

The constitutional Efficacy of the EMU: A Sovereign CDS and Bond Price System revealed

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Abstract

The motivation of this paper is to enrich the discussion in constitutional policy economy (CPE) on the monetary constitution (Buchanan 2010) by re-assessing the constitutional efficacy of the European Monetary Union (Buchanan 2005). Therefore, we analyse the interdependent relationship of sovereign CDS and bond rates as well as their dynamics over time to further explore risk premia of sovereign debt (Woo 2003). After identifying a VECM during the quasi Eurobond time period from 2000-2009 in the EMU, we assess the impact of political counter measures of its governing bodies to fight the Eurocrisis and on a CDS/bond rate system of a time series of focal Eurozone countries up until the end of 2011.

Keywords: Eurocrisis, systematic risk, unit root test, cointegration analysis, Granger causality, VECM, response and breakpoint test, CDS sovereign bond yield.

JEL-Classification: E42, E63, F 34, F42, G32, H87

1 Prologue: The constitutional economic perspective of Public Choice on the EMU – empirically focused.

The sovereign debt crisis in the European Monetary Union (EMU) reaffirms the need for analyses of fiscal and monetary constitutional rules with regard to their economic effects (Buchanan 2010, Reinhart/Rogoff 2009). As an integral part of the broad research programme of Public Choice, the perspective of Constitutional Political Economy (CPE) offers a bifocal perspective that can be applied on these arenas as follows¹:

The first addresses the question on the constitutional efficiency of the distinct constitution and its constitutive rules respectively (Buchanan 2004). This level is commonly described as the “constitutional level” in the analysis of CPE, or in Hayekian terms as the “order of rules” respectively, and directs attention on the “normative” dimension of CPE with all atrocities it may arise (Kirchgässner 1988, Vanberg 1997, Voigt 2011). In line with Buchanan, Frey, Kirchgässner and Vanberg we bind this first perspective to a normative individualistic approach on Popperian grounds (Feld/Köhler 2011) and restate the question on this level (of fiscal and monetary rules), whether there are any constitutional rules as the one observed in the here and now (Buchanan 2005) that can increase citizen or consumer sovereignty respectively (Vanberg 2010). These criteria are implicitly derived from the criterion of mutual consent CPE has been carrying forward since in its contractarian re-inception by Buchanan and Tullock (1962). Assessments and polity advices on this level are commonly stated in hypothetical imperatives.

The second of the bifocal perspective of CPE addresses the research question of the constitutional efficacy of the constitution in its institutional reality. (Buchanan 2004). This level is commonly described as the “subconstitutional level” or – in Hayekian terms – as the “order of actions” and directs attention on the “positive” branch of CPE (Voigt 2011). From this perspective, research is intended to observe and analyse the quantifiable outcomes of constitutions, their institutional arrangements and governing bodies. The research objective is to gain prudential arguments on the working properties of the analysed objects. The research problems on this subconstitutional level can also be coined as inverted hypothetical imperatives: What properties should the institutions and governing bodies account for – or how should they be reformed – if it is their task to assure and safeguard the efficacy of a given constitutional rule or framework? Following the concept of constitutional efficacy (Buchanan

¹ We refer to the distinct theoretical paradigm that has its principal roots in James M. Buchanan’s work.

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2004) helps to focus subconstitutional analyses on externally determined performance criteria – and therefore not to exceed the limits of knowledge and legitimation.

We focus on the EMU from this second perspective in this paper: Re-phrased to our problem of the constitutional efficacy of the EMU – our performance criterion is set by the Article 126 of the Treaty in combination with 124 and 125, which is to guarantee a solid and stable fiscal environment for the Euro. If the order of action is considered to broadly meet this criterion, one can – in accordance to Buchanan – assess the institutional arrangements of the constitution to grant efficacy. Our main question towards the constitutional efficacy of the EMU directs therefore attention to the question, if the properties of its institutional design can be assessed as viable and efficacious over time. Hence, we analyse the economic effects of constitutions in being – with a special respect to its institutional arrangements and polity actions.

As a matter of fact, we are not exploring the question which fiscal rules are potent to reduce risk of sovereign bonds – to let their premiums decline over time (Moessinger 2011). This study is far more downstream since we are interested in the determinants of systematic risk of sovereign debt on the real-world study of the Eurozone to enrich Buchanan's concept with prudential criteria. We thereby want to explore which certain events during the time of homogenous sovereign rates lead to first structural breaks of a long-term cointegrated time series of sovereign rates as well as to explore the reason that led to its hysteresis.

We start out with an empirical analysis of the first decade of the EMU by showing an existing and stable cointegration relationship of the member states sovereign debt rates. Causality test will direct attention on the member states that lead the cointegration system. An impact analysis of major events that cast doubt on the long-term efficacy of the EMU framework (Reform of the SGP in March of 2005), as well as test for monetary policy interdependency of the system reflects how systematic risk increases over time.

In addition we prove a significant long-run connection between bond and CDS rates – with different findings as Palladini and Portes (2011). Beyond their scope but in the heart of our analysis lies the question which determinants drive up systematic risk of government bonds. National commercial bank CDS will be therefore integrated into the analysis as well as volatility indexes.

To sum up, we want to rediscuss the doubts of Buchanan (2004) – who was in line with many other economists as Milton Friedman, Anna Schwartz or Michael Bordo (1999) – not of the opinion that the EMU could sustain its longterm-sustainable efficacy. Here we want to contribute a concept how to test these considerations with real-life data.

2 Literature Review on the Method

Former studies concluded that sovereign CDS and bond rate dynamics reveal information on the viability of the framework that constitute their underlying – the market for fiscal debt. (Hull 2004, Zhu 2006, Areznki et al. 2011, Palladinie and Portes 2011). A recent and very thorough analysis is focused on the links between rating practices and bond rates, which partly reflects our topic (Afonso et al. 2012, de Haan and Amtenbrink 2011, Hill 2010). W.r.t. structural breaks and the quantitative assessment of policy measures during the financial and debt crisis we are backed by Joyce et al (2011) by the Bank of England and Palladinie and Portes (2011) with their NBER.

Other studies on the determinants of public debt have also underlined that information of the quality of fiscal regimes corresponds positively with debt re-financing costs. (Woo 2003 Moessinger 2011).

A real life example however has not been analysed systematically in this regard to show how these market react to political force majeure.

3 The Data

For the first and second part of the analysis we retrieve daily CDS and bond rates for the member states of the EMU from Datastream.²

We have chosen these time series for three reasons: First, these rates reflect the risk premium of the EMU member states fiscal household. Second, the CDS high degree of interdependency on its underlying suggests a likewise pairwise selection as economically prudent (Palladinie and Portes; Joyce et al. 2011, de Haan 2011) Third, our selection rests upon former empirical studies that have proven their significant influence VECM systems (e.g. NBER 2011; Bank of England 2011).

We consider 2,5,10y rates within the time series analysis because of their data quality attributes (1) while meeting prudential (2) and theoretical demands (3) as well as considerations from the perspective of institutional monetary economics (4):

1. Being daily quoted by the EU institutions in cooperation with Thompson Reuters polling a set of financial intermediaries under a standardized question method for over

² We hereby thank Martina Sillak of the University of Freiburg for her help and feedback w.r.t. several inquiries and related questions on the dataset. The dataset is available here: <http://www.datastream.com>

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20 years, we consider this time series as adequate to fit data quality requirements with regard to accessibility, reliability, timeliness, consistence and completeness.³

2. Since no relevant transaction costs occurs in the trade of sovereign rates and since their trade volume is sufficiently large in an environment characterized by a high degree of capital mobility in the regulatory framework of the European financial market place, we consider this data set as appropriate for our specific use under prudential considerations.
3. As we consider the arbitrate rationale as the main theoretical backbone of this survey, its main assumptions [i.e. absence of transaction costs, unrestricted capital mobility and [in]difference w.r.t. the risk of the underlying assets] can be best matched if we consider short term interbank rates on money market products. (See part 4 for further information)
4. Alas, the sovereign CDS and bond rate act as the critical reference for crisis policy as it is targeted by the all intermedieares and especially the Rating Agencies.

The dataset is retrieved from the above mentioned URL and is provided in daily as well as in monthly quotes. The starting point of our analysis (Jan 3st 1999) is set by the first banking day. The total number of observations is xx for monthly data and xxxxx for daily data. [Still peding on the two models in use]

4 The Method

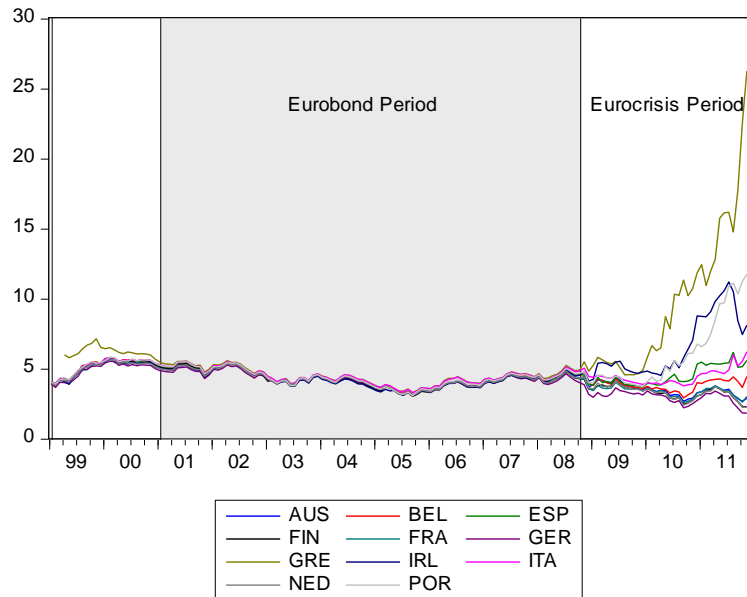
Our approach lends itself from the perspective of CPE – as stated in the prologue. Since we think that combination of empirical methods and the constitutional perspective is fruitful to amplify Public Choice into monetary economics, we need prudential and quantifiable arguments to transport and discuss the applied question, if the EMU framework can be considered to meet the criteria of constituioanl efficacy. The hypothesis is therefore, if the EMU framework can effectively mitigate risks w.r.t. sovereign risk or not.

This hypothesis is discussed twice: First, w.r.t. the quasi-Eurobond time, during which the bond and CDS rates are homogenous. Secont, wr.t. the time of Hysteresis, during which several sovereign depart from the median. For now, we have made the distinction between

³ As far as the British Bankers Association selects the commercial banks upon scale, reputation and expertise in Fixed Income and Money Market operations, we indirectly rest upon their selection criteria, of course. The standardized poll is reflected by the question: “*At what rate could you borrow funds, where you to do so by asking for and then accepting inter-bank offers in a reasonable market size prior to 11 am?*”

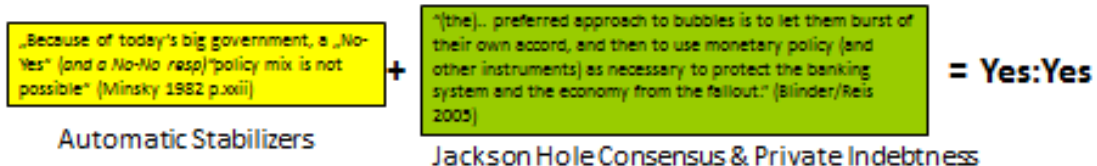
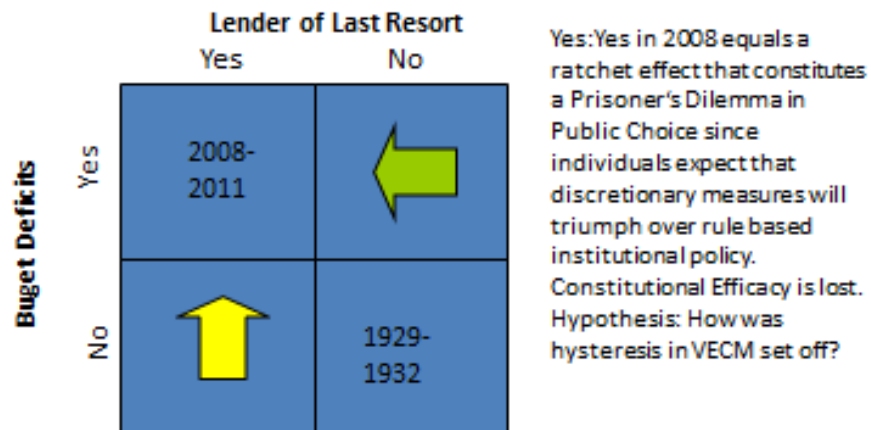
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Period I and Period II by choosing the Lehman event – when it became evident, that the State would act to “protect the financial industry from the economic fallout”, to cite Blinder.



We therefore test – indirectly – the following prisoner’s dilemma of moral hazard:

Loosing constitutional Efficacy



In order to test if the time series allows for a VECM including a long term relationship, we have to perform tests of stationarity for the time series. Therefore we conduct Augmented-

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Dickey-Fuller and Philips-Perron-Tests in line with Kirchgässner (2006), Enders (2010) After this first requirement is met, we analyse if the time series are cointegrated, which is achieved by the application of a Johansen Test. Here we apply the lag length criteria in accordance with the VAR.

To extract the long term relationship which is supposed to determine the “Eurobond” Phenomenon we then apply an Error Correction Model. At last, we test if the events of the revision of the Stability and Growth Pact on March 24 2005, Lehman Brothers in 2008, SMP announcement in May of 2010 and other related events of force majeure announcement had any effect on the phenomenon, a Chow test will be applied. Since we have retrieved monthly and daily quoted rates, the survey is broken up into two steps each. The Eurobond monthly analysis first, and the daily Crisis period thereafter.

5 Results with monthly data (Eurobond Period)

Before we examine the long run relationship of the Eurozone’s member states sovereign bond rates from January 2001 to October 2008 we first have to apply tests of stationarity to the time series to check whether long run relationships are at least possible. Already in levels stationary time series can not be integrated. Further investigation would then be obsolete.

Both the Augmented Dickey Fuller and the Philips Perron test reject the Null-Hypothesis of non-stationarity, as can be seen in table 1, for the first-differences of the data on the 1% significance level. In levels the Null-Hypothesis can not be rejected. All time series are therefore integrated of the order 1 (I(1)).

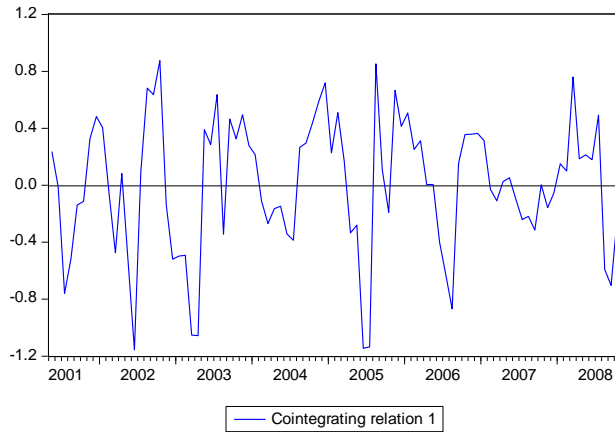
Table 1 Tests of Stationarity

Test Variable	Augmented Dickey Fuller		Philips Perron	
	Levels	1.Differences	Levels	1.Differences

*, **, *** indicate significance on the 10, 5 and 1 percent significance level

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As the time series are not stationary, at least one cointegration relationship in the system is possible. If we apply the Johansen procedure, and assume no deterministic trend in the data and allow for a constant in the cointegration relationship⁴, the Null-Hypothesis of no cointegration can clearly be rejected on the 1% significance level. The Trace and the Maximum Eigenvalue Test indicate one cointegration relationship.



6 Results with daily data (Eurocrisis Period)

Conducting the Augmented-Dickey-Fuller and Philips-Perron-Tests the Null-Hypothesis of non-stationarity can be clearly rejected in both tests for the first-differences of the data on the 1% significance level. W.r.t levels the Null-Hypothesis cannot be rejected. In accordance to the results for monthly quoted rates, the daily time series are also integrated of the order 1 (I(1)) (Table 5).

Table 5 Tests of Stationarity

Test Variable	Augmented Dickey Fuller ⁵		Philips Perron	
	Levels	1.Differences	Levels	1.Differences
GRE	XX	XX ***	XX	XX***
ESP	-XX	XX***	XX	XX***
ITA	XX	XX***	XX	XX***
POR	XX	XX***	XX	XX***
IRL	XX	XX***	XX	XX***

⁴ In the assumption of no deterministic trend and a constant in the cointegration relationship we follow Kirchgässner (2003, p. 255)

⁵ Schwartz Information Criterion SIC with a maximal lag length of X in accordance of the Schwert Rule (1989) testing for unit-root with intercept.

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*, **, ***, indicate significance on the 10, 5 and 1 percent significance level

Following up with the Johansen procedure while assuming no deterministic trend in the data and allowing for a constant in the cointegration relationship⁶, we can also clearly reject the Null-Hypothesis of no cointegration on the 1% significance level. The Trace and the Maximum Eigenvalue Test indicate one cointegration relationship. We apply additional restrictions on the resulting model due to the insignificant influence of the IRL [0.97940] in the unrestricted VECM. If we restrict the IRL=0 in the long run relationship we obtain a Chi-square(1) value of 0,817324. A test of no influence of the ESP gives us a Chi-square(1)=9,572388. W.r.t. the cointegration model an influence can therefore not be neglected. These results match with the monthly quoted data time series. A difference between the datasets can be identified in the long run relationship of the model:

$$5a) \quad \text{ESP} = \underset{(x.xxx)}{x.xxx} + \text{ITA} + \underset{(x.xxx)}{x.xxx}\text{GRE} + \underset{(x.xxx)}{x.xxx}\text{POR}$$

Following our before mentioned scheme, we can only perform tests of structural breaks in the relationship of the time series if causal relationships exist between the time series. As we detected one cointegration relationship in the daily dataset, too we once again follow Toda and Yamamoto (1995) and use one more lag (5 rather than 4 in levels).

Table 6 Tests of Granger Causality

X	Y	F(X→Y)	F(X←Y)	F(X-Y)
ESP	POR			
ESP	ITA			
ESP	IRL			
ESP	GRE			

The results of the Granger Causality tests are still under review.

⁶ We have applied the Akaike Information Criterion AIC at a lag length of XX.

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As a next step we estimate a Vector Error Correction Model (VECM) to show the interrelationship of the daily time series. Assuming one cointegration vector, which describes the long run relationship we get the following equations.

The results of the VECM are also still under review.

Table 7 Chow-Breakpoint Test

Event	CHF	EUR

*,**,***, indicate significance on the 10, 5 and 1 percent significance level

7 Conclusion

We have found out that the sovereign bond spreads during the qua-si Eurbond period between 2001 and 2008 reveal a conintegration relationship that allows for a vector error correction model with significant break points during march 2005 when the Stability and Growth Pact was re-designed granting member states more leeway for lax fiscal policy measures. Therefore we do not only empirically underpin the concept of constitutional efficacy but moreover re-affirm Buchanan's negative outlook on the long-term sustainability of the fiscal framework of the EMU that eventually culminated in the persistence of increased CDS/Bond rate spreads.

We have also found out that the second indentified system is under hysteresis after the introduction of the Security Market Programme in May 2010. Therefore, we expand the doubtful outlook on the efficacy of the EMU.

We have also found out, that any of the large scale events under empirical consideration had a significant impact on the CDS/bond rate equilibrium model.

A methodological insight is once again reaffirmed as well: Uplift standard monetary analysis on the institutional and constitutional level offers a viable approach and calls for a systematic application of the perspective of Public Choice on the monetary arena.

Therefore all aspects relevant to consitutinoal monetary economics are considered to be non-diversifiable hit the scope of constitutional monetary economics.

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