Abstract: Analyzing the source of the Eurozone sovereign debt crisis, the paper argues the need for greater risk sharing and joint liability across sovereigns. This will require amending some of the legal provisions that underlie the European Union and the creation of the Euro. Once this is done it will be possible to consider the creation of Eurobonds and other liability arrangements, which can promote investment and job creation. A simple theoretical model is presented to bolster the argument.

Keywords: economics, law, sovereign debt, eurozone crisis

1 Treaties, laws, and crises

As the global financial recession, prompted by the sub-prime crisis in the US began to abate, the sovereign debt crisis erupted in Europe, making it evident that the global problems were not yet over. This global stagnation has now persisted since 2008. While the European crisis was just one part of it, having more recently given up its place of primacy to slowing growth in emerging economies, stemming from a brew of falling commodity prices and big corruption scandals, it has opened up some deep questions concerning policy coordination across nations, and the nature of monetary unions. The widespread debate on the Eurobond is just one example of this, but there are many other related and far-reaching questions. This is not surprising. The biggest economic structures and institutions that we see around us, from trade and exchange to money and banking, did not happen as a deliberate, planned leap, but by evolution, through small changes in practices, little innovations, with some perishing thereafter and some surviving.

As far as large, deliberately-created systems go, it is not surprising that some fault lines will be discovered, as they begin to function. That is what
happened in the case of the European Union and especially the Eurozone. Before I go into analyzing some of these and try to take away lessons for future monetary and economic unions, I want to state my belief that the European Union is one of the most worthwhile economic policy experiments we have seen and this is the direction to go for the world. The idea of currency unions date far back into history, for instance, the writings of Stanley Jevons. As economic globalization progresses, the need for policy coordination across nations will grow as well. The best thing about experiments is when others do it; we can then learn the lessons without having to suffer the costs. In this sense the European experiment was a much needed one for various comities of nations and, in fact, the entire world. As the flaws are corrected and the model improved, this will be a model of some interest for other regions of the world. With that preamble, let us take quick stock of what happened and then explore various ideas of cross-country policy coordination and risk sharing.

Tomes have been written on the Eurozone crisis, but if one were to get a very short summary of this, there is no better way of getting this but from one graph: See Figure 1.¹

![Figure 1: Eurozone government bond yields.](image)

Source: International Financial Statistics. Note: “Other Eurozone” is a simple average of the bond yields of Austria, Belgium, Finland, France, Germany, Luxembourg, Malta, Netherlands, Slovak Republic, and Slovenia. Data for Estonia and Latvia are not available.

¹ This figure produced here is an adaptation of one used in Basu (2015, p. 88).
The euro came into existence in 1999 and the graph shows that the borrowing costs of Eurozone countries which were quite divergent before that suddenly became virtually identical in 1999, and remained that way till the Lehman crisis in 2008. Greece seems like the only exception but as soon as one realizes that Greece joined the Euro in 2001, the story becomes even more perfect. Greece’s borrowing costs converged to those of other European nations from 2001. What this graph demonstrates is that virtually all players assumed that lending to one Eurozone nation was as safe or as risky as lending to another. Since they were all a part of the same monetary union, and used the same currency, the risks were treated as identical and so all these sovereigns managed to borrow at the same interest cost.

This was of course a mistake, but so ubiquitous that the borrowing costs remained virtually identical till after the Lehman crisis, when it actually dawned on the players involved in this market, that this was a monetary union and not a fiscal union. Thanks to certain provisions in the Maastricht and Lisbon Treaties, each sovereign had a responsibility to repay its own debt. And indeed matters were worse than before 1999, because these nations no longer had their own central banks, which could, at least in principle, print money to repay. As this realization dawned, the borrowing costs diverged wildly. Lending money to Greece was considered much riskier than lending money to Germany and so Greece had to offer much higher interest rates to be able to borrow money. Rarely does one see as neat a graph in economics, as Figure 1.

This “nine-year lapse” (1999–2008) in understanding this new monetary union created by us did large damage and gave the sovereign debt crisis enough time to brew. By messing up the borrowing cost signals of nations, the nine-year lapse jeopardized the fiscal balances of the nations and jammed growth and job creation. Growth in the entire Eurozone stalled. From 2009 to 2014, annual GDP growth in Greece was $−5.4\%$, in Spain $−1.1\%$, in Italy $−0.8\%$ (World Bank, 2016).

It became evident that to have a monetary union, we need to have more cohesion in terms of fiscal and banking policies. There is, fortunately, serious effort afoot now to correct these. My aim in this paper is not to go over that ground but to take a more granular look at the nature of risk sharing that is essential in a monetary union. An examination of this has implications on how we view certain sections of the Treaty of Lisbon and the benefits and pitfalls of Eurobonds.

ECB president, Mario Draghi, had claimed in 2014 that “many shocks can be preempted by the right policies. But for those that cannot [...] some form of cross-country risk-sharing is essential to prevent recessions from leaving deep
and permanent scars.”² The aim of this paper is to explore the microeconomics of this idea.

In a recent paper (Basu and Stiglitz, 2015), we argued that ECB’s assurance in July 2012 that it would do “whatever it takes” to save the euro and the Eurozone was so effective because it had an implicit assurance that the problem of the Eurozone was a collective problem. But, over the years since then, it has become clear that there are severe limits to what the ECB can do. A complex organization like the European Union and the Eurozone is founded on complex laws and treaties. When they are created it is impossible to anticipate their full implications; but it is important to assess them carefully and make amendments as and when the need arises.

Most of the problems arise with Articles 123 and 125 of the Treaty of Lisbon. Article 123 prohibits overdraft facilities or any other type of credit facility with the ECB in favor of central governments or other public authorities. This usually leads to arbitraged interventions, whereby the credit is mediated via some other entities.

More pertinent to my present argument is Article 125, which puts severe restrictions on risk sharing. In particular, it states: “A Member State shall not be liable for or assume the commitments of central government, regional, local or other public undertakings of another Member State, without prejudice to mutual financial guarantees for the joint execution of a specific project.”

Some restrictions of the kind specified in these articles is understandable and is needed. At the same time, there is need for space for one Member State or some central authority to be able to stand guarantee in certain well-specified situations or investments by individual Member States. This could enhance investment, the growth of infrastructure, and structural reforms, and, through these, boost GDP growth and job creation. On the other hand, the current blanket prohibition has contributed to the sovereign debt problem and non-optimal investments (de Grauwe, 2011; Schäfer, 2012; Pisani-Ferry, Sapir and Wolff, 2013).

While a fuller discussion of this occurs in Basu and Stiglitz (2015), a simple theoretical model demonstrating the importance of this is presented in Section 3, below.³ At a more general level, this paper is concerned with international

³ In making policy, it is important to use both theory and evidence. The most celebrated case of ignoring evidence may well be Aristotle’s steadfast belief that women have blacker blood than men and also fewer teeth, and basing many gendered suggestions on this “fundamental difference.” Even if we can understand his misinformation about the color of blood since evidence on that would have been a little harder to collect in those ancient times, it is baffling why he could not ask a sample of
policy coordination – though in the model attention is restricted to a special case of this, to wit, one involving banking, investment and sovereign debt. These cannot always be left to natural market forces and may require deliberate, global policy intervention. The ongoing global economic crisis points to this.

As in Basu and Stiglitz (2015), what I am arguing is how it is possible for all of us to do better by modifying some of the rules and laws that guide our behavior. Before proceeding to the main analysis it is worth taking on one potential criticism. If one shows (as I do here) that people can do better by behaving differently, some mainstream economists are prone to argue that there must be a flaw in the analysis because if people could have done better behaving differently, then they would already be doing so. This criticism has to be false because otherwise it would be unclear why human beings waited till the 19th century to have cars, 20th to have computers and 21st for Skype. A new technology is nothing but the discovery of high returns associated with new behavior. What we need to understand is that our knowledge deficiency can extend to social strategies too. There are social and behavioral innovations just like technological innovations; and just as technological innovations rely on inventions and discoveries so do social and behavioral innovations. The aim of this paper is to outline new strategies that can make international lending across nations that are inter-connected, such as the current European Union nations, more efficient and robust.

2 The economics of Eurobonds

The debate is still open on whether the Eurozone crisis was a solvency crisis due to reckless borrowing or a “sudden stop” of cross border capital flows that turned systemic because of the lack of crisis resolution mechanisms, such as a lender of last resort, or any combination of the two. As Figure 1, above, illustrates, the nine-year signal failure, damaged the credit market and fellow Athenians or Macedonians to open their mouths for a quick statistical check of the dental asymmetry hypothesis. Having said this, I wish to stress here the importance of theory since this is ignored far too flagrantly by policy economists. First of all, in many areas, theory is simply more efficient. If the early geometricians, such as Thales and Pythagoras, had tried to establish their theorems by measuring lots of circles and triangles and then using induction, they may have reached the same results but would have been hugely inefficient. But, even apart from efficiency, theory is basically a way to do consistency checks with well-known facts and the ideas that we are putting forth. Section 3 is an illustration of this.

4 This is an area where market failures and inefficiencies are common in the best of times (Basu, 1991; Stiglitz, 2002).
precipitated the debt crisis. Whatever the causes, the problem is that the crisis reduced significantly the already-limited fiscal space of many Eurozone members, and this may have led to excessively contractionary fiscal policies that, in turn, contributed to the further deepening of the crisis.

What has been argued by many and I would echo that view is that there is need to develop limited but well-designed form of risk and liability sharing across the nations of a monetary union. This would facilitate certain forms of efficient lending and investment, and, as a result, promote job-creation and growth.

Among the different instruments that can enable cross-country risk sharing, an important one is Eurobonds, that is, government bonds, issued and backed by all Eurozone members. The issuance of such bonds would improve individual countries’ market access in times of distress. The details of how Eurobonds are designed and issued are not a concern of this paper. I will briefly survey some related ideas and then, in the next section, construct a theoretical argument to show why it is important to amend the Treaty of Lisbon so as to enable some amount of joint liability across member nations.

One risk of Eurobonds that has been of concern is that, absent a common fiscal policy, the mutual financing of Eurozone members’ debt through Eurobonds would delink the costs of borrowing from any country’s fiscal position, and it would thus create the kind of failure associated with the commons problem.

To cope with such a drawback numerous ideas have been proposed over the years. For instance, von Weizsäcker and Delpla (2010) proposed the mutualization of each member state’s debt, up to 60% of GDP, by swapping it into “blue bonds,” backed by the collectively by the Eurozone and declared senior. The remainder of the debt would instead be financed by junior national “red bonds,” with no Eurozone backing. The 60% threshold reflects the Maastricht Treaty debt sustainability criterion.

The blue-red bond proposal is attractive, but blue bonds’ sovereign guarantees may nonetheless pose legal and political problems. To overcome these, Brunnermeier et al. (2011) suggest some financial engineering. They propose that a European debt agency buy on the secondary market sovereign debt in an amount equal to 60% of Eurozone GDP – with the weight of each country’s debt equal to its contribution to aggregate GDP. As in von Weizsäcker and Delpla’s proposal, each marginal euro of sovereign debt beyond 60% of GDP would reflect true sovereign risk. To finance its debt purchase, the debt agency would issue two securities: European Safe Bonds (ESBies) and European Junior Bonds (EJBies). The ESBies would be senior to EJBies, which would take the hit if one or more sovereign defaults occurred. European banking regulations and ECB policies would then be adjusted to create the incentives for banks to invest in safe
ESBies, instead of risky sovereign debt. By holding ESBies, banks would no longer be exposed to national sovereign risks – thanks to the double protection of diversification and seniority – but to a combined Eurozone risk; in addition, any flight to safety would be from the EJBies to the ESBies and not from one country to another, thus reducing a major source of instability.

Hellwig and Philippon (2011) suggest a variant of the blue-red proposal, limited to short-term debt. They suggest a debt instrument with maturities of less than a year, for up to 10% of Eurozone GDP. A new joint Debt Management Office would issue these, conducting auctions to satisfy the needs of all member nations, subject to certain constraints. The short maturity has the advantage of requiring continuous discipline, it implies limited commitment, and is easily reversible (Claessens et al., 2012).

To insulate the ECB and the Euro against default risk, and to restore confidence in the financial system, while avoiding debt mutualization, Beck et al. (2011) suggest the creation of synthetic Eurobonds, through the formation of a European debt mutual fund, which would hold member countries’ debt instruments, proportionally to each country’s GDP. The fund would then issue tradable securities, fully backed by these bonds, and remunerate them according to the returns of the bonds in its portfolio.

The PADRE⁵ Mechanism proposed by Pâris and Wyplosz (2014) is based on the idea that the ECB acquires at face value (a share of) existing member countries obligations and swaps them into zero-interest perpetuities – de facto wiping out corresponding debts. The cost of the operation⁶ will eventually be borne by Eurozone member countries that would securitize their own share of ECB’s seignorage. The current very low interest rate environment may increase the attractiveness of the proposal.

With an eye on implementing countercyclical fiscal policies and one on moving towards a fiscal union, Ubide (2015) proposes the creation of a system of stability bonds in the Eurozone, to be issued by a new European Debt Agency to partially finance the debt of Eurozone countries, up to 25% of Eurozone GDP. Initially, such an agency will be financed by tax revenues from national treasuries and, in due course, by Eurozone-wide tax revenues. The new debt could be used to fund either national projects or Eurozone-wide fiscal stimulus packages. The stability bonds would strengthen economic infrastructure building, creating incentives for countries to reduce their

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⁵ Acronym for “Politically Acceptable Debt Restructuring in the Eurozone.”
⁶ The cost of the operation is equal to ECB’s cost of funding (given that it receives no interest earnings on the perpetuities).
deficits, but not forcing them to do so when this would drive their economies further into a downturn.

Not surprisingly, the support to Eurobonds is not unanimous in the profession. Corsetti et al. (2011) argued that Eurobonds (and debt repurchase programs financed by the Eurozone Stability Mechanism or ESM) could exacerbate the very problems that triggered the crisis. By acting as a full-coverage insurance against insolvency, and preventing the emergence of risk premia that reflect fundamentals, Eurobonds will further strengthen the incentives for opportunistic behavior on the part of debtors and creditors. Some observers have deemed the idea that comprehensive insurance packages would increase the stability of the Eurozone not persuasive because of the moral hazard it will generate.

More importantly, even if a large number of prominent European economists are in favor of the issuance of (some form) of Eurobonds, nonetheless, they also realize that the road is full of obstacles. First of all, many recognize a certain logic in the argument that since Eurobonds involve joint and several liability of all member states, it is difficult to launch them without launching a common fiscal policy first (Brunnermeier et al., 2011). Unfortunately, very little progress has been made in such a direction.

Also, the cross-default clause embedded in Eurobonds may not only be against the spirit, but (most likely) also against the letter of Article 125 of the Treaty of Lisbon, and may thus demand changes in the EU legal infrastructure, either in the Treaty, or in EU legislation (see Favero and Missale, 2012). Notice, however, that this would require unanimity not only among Eurozone, but among all EU members.

As the above discussion demonstrates, even if a full-fledged, undifferentiated Eurobonds issue is too risky to be advisable, there are variants, with different seniorities, that can be designed and used. The stumbling block is that under the current treaty requirements this may not be feasible. What I wish to demonstrate now is a theoretical argument to demonstrate that there are clear gains possible by permitting one Eurozone nation to take on some of the liabilities of another nation, and, by extension, to amend the Treaty that underlies the EU.

3 A simple model

This section illustrates how the sharing of some liabilities can enhance the well-being of all, that is, result in Pareto improvements. While the example is new, this kind of theorizing is not novel to economics (see, for instance, Ghatak and Guinane, 1999). Both joint liability and peer monitoring arguments are familiar
in the literature. Peer monitoring associated with insurance contracts has been shown to improve insurance markets (Arnott and Stiglitz, 1991). The theory of peer monitoring associated with joint liability among a group of borrowers has provided micro-foundations for the success of micro-finance (Stiglitz, 1990).

Assume a small economy, such as Cyprus, call it country j, has a potential infrastructure project which requires a large initial investment of B dollars, which j does not have. It has to borrow it from an international bank. The Bank is willing to lend this only if it can recover B dollars from it. (We may assume that the bank has access to zero interest credit.)

If the project succeeds, it yields a return of X dollars. However, the success of the project depends on how much effort j puts into the project. If it puts in no effort, the project has a probability \( p_L \) of being successful. If it puts in effort, the project has a probability \( p_H \) of succeeding. Of course, \( p_H > p_L \). The cost, to j, of putting in effort is C. If the project fails, it yields 0.

The effort that j puts in may be visible to the Bank but not something that the Bank can demonstrate to a third party, like a court. So writing down a contract with an “effort clause” is pointless. It is also assumed that there is a limited liability clause, whereby j repays the loan only if the project succeeds, because B is very large and j is not rich enough to repay this in the event of project failure. To focus on the interesting case suppose the parameters above are such that the following two conditions hold:

\[
p_H X - C - B > p_L X - B > 0 \tag{1}
\]

\[
p_H (X - B/p_H) - C < p_L (X - B/p_H) \tag{2}
\]

[1] means that for society as a whole, the optimum outcome is one in which j takes the loan for the project and puts in effort. However, if [2] is also true, then in the bilateral equilibrium (between j and the Bank), the optimum outcome will not be achieved. To understand this, note that if j puts in effort, so that the probability of success is \( p_H \), then the Bank will ask for \( B/p_H \) dollars repayment for the loan of B. That way the Bank expects to earn its normal profit, namely, 0. With this in mind it is evident from [2] that if the Bank asks for such a repayment, j will be better off not putting in any effort. Hence, j putting in effort and the Bank lending and asking for a repayment to cover its cost can never occur in equilibrium. In brief, the optimum is not achievable. In equilibrium, j takes the loan of B, offers to pay back \( B/p_L \), in the event of the project succeeding and then puts no effort into the project.

This is where the third nation comes in. Suppose j is part of a monetary union and it has close trading and business relations with other members of this union. In particular, it has close relations with a large member nation that we...
shall here refer to as k. This country being close to j can also observe the effort that j puts into the infrastructure project. In addition, k and j run a joint business venture, which yields a return of A. For the project to yield A both players must participate in it. Hence, both not participating is a Nash equilibrium. If both choose to participate, each has to specify the amount they expect to earn. If these expectations add to A, each gets the expected amount. If the stated expectations add up to a number different from A, they get nothing. Call this the Joint Venture game. It is evident that both players asking amounts that add to A is a Nash equilibrium. To start with, assume that j and k are in a Nash equilibrium in which j gets R and k gets A − R. Where this equilibrium comes from is not important for our analysis. All we know is that this is a possible equilibrium.

This business venture can be used as leverage to improve the efficiency of the credit interaction between j and the Bank. Basically, this entails k making the following offer. It tells j to put in effort into the infrastructure project for which j borrows money from the Bank. It then says that in case the infrastructure project fails, k will repay the debt on behalf of j. Finally, it wants something in return; so it says that it will now pay j less than R (which was the payment earlier) for their joint venture. It will instead pay $\bar{R}$, where $\bar{R}$ is defined, implicitly, as follows:

$$R - \bar{R} = p_H(X - B) - C - [p_L X - B]$$

Note that the right-hand side of [3] is the gain that j has by virtue of going from the inefficient bilateral equilibrium, where it was earning $p_L X - B$ to the amount it would earn if it took on the offer that k was making. In other words, R is defined such that what it gains from the new terms in the credit market it loses out from the joint business venture. Thus j will be indifferent between not accepting the new contract and accepting it. I am making a simple tie-breaker assumption that, under these circumstances, it will take the contract. If the reader feels uncomfortable with this assumption, we could without loss of generality assume that k offers j for the business joint venture $\$ R + \varepsilon$, where $\varepsilon$ is a small number.

In addition, k has to make it clear to country j that, if it cheats and puts in no effort, then k will withdraw from the joint venture (and, as we noted, it is an equilibrium for both to withdraw from the project. This is an equilibrium since the Bank earns as much as before, country j earns as much as before and k earns a positive amount over and above the earlier income of A − R, the additional amount being equal to the extra aggregate income generated by moving from the inefficient equilibrium to the efficient outcome.
To see that this can be a subgame perfect equilibrium, assume further that the (expected) returns to the joint project depend on the success of the project, and that if $k$ observes that $j$ has not exerted effort, it pays him to break off from the joint venture (even taking into account the investments he may have already made in the joint project). If $j$ shirks, it gets $p_L(X-B)$, if it does not shirk, it gets $p_H(X-B) - C + R$. It pays $j$ not to shirk provided the stake is large enough, that is, $R > C - (p_H - p_L)(X-B)$.

By eq. [3], this means that we need the following condition: $R > (1-p_L)B$. Since $R$ was an arbitrary initial equilibrium condition, and all we know is that $R \leq A$, basically what we need is that $A$ is sufficiently large, in particular, greater than $(1-p_L)B$. In words, the joint venture game must give enough returns for it to be valuable as providing enough leverage to compel country $j$ to be efficient.

It is worth noting this is not the only way to enforce good behavior. Assume if $j$ reneges, in the Joint Venture game, $j$ and $k$ go for Nash equilibrium $(0, A)$, that is, one in which $j$ gets nothing and $k$ everything. Clearly, this is an equilibrium, and this incentivizes $j$ to behave well.\(^7\)

### 4 Concluding remark

The aim of this paper was a limited one, to demonstrate that the current treaty requirements underlying the EU that put a blanket prohibition on one member nation taking on the debt liability of another is detrimental to the effective functioning of the group. The amendments needed have to be nuanced to prevent reckless cross-country liability, but some amendments are needed to enable some variant of Eurobonds to be implemented and advantage taken of the fact that the EU nations and, even more, the Eurozone members have trade and other inter-connections which can be leveraged for investment, growth and job creation.

**Acknowledgements:** This is a revised version of the lecture given (by audio) to the “Workshop on the Law and Economics of Eurobonds beyond Crisis Management” held at Bucerius Law School, Hamburg, on 8 January 2016. I am grateful to Tito Cordella, Vivian Hon, Magali Pinat, Hans-Bernd Schäfer, and other participants of the Workshop. I had presented some related ideas as part of

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\(^7\) In case we want the Nash equilibrium to be a strict equilibrium (though we do not need this for subgame perfection) we can assume that the punishment Nash equilibrium is $(\epsilon, A - \epsilon)$, where $\epsilon$ is a small positive number.
my Global Economy Lecture at the Österreichische Nationalbank, in Vienna, on 16 November 2015. I am grateful also to the participants of that lecture for numerous helpful comments.

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