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Debt and Punishment: Market Discipline in the Eurozone

CHARLOTTE ROMMERSKIRCHEN

This article challenges the conventional wisdom of weak market discipline in Economic and Monetary Union (EMU). In so doing, we empirically analyse the dynamics of market discipline for all 27 EU member states between 1992 and 2007. The existing literature tends to assert that markets discipline governments, without measuring whether the interest punishment markets impose actually has the purported effect on government policy. To better grasp the dynamics of market discipline it is essential to consider both sides. Market discipline is thus understood as a two-sided phenomenon. On the one hand, financial investors react to policy developments. On the other hand, policy-makers react to market signals. We find strong evidence that although the impact of fiscal policy developments on market punishment slightly decreases with monetary integration, government responsiveness to market punishment increases. This runs counter to the conventional narrative of policy-makers banking on bailout from fellow EMU members.

Keywords: Economic and Monetary Union, market discipline, moral hazard, euro

Introduction

A long-standing research question in international and comparative political economy concerns the relationship between international financial markets and government policies. How much power do financial markets exercise over policy outcomes? Are governments the 'masters of markets' or should markets be cast as the 'masters of the governments of states' (Strange 1996: 4)? Although this question has attracted considerable attention during the Eurozone's Sovereign Debt Crisis, scholarly interest in the dynamics of market discipline predates the present woes of the Eurozone. The increase in scholarly attention over the past decade has been provoked by comparatively recent developments, namely financial globalisation, the design of complex financial instruments and the growing

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financialisation of government bond markets.[1] This is particularly true in the context of Economic and Monetary Union (EMU). The introduction of the euro eliminated exchange risks between the currencies of participating Member States and thereby led to a considerably more integrated public debt market. Furthermore, against the backdrop of rising debt levels and public deficits, European monetary integration has prompted questions as to which role, if any, financial market creditors may play in achieving fiscal sustainability. One answer points to the market discipline hypothesis (see Bishop 1992, Lane 1993). Ever since the post-Bretton Woods era, market discipline was seen as a force for fiscal prudence, with proponents '[applauding] the way international financial markets would discipline government policy and force states to adopt more conservative, "sound" fiscal [. . .] programmes' (Helleiner 1995: 324). The market discipline hypothesis hinges on the responsiveness of both financial markets and national policy-makers. On the one hand, financial markets must react to fiscal policy changes. On the other hand, borrowers must respond to market punishment (debt servicing cost).[2] Market discipline is thus defined as the mutual responsiveness of financial markets and sovereign borrowers.

Whereas empirical studies of the first aspect of the market discipline hypothesis (market responsiveness) are abundant, its flip side (government responsiveness) has been widely neglected. The existing literature tends to assert that markets discipline governments, without measuring whether the interest rates punishment markets impose actually have the purported and 'desired' effect on government policy. Yet government responsiveness is key. Interest rate penalties can trigger significant macro-economic consequences. Higher interest rates for government bonds result not only in a deterioration in the fiscal position, but usually in higher long-term interest rates in the rest of the economy, with potentially disruptive effects for investment and consumption decisions (Gros 2012). In Greece and Portugal, the Sovereign Debt Crisis has also fed into a banking crisis, where domestic banks were the main investors in the domestic sovereign bond market. A fall in the market value of the bonds of their own government had an immediate impact on the capital of the banks and led to falling share prices and widening credit default spreads to which banks ultimately reacted by refusing to provide other banks with inter-bank liquidity (de Grauwe 2011). Domestic banks faced further funding problems as domestic liquidity declined and reduced lending to the real economy. Such real economic losses thus add to the fiscal burden of higher funding costs. According to Favero *et al.* (2000: 2) if market punishment puts a country's solvency at risk 'then the role of yield spreads on national bonds as a fiscal discipline device is considerably weakened'. Similar to Lane (1993), Hallerberg (2011) argues that populations need to interpret market discipline as an indication about their government's competence and punish governments that face market pressure. It is this punishment which would induce what Lane (1993) considers the fourth criterion of market discipline, namely governments' responsiveness. For market discipline to work, policy-makers have to respond, hoping to avert ever-growing interest penalties before high-debt levels with increasing rollover risk become unsustainable. If not, market punishment risks turning into fiscal bloodletting, aggravating the very illness it is supposed to cure.

This article seeks to advance the literature in two important ways. First, analysing the dynamics of market discipline for all 27 EU member states between 1992 and 2007, it is one of the very few studies to explicitly model the bi-directionality of market discipline. By considering both financial market and government responsiveness, this study '[brings] the state [yet again] back in' (Jessop 2001). In so doing, this article contributes to the wider globalisation-state debate in international and comparative political economy (see Phillips 2005a). Second, it is, to our knowledge, the first study to test both sides of market discipline for all 27 EU Member States and to account for differences between Eurozone and non-Eurozone countries. The Eurozone Sovereign Debt Crisis has given testimony to the need for an urgent understanding of how monetary integration has altered the 'character of financial market-government relations' (Mosley 2003a: 312). This empirical analysis of the 'inherent fragility' (de Grauwe 2011) of monetary union is the first step to do just that.

The remainder of this article proceeds as follows. After situating the concept of market discipline in the broader policy framework of disciplinary neo-liberalism and discussing the conventional wisdom of weak market discipline in EMU, the subsequent section presents our conceptualisation of market discipline, which encompasses both market and government responsiveness. We argue that market punishment is most acutely inflicted by the debt servicing costs. Next, we present our model specifications and data. The subsequent section presents the empirical results. As a robustness check we then test for the ability of governments to respond to market signals by considering discretionary fiscal policy choices. The penultimate section discusses our main findings which, taken together, challenge the conventional wisdom of weak market discipline in monetary union. Although the relationship between fiscal policy developments and market punishment (measured as debt servicing costs) decreases with monetary integration, we find strong evidence for an increase in government responsiveness to market signals. This runs counter to the narrative of policy-makers pre-crisis running moral hazard[3] fuelled policies, banking on bailout from fellow EMU members. The final section concludes.

For the sake of clarity, it is important to stress what this article does not seek to do. First, this is not a study on market efficiency. The research design and empirical modelling does not allow us to draw any conclusions as to whether bond prices accurately reflect sovereign default risk, or whether governments take adequate policy actions in response to market punishment. Second, this article attempts to investigate neither the complex determinants of market responsiveness nor the gamut of causes of deficit spending. Instead, we are primarily interested in testing the bi-directional relationship between market punishment and government responsiveness in Eurozone and non-Eurozone EU Member States. Our comparatively simple specification reflects this purpose. Third, this study does not scrutinise the anticipatory mechanisms of government and financial market responsiveness per se: we neither test which of these two is more near-sighted, nor do we analyse the psychological aspects of creditworthiness which cannot be captured by our empirical specification.

EMU's disciplinary neo-liberalism

Market discipline was, and still is, considered to be a key ingredient for the functioning of EMU (Padoa-Schioppa 2002, Cœuré 2013). Although Eurozone Member States are able to issue debt in their own right, they are limited in their policy options in the face of financial difficulties because they are no longer in charge of monetary policy. This has given rise to one of the 'founding fears' of EMU, namely that governments would seek either monetary bailout from the European Central Bank (ECB) or a fiscal bailout from other member states (Ravasio and Ohly 1997: 480, Cafruny and Ryner 2007: 151). Market discipline was thought to contribute to EMU's fiscal constraint along the lines of what the Stability and Growth Pact (SGP), the monetary financing prohibition, the banning of privileged access for the public sector to financial institutions and the 'no bailout clause' aimed to ensure; 'to the extent that market-imposed discipline leads to more prudent fiscal policies and helps prevent fiscal crises [. . .], it protects the citizens against having to pay for the profligacies of the governments of other states' (Schuknecht *et al.* 2009: 371). Indeed the incapacity of the SGP to discipline fiscally profligate states led Artis and Corsetti (2005) to suggest that the EU 'may have to look to the market to sanction the inveterate debtors'.[4]

The notion that policy-makers can 'harness resources outside the public sector in furtherance of public policy' (Grabosky 1995) is not singular to the EMU project. The role of disciplinary neo-liberalism has been promoted in the policy frameworks of globalisation and is commensurate not only with the Maastricht Agreements and EMU, but with the broader perspective of the Washington Consensus (see Babb 2013). Disciplinary neo-liberalism, according to Gill (1998: 6), espouses 'a world in which the actions of governments, as well as firms and workers, are internally and externally disciplined by market forces, or put differently, by the power of capital'.[5] The underlying principle to turn market discipline into 'a sword to attack errant governments' (Dyson and Featherstone 1999: 674) has retained resonance both in policy-maker and academic circles. In his web-based survey of 263 randomly selected economists from the top 150 academic departments in the world, Chwieroth (2009: 94) finds that the majority of economists surveyed (69 per cent) rejected the proposition that governments should insulate themselves from market discipline. Amidst the Asian Financial Crisis, Michel Camdessus (1997), then Managing Director of the International Monetary Fund (IMF), insisted that 'countries cannot compete for the blessings of the global capital markets and refuse their discipline'. The IMF's *World Economic Outlook 1997*, along similar lines, lauded the crises in the European Exchange Rate Mechanisms in 1992 and 1993 as examples that 'international financial markets can serve to "discipline" governments (either by raising default premiums or by forcing adjustments in exchange rates), encouraging the adoption of appropriate policies' (Gill 1998: 15).

In the context of EMU, market discipline, in the words of former ECB president Duisenberg (2000), is presented as 'offering a sound incentive to pursue the right policies'. Prompting 'appropriate' policy changes, market discipline was thought to overcome the troublesome geography of the euro as characterised by Mundell's Theory of Optimum Currency Areas (1961).[6] According to the monetarist school

of endogenous convergence, monetary union was to be facilitated by the corrective mechanisms of market discipline to remedy divergences (Pisani-Ferry 2014: 22). Disciplinary neo-liberalism thus presented a solution to 'Optimum Currency Area' objections raised against monetary integration (Snaith 2013: 193). This endogenous change brought about by market forces is also endorsed in the 'Memoranda of Understanding' for Greece and Ireland, which impose a broad range of liberalising 'structural reforms' (Scharpf 2013). The political appeal of 'market-led' solutions has survived the recent economic and financial crisis unscathed (Best 2010: 40). Contrary to Baker's (2013) assessment of what he calls 'the new Basel consensus' on financial regulation, market discipline continues to be at the heart of EU fiscal policy coordination.

The failure of market discipline: the conventional wisdom

Market discipline is regularly limited by the responsiveness of financial market participants to public policies. Numerous studies have scrutinised the effect of deficits and debt levels on indicators of sovereign risk. In this literature, fiscal policy outcomes are modelled as determinants of long-term interest rates, bond yields (either absolute yields or spreads over a risk-free benchmark interest rate), credit default swap spreads[7] or credit ratings. The majority of empirical studies point to a significant effect of market responsiveness to 'excessive' fiscal policy in developing countries (Edwards 1984, Gelos *et al.* 2011), emerging market (Min 1998, Ferrucci 2003), advanced economies (Alesina *et al.* 1992, Ardagna 2009) and EMU Member States (Lonning 2000, Maltritz 2012).

The alleged absence of market responsiveness leading to debtor moral hazard[8] has been widely indicted as the main culprit of the European Sovereign Debt Crisis. Wójcik and Fahrholz's narrative (2011) is representative of the conventional – and as we argue incomplete – wisdom:

> At the economic end, [. . .] markets have for many years been taking far too many risks by treating, for instance, Greek and German bonds in essentially the same way. This has led to a reduction in market discipline [. . .] which in turn has led countries like Greece to indulge in excessive fiscal spending.

The European Commission (COM 2011: 7) lamented the 'inconsistency' of market responsiveness in Eurozone Member States as 'a notable feature of the period since the launch of the euro'. This inconsistency has been directly accredited to monetary union. Arghyrou and Kontonikas (2011) find support for the 'convergence trade' preposition for the pre-2007 period, according to which market participants assumed the best-case scenario of full convergence to German fundamentals, even for countries with a clear deterioration of their macro-fundamentals. Bernoth *et al.* (2004) ascertain that the liquidity risk premium, which reflects the risk that an investor might not be able to liquidate his investment within an expected time period, was reduced with EMU membership (see also Faini 2006).

This suggests that 'markets may anticipate fiscal support for EMU countries in financial distress' (Bernoth *et al.* 2004: 18, see also Talani 2004: 128, Pisani-Ferry 2014: 68). The acceptance of a no bailout agreement is considered a fundamental condition for market discipline to work efficiently and to ward off investor moral hazard[9]: 'Markets must not anticipate that a delinquent borrower will be bailed out' (Lane 1993: 54). The lack of a credible no bailout commitment is thus said to have muted market responsiveness to different profiles of sovereign risk within the Eurozone. As Larry Summers (2011), former director of the US National Economic Council, concludes: '[i]t is now clear that market discipline within monetary union is insufficiently potent and credible to assure sound finance'.

The conventional wisdom of the failure of market discipline is incomplete if not misguided. First, Wójcik and Fahrholz's portrait (2011) of a reduction of market responsiveness which led 'countries like Greece to indulge in excessive fiscal spending' is problematic; one is left to wonder what countries other than Greece the authors have in mind. There is a growing consensus that neither the financial crisis of 2008 nor the broader Sovereign Debt Crisis can be cast as a cautionary tale of fiscal profligacy (Armingeon and Baccaro 2012, Blyth 2013. The sharp deterioration in public finances and borrowing conditions was not caused by policy-makers allowed to run deficits to curry electoral favours, but was a result of 'sizeable fiscal costs through a combination of financial sector rescues, forfeit revenues owing to depressed activity, and, more secondarily, discretionary counter-cyclical fiscal impulse to lessen the downturn' (Buti and Carnot 2012: 903).

Second, the conventional wisdom of toothless market discipline furthermore tends to ignore evidence that monetary union has the potential to strengthen market discipline. Financial market participants may be more wary of unsustainable fiscal policies because default risks are higher in the absence of debt monetisation (Favero *et al.* 2000, Missale 2001).[10] Monetary unification thereby creates 'quasi-sovereign debt' (Gelpern 2012)[11] which makes Eurozone Member States vulnerable to the pathologies associated with what Eichengreen and Hausmann (2005) call 'original sin': the inability of a country to borrow abroad in their own currency. This leads to a deterioration of the borrowing conditions of EMU Member States, downgrading countries who – similar to developing countries – now effectively borrow in a 'foreign currency'. Eurozone sovereigns, having lost control over the currency in which their debt is issued, can then be forced by financial markets into default. As put by Krugman (2011):

> Fears of default, by driving up interest costs, can themselves trigger default [. . .]. A country with its own currency isn't in the same position: even if it is pushed into some inflation, there's no red line that need be crossed.

Financing public debt in a monetary union is inherently unstable because a government that loses investors' vote of confidence has few other options left than to default. This is what de Grauwe (2011) considers the 'inherent fragility' of a monetary union. According to a fund manager asked about the implications of

monetary union in Mosley's (2004) study on the relationship between government and financial markets after EMU, 'there is no default risk when the government runs its own printing presses, so the risks associated with bonds will change with EMU' (Mosley 2004: 193).[12] Given that default is often an abrupt and unpredictable event for investors, markets are said to favour debt monetisation as means to reducing the burden of a high public debt: 'the high probability of a low impact event (a bit of inflation) is not equivalent to the low probability of a high impact event (default)' (Gros 2012: 42).

Policy-makers ideally realise at some point that fiscal consolidation is preferable to borrowing at higher interest rates, and they change their behaviour accordingly (Hallerberg 2011: 130). But because governments can no longer use monetary policy as a tool for repayment, fiscal consolidation gains importance as a policy choice to address growing debt burdens. Responsiveness to market signals thus becomes a primarily fiscal, not monetary, phenomenon. This is why we expect government responsiveness to market signals to be stronger not weaker in monetary union.

Furthermore, conventional wisdom accounts usually fail to consider the state. This disregard is in line with a broader trend within IPE emerging in the late 1980s to sideline state action and agency (see Schmidt 2007). And yet, states are by no means passive recipients of market punishment. Instead, they take on the role of active managers of market discipline. This management takes two main forms (a) debt management strategies which influence debt servicing costs and (b) the actual responsiveness of policy-makers to changes in debt servicing costs. By considering state agency as an integral part of market discipline this study rejects the notion of the 'powerless state' (Weiss 1998). So doing, we contribute to the broader literature that challenges the backseat place the state is frequently relegated to in comparative and international political economy (Hobson and Ramesh 2002, Mosley 2003a, Phillips 2005b, Weiss 2005).

Market discipline

Market discipline has become the headline for analyses that actually focus on the determinants of credit risk, as measured by the differential (spread) of borrowing costs and a 'benchmark' interest rate. Sovereign spreads are a perfectly suitable measure of sovereign creditworthiness (Obstfeld and Taylor 2003); yet as an indicator for market discipline their suitability is less convincing. Codogno *et al.* (2003: 56, own italics) assert that 'yield differentials are important indicators of market perceptions of fiscal vulnerability and, since higher bond yields *imply* higher debt service costs, impose market discipline on national governments' fiscal policies'. Given the substantial size of most government debt burdens, even small variations in bond prices may entail significant real costs for taxpayers as well as political costs for governments (see Manganelli and Wolswijk 2007). However, reactions of the financial markets translate only slowly into higher debt servicing costs, as higher interest rates are of course only to be paid for newly issued debt (Somogyi 2006: 3). To obtain a measurement of market punishment, it is preferable to use the current debt servicing costs for the purpose of our study.

A (variant of the) debt servicing variable is featured in studies on the determinants of fiscal policy. Using actual changes in debt servicing expenditure is consistent with the public choice view of government which dominates the public finance literature, according to which policy-makers are opportunistic and prone to time-inconsistent behaviour. This is not to suggest that governments do not respond to market signals in the form of higher bond yields or credit downgrading. This response is however likely to vary considerably depending on the debt structure (that is, how quickly a rise in interest rates translates into a higher debt servicing cost) and on the 'audience costs' (Lohmann 2003) governments face. Various-related studies on the determinants of public deficits, starting with Roubini and Sachs (1989), control for debt servicing costs (De Haan and Sturm 2000). Hallerberg *et al.* (2007: 350), for example, argue that the 'debt servicing costs capture the impact of interest payments as well as political pressures that might emerge from high levels of interest payments on governments'. These 'political pressures' may cover a broad range of concerns regarding the government's competence in fiscal management, the fear of rising taxes and/or expenditure cuts to offset the higher debt servicing costs, and ultimately the probability of default. Particularly in the fiscal consolidation literature, debt servicing costs are frequently included to account for the pressure for budgetary improvements (Wagschal and Wenzelburger 2008, Nickel *et al.* 2010, Molnar 2012).

A first look at the data (Figure 1) shows the debt servicing costs for the EU27 between 1995 and 2012, with the sample divided into (future) Eurozone Member States and non-Eurozone EU Member States. It becomes immediately apparent

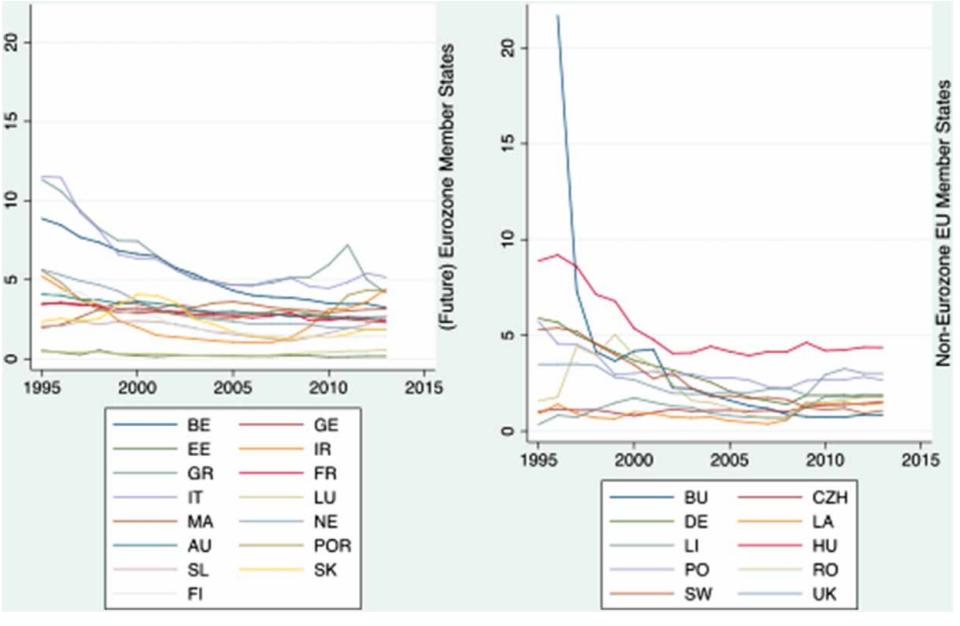

FIGURE 1. Debt servicing cost (per cent of GDP), 1995–2013
Source: AMECO.

that market punishment was reduced steadily in the 1990s. The decline of debt servicing costs is evidently a *broader* EU27 phenomenon and not reserved for Eurozone Member States. The first decade of EMU was dominated by the search for yield. This has to be seen in the global context of low volatility, reflecting broader patterns of declining costs of sovereign borrowing across developed and emerging market economies (Pisani-Ferry 2014: 68). What is more, despite a clear trend of increasingly favourable borrowing conditions prior to the Sovereign Debt Crisis, market punishment seems to be less homogeneous and, for the post-2009 period, increased less dramatically than the ubiquitous figures of rocketing bond yields would suggest, see Figure 2. Indeed for the 1992–2011 period, the correlation of real long-term bond yields for EU Member States and debt servicing costs suggests that the risk premium charged by investors account only partially for the actual price governments have to pay for sovereign borrowing ($r(328) = 0.50$, $p < .01$).[13] This correlation is less strong for Eurozone Member States ($r(153) = 0.22$, $p < .01$) than for non-Eurozone Member States ($r(175) = 0.55$, $p < .01$). The average residual maturity[14] of debt in the Eurozone converged prior to the financial and economic crisis, with notably high-debt countries seizing the opportunity to expand long-term financing at cheaper cost (Wolswikij and de Haan 2005). Yet there is still (and increasingly so) considerable variation in the average debt maturity structure of the government bond market (Lojisch *et al.* 2011).

Naturally, the improvements in budgetary positions during the 1990s across developed economies affected public debt management positively and reduced debt servicing costs. Beyond fiscal reasons for a reduction in market punishment,

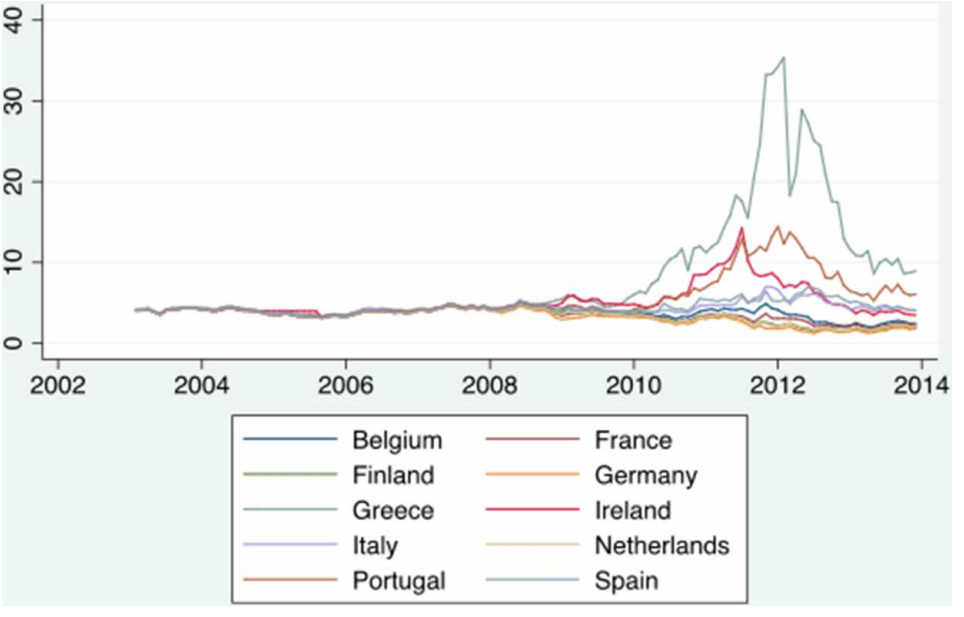

Figure 2. Yields of 10-year Government Bond Rates
Source: Datastream.

the debt management strategies during the past two decades of comparatively benign market conditions, with a focus on long-term, non-indexed fixed-rate debt, meant that increases in marginal interest rates took longer to feed through to average borrowing costs.[15] This active debt management insulated both Eurozone and all EU Member States (albeit to varying degrees) from any deterioration in market sentiment. Particularly, the maturity structure of sovereign debt is key here. The financial crises in Mexico in 1994 and Indonesia, Korea, Malaysia, Thailand and Russia in 1997/1998 were characterised by the fact that these countries had to roll over large amounts of short-term external debt which made them particularly vulnerable to an abrupt change in market perceptions (Jeanne 2004: 2135). In 2010, the maturity of Greek debt was the second longest maturity among advanced economies (Cottarelli *et al.* 2010: 18). As a result, Greece was able to benefit from low pre-crisis rates in addition to the comparatively favourable rates of EU financial assistance; in 2012, Greece debt servicing costs stood at 5 per cent of GDP. This is the same figure as in 2003, despite the fact that Greek debt levels had risen from 98 per cent of GDP in 2003 to 157 per cent in 2012. Similarly, Spanish debt servicing costs as percentage of GDP was identical in 2012 and 2001 (3 per cent of GDP). This figure is remarkable given that the public debt to GDP ratio had risen from 55 to 86 in the same period. For Belgium, German, the Netherlands, Austria and Sweden, interest expenditure on debt *fell* continuously during the 1995–2013 period – including the financial and economic crises years during which debt levels soared. These figures of actual debt servicing costs suggest that under certain conditions EMU Member States are able to manage financial market constraint. To scrutinise the dynamics of market discipline in monetary union beyond descriptive statistics the rest of this article sets out to empirically analyse the determinants of both market punishment and government responsiveness.

Empirical model

Our yearly, unbalanced panel data set includes all 27 EU countries from 1992 to 2007. The Maastricht Treaty, signed in 1992, is considered the starter's gun for monetary integration (cf. Baun 1995) and is thus chosen as reference year for this empirical investigation. The year 2008 marks the financial sector fallout that ignited the European Sovereign Debt Crisis; therefore, 2007 is chosen as the endpoint of the analysis. The first dependent variable, *Punishment*, measures the interest expenditure as a percentage of GDP. The second dependent variable, *Budget*, refers to the general primary budget balance. In line with previous studies (de Haan and Sturm 2000, Heinemann and Winschel 2001, Bulut 2012), we exclude the interest payment component and rely on the primary budget balance in our measurement for government responsiveness. The effect of the real interest rate on budget deficits via net interest expenditure on the outstanding government debt is thereby not included. The *Punishment* model analyses investor moral hazard by considering financial market participants' responsiveness to fiscal policy outcomes. The *Budget* model investigates debtor moral hazard by considering governments' responsiveness to market signals.

The quadratic transformations of both variables (*Punishment Square* and *Budget Square*) are used to account for the potentially non-linear relationship between interest penalties and fiscal outcomes.[16] First, market responsiveness is thought to rise at an increasing rate with the level of borrowing (Bayoumi *et al.* 1995: 1046). As Codogno (2004) notes, '[t]he effects of doubts about a country or economic area's creditworthiness become exponentially more severe as those doubts grow'. This non-linearity is further precipitated by information cascades or herd behaviour (Bikhchandani and Sharma 2001). If these incentives fail to restrain what is deemed unsustainably borrowing, financial markets may eventually deny the sovereign borrower access to credit. Second, government reactions to higher interest rates are likely to display non-linearities in the sense that the severity of the punishment may exponentially increase government responsiveness. If, however, a certain threshold is reached at which the solvency is put into question, it is possible that market responsiveness may lead to an exponential deterioration in the budgetary position. The notion of non-linear behaviour is not new. Flandreau *et al.* (1998: 145) analyse the gold standard experience in Europe from 1880 to 1913 and argue that although markets react to increases in debt by imposing higher risk premiums, 'countries had to plunge quite deep into debt before they started feeling the pain'.

In the empirical model, we include several relevant macro-economic variables. These are the primary general public debt to GDP ratio (Debt), the annual change in GDP (ΔGDP), the real short-term interest rate (Short),[17] the inflation rate (Inflation) and a dummy for Eurozone membership (Eurozone). Obviously, the size of the debt burden should be a key determinant for debt servicing costs. All things being equal, we expect countries with larger debt levels to face higher debt servicing costs. Furthermore, the public debt to GDP ratio (Debt) is used as a proxy for a country's fiscal room for manoeuvre, which is thought to constrain policy-makers' fiscal policy choices and is used by investors as a yardstick for the sustainability of public finances. Debt levels are also an indicator of debt dilution; the higher the debt burden, the lower the proportion of their claim that existing creditors expect to recoup in the event of default (Jeanne 2004). To avoid issues of reversed causality, we exclude the interest paid as a percentage of gross public debt. The annual change in GDP growth (ΔGDP) accounts for the fact that sovereign debt becomes riskier during periods of economic slowdown (Alesina *et al*. 1992). This is largely due to the fact that economic growth is an important determinant of fiscal policy outcomes. First, the budgetary impact of automatic stabilisation is contingent on the economic climate. Second, in the context of active demand management, discretionary spending is likely to increase in times of recession. Following Manganelli and Wolswijk (2009), we include the real short-term interest rate (Short). Short-term rates are related to risk aversion via two main channels. First, interest rates have an impact on investor's readiness to take on risk (Rajan 2006). Whereas low interest rates pose an incentive for investors to take on greater risk to improve the expected return on their investment, high interest rates enable investors to realise a sufficient return investing in safer assets. Especially leveraged investors, such as hedge funds, are sensitive to short-tern price fluctuations. Second, interest rates have an impact on the state of the economy and, by implication, on investors' appetite to take on risk. We also

include the variable, *Inflation*. In the short term, higher inflation reduces the domestic debt burden of governments relative to GDP and therefore leads to a reduction in debt servicing costs. In the medium to long term, however, higher inflation rates can lead to a loss of competitiveness and increases the cost of capital, therefore increasing sovereign risk and driving up interest payments (Maltritz 2012). Eurozone membership (Eurozone) is thought to constrain Member States in their fiscal 'profligacy'. The variable also controls for the fact that market participants may (a) not have discriminated between the sustainabilities of Eurozone Member States' public finances during the early years of EMU as discussed above or (b) evaluate Eurozone Member States' sovereign risk more critically. Table 1 presents the descriptive statistics for all variables.[18]

Modelling bi-directionality: 3SLS

Again, market discipline has two sides. The first side stipulates that financial markets react to fiscal policy outcomes; the second argues that policy-makers react to market punishment, see Figure 3. This twin logic means that causality is difficult to establish and raises concerns over the endogeneity of the regressor and heterogeneous dynamic of the error term. Further complicating the relationship between market responsiveness and government responsiveness is that fact that, on the one hand, governments may anticipate an increase in borrowing costs and adjust policies accordingly. This anticipatory mechanism does appear to be at work for example in the UK's austerity politics despite low borrowing costs (Corsetti 2012). Wolf (2010) critically summarised this policy as 'giving the markets what we think they may want in future – even though they show little sign of insisting on it now'. Markets, on the other hand, may react to political news in anticipation of the fiscal consolidation/expansion, thus anticipating actual fiscal policy outcomes (Phillips 2012, Mohl and Sondermann 2013).

Not considering the preceding feedback effect might lead to misleading conclusions. The bi-directionality of market discipline means that the ordinary least squares (OLS) estimates may be biased and inconsistent. Following Bulut (2012), we address this problem by using a simultaneous-equation model, three-

TABLE 1. Summary statistics for key variables

Variable	Mean	Std. dev.	Min.	Max.
Punishment	3.403	2.571	0.146	21.697
Budget	0.838	3.487	−28.212	10.480
Realshort	2.202	3.862	−23.314	20.146
Debt	48.155	27.466	3.518	123.293
Inflation	3.571	3.948	−1.105	52.487
GDP	3.479	3.541	−32.100	22.900
CyBudget	0.811	2.942	−7.969	11.922

Source: See Appendix.

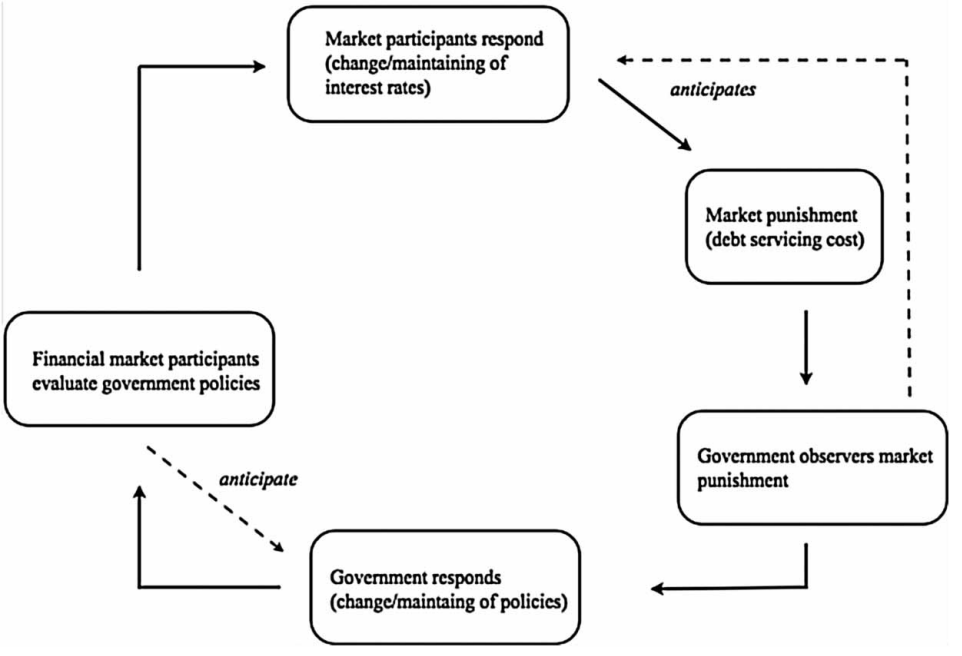

FIGURE 3. A stylised model of market discipline (adapted from Mosley 2000)

stage least squares (3SLS) (Zellner and Theil 1962).[19] The linear specification used is as follows:

$$\text{Punishment}_{i,t} = \gamma + \theta_1 \text{Budget}_{i,t} + \theta_2 \text{Budget Square}_{i,t} + \tau X_{i,t} + \Phi Y_{i,t} + \upsilon_{i,t},$$

$$\text{Budget}_{i,t} = \alpha + \beta_1 \text{Punishment}_{i,t} + \beta_2 \text{Punishment Square}_{i,t} + \psi Z_{i,t} + \Phi Y_{i,t} + \varepsilon_{i,t},$$

where $X = \{\text{Short, Debt}\}$, $Y = \{\Delta\text{GDP, Inflation, Eurozone}\}$ and $Z = \{L.\text{Debt}, t\}$. X is a vector of controls that are thought to impact the market responsiveness variables. Y includes all exogenous variables common to both equations. Finally, variables in vector Z are believed to impact on the primary structural balance. To capture 'push' and 'pull' factors which influence both market and government responsiveness, country and year dummies are included in all models.[20] Similar to Maltritz (2012: 664), we consider annual data because we are interested in fundamental and long-term determinants of market discipline. On a practical note, the majority of variables are available in annual frequency only.[21] Before proceeding to the empirical results, we also confirm poolability for both the whole and subsamples using the standard Chow test. Poolability of data refers to the reasonable approximation of coefficients over 'space' (countries or country groups such as Eurozone/non-Eurozone) and 'time' (1992–2007). Unite root tests (Levin–Lin and Im–Pesaran–Shin) results prove that our series are stationary series.

Empirical results

Table 2 displays the 3SLS estimation results for Models 1–3. In all models, the overall explanatory power of the model for market punishment is larger than for the government responsiveness model. The results in Model 1 show that the

TABLE 2. Market discipline and EMU membership

	Model (1)		Model (2)		Model (3)	
	EU27 (1992–2007)		Eurozone (1999–2007)		Non-Eurozone (1999–2007)	
Variables	*Punishment*	*Budget*	*Punishment*	*Budget*	*Punishment*	*Budget*
L.Punishment	0.842***	–	0.697***	–	0.679***	–
	0.028		0.064		0.054	
L.Budget	–	0.715***	–	0.783***	–	0.808***
		0.037		0.084		0.066
Budget	−0.026*	–	−0.038	–	−0.037**	–
	0.015		0.028		0.016	
Budget2	0.001	–	0.003	–	0.004	–
	0.002		0.003		0.003	
Punishment	–	0.276	–	1.989*	–	1.020
		0.236		1.089		0.743
Punishment2	–	−0.001	–	−0.084	–	−0.108
		0.013		0.065		0.075
Realshort	0.011	–	0.047*	–	0.040***	–
	0.007		0.026		0.012	
Debt	0.006***	−0.009	0.012***	−0.083*	0.019***	−0.011
	0.002	0.010	0.004	0.044	0.004	0.028
Inflation	−0.001	−0.090*	0.003	−0.251	0.038**	−0.092
	0.013	0.052	0.040	0.237	0.017	0.090
GDP	−0.038***	0.103***	−0.013	0.103	0.003	0.181*
	0.009	0.040	0.015	0.128	0.018	0.097
EU	−0.030	0.605**	–	–	0.045	0.087
	0.071	0.294			0.094	0.505
Eurozone	−0.039	0.145	–	–	–	
	0.064	0.275				
Constant	0.145	−0.629	−0.063	−0.311	−0.197	−0.327
	0.119	0.515	0.139	1.239	0.184	1.272
N	347	347	107	107	134	134
R^2	0.97	0.72	0.99	0.78	0.96	0.72

Source: See Appendix.
Note: The table shows three-stage OLS estimation for the system of simultaneous equation. Both country and year fixed effects are controlled in the estimations; yet the coefficient estimates are not shown because of space constraint. Standard errors are calculated with small sample adjustments. *p* values are below coefficients.
***Denotes significance at 1%.
**Denotes significance at 5%.
*Denotes significance at 10%.

markets punish a deterioration of the budgetary position in EU Member States, though we detect no evidence for government responsiveness to this market punishment. Changing the timeframe of our analysis (1999–2007), we find evidence for both the sensitivity of market punishment to fiscal outcomes and the responsiveness of governments to market punishment. Our interpretation of the positive coefficients of *Budget Squared* is that market forces react less strongly to an improvement in the budgetary position once a country has reached a (very) favourable budget balance. The negative coefficient of *Punishment Squared* suggests that as market punishment increases, governments find it increasingly difficult to improve their budget balance. Arguably, this trend can be contributed to the self-fulfilling dynamics of market punishment: Concerns about sovereign risk, which are reflected in the debt servicing cost, create the very conditions that make insolvency more likely (de Grauwe 2011). However, our results show that this threshold is very high (interest payments of 11.84 per cent of GDP according to Model 4) and was not reached by any of the Eurozone countries, which means that effectively there is always a positive relationship.[22]

The lagged dependent variables are statistically significant in all modes. In the public finance literature, the inclusion of a lagged dependent variable is a common feature and has frequently been attributed to the path dependency of fiscal policy choices (Davis *et al.* 1966). As Kittel and Obinger (2003: 24) point out, it seems appropriate to assume persistency, particularly in the context of the comparatively large European welfare states. Welfare budgets are made with reference to the budget of the previous year and the largest shares of social spending (health care and pensions) tend to increase incrementally. Regarding the debt servicing cost, persistence is also likely. First, as only a fraction of interest expenditure is related to newly issued debt, the fixed component of interest expenditure is likely to be high. The degree of persistence hinges on the gross financing needs of a country, which is composed of the maturing debt plus the budget deficit.[23] A second source of persistency stems from financial investors' evaluation practices. Sovereign risk is usually not evaluated from scratch but instead informed by previous country and group models and information shortcuts (Mosley 2003b: 743f.) which favour stickiness.

In all models, an increase in the real short-term interest rate leads to higher debt servicing costs. This is consistent with the literature, demonstrating a link between short-term interest rates and investor's risk aversion (see Rajan 2006). Note that where primary balance and its squared term are not statistically significant, the debt variable is always statistically significant. All things being equal, the more debt a country accumulates the higher its debt servicing costs. This is of course hardly surprising, but in light of the alleged severing of the ties between public finances and financial market behaviour in EMU, it is worth pointing out.

As expected, GDP growth both reduces the debt servicing cost and has a positive impact on the primary deficit with the latter effect being stronger – although in both cases the variable is not consistently significant for all models. We find only weak evidence (Model 3) that inflation rates lead to an increase in market punishment, as investors worry about their return of investment. This would suggest that for the period 1999–2007, albeit a period of historically low inflation and the country group in question (Non-Eurozone EU) the 'inflation worry' effect

is larger than the 'inflation ease' effect of reducing the repayment of the debt burden. The primary debt burden has a negative impact on the budgetary position. To our surprise, the variables *EU* and *Eurozone* remain insignificant in the majority of specifications.

As we are interested in the possible variation in market punishment and policy-makers' responsiveness between Eurozone and non-Eurozone EU Member States, we split our sample into a Eurozone group and a non-Eurozone group (Models 2 and 3 in Table 2). Overall, we show that market punishment in the Eurozone is not influenced by the primary deficit but is instead driven by the debt level. Given that debt servicing costs are a function of debt levels, this finding is not surprising. The effect of primary debt levels, that is debt minus current debt servicing costs, on market punishment is however less strong in the Eurozone than in the non-Eurozone countries, echoing Howarth's assessment (2008: 126, see also Clift and Tomlinson 2004, Torres 2004: 54) of EMU governments being 'sheltered by the single currency'. On the supply side, this suggests that governments in the Eurozone are in a better position to manage their debt burdens and (re)finance sovereign borrowing in advantageous instruments (e.g. long-term, non-indexed fixed-rate contracts). On the demand side of market punishment, our findings point to the fact that government debt is considered less risky in the Eurozone.[24] Brooks *et al.* (2014) argue that even as Member States 'accumulated public debt in the mid-2000s, investors assumed that eurozone governments were, as a group, safe'. This safety stems from explicit bailout expectations (Bernoth *et al.* 2004), which overcome concerns regarding the inability to monetise debt.[25] According to Sara Bertin, former Greece analyst at the rating agency Moody's, there was a widespread 'belief that Greece was now part of the Eurozone and that nobody was ever going to default' (Creswell and Bowley 2011). EU institutions may well have (inadvertently) encouraged this (mis)perception by treating Eurozone sovereign debt as risk-free in financial regulation and collateral requirements for central bank lending (Cohen 2008: 14, Mayer 2012: 98). Already two decades before the Sovereign Debt Crisis, the European Commission (1990: 112) anticipated the incredulity of market participants vis-à-vis the Eurozone's no bailout pledge: 'It cannot be taken for granted that market discipline would be sufficient, due to expectations of Community assistance [. . .].' Despite evidence of a 'euro effect' that is predicted and diagnosed within the political economy literature (Mosley 2004), both Eurozone and non-Eurozone EU Member States continued to face market punishment for rising debt levels in the form of higher debt servicing costs.

Whereas our findings of investor moral hazard are in line with existing studies (Bernoth *et al.* 2004), we find no evidence for debtor moral hazard in EMU. Instead we are able to confirm government responsiveness to market punishment within the Eurozone. For example, the estimated effects of an increase in debt servicing costs from 3 per cent of GDP (the sample's mean) to 4.6 per cent of GDP (one standard deviation up) leads to, ceteris paribus, an improvement in the primary deficit of 3.2 per cent.[26] Results show that government responsiveness is weaker in non-Eurozone countries than within the Eurozone. Model 3 even suggests an absence of government responsiveness post 1998 (we find a significant but smaller effect for the 1992–2007 period). The finding of heightened

government responsiveness to market punishment contests the notion of 'spendthrift' Eurozone countries who engaged in 'excessive' fiscal policies banking on bailout by their confederates (that is, debtor moral hazard as argued by *inter alia* Wójcik and Fahrholz 2011, von Hagen 2003). Arguably, policy-makers retained an awareness of the potentially heightened constraints of the new currency and the political uncertainty of financial assistance. Long before the Sovereign Debt Crisis erupted, the implications of monetary unification for sovereign borrowing were viewed with concern. Wray (1998: 92), for example, characterised EMU Member States as attempting 'to operate fiscal policy in a foreign currency; deficit spending will require borrowing in that foreign currency according to the dictates of private markets'. The reason for this lies in the transformation of the nature of domestic currency debt in EMU.[27] The fact that some of the major ratings agencies collapsed EMU members' local currency and foreign currency ratings into a single measure can be seen as further evidence for this altered nature of domestic debt (Mosley 2004: 198). Joining the Eurozone, members gave up the ability to borrow in their own currency and faced the pathology of 'original sin' (Eichengreen and Hausmann 2005, see also de Grauwe 2011).

Eichengreen (1990: 164f.) predicted a net increase in default risk and therefore a higher risk premium on the bonds of some Eurozone Members. This risk premium did not manifest itself in the first decade of EMU because of bailout expectations, as argued above. What is more, the declining borrowing costs across the EU (not just EMU) have to be seen in the global context of low volatility and the resulting search for yield (Pisani-Ferry 2014: 68). Once markets began to doubt the ECB's and other Member States' readiness to backstop public debts and circumvent the prohibitions of debt monetization and financial assistance post 2008, the Sovereign Debt Crisis has turned into a case study of original sin in monetary union. Especially by barring the ECB from guaranteeing sovereign borrowers' access to liquidity, EMU's architecture empowered market discipline.[28] In sovereign borrowing, bailout provisions typically exist. EMU, therefore, excludes insurance mechanisms that would normally come with currency unification: the policy framework deliberately exposes Member States to market discipline.

Carrots and seals

So far, we have distinguished between Eurozone Member States and non-Eurozone Member States within the sample of the EU27. Yet there are at least two compelling arguments suggesting that the forces that would mute or amplify market discipline are already at work prior to monetary integration. The 'carrot-of-entry argument' primarily concerns government responsiveness. In the run-up to EMU, so the argument goes, candidates had a strong incentive to bring their fiscal house in order.[29] During the EMU convergence period, applicant Member States thus submitted government policies to 'the daily test of market discipline' (Jabko 2007: 63) in order to qualify for membership. Three out of the five Maastricht criteria relate to deficit, debt levels and long-term interest rates. Where debt servicing costs where high, Eurozone candidates were more likely to curb their deficits. Conversely, after joining the Eurozone, Member States faced a

TABLE 3. Market discipline in the (future) eurozone member states

	Model (4)		Model (5)		Model (6)	
	1992–2007		1999–2007		1999–2007 without East	
Variables	*Punishment*	*Budget*	*Punishment*	*Budget*	*Punishment*	*Budget*
L.Punishment	0.850***	–	0.689***	–	0.749***	–
	0.030		0.043		0.055	
L.Budget	–	0.681***	–	0.713***	–	0.774***
		0.053		0.071		0.084
Budget	−0.025	–	−0.019	–	−0.025	–
	0.019		0.016		0.023	
Budget2	0.001	–	0.003	–	0.001	–
	0.002		0.002		0.003	
Punishment	–	0.992**	–	1.523**	–	2.066*
		0.496		0.747		1.093
Punishment2	–	−0.026	–	−0.061	–	−0.115*
		0.025		0.052		0.066
Realshort	0.026**	–	0.035***	–	0.062***	–
	0.011		0.013		0.019	
Debt	0.007***	−0.043**	0.015***	−0.062**	0.011***	−0.076*
	0.002	0.021	0.003	0.031	0.003	0.042
Inflation	0.016	−0.241***	0.026	−0.302**	0.037	−0.178
	0.020	0.093	0.019	0.139	0.031	0.223
GDP	−0.018*	0.196***	−0.022*	0.243***	−0.011	0.118
	0.011	0.055	0.012	0.090	0.015	0.124
Eurozone	−0.088	0.745*	−0.147**	0.794	−0.118	0.513
	0.011	0.407	0.060	0.494	0.074	0.632
Constant	−0.055	−1.136	0.093	−1.578	−0.061	−1.196
	0.126	0.816	0.122	1.082	0.159	1.523
N	233	233	151	151	124	124
R^2	0.98	0.71	0.98	0.74	0.99	0.77

Source: See Appendix.
Note: The table shows three-stage OLS estimation for the system of simultaneous equation. Both country and year fixed effects are controlled in the estimations; yet the coefficient estimates are not shown because of space constraint. Standard errors are calculated with small sample adjustments. *p* values are below coefficients.
***Denotes significance at 1%.
**Denotes significance at 5%.
*Denotes significance at 10%.

situation that was referred to as 'all sticks and no carrots' (Bean 1998). The sticks enforcing 'sound' fiscal policies in EMU were then the weak SGP and market discipline.[30] Empirically this would mean that government responsiveness was higher for EMU candidate countries. We are left with insufficient observations for the 1992–8 period to split the sample accordingly. To test for a carrot-of-entry bias, we included future Eurozone countries in the Eurozone sample. Results are presented in Table 3. Model 4 shows the results for the 1992–2008

period. Compared to Model 2, government responsiveness is less strong with the 'Maastricht years' included. However, the coefficient for *Eurozone* has a positive and statistically significant impact on the primary balance. Since the same coefficient remains insignificant in the previous models (Table 2), it may be argued that the fiscal discipline of Eurozone membership was mainly stemming from the Maastricht criteria. This is in line with Buti and Giudice (2002) who present evidence that the Maastricht Treaty and the related convergence period reduced deficit levels, but that this disciplinary effect disappeared with the introduction of the euro.

Second, the 'seal-of-approval argument' suggests that a 'Eurozone discount' is likely to play a role even before joining the Eurozone. The underlying idea here is that Eurozone membership confers a seal of approval to participating countries, which increases investor confidence (Gray 2009). Bond yields of Eurozone candidates started to converge well before 1999. On a related note, as Figure 1 shows, debt servicing costs declined steadily throughout the 1992–8 period, partially due to a reduction in debt levels and active debt management. Crucially, this seal of approval designates not only the 'company states keep' (Gray 2013), but also the company they are set to keep. The risk premium on a country's sovereign debt is then determined not only by its own country characteristics, but also by market assessments of countries with which it is categorised (Brooks *et al.* 2014). The results of Models 4 and 5 suggest that market punishment was not driven by a Eurozone seal-of-approval effect.[31] To test whether our results are biased due to the inclusion of nine post-communist EU countries, we excluded them in Model 6.[32] It is reasonable to assume that both market punishment and government responsiveness should be different for these countries. Market punishment may differ due to investors' different evaluation criteria of sovereign risk in emerging markets (Mosley 2003a); government responsiveness may differ due to the more stringent enforcement of the Maastricht criteria. However, comparing Model 6 with Model 5 yields similar results and suggests that the inclusion of Eastern EU Member States did not bias results.[33]

Robustness check: discretionary fiscal policy

Analysing sovereign borrowers' responsiveness to market pressure, this study has worked with the underlying assumption that policy-makers have the ability to implement policy change that will then show up on the balance sheet. But of course this proposition does not hold equally for all EU Member States across time. The current debates on optimal consolidation strategies have shown that governments in dire need for economic adjustment are often the least able, both for economic and political reasons, to implement reforms. To better gauge governments' voluntary responsiveness to market punishment, we run the same models with a measurement of discretionary fiscal policy choices. There is no consensus in the literature on the appropriate methodology for the construction of a measure of discretionary fiscal policy (Alesina *et al.* 2002). The European Commission (2010) defines a country's discretionary fiscal policies as the change in the structural balance relative to the preceding period. When the change is positive (negative), the fiscal stance is said to be expansionary (restrictive). We follow this

TABLE 4. Market discipline and discretionary fiscal policy

	Model (7)		Model (8)		Model (9)	
	1992–2007		1999–2007		1992–2007	
	EU		Eurozone		Non-Eurozone	
Variables	*Punishment*	*Budget*	*Punishment*	*Budget*	*Punishment*	*Budget*
L.Punishment	0.795***	–	0.742***	–	0.804***	–
	0.025		0.066		0.032	
L.CyBudget	–	0.773***	–	0.777***	–	0.755***
		0.034		0.089		0.044
CyBudget	−0.032***	–	−0.036	–	−0.041***	–
	0.011		0.024		0.015	
CyBudget2	−0.0001	−0.003	–	−0.001	–	
	0.002		0.003		0.003	
Punishment	–	0.667**	–	2.190*	–	0.485
		0.302		1.149		0.326
Punishment2	–	−0.027*	–	−0.090	–	−0.023
		0.015		0.067		0.017
Realshort	0.045***	–	0.050*	–	0.042***	–
	0.007		0.026		0.009	
Debt	0.010***	−0.022*	0.011***	−0.095**	0.012***	−0.004
	0.002	0.013	0.004	0.047	0.003	0.016
Inflation	0.004	−0.136***	0.006	−0.168	0.003	−0.117*
	0.012	0.052	0.039	0.250	0.015	0.060
GDP	−0.008	0.016	−0.016	−0.028	−0.006	0.028
	0.008	0.039	0.014	0.133	0.011	0.047
EU	0.055	0.301	–		0.037	0.171
	0.060	0.271			0.082	0.322
Eurozone	−0.054	0.177	–		–	
	0.056	0.268				
Constant	−0.189*	−0.557	−0.075	−0.147	−0.177	−0.233
	0.106	0.493	0.137	1.272	0.154	1.482
N	337	337	107	107	230	230
R^2	0.98	0.78	0.99	0.75	0.98	0.76

Source: See Appendix.
Note: The table shows three-stage OLS estimation for the system of simultaneous equation. Both country and year fixed effects are controlled in the estimations; yet the coefficient estimates are not shown because of space constraint. Standard errors are calculated with small sample adjustments. *p* values are below coefficients.
***Denotes significance at 1%.
**Denotes significance at 5%.
*Denotes significance at 10%.

definition, but again filter out interest payments.[34] The structural balance is computed in a two-stage procedure: a cyclical component of the budget balance is first estimated and subsequently subtracted from the budget balance (data are available in the Commission's AMECO database).[35]

Running the same 3SLS regressions as in the preceding analysis, we are able to substantiate our previous findings, see Table 4. First, we find that the link between market punishment, as expressed by debt servicing costs, and discretionary fiscal policy choices is more pronounced in the Eurozone. In other words, sovereign borrowers are more responsive to market punishment in EMU Member States. It is worth noting that in the case of Eurozone countries the responsiveness of discretionary fiscal policy is larger than that of the primary budget balance. This makes sense intuitively: responsiveness should increase with the ability to take action. Turning to the other side of market discipline, cyclically adjusted deficit levels have only a significant impact on the debt servicing cost for the EU27 and the non-Eurozone samples (Models 7 and 9). Here, the higher the structural deficit, ceteris paribus, the stronger the market punishment. Note, however, that the impact of debt levels on debt servicing costs is statistically identical for Eurozone and non-Eurozone countries.

Conclusion

This article has explored market discipline in the context of monetary integration. Our empirical analysis of 27 EU Member States between 1992 and 2007 is one of the few to scrutinise both sides of market discipline. By adopting 3SLS to incorporate the contemporaneous feedback effects between market responsiveness and government responsiveness, we are able to control for the bi-directional relationship between both phenomena. First, we find that EMU membership led to a decrease in market punishment and by implication led to investor moral hazard. On the demand side of market punishment, that is investors' pricing of sovereign risk, there is evidence that, at least during its first decade (up to 2008), EMU membership was perceived as reducing credit risk. On the supply side, EMU membership enabled governments to manage their debt burdens more advantageously and thus reduce the debt servicing costs.

Second, our findings indicate that policy-makers consolidate public finances in response to higher debt servicing costs. Crucially, governments' responsiveness is stronger within the Eurozone. Indeed, we find only weak evidence for policy-makers' responsiveness to market punishment outside EMU. The finding challenges the common wisdom of weak market discipline in monetary union and rampant debtor moral hazard. Instead, we argue that policy-makers retained an awareness of the potentially heightened constraints of the new currency.

The euro, 'defective but defended' (Cohen 2012: 699) is poised to endure. In the wake of the – for now – becalmed European Sovereign Debt crisis, EU Member States have yet to 'find a way to channel market discipline in a positive way' (Hallerberg 2011: 129). The persisting weakness of the reformed economic governance architecture in combination with an explicit endorsement of financial market pressure suggests that EU policy-makers are prepared, for better or for worse, to continue to rely on market discipline as a means to limit stability free-riding. The investor moral hazard of the first decade of the euro has been replaced by a situation where EU institutions are unwilling and unable to protect Member States against pro-cyclical bond markets (Mabbett and Schelkle 2014). Current bailout arrangements, whether they involve Member States or

the ECB, are deeply political. Their credibility is, in other words, contingent on the political ability and willingness to assist Member States in crisis. What is more, bailout programmes for EMU Member States have not only been surrounded by uncertainty but have been politically and economically costly for the countries in question (cf. Lütz and Kranke 2013). This article's contestation of debtor moral hazard in EMU pre-2008 is therefore set to hold true post crises.

Despite the tremendous upheaval of the Sovereign Debt Crisis, EU policy-makers did not agree to discourage discrimination in sovereign risk pricing. On the contrary, the German Finance Minister Wolfgang Schäuble (2011) launched into a full-hearted defence of market discipline:

> But we must not simply abandon interest rates as a disciplinary mechanism. Governments need the markets. Markets tell governments things that governments don't want to hear. And they force governments to do the right thing [. . .]. For this reason, I am convinced that we cannot do away with the threat of higher interest rates for spendthrift states.[36]

Schäuble's argument shows a striking persistence of Europe's neo-liberal policy consensus supporting a 'depoliticised' monetary union (see McNamara 1998: 175, Dyson and Featherstone 1999: 786, Jabko 2003, Martin 2004, Scharpf 2013). The past and current designs of EMU have emerged as the midwife of market discipline. In times of fiscal consolidation, financial markets offer a scapegoat for unpopular policy choices (see also Hardie 2011: 3).[37] Austerity politics are thus presented as the forced policy of a state that has become a residual authority sandwiched between financial market pressure and the conditionality of EU financial assistance. This view is echoed by De Grauwe and Ji (2012), who argue that austerity measures in peripheral Eurozone Member States 'have been dictated too much by market sentiment instead of being the outcome of rational decision-making processes'. Consequently, fiscal consolidation is presented as the price for restoring market confidence. This narrative of the powerless state, faced with, as the French President Hollande put it, 'the enemy [of] the world of finance' (Marriage 2012), is politically convenient. Extending Schäuble's (2011) logic, financial markets not only 'tell policy-makers what they don't want to hear', but also what other Member States cannot or do not want to enforce. Not wanting to forgo the disciplinarian effects of sovereign risk pricing, policy-makers have amplified the constraints of market discipline with considerable costs for national economies and the E(M)U project as a whole. The absolution that 'markets triggered the Eurozone crisis, not politicians' (Altman 2013), as administered by the former US treasury secretary, denies the agential power of states to mitigate and author market structures (Weiss 2005). Adapting Hobson and Ramesh's (2002) verdict on the state/globalisation debate, market discipline 'makes of states what states make of it'.

The emergence of strong market discipline in developed economies post 2008 (see Figure 2) put existing assumptions of credit risks into question – 'old market assumptions have broken down' (*Financial Times*, 9 June 2010). Phillips (2012: 4) suggests that the past crisis years have revealed 'a new paradigm of financial

market behaviour in developed countries, one in which policy-makers find their "room to move" is significantly constrained'. If this is indeed the case, policy-makers in the EU and beyond need to reconcile the constraints of financial globalisation with their deliberate choice to enlist market forces as fiscal policy sheriff.

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Notes

1. Hardie (2011: 143) defines financialisation as the increased ability to trade risk. The broader trend of financialisation can be attributed to the financialisation of the financial actors in the market as well as the financialisation of the structure of the government bond market itself (Hardie 2011).
2. Market punishment is hardly the result of a normative or pedagogical agenda of market participants, but instead, first and foremost, the result of any portfolio model with standard preferences for risk and return. Put crudely, market discipline is therefore primarily concerned with supply and demand, not crime and punishment.
3. Moral hazard refers to a situation where the provision of insurance, by diminishing the incentives to prevent a particular outcome, may make this outcome more, not less, likely.
4. The SGP sets budgetary rules which apply to all EU Member States. Specifically, it stipulates a deficit to GDP threshold of 3 per cent and a debt level threshold of 60 per cent of GDP. The challenges of fiscal restraint are not E(M)U specific. On the international level, for instance various studies have highlighted the weakness of International Monetary Fund conditionality, as a form of political discipline to bring about 'sound' fiscal policies, with 'the clear majority of Fund programmes [. . .] uncompleted' (Bird 2002: 847).
5. For a distinction between market discipline and capital discipline, see Milios and Sotiropoulos (2010).
6. Robert Mundell (1961, see also Snaith 2013) argues that three factors determine whether or not two (or more) countries should share the same currency; the degree of economic integration, the degree of asymmetry between countries and the existence of correction mechanisms to correct divergences.
7. A 'credit default swap spread' for a particular bond issuer refers to the quoted market price to enter into a credit default swap written on that issuer's bonds. A credit default swap is a financial instrument negotiated between a buyer and a seller in which the seller agrees to pay to the buyer the recovery value of the issuer's bonds, contingent upon its default. It thus functions as a form of insurance against the risk of default.
8. Debtor moral hazard refers to a situation where debtor countries have weak incentives to implement politically costly reforms or pursue 'conservative' economic policies expecting to be bailed out in the event of crisis and thus raising the probability of such crisis occurring.
9. Investor moral hazard refers to excessive risk taking which is linked to the perceived insurance of future bail-outs.
10. Corsetti and Dedola (2012) argue that the moment investors anticipate inflationary financing, interest rates would rise, reducing the gains from debt monetisation. Instead, the main constraint of monetary union stems from the national central bank's inability to swap debt for interest-bearing reserves, which according to their estimates does not necessarily lead to a burst of inflation. The core of the 'original sin' argument of monetary union however still holds.
11. Gelpern (2012) uses the term 'quasi-sovereign debt' to describe sub-state borrowing in the USA. She explicitly relates one of the main arguments, namely that the absence of monetary policy results in 'a hard budget constraint, as in a country that can only borrow in a foreign currency' (Gelpern 2012: 917), to EMU.
12. History obviously offers ample evidence of sovereign default where governments were in control of the printing press (see Tomz 2007).

13. Real long-term bond yields from the IMF Data Mapper. Correlation results for 10-year government bond yields point to a similar relationship (($r(139) = 0.39$, $p < .01$)). DataStream 10-year government bond yields for Eurozone countries: Austria and Belgium (2003–2013); France, Finland, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain (2002–2013); Malta (2012 and 2013) and Slovenia (2007–2013).
14. The residual maturity is the time from the reference date until the contractual redemption date of an instrument.
15. Across the Organisation for Economic Co-operation and Development (OECD), governments have followed a more market-oriented approach to debt management. This led governments to privatise the administration of sovereign debt and to use new financial instruments. For an account of the institutional transformation of the German public debt agency, see Trampusch (2015).
16. An additional option would be to take the log of *Interest* to account for non-linear effects. This is not possible for the variable *Budget*, as it takes negative values. Given our joint estimation of both effects, we opted for the identical variable transformation and thus included the squared term. Testing the misspecification of the functional form, regression equation specification tests reject the addition of the cubic term for both dependent variables. Using the log form transformation of *Interest* does lead to similar results which can be obtained upon request.
17. Luxembourg does not publish its short-term interest rates. For Luxembourg the Belgian short-term rates are therefore taken, which is an obvious choice given the long-standing monetary policy cooperation between both countries. To test whether this approach biases results, we excluded the variable *Short;* results are similar and can be obtained upon request.
18. Bulgaria's debt servicing costs stood at above 21 per cent of GDP in 1996 (see Dobrinsky 2000 on the Bulgarian 'transition crisis' of the 1990s). Note that this outlier figure, both within the sample and for the country (interest expenditure fell to 7.29 per cent in the following year), is not included in any model due to the lack of available data for several of the independent variables.
19. 3SLS has the advantage of modelling the contemporaneous feedback effects between budget outcomes and market punishment. 3SLS is based on Two-Stage Least-Squares where an instrumental variable technique for the endogenous variable provides consistent estimators. The instrumental variable technique regresses all exogenous variables on the endogenous variable. It creates a 'proxy variable' that resembles the endogenous variable but is not correlated with the disturbance term, therefore producing unbiased and consistent coefficients.
20. Eichengreen and Mody (2000) distinguish between 'push' (external) and 'pull' (internal) factors and argue that the former are as important, if not more, for developing countries' financing conditions as the latter.
21. There is evidence that the responsiveness of both market participants and policy-makers may be delayed (Balassone *et al.* 2004, Ardagna 2009). We therefore check the sensitivity of our estimations by taking the lag of the two dependent variables as well as the macro-economic controls. The results are similar to the findings presented in Table 3 and can be obtained upon request
22. Results for the EU27 (1999–2007) and the Non-Eurozone EU (1992–2007) are very similar and can be obtained upon request.
23. The IMF's (2009: Table 8.) *Fiscal Monitor* lists the total financing needs of selected advanced economies. Japan stands out with a 59.4 per cent of GDP financing needs, followed by Italy with 30.1 per cent Germany and Sweden (8.5 per cent and 4.7 per cent) conversely have a comparatively low financing need.
24. Correlation results suggest as much. For the 1992–2008 period, the correlation between 10-year government bond yields (IMF) and government debt (AMECO) is strong and statistically significant only for non-Eurozone Member States (($r(185) = 0.43$, $p < .01$.) vs. ($r(98) = 0.11$, $p < .26$)).
25. Bail-out expectations exist also within the EU27. Indeed three of the eight EU Member States who received financial assistance since 2008 are not Eurozone members. See Gray (2013: Chapter 4) for empirical evidence of financial markets' bail-out expectations for the EU27. A broader perspective on investor moral hazard beyond the EU can be found in *inter alia,* Vaubel (1983) and Breen (2013).
26. The squared term of *Punishment* is neither individually nor jointly with the linear term statistically significant. Overall the squared terms add to the fit of the model and their inclusion is theoretically justified. Even where statistically not significant the squared form is kept, which furthermore makes the models easier to compare. The exclusion of non-linear terms does not change the results qualitatively.
27. Currency composition is a crucial factor of a country's likelihood to default. Advanced economies' debt is predominantly denominated in domestic currency. Conversely, in 2005 the share of sovereign debt denominated in or indexed to foreign currency stands at 42 per cent in the emerging economies. In the emerging

economies that defaulted over the past two decades, foreign currency averaged at 63 per cent the year prior to default, with Argentina's foreign currency debt standing as high as 99 per cent of total debt (Cottarelli *et al*. 2010: 15).

28. The warning that Member States in a currency union without lender of last resort might face liquidity issues can already be found in the Delors Report (1989: 20, see also Dyson and Featherstone 1999: 669–73).
29. Despite the fact that the so-called Maastricht criteria, which lay out the conditions for EMU membership, 'were massively relaxed when the current Member States faced their entrance exams in 1998' (De Grauwe 2009).
30. A related explanation for muted government responsiveness can be found in Wyplosz's post-Maastricht fatigue (2006).
31. As an additional test we created an interaction term, multiplying both dependent variables and future Eurozone Member States status. The interaction term was not significant in any of the time periods and country groups analysed. The lack of a seal-of-approval effect is potentially due to the coverage of our data. With only EU and future EU Member States, theoretically the entire sample could be covered under such a seal of approval. To tease out the different membership discounts both a larger time-period starting already in the 1980s and the inclusion of non-EU countries as control group would be required.
32. As of 2012 these are (year of entry): Bulgaria (2007), Czech Republic (2004), Estonia (2004), Hungary (2004), Latvia (2004), Lithuania (2004), Romania (2007), Slovakia (2004) and Slovenia (2004).
33. This is further confirmed by the inclusion of interaction terms with a post-communist country dummy and both dependent variables which remains insignificant throughout the different specifications.
34. Not doing so would create bias as interest payments are already taken as a dependent variable. Furthermore, interest rate payments, while to a large extent dependent on a country's economic outlook and debt sustainability, can be subject to fluctuations that are out of the hands of national policy-makers. According to Fedelino *et al.* (2009: 1) 'interest payments are often kept separate because their movements, while "automatic" in the sense of not generally reflecting discretionary fiscal policy actions, may not be necessarily correlated with cyclical output changes'.
35. So doing requires two inputs: first, the cyclical position of the economy as measured by the output gap (the distance between actual and potential output); second, the responsiveness of the budget balance to the economic cycle as expressed by budget elasticities. See Larch and Salto (2005) for a detailed description.
36. Wren-Lewis (2013) goes on step further and argues in favour of market discipline formally replacing the SGP: fiscal governance, so his argument goes, can and should reside at the national level, where it can focus on both national stabilisation and the control of public debt.
37. The external constraints imposed by globalisation or European integration (Hay and Rosamond 2002) are frequently evoked as cause and justification for painful and/or unpopular social and economic reforms. For example, in the context of monetary union, Talani (2003) argues that Italy's policy-makers deliberately imported disciplinary neoliberalism to push through domestic reforms (see also Dyson and Featherstone 1996).

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Appendix. Definition of variables

Punishment
Debt servicing cost as a percentage of GDP. *Source*: AMECO.
Budget
Primary budget balance as a percentage of GDP. *Source*: AMECO.
CyBudget
Cyclically adjusted budget balance as a percentage of GDP. *Source*: AMECO.
Debt
Debt servicing cost as a percentage of GDP. *Source*: AMECO.
Realshort
Real short-term interest rates with deflator GDP = (ISN − PVGD) : [(PVGD : 100) + 1], where ISN = nominal short-term interest rates and PVGD = price deflator gross domestic product at market prices. *Source*: AMECO.
GDP
Annual GDP growth, percentage. Source: AMECO.
Inflation
Inflation rate based on annual changes in the Harmonised Indices of Consumer Prices. *Source*: AMECO
EU
Dummy variable, equal to 1 if member of the EU, 0 otherwise.
Eurozone
Dummy variable, equal to 1 if member of the Eurozone, 0 otherwise.