crisis. The Eurosystem stands out, as it traditionally attaches a larger role to private debt in both credit and outright operations (see Table 5).

6.4. CONCLUSIONS

Considerable differences can be observed in the treatment of sovereign debt in monetary policy implementation of the Eurosystem, the Federal Reserve, the Bank of England and the Bank of Japan. The treatment of sovereign debt is usually favourable, but the frameworks and practices differ with regard to the treatment of private debt in outright and repurchase operations. Yet it is exactly these relative differences in the treatment of private and sovereign debt that are likely to have some effects on relative yields between assets. However, it is not obvious to explain the differences across approaches with objective criteria related to the economic and financial environment. The euro area stands out, as the separation between the government and the central bank appears more of a necessity in a multi-country currency area.

The different practices seem also to be driven by different doctrines related to the idea of a ‘consolidated state sector’ versus ‘central bank independence’. At the same time, some convergence in implementation practices could be observed during the recent financial crisis. The Federal Reserve and the Bank of England widened their collateral frameworks considerably and created new lending facilities that also accept non-government assets. Similarly, the Eurosystem bought for the first time sovereign debt of some euro area Member States, albeit with a different purpose than the purchases at other major central banks. In the period ahead, it will be interesting to see if these recent changes in the treatment of sovereign debt in outright and repurchase operations will remain and become a permanent feature of central banks’ monetary policy frameworks.

Table 5: Sovereign Debt Held Outright and Pledged as Collateral in Relation to Three Alternative Indicators (percentages)

	ECB		FED		BOE		BOJ		
	2006	2008	2012	2006	2008	2012	2006	2008	2012
Total outstanding sovereign debt									
held outright	0	0	3	16	8	14	2	2	29
pledged as collateral	5	3	6	n/a	0	0	7	14	0
total	5	3	9	16	8	14	9	16	29
Central bank balance sheet									
held outright	0	0	9	89	21	57	9	5	95
pledged as collateral	23	9	15	n/a	1	0	37	37	0
total	23	9	24	89	23	57	46	42	95
Nominal GDP									
held outright	0	0	2	6	3	11	1	1	25
pledged as collateral	2	2	4	n/a	0	0	2	6	0
total	2	2	6	6	4	11	3	7	25

Source: ECB, Federal Reserve Board of Governors, Quarterly Reports on Federal Reserve Balance Sheet Developments, Bank of England, UK Debt Management Office and Bank of Japan.

Notes: Collateral is reported after valuation and haircuts and comprises also over-collateralisation, which in total accounts for more than half of the collateral pledged with the Eurosystem and the Bank of Japan. Total sovereign debt is reported at market value, except for the Eurosystem, where total sovereign debt is all eligible central government collateral in nominal amounts, comprising euro-denominated debt that was issued in the EEA by an EEA or a G10 country.

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7. RISK MANAGEMENT OF A PUBLIC DEBT PORTFOLIO: THE ITALIAN EXPERIENCE

Maria Cannata Bonfrate

7.1. INTRODUCTION

A proper sovereign debt management is characterised by the pursuit of a low cost of funding in a medium-long term perspective. This implies that a substantial focus needs to be devoted to limit market risks, to the purpose of preventing a myopic policy caring only immediate advantages in terms of cost of funding.

A careful risk management is very important when public money is at stake. This is even more evident in presence of a high level of public debt and, as a consequence, the frequency of issuance is necessarily high. Indeed, in such situation it is crucial a sound distribution of the supply, making securities more attractive for investors in every market condition. The financial crisis started at the end of 2007 has further emphasized the necessity of adopting strategies which take properly into account the risk control.

Being a big and frequent issuer, Italy has directly experienced the relevance of managing market risks in a prudent manner. In this paper we are going to think back to the history of the past three decades, so as to learn some lesson from errors and successes.

7.2. THE 1980S

In the early 1980s the Italian public debt to GDP ratio was around 60% and one of the major problems in the economy was represented by the high inflation rate (around 20%) consequent to the two oil price shocks occurred in the 1970's. In such environment, together with a policy ignoring the urgency of keeping public accounts under control, the attempt of reducing the interest expenditures was mainly pursued by shortening the maturity of securities. Accordingly, the vast majority of issuances were covered by Treasury bills, and the average life of the overall stock of Central Government debt dropped to a level just slightly above one year. Unfortunately, the curb of funding cost was not effectively achieved, as the ongoing pressure on the market for rolling over T-bills meant also an increase in their rates, partially offsetting the lower cost of such instruments versus bonds.

Nevertheless, a honest analysis of that period cannot forget that, at that time, the appetite for medium-long term bonds was quite limited, and this just because of

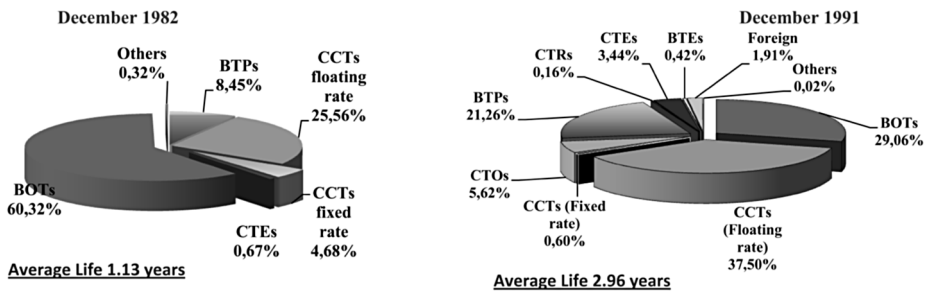
the high level of inflation. Therefore, the choice of shortening the maturity of issuances was in part obligated, in order not to lock high rates for a long period. Nevertheless, it is equally true that such reliance on short term paper protracted for a probably overlong period before realising that the funding cost had anyhow grown too much.

When the necessity of lengthening the maturity of issuances became evident, it was increased the supply of floating rate notes, aiming at stimulating the demand for securities longer than T-bills. Such instruments (CCT: Certificati di Credito del Tesoro) had a coupon (generally semi-annual) linked to T-bills yields, with a maturity initially limited between two and four years, but gradually extended up to ten years. At the same time, when inflation was brought back to one digit figure, it was restored a major supply of fix rate bonds, whose outstanding grew from 13% at the end of 1982 to 28% at the end of 1991. At the same time, the T-bills share was lowered to 29% in 1991 from over 60% in 1982, whereas in the same period floating rate notes increased to 37.5% from 25.6% and BTPs – the traditional fix rate bonds – recovered to over 21% from the scarce 8.5% of 1982.

A noticeable contribution to this shift to longer maturity was given in those years by the creation in 1988 of MTS, a screen based market (the first in the world), where secondary market transactions could be concluded fully electronically in a transparent way.

Looking at the chart below, the progress in term of reduction of the rollover risk was quite evident, as 70% of the outstanding was represented by medium-long term instruments. Nevertheless, the average life of the debt was still quite low (2.96 years), although almost three times that of 1982 (1.13 years) and, more relevant, the exposure to rate risk was still very high, because two thirds of the stock were exposed to the fluctuation of rates.

Figure 1



7.3. FROM THE 1992 CRISIS TO THE EMU

The fragility of such structure of the debt arose dramatically during the 1992 financial and monetary crisis, which produced a jump in the level of interest rates of 6 percentage points (from 12% to 18%) whose consequence in the interest expenditures was almost immediate and very relevant.

It was a tough experience, but also very instructive and the lesson was well learnt. The awareness about the importance of consolidating the debt structure by increasing the fix rate component became one of the key factors for defining a more comprehensive issuance policy. Then, a special care was devoted to promote the efficiency of the secondary market – essential to support the primary one – and to plan the issuance programme in a transparent and predictable way. Indeed, only through a liquid secondary market and a clear communication followed by a consistent supply policy it was possible to create a renewed appetite for fix rate and long dated bonds. But during the 1992 crisis it became evident that some mechanisms had not properly worked in the Italian Government bond market and an intervention from the authorities was absolutely necessary.

In fact, some inefficiencies recorded in the secondary government bond market contributed to weaken the primary market, producing a heavy impact on the State budget. Therefore, during 1993 an extensive scrutiny of market problems was conducted, dealing to a deep revision of the relevant regulation. At the beginning of 1994 a new regime entered into force, enacting several simple measures to improve secondary market liquidity, especially to promote transparency and smooth functioning of the regulated trading platform. At the same time, it was created the group of Specialists of the Treasury in Italian government bonds. These intermediaries were selected (and still are, with just some modifications consequent to the evolution of the European regulation on transparent trading venues) among the primary dealers of the regulated secondary market, requesting them a commitment of constant presence in auction, besides an additional commitment in terms of performance in the regulated secondary market. Since then, each Specialist has had to subscribe at least 3% of securities (bonds and bills) offered in auction by the Treasury. This percentage has been calculated on annual basis, attributing different weights to various securities, generally based on the duration.

Against this commitment, Specialists have become privileged interlocutors of the Treasury, with a daily informal dialogue and monthly meetings where market problems and opportunities are regularly analysed and discussed, in order to help the issuer to calibrate the supply and intervene, when necessary, to provide the market efficiency with a suitable regulatory framework.

The effectiveness of such reform was proved quite soon: in early 1995 another financial crisis hit financial markets, with an intensity similar to the 1992 one. Moreover, on March 1st 1995 had to be reimbursed the first Italian government bond with a very large outstanding. This stemmed from the necessity to ensure, for each bond, a size large enough to make it liquid in the secondary market. Just to obtain this result, since 1990 the Italian Treasury, following the French example, had started offering its bonds in several tranches, so as to reach gradually the ideal size.

Although the challenging context, the auctions carried out in that period were fully covered and during the pick of the crisis the increase of rates was limited, 1% on average against the 6% of 1992, followed by a quicker recovery to the pre-crisis levels. The reason of such better resilience of the system was essentially due to the new stronger structure of the market, consequent to the 1994 reform.

Nevertheless, a market friendly approach is intrinsically challenging for a public debt manager, because of the increasing number of factors to be taken in consideration when a decision is adopted. For instance, to favour the liquidity of a bond in the secondary market is necessary that its outstanding is large enough. The issuance in several tranches until the ideal size is reached is a perfect solution to meet this goal, but in this manner the amount to be reimbursed at maturity becomes very high, pushing the issuer to adopt special measures to avoid future problems in the rollover.

To mitigate this risk, the policy issuance needs to be planned largely in advance, with a regular supply which become almost independent by the redemptions at specific dates, doing adequate pre-funding also when there are not imminent reimbursements. Consequently, when a new bond has to be launched, it is very important to bear clearly in mind the future redemption profile, being careful to choose its date of expiry, to avoid an excessive concentration at the reimbursement date and trying to distance enough each redemption.

To facilitate this task, after 1992 crisis, lengthening life and duration of the debt, to protect the budget from negative consequences of shocks on rates, became the first objective of the Italian public debt managers.

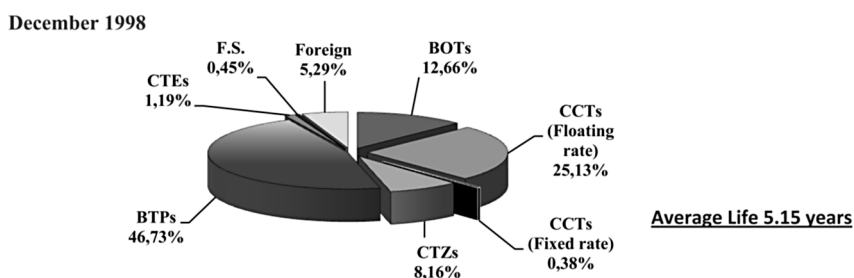
The major difficulty found in those years was the achievement of a significant and fast reduction of the share of T-bills in the stock of government bond portfolio. Indeed, Italian citizens were so used to invest in these short term instruments that the initiatives taken to push them to lengthen the horizon of their investments obtained only a modest response. For instance, starting from 1994 a new instrument was included in the basket of the Treasury supply, the CTZ, a 2 year zero-coupon bond, trying to provide an incentive to Italian retail investors to move from T-bills towards longer maturities. The new bond positively received

by monetary funds, but not by individual investors, that still represented, at that time, quite a wide part of the Treasury's securities underwriters.

Considering that then all the three standard T-bills maturities were proposed twice a month, the solution was the reduction of the frequency of their supply. To do this, instead of offering each time a new BOT, was arranged to re-open each of them once, auctioning the first tranche of 3 and 12 months BOTs at mid-month and doing the same at the end of month for the 6 months T-bills.

This way, in twelve months between October 1997 and October 1998 the frequency of T-bills issuance became monthly and it was possible to further reduce the supply. Then, if at the end of 1996 the weight of BOTs was still over 19% of the government securities outstanding, two years later it had lowered at 12.66%. At the same time, just before the launch of the Euro, the average life of the debt overtook the 5-year maturity.

Figure 2



Together with the development of large fix rate segment, this achievement allowed to reduce rate and refinancing risk. Such results were also supported by the publication of an annual issuance calendar, with the indication of all announcement, auction and settlement dates, accompanied by quarterly programmes giving additional details regarding new bonds, included the final size that the Treasury was committed for each of them.

For such reason, the strict respect of what announced in calendar and quarterly programmes was particularly appreciated by market participants, allowing the Treasury to reduce drastically both market risks and cost of funding.

Indeed, especially for a large and frequent issuer as Italy is, it is extremely important to be regular and transparent in the supply, privileging the predictability instead of an opportunistic approach, which could appear immediately positive in terms of individual issuance cost, but could turn into negative in the long run, pushing investors away in the future. As we can see later on, the Italian debt manager never wandered to this stance.

7.4. THE EURO SINGLE MARKET

With the introduction of the Euro in financial markets, the exigency of liquidity became further important for all sovereign issuers in the EMU, producing an additional push to increase the size of each bond.

Similarly, the presence of a strip market, disciplined in Italy just before the starting of the EMU to give an useful support to the demand and increase the number of investors, determined the necessity to provide a large mass of bonds with the same coupon cycle, increasing the concentration of interest payments in few dates. This introduced another factor to be considered by the debt manager when a decision had to be taken about redemption date of a new bond.

Consequently, also in this case, the rollover risk at the redemption date was increased and, in the course of time it would have emerged a theme of liquidity management, due to the concentration of interest payments in certain dates.

The first of these two problems (rollover risk) pushed the Italian Treasury towards a more proactive approach in managing the redemption profile. If since 1995 it has been possible to buy-back government bonds using privatisation proceeds, since 2002 the Treasury has also started an activity of exchange transactions, where a new bond can be issued against the repurchase of old ones. In this way, it has been possible to smooth the future redemption profile not only in presence of resources coming from privatisations, but also independently from them. Moreover, the selection of the bond offered in exchange could be done by targeting the correction of misprices observed in the secondary market, so contributing to its efficiency and liquidity.

The second problem (liquidity management), due to the mismatch originated by an excess of concentration both in reimbursements of bonds and payments of coupons, was faced by two ways: a careful planning of medium-long issuances and some major flexibility in the use of short term instruments. Indeed, the three traditional maturities of T-bills (3, 6 and 12 months) were accompanied by the issuance, when necessary, of 'flexible' T-bills, i.e. T-bills with a non-standard maturities, which could be very short (even less than 2 months), or quite long (9 to 11 months). Moreover, since 1999 a Commercial Paper programme has added further flexibility to the cash management.

In a context of a really open market, with many sovereigns borrowing in the same currency, it was also important to enlarge as much as possible the investor base. To better reach new ones, a diversification of supply also in the currency denomination of bonds represented an opportunity.

The Republic of Italy had already been present in the international market since the mid 1980's. In 1993 the issuance of bonds in foreign currencies (especially

USD) started be done under the Global format disciplined by the New York law. Since 1999 this channel of funding has become more relevant and regular. Moreover, always since 1999, it has been opened a Euro MTN programme, aiming at exploiting the opportunity of issuing bonds (both in Euro and foreign currencies) in the international markets, but under the discipline of the Italian law.

All this incremental activity determined a growing need to hedge the exchange exposure. A prudent risk management, in fact, imposes to care first those risks which are most out of control and the exchange rate risk is probably the most unpredictable one, being independent on any action that a public debt manager can adopt. In general, bonds in US dollar and yen were immediately covered via cross currency swap, while those in Swiss franc were not. Indeed, if the amount of bonds issued in foreign currency is negligible, some exposure could remain open. Nevertheless, when the dimension is becoming more relevant – even if still marginal in the overall stock – it is better not to keep this kind of risk.

Accordingly, since 2006 *all* new issuances in currencies different from Euro have been immediately covered by cross currency swaps and it was decided of not to take any exchange exposure anymore, swapping into Euro also the outstanding bonds denominated in foreign currency still not hedged.

In 2003, the exigency of enlarging the investors base and the presence of a relevant demand of inflation linkers pushed the Italian Treasury to set a programme of bonds indexed to HIPC ex-tobacco, the BTP€is. Also in this case, a preliminary and accurate risk analysis preceded the decision.

Issuing inflation linked bonds, especially when there is a capital accumulation at redemption, implies a careful assessment of many factors: on one side, the confidence in the authorities capability of keeping inflation under control, to prevent unexpected jumps both in the interest expenditures and capital accumulation at redemption, together with an evaluation of the degree of automatic hedge represented by the fiscal incomes increase in times of growing inflation; on the other side, the beneficial effect on the overall cost of funding coming from both the premium that investors could be available to pay for the protection against inflation risk and the diversification in itself, which lightens the pressure on other market segments.

After this long but not exhaustive list, it appears quite clear that any decision requests to carefully consider a large number of variables, aiming at reducing the funding cost by meeting the preference of intermediaries and investors, preserving secondary market liquidity, enlarging the investor base, but also taking properly into account different risks in terms of budget and liquidity management.

To benefit from an analytical and quantitative support in the decision process, since early 2000s the Italian Treasury has developed an internal model to define an efficient frontier curve between risk and cost in presence of different portfolios of future issuances. With this model a large number of Montecarlo scenarios are estimated to find an optimal bond portfolio. In the course of time, numerous constraints have been introduced to make more realistic the scenarios simulated by the model, so that it could provide suggestions not only theoretically meaningful, but also useful in practical terms. Nevertheless, it is important to stress that the support provided by this kind of models has to be exploited not on daily basis, to take single decisions of issuance, but rather to define the general policy and periodically check how distant has been the actual issuance activity from the optimal one.

7.5. THE CURRENT FINANCIAL CRISIS

The current financial crisis, even if it has already mutated its face several times since its beginning, started in the second half of 2007 in consequence of the explosion of the sub-prime bubble in USA and the following interbank credit crisis.

The first effects on the Italian government bonds were mixed, as the lack of confidence in banks turned to positive for sovereign issuers, but the liquidity of secondary markets was hampered by the difficulties in the banking sector. Therefore, until the Lehman Brothers' default, apart some more flexibility in the supply of off-the-run bonds (consequence of the reduced liquidity in the secondary market), no relevant interventions were requested to public debt managers.

After September 15, 2008, on the contrary, the trouble in the market was so deep and intense, the volatility so high, that it was unavoidable to introduce a drastic change in the auction method. Indeed, in such a volatile environment, the newly arising risk was an inefficient auction process, due to the sharp change of market mood possible between the announcement of an auction and its execution. Until then, the Italian Treasury had announced, for each bond, a fixed amount to be issued and the process of allotment had been fully automatic, without any human intervention. During the three days between the announcement and the auction, if the market sentiment had changed, in one case the amount offered could be too high, putting at risk the auction coverage; in the other case, the issuer could not fully exploit a demand higher than expected and the auction could result overpriced, creating discontent among investors.

To solve this problem, starting from October 2008, the auction method was changed, announcing a range of amounts within which the Treasury decides at what price to cut the auction. This innovation has been extremely successful, as clearly proved even in the toughest moments of sovereign debt crisis; indeed, Italy has never recorded an uncovered auction, included at the end of 2011.

The volatile market has created execution problems and increased risks also to syndicated deals, imposing the necessity of taking into account an incredible number of additional factors to be considered, in order to limit as much as possible the so called 'headline risk'. Indeed, the types of news that could influence the market have increased dramatically and it has become not any longer sufficient to consider the traditional data releases that in the past typically could move the market. This has pushed to a time compression of book-building process so that now bonds are priced the same day the transaction has been launched and book closed. Consequently, this method of placement, which in the past was considered less risky and more comfortable for the issuer, has become more challenging, as the reputational risk connected with a modest outcome needs to be seriously assessed before deciding if, and exactly when, to start.

During all this period, Italy did not change the issuance principles followed so far and, even if some adjustments have been introduced to better adapt issuance plans to the extreme volatile market, the care of preventing rate and refunding risk has remained very high. Also when short term rates touched historical low records, the proportion between short and medium-long term issuances was not changed, differently from several other sovereigns in Europe, and the average cost of funding did not suffer, resulting very low (2.18% in 2009 and 2.1% in 2010). On the contrary, in particular during 2010 and 2011, efforts were addressed to reduce T-bills outstanding. The rationale of this strategy was the very high level of 2012 bond redemptions, furthermore concentrated in few months, especially between February and April. Not adding short term reimbursements to these redemptions and leaving space for major reliance to T-bills issuance in presence of such a situation was the most prudent behaviour. Moreover, in order to smooth the picks of redemptions in 2012, during 2010 and 2011 were also conducted buy-back and exchange operations, where almost EUR 9 billion of bonds expiring in 2012 were repurchased.

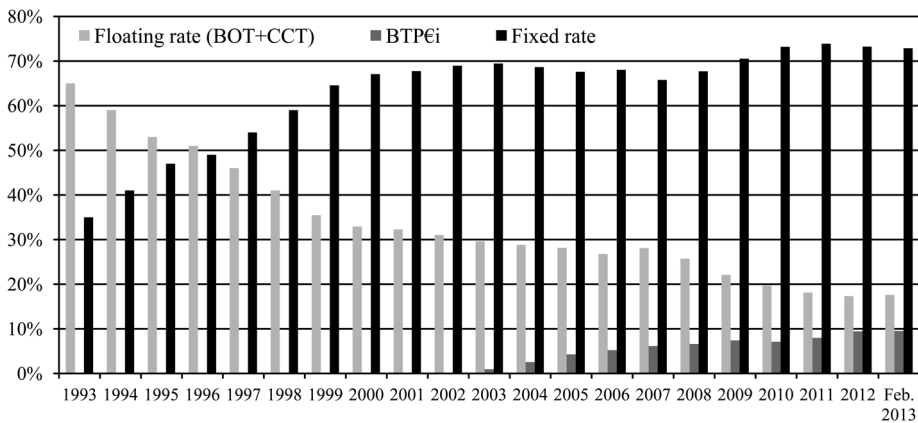
These choices turned out to be particularly right, as the turbulence that overwhelmed Italian government bonds in the second half of 2011 was still leaving aftereffects at the beginning of 2012, even in an improving context.

Another factor which awarded the firm attitude of the Italian Treasury in facing difficult market conditions was undoubtedly the continuity of the auctions, the respect of the calendar, together with the regularity in offering all the bonds up to the 10-year maturity, only temporarily renouncing to the ultra-long issuances, for

obvious reasons. In this way, on one side, it was showed to the market the self-confidence of the Country; on the other side, being only a question of price, all the auctions – although expensive – were fully covered, making evident that the market access was open. And when it is only a question of price, problems can be solved.

Moreover, as shown in the chart below, thanks to the long lasting policy of extending average life and duration of the debt, its structure was solid enough to absorb quite well the picks of yields recorded in the auction at 2011 end. In fact, the overall cost of funding of 2011 was limited to 3.61%.

Figure 3



In 2012 some more reliance on T-bills and short bonds was necessary and, in a market still volatile and problematic, it was not possible to issue in size the very long dated bonds (i.e. over the 10 year maturity).

Moreover, to compensate the lower demand of traditional inflation linkers – which were particularly sensitive to rating actions occurred in the year¹ – and better exploit the potentiality of the retail demand, the Treasury launched a new type of inflation linked bond: the BTP Italia. It is a 4 year bond linked to the domestic consumption price index, paying the capital revaluation semi-annually, together with the coupon, which can be purchased directly on the Italian regulated retail platform (MOT). It has been extremely successful but, having only a 4 year maturity, contributed to reduce the average life of the government securities stock.

¹ In particular, to prevent disruptions in the secondary market of BTPeIs after the Moody’s downgrade, in July 2012 the Treasury conducted an exchange operation, buying back 4 BTPeIs and issuing a 5 year nominal bond. Consequently, the secondary market absorbed the shock in an orderly way.

Nevertheless, in the end such reduction was quite limited (from 6.99 years at 2011 end to 6.62 years at 2012 end) and the Treasury repeatedly stated that its higher reliance on the short term was only tactical and temporary, as the long term guidelines has not been changed.

In fact, after the positive market reaction to the EBC statement on 6th September 2012, the situation has gradually and constantly improved, foreign investors have come back to buy Italian government bonds in size and it has been possible to launch new lines of BTP in the 15 and 30 year tenor, receiving a very positive response from investors and allowing to recover a stable presence in the ultra-long market segment. Therefore, in the coming months it should be possible to extend again the average life of the debt, limiting further market risks.

7.6. CONCLUSIONS

The present brief historical reconstruction is dealing to some indications for debt managers, especially when they are large and frequent issuers. First, never neglect the risk control, both when the overall issuance strategy is defined and a single decision of issuance has to be made. Second, be always ready to individuate new potential sources of risk when market conditions are rapidly changing. Finally, do approach always the market in a meaningful and consistent way, as the confidence is the first pillar on which it is possible to build a solid and stable relation with all market players. In the long run such behaviour reduces the funding cost and limits risks.

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8. GDP-INDEXED BONDS: A TOOL TO REDUCE MACROECONOMIC RISK?

Guido Sandleris and Mark L.J. Wright

Abstract

In this paper, we review the case for the introduction of GDP-indexed government securities. After discussing different types of debt indexation, we review the experience of sovereigns with the issuance of indexed debt, including indexation to inflation, commodity prices and real variables like Gross Domestic Product (GDP). We then provide an assessment of the potential gains from the introduction of real GDP indexed debt. Finally, we discuss possible barriers to the more widespread introduction of indexed debts including issues of liquidity of the new instruments, the incentive for governments to misrepresent economic data such as inflation or real GDP, and the political costs associated with state-contingent liabilities.

8.1. INTRODUCTION

The debts of sovereign nations differ in important ways from the debts of corporations and households. Perhaps most importantly, the doctrine of sovereign immunity has historically limited the ability of private agents to sue a sovereign government and/or attach any sovereign government assets in fulfilment of the debt. And although over time the absolute doctrine of sovereign immunity has been weakened to a restrictive doctrine of sovereign immunity¹, the attachment of sovereign assets remains very difficult to this day (see Wright, 2012 and Pitchford and Wright, 2012 for some examples of these difficulties).

In the absence of sovereign collateral and a supranational organization capable of imposing a debt restructuring on a sovereign creditor, a sovereign government facing repayment must negotiate a debt restructuring with their creditors. As the debt contracts involved are often quite disparate, and the holders of these debt contracts quite dispersed, this often leads to costly negotiations that with increasing frequency end up in litigation. The resulting outcomes seem particularly inefficient, with the average sovereign taking many years to restructure its debts (Pitchford and Wright, 2007), the average creditor losing roughly 40% of the net present value of their claim (Cruces and Trebesch, 2012),

¹ The restrictive doctrine of sovereign immunity was codified in the United States with the passage of the *Foreign Sovereign Immunity Act* of 1976, in the United Kingdom by the *State Immunity Act* of 1978, and accepted by the general assembly of the United Nations in the *Convention on Jurisdictional Immunities of States and Their Property* of 2004. The restrictive doctrine limits the immunity of a sovereign to acts of state, and not to its commercial activities, including debt issuance.

and with the average sovereign typically exiting default without significant declines in their nominal debt (Benjamin and Wright, 2008).

Set against this background, there has been an active policy debate over the last ten years as to how the debt restructuring process can be reformed to result in better outcomes from debt restructuring operations *ex post*, as well as to promote better borrowing and default decisions *ex ante*. Although early discussions raised the possibility of establishing an international sovereign bankruptcy regime (see Krueger and IMF, 2013), most policy proposals have focused on redesigning sovereign bond contracts in order to shape the sovereign debt restructuring process. Although to date, much of this contractual reform has focused on the addition of engagement, collective action, and aggregation clauses to bond contracts, there remains a significant undercurrent of opinion that an alternative, and possibly more efficient, method to avoid restructuring debts could be found by explicitly indexing sovereign debt repayments to current economic conditions as summarized by, for example, estimates of Gross Domestic Product (GDP)².

The argument is that indexing debt to such variables would not only help countries avoid debt restructuring but would also improve risk sharing between governments and foreign creditors. The intuition works as follows. Having a constant stream of interest payments, as in a plain vanilla bond, would imply that the government has to pay the same amount of interest in good and bad times. This makes repaying in bad times more costly because there are less resources available and there are greater alternative spending needs. Indexation of sovereign debt payments to government revenues/GDP/commodity prices makes payments of sovereign debt explicitly contingent. As a result, a government would have to repay less when hit by a bad shock and more when hit by a good one.

In this paper, we review the past experience of countries with the issuance of indexed debts, and review the case for the wider use of indexed debts including, but not limited to, GDP indexed debt. We compare actual indexed debt contracts with alternative forms that might be preferable in terms of their impact on sovereign government finances. We are especially critical of direct indexation to GDP growth without regard for the level of GDP, as it often implies large interest payments as an economy emerges from a deep recession.

Finally, we conclude by examining the reasons why indexed debt has not been more widely adopted, and in turn review potential barriers to their more widespread adoption. We argue that indexing sovereign debt instruments to variables such as GDP or commodity prices can improve welfare for many

² See for example, Borenztein and Panizza (2004) or Sandleris *et al.* (2010) for an analysis of the positive effects of sovereign debt indexation.

countries. The fact that these kinds of instruments are not more widely used could be related to several facts. First, introducing new instruments usually involves some fixed costs of market setup as investors might be reluctant, initially, to include them in their portfolios. Second, indexed debt can generate some perverse incentives to manipulate official statistics. Third, political factors might reduce the incentives for a government to issue indexed debt. Finally, there are instruments already in use that could allow governments to reap many of the benefits that indexed debt can generate.

The rest of this paper is organized as follows. Section 8.2. reviews past experiences with indexed sovereign debts and outlines the case in favor of their more widespread use. Section 8.3. evaluates the extent of indexation in extant sovereign bond contracts and contrasts this with other forms of indexation that might be preferable in terms of their effect on government finances. Section 8.4. then asks why we do not observe more indexed debt and in the process raises some issues that might impact on the optimal design of indexed sovereign debt, while Section 8.5. concludes.

8.2. THE EXPERIENCE WITH INDEXED DEBT

In this section, we define what we mean by the terms indexed debt and real indexed debt. We then go on to discuss some examples of both kinds of debt that have been issued historically.

8.2.1. Indexed Sovereign Debt

When we think of a bond, whether issued by a sovereign or a corporation, we typically think of a security that promises to pay a fixed amount of a given currency at given points in time. We will refer to such a bond as non-indexed because the amount paid at any point in time is a fixed amount of the relevant currency. By contrast, a bond that specifies that the amount, or timing, of payments varies with some observable quantity will be referred to as *indexed* with the observable quantity possibly representing an index of economic activity (such as the inflation index, or an index of real GDP) but also possibly representing some other variable such as a market quantity or price.

It should immediately be obvious that this distinction can be misleading in practice. The first problem is that it is typically the case that investors are concerned with the *real* amount of repayment; that is, the amount paid after adjusting for the effects of inflation. What we have referred to above as a non-indexed bond pays a fixed nominal amount in a pre-specified currency,

which will, if the general level of prices is not constant, and hence inflation is not zero, pay a real amount that declines when prices rise, and rises when prices fall. That is, a non-indexed nominal bond can be thought of as a real bond that is indexed (negatively) to the level of prices in an economy. Conversely, a bond that has its nominal value linked to the level of an index of prices, and hence can be accurately referred to as an indexed nominal debt, may pay a constant amount in real terms after adjusting for inflation, and hence also be accurately referred to as a non-indexed real debt.

Table 1. Post-war introduction of public inflation indexed securities

	Period of issue	Index	Outstanding Number	May 2012 USDb
Argentina	1972–1989, 2002–	Non-agricultural wholesale prices	5	13
Australia	1985–1988, 1993–2003	Consumer prices	5	26
Austria	2003–	European consumer prices	–	–
Bolivia	2002–	Consumer prices	–	–
Brazil	1964–1990	Wholesale prices	}12	283
	1991–	General prices		
	2002–	Consumer prices		
Canada	1991–	Consumer prices	6	63
Chile	1967–	Consumer prices	19	14
Colombia	1967	Wholesale prices	–	–
	1995–	Consumer prices	3	2
Czech Republic	1997	Consumer prices	–	–
Finland	1945–1967	Wholesale prices	–	–
France	1998–	Fr. & Euro. consumer prices (ex. tobacco)	13	235
Germany	2006–	European consumer prices (ex. tobacco)	4	60
Greece	1997–2003	Consumer prices	–	–
	2003–	European consumer prices (ex. tobacco)	3	–
Hungary	1995–1999	Consumer prices	–	–
Iceland	1964–1980	Cost of building index	–	–
	1990–1994	Credit terms index	–	–
	1995–	Consumer prices	–	–
India	1997, 2013–	Consumer prices	0	0
Israel	1955–	Consumer prices	11	41
Italy	1983	Deflator of GDP at factor cost	–	–
	2003–	European consumer prices (ex. tobacco)	9	132
Japan	2004–2008, 2013–	Consumer prices (ex. fresh food)	16	51
Kazakhstan	1999–	Consumer prices	–	–
Mexico	1989–	Consumer prices	9	53
New Zealand	1977–1984, 1995–1999	Consumer prices	–	–
Norway	1982	Consumer prices	–	–
Poland	1992–	Consumer prices	2	7
South Africa	2000–2009	Consumer prices (ex. mortgage costs)	}5	31
	2009–	Consumer prices		
South Korea	2007–	Consumer prices	3	6
Sweden	1994–	Consumer prices	6	36
Thailand	2011	Consumer prices	1	2
Turkey	1994–1997	Wholesale prices	}10	48
	1997–	Consumer prices		
UK	1975–	Consumer prices (non-marketable securities)	–	–
	1981–	Consumer prices (marketable securities)	19	549
USA	1997–	Consumer prices	33	866

Notes: National public debts. ‘–’ denotes not available. Blank denotes not available, believed to be zero. Sources: Deacon, Derry and Mirfendereski (2004), Barclays (2012), Campbell and Shiller (1996), Borensztein and Mauro (2004), McCray (1997), Shen (2009), Bundesrepublik Deutschland Finanzagentur GmbH, Rajesh Roy and Anant Vijay Kala (2013) "India to Launch Inflation-Indexed Bonds." *Wall Street Journal*, 29th April.

Indeed, the most widely used nominal indexed debts are debt linked to an index of the level of prices in an economy. Price indexed bonds (often referred to as inflation indexed bonds or inflation linked bonds) have a long history, with the first known issue by the Commonwealth of Massachusetts in 1780 during the Revolutionary War (Shiller, 2003). As shown in Table 1, in modern times, Finland first issued inflation protected securities in 1945, with a number of countries, including France, Israel and Chile, introducing inflation indexed debts in the 1950s. More western countries began to issue inflation indexed debt in the high inflation 1970s following the United Kingdom in 1975. The United States followed suit in 1997 when it first issued its Treasury Inflation-Protected Securities (TIPS).

A second problem with this definition of indexed debt is that it neglects the fact that a country can construct a portfolio made up of entirely non-indexed nominal bonds that, because the bonds are issued in different currencies and at different maturities, generate a bond portfolio that varies in value over time. In particular, if the set of currencies and maturities is rich enough, and if the prices of these bonds covary with some desired index, a country may be able to design a portfolio of non-indexed debts that closely tracks the desired index. Indeed, Angeletos (2002) and Buera and Nicolini (2004) show how this can be done using only bonds issued at different maturities.

A third problem is that a country may issue only non-indexed debts and nonetheless construct a portfolio of liabilities that tracks a desired index by issuing derivative securities. The treasuries of number of countries have, and in some cases still do, trade actively in derivative securities, including most notably interest rate and currency swaps.

Notwithstanding these conceptual issues, we continue to use the same terminology below where we are interested in real-indexed debts in which the nominal payments are indexed to vary with some indicator of real economic activity (or some variable that affects real economic activity) other than the general price index.

8.2.2. Real-indexed Sovereign Debt

Although relatively rare, a number of countries have issued real-indexed debts throughout history. One of the earliest examples comes from medieval Spain where King Philip II contracted debts with repayment dates and amounts that depended on the date of arrival of the silver fleet from the America's (Drelichmann and Voth, 2011). This is the only example, as far as we know, of a sovereign country issuing debt that is indexed to their revenues, although there is one case of a sub-national government issuing debt indexed to revenues: the City

of Buenos Aires in Argentina issued bonds which included indexing principal repayments to city revenues (Borensztein and Mauro, 2004).

It is somewhat more common to see debt contracts with payments indexed to a commodity price. In 1782, the State of Virginia issued bonds linked to the price of land and slaves (Borensztein and Mauro, 2004). In 1863 the Confederate States of America issued cotton bonds, whose payments increased with the price of cotton (see, for example, Weidenmier, 2005). Gold clauses, effectively indexing payments to the price of gold, were widespread in the United States in the 19th century and early 20th century. France also experimented with gold-price-indexed bonds in 1952 and 1973 (the Giscard) but the losses caused by the depreciation of the French Franc caused the government to cease offering this instrument.

After gold, the most commonly used commodity for indexation purposes is oil. Oil-backed bonds first appeared in the financial markets during the late 1970s. Mexico is believed to be the first country to offer oil-linked bonds in April 1977. The Petrobonos were issued domestically on behalf of the government by NAFINSA, a development bank owned by the Mexican government. Upon maturity, the Petrobonos were redeemed at a value equal to the maximum of the face value or the market value of the referenced units of oil plus all coupons received during the life of the bond. Venezuela and Nigeria also issued oil-linked warrants combined bonds in exchange for defaulted loans in the early 1990s as part of their Brady agreements. India issued oil-linked bonds to oil companies in April 1998 in payment for debts it had incurred by receiving oil products below market cost.

Linking bond payments to GDP or some other measure of aggregate output is somewhat rarer. Among advanced economies, France experimented with bonds indexed to industrial production in 1956 (Deacon, Derry and Mirfendereski, 2003). A handful of emerging market economies issued bonds with partial indexation to real GDP in the past. Various Brady bonds issued by Bosnia and Herzegovina, Bulgaria and Costa Rica in exchange for defaulted loans in the early 1990s included Value Recovery Rights (VRRs). The VRRs were designed to provide the banks with a partial recovery of value in the event of a significant increase in the debtor country's capacity to service its external debt. In practice these VRRs contained elements of indexation to GDP. In the case of Bulgaria for example, its Discount Brady bonds had a component named Additional Interest Payments (AIP) that was indexed to GDP. The AIP was triggered when two conditions were met: (1) Bulgaria's GDP surpassed 125% of its 1993 level, and (2) there was a year-over-year increase in GDP. For these years (not including the year in which the threshold is reached) the semi-annual interest supplement was defined as half of that year's GDP growth. The outlays themselves were scheduled to occur as soon as practically possible and were to coincide with regular interest

payment dates. The AIP were not warrants, detachable or otherwise, though they were intrinsically equivalent.

Bulgaria's GDP-linked bond was generally viewed as a failure as a result of two factors. First, the bonds were callable at par. This meant that the government could decide to repurchase the bonds rather than pay out when faced with onerous GDP-linked payments, and as a result investors would miss out on the lucrative upside. In fact this is exactly what happened. A second problem with Bulgaria's bonds was that the conditions under which AIP would be paid were vague. In effect, GDP itself was not clearly defined: was it to be measured in US Dollars or Bulgarian lev? Was it to be measured in current or constant prices (inflation adjusted)? Was it to be estimated by the production, income or expenditure method? As a result, the government was able to exploit this ambiguity by choosing definitions of GDP that prevented the AIP from being triggered.

Bosnia and Herzegovina's GDP-linked Brady bonds included additional interest payments whenever GDP growth rates exceeded for two years a predetermined growth rate and GDP per-capita rises above USD 2,800 (at 1997 prices adjusted by German CPI). These bonds have also suffered with problems in the definition of GDP and their trading activity has been very limited.

One of the most recent experiences with sovereign bonds indexed to real variables is Argentina's GDP-warrant. In March 2005, Argentina finished the first stage of its debt restructuring process that followed the default and financial crisis of 2001³. Each new bond issued in the restructuring included a unit of GDP-linked warrants. These warrants were tied to the bonds for the first 180 days, and became detachable thereafter.

Given the magnitude of the restructuring, Argentina's GDP-warrants were the first sovereign debt instruments indexed to real variables for which there is a sizable market. Payments on the GDP-linked securities take place only if the following three conditions are met⁴:

- 1) actual real GDP exceeds the base case GDP for each reference year;
- 2) annual growth in actual real GDP is higher than the growth rate in the base case GDP for the reference year (base case GDP real annual growth rate is 3.5% per year initially, gradually converging to 3% over time);
- 3) total payments made on the security do not exceed the payment cap of 48% of the notional amount during the life of the security⁵.

³ A second stage of the restructuring was completed in 2010 with the same conditions of the first one. Bond holders that accounted for 93% of the debt that had been defaulted accepted the restructuring. A further bond exchange was announced in September 2013.

⁴ In all cases, calculations are based on the data published by Argentina's Bureau of Statistics (INDEC).

⁵ The GDP-warrants expire when the 48 cents per dollar cap is reached, and no later than December 15th, 2035.

Whenever these three conditions are met the formula used to calculate the payments for each notional unit of the warrants is the following:

$$\text{Payment} = 0.05 \times \text{Excess GDP} \times \text{Unit of Currency Coefficient}$$

where Excess GDP is the amount by which actual real GDP converted into nominal GDP using the GDP deflator exceeds the base case nominal GDP, and the Unit of currency coefficient is defined as: USD: $1/81.8 = 0.012225$, Euro: $1/81.8 \times (1/0.7945) = 0.015387$, ARS: $1/81.8 \times (1/2.91750) = 0.004190$.

As GDP data is usually published with a lag of a couple of months and it is usually revised in the following months, payments are calculated on the November following the relevant reference year, and made effective a month later. This creates a lag of a year between the economic performance that might trigger a payment and the payment itself.

Trading of these GDP-warrants began in a when-and-if market before they were detached. In May 2005 the consensus value of the GDP-warrant with dollar coupon among investors was 2 cents per dollar. In July 21st, the first available date with data from the when-and-if market, the bid price for the GDP warrants was 3 cents per dollar coupon (50% increase in two months). Furthermore, by the end of 2005 the Argentina's outstanding growth rates and a better understanding of the instrument led the markets to reevaluate their assessment of the value of the GDP-warrant. The price almost tripled when compared with the consensus value upon issuance. By the end of 2006 its price reached 13 cents per dollar coupon, six times higher than the consensus value at the time of the exchange and four times higher than the first available trading price. This remarkable increase in price has caught the attention of investors, authorities and the public in Argentina⁶.

Argentina has been servicing these warrants since issuance. The first payment of the GDP-warrant took place in December 2006 and amounted to USD 387m. Payments on the indexed component tripled in the following two years as a result of the good performance of the Argentine economy and in many years they exceeded all other interest payments made by the government.

In summary, the issuance of debt securities with repayment provisions that depend on some real variable such as commodity prices or an index of GDP, while not unheard of, are uncommon. Moreover, as a general rule, the amount of indexation is limited, sometimes specifying an additional fixed payment should the index, for example GDP, rise above a pre-specified level. In the next section, we contrast this limited form of indexation with alternative indexation schemes.

⁶ The fact that the 'consensus' price initially was so low, showed, in part, the mistrust that existed about these kind of securities. As a result, the issuance might not have been such a good deal for Argentina, as it had to bear the costs of 'opening a new market'.

8.3. ALTERNATIVE FORMS OF INDEXATION

Choosing the right indexation variable (the right index), as well as the appropriate amounts by which bond payments should vary with the index, is not always easy. In this section we present an example of how different indexation rules would affect the intertemporal profile of debt payments that a government faces. We will focus on the case of Argentina for the period 1991-2011 and compare the profile of interest payments observed for Argentina during that period with the one that would have taken place under different GDP indexation rules.

Let y_t be the ratio of interest payments plus GDP coupon payments to Total Public Debt for year t . We denote interest payments on non-indexed debt by $y_{ni,t}$ and interest payments on indexed debt by $y_{i,t}$. We will assume that indexation takes a threshold form like

$$y_{i,t} = \begin{cases} r_i & \text{if } g_t < \bar{g} \\ r_i + g_t - \bar{g} & \text{if } g_t \geq \bar{g} \end{cases}$$

where r_i is the interest rate, g_t is the growth rate of GDP in period t and \bar{g} is a threshold above which the GDP coupon payment is triggered. When the debt is non-indexed payments are

$$y_{ni,t} = r_{ni,t}$$

In order for both types of debt to be traded in a competitive equilibrium with risk neutral creditors, we must have

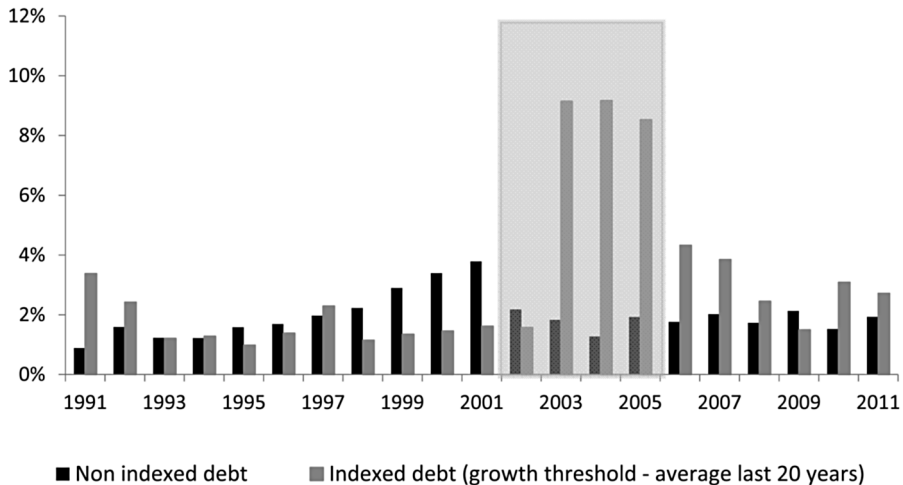
$$E(y_{ni,t}) = E(y_{i,t})$$

We pin down $r_{ni,t}$ each year from Argentine data on public debt and then compute $E(y_{i,t})$ to make creditors indifferent. We assume that \bar{g} is set to the average growth rate for the period under analysis⁷. The intertemporal profile for indexed and non-indexed debt is depicted in Figure 1 in which the period of time from Argentina's sovereign default up to its settlement with a majority of creditors is shaded in grey. As show in the graph, payments would have been significantly higher under non-indexed debt than under indexed debt in the period 1998-2001 in the lead up to the default crisis when Argentina was undergoing a recession. After the default, the opposite is true. Hence, the default turned out to be a very costly way of lowering interest payments for the country. With indexed debt, payments would have been smaller in the bad years (1998-

⁷ We also analyzed the case where \bar{g} is set equal to the historical average for Argentina in the 20th century (excluding the period under analysis).

2001) and would then increase when the economy rebounded. The government would have then be paying more when the economy grew more. Note that this indexation rule implies that the government is required to pay more if the economy rebounds from the crisis even if the level of GDP were well below that of trend GDP, placing great strain on government revenues at a time when they were recovering.

Figure 1. Debt Service (interest + GDP Warrant Payments, if any)/GDP

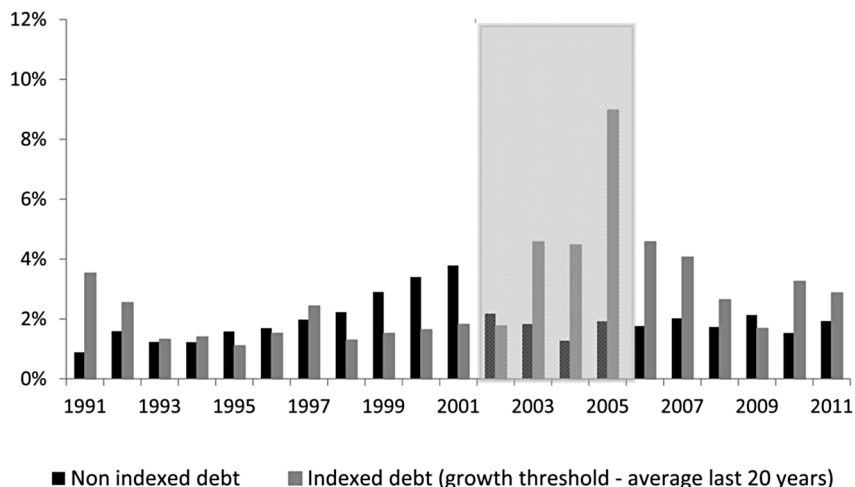


In order to gain a better understanding of how different indexation rules work, we now impose the additional requirement that GDP must be above trend GDP for the GDP-indexed coupon payments to be triggered. This is similar in spirit to Argentina's GDP Warrants which condition both on GDP growth and level. Formally, we consider a form of indexed debt with payments given by

$$y_{i,t} = \begin{cases} r_i & \text{if } g_t < \bar{g} \quad \text{or } GDP_t < GDP_{trend} \\ r_i + g_t - \bar{g} & \text{if } g_t \geq \bar{g} \quad \text{and } GDP_t \geq GDP_{trend} \end{cases}$$

Of course, a more stringent rule to trigger repayment requires a higher equilibrium interest rate, $r_{i,t}$. The profile of payments ($y_{i,t}$ and $y_{n,t}$) under this indexation rule and without indexation are depicted in Figure 3. Note that with this indexation rule payments are lower than before in the period 2002-2004, when the economy was growing but its GDP was below trend, before become higher still post 2005.

Figure 2. Debt Service (interest + GDP Warrant Payments, if any)/GDP



As we can see in the graphs, the presence of real indexed debt again would have substantially decreased interest payments for Argentina in the years prior to the crisis. It could be argued that they might have been enough for Argentina to avoid default in 2001. Furthermore, the graphs show very clearly the relevance of choosing an adequate indexation rule. A rule that ties payments just to current GDP growth rates disregarding the level of output, would trigger high interest payments when an economy is well below its potential GDP.

8.4. WHY DON'T WE OBSERVE MORE REAL INDEXED DEBT?

In light of the arguments in favor of issuing real-indexed debt, why are such bond contracts rare? Moreover, why is the degree of indexation in observed real-indexed debts so limited? In this Section we review four arguments as to why we do not observe more real indexed debt and in the process outline some of the disadvantages associated with their issuance.

8.4.1. The Existence of Substitutes for Real-Indexed Debt

As noted above, a government may only issue non-indexed nominal debts, but still hold a portfolio of liabilities that is indexed to fluctuations in revenues or GDP. This may occur implicitly through a managed portfolio of debts issued in different currencies and at different maturities whose value will fluctuate with movements in currencies and the shape of the yield curve, or explicitly through

trades in derivatives such as currency and interest rate swaps. If so, there may be no need to issue additional debts that are explicitly indexed to real GDP or government revenues.

As one possible example, El Salvador hedges a significant part of its macroeconomic risk by issuing debts with a variable interest rate. As El Salvador is dollarized, and its GDP is highly correlated with US GDP, a bad shock to US GDP is likely to coincide with a bad shock to El Salvadorian GDP. However, if the US Federal Reserve responds to this shock by lowering interest rates, El Salvadorian interest rates will also decline and the effect on its finances reduced.

Nonetheless, while this is possible for some countries, it is not true in general for many countries. Hence, we remain somewhat skeptical that this is the primary reason for the absence of more real-indexed debts.

8.4.2. Fixed Costs of Market Set-Up

Another possibility is that there are benefits to issuing real-indexed debts, but that these benefits are offset by significant fixed costs of setting up a market for a new debt product. These costs could be explicit, such as the writing of a contract for, and marketing of, a new debt instrument, or implicit such as the risk of low liquidity and unfavorable prices at issuance of the initial security.

There is some evidence that existing markets for indexed debt are illiquid. Even the market for US TIPS, although quite deep relative to many other financial markets, is believed to suffer from significant illiquidity problems that affect their price and arguably make their issuance not profitable (see the discussion in Dudley, Roush and Steinberg Ezer, 2009). In some countries, such as Australia and New Zealand⁸, issuance of inflation indexed government securities was curtailed at least in part as a result of illiquidity in the market for these securities (McCray, 1997, Shen, 2009). Moreover, even the market for non-indexed debt for many sovereigns is quite illiquid, with prices not available for all but a small number of debts issued by the largest borrowers. This leads us to conjecture that the market for indexed debt would face similar problems.

Other evidence in favor of this argument comes from historical studies of the development of local currency debt markets. Bordo, Meissner and Redish (2003) argue that Canada, Australia, New Zealand and South Africa developed domestic-currency debt markets only after major shocks – such as wars or the breakdown of the Bretton-Woods System – made it worthwhile to pay the

⁸ Australia introduced inflation indexed government debts in 1985 but has not issued them since 2003. New Zealand introduced inflation indexed securities in 1996 but discontinued their issuance in 1999. In 2012, New Zealand announced that it will reintroduce inflation indexed debt in the near future (New Zealand Debt Management Office 2012).

necessary fixed costs. Consistent with this thesis, it has been observed that larger countries, who plausibly face lower set-up costs (as they issue more and hence experience less problems with illiquidity), are substantially more likely to issue debt in their own currency than smaller countries (Eichengreen, Hausmann and Panizza, 2005b).

Evidence against this view comes from survey evidence which finds that participants in the market for sovereign debt are not concerned about the complexity of indexed debts, or the details of their pricing. For example, a survey by the Emerging Market Traders Association of its buy-side members found that only one respondent raised concerns about the complexity of the product (Griffin 2013). All hedge fund respondents indicated that they had the ability to produce pricing models for these assets.

On balance, we believe that the fixed costs associated with the set-up of a real-indexed bond market are likely to be substantial, although the source of the costs would appear more closely linked to issues of market depth rather than the complexity of the bond contracts per se. Hence, they will likely act as a hindrance on the establishment of new markets. However, this could be addressed by the coordinated action by a number of the world's largest sovereigns. If several large borrowers introduced real-indexed debt, smaller sovereigns would be able to free-ride on some of the set-up costs paid by these large issuers.

8.4.3. Moral Hazard and Incentives to Misrepresent Data

Another possible reason for why we do not observe more indexation to real data is that it may create an incentive problem for a sovereign government. For example, governments may change their policies in order to target economic outcomes and hence reduce interest payments. Such incentive problems are often referred to as problems of moral hazard. For real-GDP indexed debt, this problem is arguably small given that the amounts saved in lower interest payments are likely to be small relative to the direct economic harm associated with lower real-GDP. For government-revenue-indexed debt, this problem is arguably quite large. Governments already have a great incentive to lower taxes, which should stimulate economic activity and would be politically popular. This incentive would only be stronger if lowering taxes also reduced the amount of interest payments due on that government's debt. This is, we believe, why we do not observe more revenue-indexed debt, except in cases where some component of revenues cannot be manipulated by the government such as with the arrival of the silver fleet in Medieval Spain, discussed above, or when government revenues are based on commodity prices.

An alternative incentive problem arises from the fact that governments, or their agencies, are themselves responsible for constructing national economic data. As a result, linking debt repayments to these data would give governments an incentive to mis-report them. There is a long history of governments mis-reporting or otherwise manipulating data when it is in their own best interests to do so. This occurs in both developed and developing countries. Often the motivation is political. For example, during the 1980s, the definitions underlying the construction of British unemployment statistics were changed numerous times, almost all of which worked to decrease the headline level of unemployment (Johnes and Taylor, 1990; Blanchflower and Freeman, 1993). In other cases, the motivation is to get around targets or limits placed on government spending and borrowing. For example, a number of European countries manipulated their government budget and debt statistics in the lead up to EU accession (see the discussion in Easterly, 1999; Piga, 2001; Milesi-Ferretti, 2004 and Koen and van den Noord, 2005). Recently in the U.S. a number of Californian school districts manipulated the form of their debt contracts to evade limits on debt issuance⁹. In yet other cases, the manipulation is directly related to the desire of the government to reduce the burden of debt service. The best known recent example of this concerns the alleged understatement of Argentine inflation data to reduce repayments on inflation-indexed bonds, which has drawn censure from the International Monetary Fund¹⁰.

This issue is of particular concern when it comes to indexation of bond repayments to government revenues, statistics on which are invariably controlled by the government itself. As a consequence, this may explain why we see almost no debts indexed to such variables; the only exception – medieval Spain – involved revenues from the arrival of the silver fleet, which was a publicly observable event.

It is possible that data manipulation concerns are less significant for GDP-indexed debt, where any gain from understating GDP statistics in terms of reduced debt repayments would be somewhat offset by the political costs to the government of reporting weak growth. However, in a survey of market participants attitudes to real indexed bonds, every respondent cited issues of data integrity as a concern (Griffin, 2013). One reason for the more widespread adoption of commodity price indexed contracts is that in such cases these concerns are plausibly absent at least in markets where the price is hard for any

⁹ See the discussion in “The Poway Deal gets Fishier” by Felix Salmon, *Reuters*, September 26th 2012; “Risky Bonds Tie Schools to Huge Debt” by Dan Weikel, *Los Angeles Times*, November 29th 2012; and “Poway not Alone in Issuing Capital Bonds: 41 other Borrowings Across California Have More Costly Repayment Ratios” by Matt Clarke, *Union Tribune San Diego*, November 29th 2012.

¹⁰ See, for example, “Don’t Lie to Me Argentina” in *The Economist* 25th February 2012, and “IMF to Put Argentina on Path to Censure Over Inflation Data”, Bloomberg 18th September 2012.

single country to manipulate, although this may be a problem where a small number of countries dominates world supply of the commodity.

In summary, the threat that governments may manipulate their statistics is very real, and may go some way towards explaining why debts indexed to government revenues are rarely observed. However, it probably does not explain why we do not observe more debts linked to relatively manipulation-free data such as world commodity prices.

8.4.4. Political Costs

An optimal indexed debt contract will typically specify smaller repayments in bad times, when economic activity and government revenues are depressed, and larger payments in good times when revenues and economic activity are high. While it is likely that lower repayments in bad times will be politically popular, during good times political opposition will conceivably increase. Indeed, a similar phenomenon is observed in the context of resource royalty agreements, where there is some evidence that higher prices for the resource – and hence larger transfers to the multinational corporations operating these projects – tend to lead to a renegotiation of the royalty agreement and in some cases lead to outright nationalization of the industry (see Tomz and Wright, 2010; Eden, Kraay and Qian, 2012).

Related issues also have arisen in the context of sovereign debt management. For example, the Australian Treasury has used both interest rate and currency swaps to manage its debt, with the first cross-currency swaps issued in the 1991-1992 fiscal year. Up until 1996-1997 it has been estimated that these operations reduced the government's borrowing costs by more than AUD 100m per year for a total gain of close to AUD 3 billion (see Henry, 2007 for more details). However, following a sharp depreciation of the AUD against the US dollar in the second half of 1997, the strategy resulted in losses approaching AUD 2 billion. Although in net terms trade in cross currency swaps had still reduced Australian government borrowing costs, the resulting political uproar became an electoral issue and the program was wound up beginning in 2001, leaving the overall reduction in government borrowing costs at only AUD 800 million. Similar issues have arisen in other countries. For example, recently the Italian Treasury has been criticized for using derivatives to hedge its public debt which then incurred significant losses during the Eurozone crisis¹¹.

¹¹ See, for example, "Italy Probes Use of Derivatives to Hedge Public Debt" by Guy Dinmore, *Financial Times*, 26th June 2013.

8.5. CONCLUSIONS

In summary, the theoretical case for the widespread adoption of bonds with repayments indexed to GDP or government revenues is clear: they would provide insurance for the government of a sovereign country against unexpected declines in revenues and would possibly allow countries to avoid a protracted and costly debt restructuring. In practice, however, the issuance of bonds indexed to GDP or other economic variables is problematic.

The more widespread adoption of GDP indexation faces the problem of ensuring adequate market liquidity, potential political costs when buoyant economic activity requires large payments, and concerns about the integrity of government produced data. Problems of illiquidity could be solved if large debt issuers, and in particular some developed country debtors, would take the lead in issuing these bonds. This would both ensure a liquid market, and prompt potential future issuers to coalesce around a standard contract form. Problems of data integrity can be solved by indexation to the prices of commodities that are traded on deep world markets and that are consequently free from concerns of manipulation. However, this comes at the cost of producing repayments that are less closely correlated to the economic fortunes and government revenues of the country. A possible resolution of this data integrity problem is the establishment of an international data referee or more active use of the IMF's activities as monitor of their Special and General Data Dissemination Standards.

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