Incoherence in Regime Complexes: A Sentiment Analysis of EU-IMF Surveillance

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In February 2001, Ireland received a public rebuke over its economic policy from the European Union (EU). By pursuing expansionary budgetary policies in spite of 'an increasing extent of overheating', the EU's Council of Ministers (2001) concluded, the Irish government's macroeconomic policy mix was 'inappropriate'. Irish fiscal policy should have been 'neutral rather than expansionary', the International Monetary Fund (IMF) concluded in August 2001, while praising the government's tax policies (IMF, 2001). This difference of tone, though it should not be exaggerated, blunted the EU's efforts to hold Irish authorities to account. Ireland's Finance Minister Charlie McCreevy challenged the EU's recommendation and the IMF's analysis allowed him, as one commentator put it, 'to make the point to Brussels that it is the EU…not Ireland that is out of step on fiscal policy' (Clery, 2001).

This affair proved costly for Ireland, which allowed severe macroeconomic imbalances to accumulate, and for the EU, which was drawn a sovereign debt crisis that the unwinding of imbalances in this member state and others eventually triggered. Nor was it an isolated case. Tensions between EU and IMF surveillance are common, a high-level study concludes, because of differences in views about the effectiveness of policy instruments and because EU rules may, on occasion, prevent EU member states from following IMF policy (Task Force on IMF Issues of the International Relations Committee of the European System of Central Banks, 2015).

Cases of this kind can be conceptualized as problems of incoherence in a regime complex. The concept of regime complexity was pioneered by Raustiala and Victor to explore the 'array of partially overlapping and nonhierarchical institutions governing a particular issue-area' (Raustiala and Victor, 2004: 279). Initially applied to the global

governance of plant genetic resources, the last decade has seen empirical applications of this regime complex approach to intellectual property, human rights, security and defense, climate change, refugees, maritime piracy, and election monitoring, reflecting the increased density of the international system. Incoherence occurs when the elemental components of a regime complex –typically, but not exclusively, international institutions – impose conflicting obligations on states. Existing studies in this field suggest that as institutions proliferate density and uncertainty intensifies (Keohane and Victor, 2011) so too does the probability that regime complexes will produce 'multiple, possibly mutually contradictory, sets of regulations' (Gehring and Faude, 2014). By providing actors with the ability to exploit opportunity structures (Farrell and Newman, 2014) and forum shopping opportunities to escape regulation or obtain a favorable outcome (Alter and Meunier, 2009; Gomez-Mera and Molinari, 2014), incoherence weakens the credibility of international regimes (Drezner, 2009) and the effectiveness of international cooperation (Gehring and Faude, 2014). While these studies suggest that incoherence is costly for international governance, it is surprising how little we know about how to measure incoherence in regime complexes and its determinants.

In this article, we are interested not in explaining the formation of a regime complex but in why the elemental components of an existing regime complex impose conflicting obligations on states. Specifically, we investigate the extent of – and factors driving – incoherence between two key players in the regime complex surrounding international economic surveillance: the IMF and the EU. The IMF is the premier global forum for international surveillance because of the universality of its membership and technical proficiency of its staff (Lombardi and Woods, 2008: 714). The EU goes well beyond the surveillance efforts of other regional organizations, in part, because of the

governance challenges created by the euro (Savage and Verdun, 2016). The two organizations, in short, offer an excellent laboratory for studying regime complexity.

This article provides the first, systematic test of two competing conjectures to explain incoherence in regime complexes. The first sees international organisations as treading softly with more powerful states and conjectures that the EU and IMF impose different obligations on states where these states wield different degrees of power within these institutions. The second sees EU and IMF as subject to rules that allow for different degrees of discretionary authority and so liable to impose different obligations on the same states as a result. Our aim is not to reduce the problem of incoherence to either of these explanatory variables but to conduct a systematic analysis of these two variables that could potentially be extended to other lines of inquiry. A major methodological innovation of this paper is to use sentiment analysis to measure incoherence in a regime complex. A method of quantitative text analysis with hitherto underexploited potential for students of international relations, sentiment analysis is used to derive a simple standardized measure of the tone of over 400 IMF and EU surveillance documents for the same group of EU member states over the period 1997-2014. Analyzing these documents as a whole rather than the recommendations within them, we treat differences in the tone of for the language used within as a useful proxy for measuring policy coherence. Positive tone indicates the validation of member states' economic policies, whereas a negative tone brings with it an obligation to alter the status quo, albeit the kind of 'soft' obligation described by Simmons (2000) in her study of IMF surveillance.

Our results reveal the extent of incoherence within this regime complex. On average, the IMF is found to be more pessimistic than the EU in its assessment of EU member states' economic policies. The IMF was also significantly more pessimistic

before the global financial crisis but it was less pessimistic thereafter. Using linear and panel regression analysis, we explain such incoherence not by differences in the distribution of power within the EU and IMF but by differences in the discretionary authority that the two organizations enjoy in performing surveillance. The influence of agency discretion is stronger for the EU, which appears to be more constrained than the IMF in its judgment of members' economic policies.

The first section of this article explores the problem of incoherence in regime complexes before setting out competing theoretical explanations for why incoherence arises. The second discusses our decision to focus on IMF and EU economic surveillance and the methodology behind the sentiment analysis before presenting our findings. The final section summarizes our results and discusses their significance for wider debates in international relations and EU studies.

The Problem of Incoherence in Regime Complexes

The problem of incoherence, as we define it, describes a situation in which the constitutive elements of a regime complex impose conflicting obligations on the same member states.[1] Following Abbott et al. (2000: 401), we think of obligations as binding states such that their 'behavior thereunder is subject to scrutiny under the general rules, procedures, and discourse of international law, and often of domestic law as well'. Obligation is not a binary variable; it occurs on a sliding scale that ranges from binding legal rules to non-binding norms (Abbott et al., 2000: 404). We consequently conceive of incoherence as a spectrum that runs from a situation in which obligations imposed by institutions differ to a situation in which they are incompatible. In the extreme case of incompatibility, an international institution imposes obligations that require member states not to implement the obligations imposed by other institutions. In all other cases of incoherence, conflicting obligations give rise to a situation where states choose,

prioritize or balance among multiple courses of action. In what follows, we move beyond existing insights on the origins of incoherence by focusing on its endogenous sources. Specifically, we consider two major factors for the emergence of incoherence based on the combination of the literature on international regimes with the scholarship on international organizations. Though they do not capture all explanatory variables, they map into the broad debate on the influence of state power and discretion in international politics.

Power Distribution: Scholars of regime complexity assume that state power shapes the formation and persistence of regime complexes (Keohane and Victor, 2011: 8-9). We go a step further by conjecturing that differences in the distribution of power within a regime complex drive incoherence. Specifically, we expect states to be subject to differing obligations from the elemental components of a regime complex in cases where such states wield different degrees of power within these elemental components.

In thinking about the impact of power on incoherence we start from two assumptions. First, all other things being equal, more powerful states carry greater weight within international organizations. We would expect the constituent elements of a regime to tread more softly with states that wield more decisional or economic power because the former is more politically and financially dependent on the latter or because more powerful states are less compliant. Second, we assume that a state's power is likely to vary across elemental components*, inter alia*, because the relative size of states varies according to their membership of international organizations and the governance structures of these bodies. Indeed, internal decision-making procedures – both formal and informal – are key for states to exercise their influence (Stone, 2011). On this basis, we expect a state that wields greater influence within one international institution than

another will, all other things being equal, face more stringent obligations from the first than the second. This accounts, to some degree, for why US President Donald Trump faced greater pressure in the G20 than the G7 over his withdrawal from the Paris Agreement. Whereas the G7 summit in Charlevoix essentially took note of the difference between the United States and others members over the climate change accord (G7, 2018), all members except the United States signed up to a Climate and Energy Action Plan for Growth at the G20 summit in Taormina in a show of support for the Paris Agreement (G20, 2018). In view of these considerations, we can formulate the following hypotheses:

H1: Decisional power: The greater the differences in decisional power between the elemental components of a regime complex, the greater the potential for incoherence.

H2: Economic power: The greater the differences in economic power between the elemental components of a regime complex, the greater the potential for incoherence.

Discretionary Authority: A second factor that may produce incoherence in a regime complex lies in the differing degree of discretionary authority delegated to the elemental components of the regime. Viewed in principal-agent terms rules help principals to keep agents accountable, identify agency slack and thus punish it including via a revision to the terms of delegation (Stone Sweet and Brunell, 2013: 64). Hence, principals may opt to specify the rules for agents to follow in the performance of their delegated functions as a way to minimize the probability of agents' deviant behavior. For example, international institutions that act under rule-based delegation – the circumstance in which the state principal instructs the agent on how the agent has to

pursue its mandate – are generally more constrained than institutions that operate under discretion-based delegation when it comes to imposing obligations on states (Hawkins et al., 2006: 27-8). Likewise, ambiguity and flexible institutional arrangements will, all other things being equal, amplify the agent's discretion (Doleys, 2009) thus enhancing the likelihood of the agent's deviation from delegated goals. Agents are frequently assumed to be rogue in studies of international organizations but they can be dutiful (Cortell and Peterson, 2006), with dutifulness depending, *inter alia*, on the degree of internal fragmentation within such institutions (Graham, 2013). As such, the constituent elements of a regime complex may embrace institutional constraints that limit their own discretion rather than chaffing against them.

While we see rules as determining discretion, the question of whether more or less discretion encourages international institutions to impose tighter or looser obligations on states is an empirical one. Dutiful agents will use their discretion to reinforce the interests of their principals, while overzealous agents may use discretion to impose more stringent obligations (Tallberg 2003). The more general theoretical claim that we wish to interrogate is that a regime complex in which the constituent elements are subject to different rules and hence different degrees of discretionary authority are more likely to impose incoherent obligations on states. Thus, for example, we might expect that the regime complex surrounding human rights in Europe will impose different obligations on states at times because the Court of Justice of the EU European Court of Human Rights operate under jurisdictions that differ in important respects (Douglas-Scott, 2006). This brings us to the following hypothesis:

H3. Design: The greater the differences in discretionary authority accorded to the elemental components of a regime complex, the greater the potential for incoherence.

Power and design certainly do not exhaust the list of potential drivers of incoherence. For instance, a burgeoning literature has drawn attention to recruitment patterns and professional networks to explain the (different) behavior of international institutions (Ban, 2015; Seabrooke and Tsingou, 2014). While it is plausible to foresee cases whereby incoherence arises because of variation in educational and professional backgrounds between officials in two institutions, we have not included in our empirical analysis a variable measuring the impact of professions for lack of comparable data between the IMF and the European Council and Commission.

Data and measurement

Case selection

Today, most states have their economic policies monitored simultaneously by several intergovernmental organizations and other types of international institution. The G20, the G7, the Bank for International Settlements (BIS), the World Bank, the Organization for Economic Cooperation and Development (OECD), the Financial Stability Board and the Association of Southeast Asian Nations are just some of the bodies that make up this regime complex. Since countries may be members of more than one of these international bodies, national governments are under the gaze of many eyes and subject to multiple recommendations that need not necessarily cohere. This article focuses on two elemental components of this regime: the IMF and the EU. The interaction of other international institutions within this regime could be studied but the IMF and the EU provide an excellent starting point not only because their policy assessments are highly consequential for domestic political battles (Newmann and Posner, 2018) but also because the institutions are frequently at odds (Broome, Homolar and Kranke, 2017). It could be argued that comparing IMF and EU surveillance is problematic because the

IMF's Articles of Agreement and EU Treaties impose differing degrees of obligation on states. Our response is that the obligations imposed by EU surveillance should not be overstated. To date, no financial penalties have been imposed on member states even through excessive deficits have been commonplace.[2] Following Simmons (2000), we see the Articles of Agreement as imposing low obligations on states rather than no obligation at all. Furthermore, like much soft law in international financial governance, IMF surveillance can be particularly powerful to the extent that it tilts domestic policy debates by empowering some actors over others (Newmann and Posner, 2018) and by providing trusted expertise (Broome, Homolar and Kranke, 2017).

Sample

Our analysis equates differences in the tone of IMF and EU surveillance with differences in the degree of obligations imposed on member states and so policy incoherence. Where states are simultaneously subject to positive and negative evaluations of their economic policies by these institutions, this creates ambiguity about their obligations, a negative assessment encouraging policy change and a positive assessment favouring the status quo. We focus on two key surveillance documents: Public Information Notices (PINs)[3] and EU Council opinions on member states' stability programs. These documents are central to the conduct of surveillance. PINs summarize the Executive Boards' views on the Article IV reports prepared by Fund staff following their missions to member economies, which are usually conducted on an annual basis. Under the EU's Stability and Growth Pact, EU member states submit stability (or convergence) programs each year that set out medium-term budgetary plans in compliance with the EU's fiscal rules. It then falls to the Council, acting on a recommendation from the Commission to issue an opinion on these stability programs.

When the IMF and EU believe that governments are implementing 'good' policies, surveillance reports should contain less pessimistic language and, consequently, less pressure to change domestic economic policies. The corollary of this point is that pessimistic language places a higher degree of obligation on a state than positive language; whereas positive language validates the economic policies of the state under review, we contend, negative language implies that states must change their economic policies either because of bad policy choices or worsening economic conditions or both. Furthermore, even if the EU and IMF are both pessimistic about a member states' economic policy, the institution that is most pessimistic applies the most pressure. Specifically, we compare PINs issued by the IMF Executive Board for the EU 15 between 1997-2014 with Council opinions on member states' stability programs during the same period. We focus on documents rather than recommendations contained within as this provides us with a richer view of surveillance documents and more documents. The combined corpus includes 442 cases (i.e. documents) and around 595,000 words.

To date, there has been no attempt that we know of to apply this methodology along these lines.[4] Hallerberg and Bridwell (2008) code differences between Commission recommendations concerning, and Council opinions on, stability and convergence programs between 1998 and 2007. Baerg and Hallerberg (2016) use a similar research strategy to investigate the differences between European Commission assessments of member state economic programs and the assessment of the Council of Ministers. This analysis has the advantage of distinguishing between nature and content of the obligation imposed on member states, but it deals with just two categories – differences between Commission and Council texts and the precision of Commission recommendations – and so loses much of the semantic nuance in EU surveillance

efforts. Turning to the literature on the IMF, Fratzscher and Reynaud perform a content analysis of all PINs for a group of emerging markets over the period 1996-2007 (Fratzscher and Reynaud, 2011). Each document in this corpus is coded according to its 'favorableness' towards national economic policies both overall and in terms of seven policy categories and 13 subcategories. Manual coding of a concept like favorableness, or indeed incoherence, can provide a rich picture of the obligations places on member states but the methodology raises serious concerns about reliability, as one coder's view of what constitutes favorable may differ considerably from another's, especially in documents that cover multiple policy areas (Krippendorff, 2012: 267-329). We redress this problem by combining an automatic content analysis of the words used by the IMF Executive Board and the EU Council of Ministers and a sentiment analysis that distinguishes between words with different connotations.

Measuring Incoherence in Surveillance Reports

We measure incoherence by using differences in the tone of the policy assessments issued by the IMF and the EU. When the IMF and EU believe that governments are implementing 'good' policies, surveillance reports should contain less pessimistic language. Conversely, when they believe that governments are not doing so, they should contain more pessimistic language. The uniformity and consistency of our surveillance texts, as well as their clear structure and careful use of language makes them an ideal candidate for this methodology. Moreover, there is virtually no informal language or fundamental changes in the meaning of different words within our corpus. It is very unusual to have comparable sets of documents with all of these attributes, which lends credibility to our analysis.

To measure the tone of each report, we use dictionary-based sentiment analysis. According to Loughran and McDonald (2011: 35), mainstream dictionaries fail miserably in financial contexts as the majority of words they identify as negative are not typically considered negative in the financial world. We use the sentiment dictionary that Loughran and McDonald developed to address this problem. When we apply their dictionary to our surveillance texts it generates word frequencies across the following categories: negative, positive, uncertain, strong, and weak words.[5] Figure 1 illustrates the distribution of these words across our categories. It shows that the distribution is very similar across both types of surveillance, and that negative words are the most common type of word, followed by positive, uncertain, weak, and strong words.

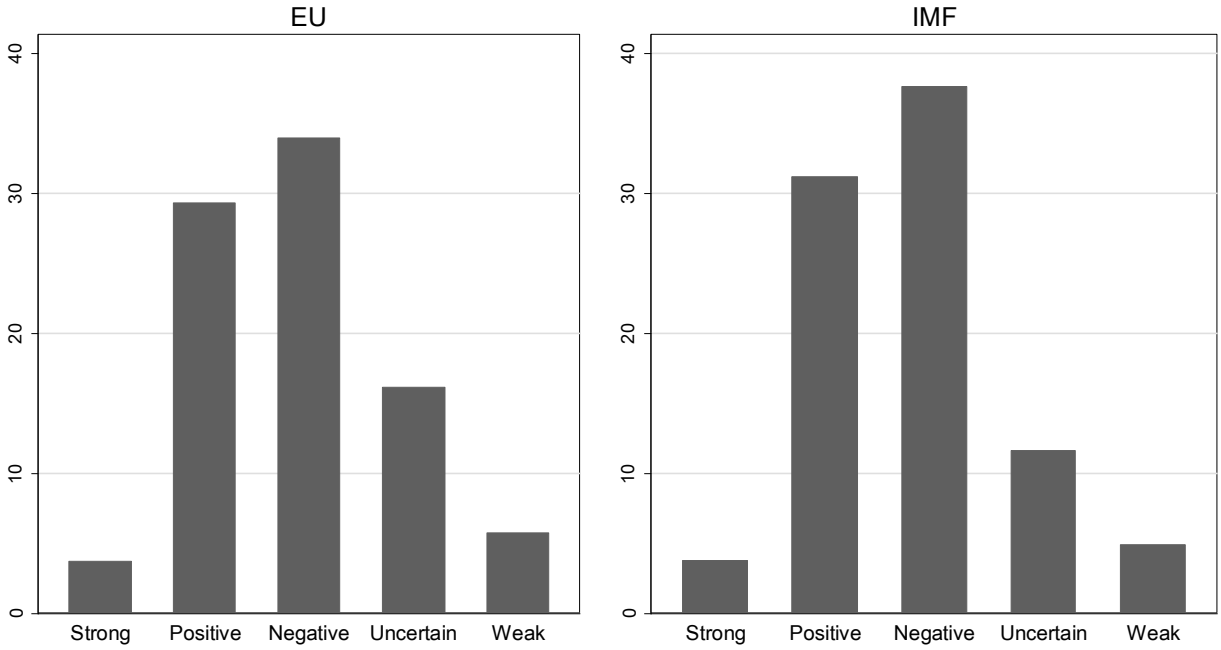

Figure 1. Categories of Language in International Economic Surveillance

Like Tetlock (2007), we use principal components factor analysis (PCA) to derive a single, replicable, measure of tone, which incorporates all word categories. The results, presented in Table 1, show that across both EU and IMF texts the first semantic

component is heavily loaded with negative, weak, and uncertain types of language. By contrast, the second component is dominated by positive and strong language and contains much less weak and uncertain language. Therefore, it can be said that IMF and EU reports that score higher on the first factor contain more language associated with pessimistic evaluations.

Table 1. Principal Components of Surveillance Texts

EU sentiment

	Comp1	Comp2	Comp3	Comp4	Comp5
Negative	0.50	0.21	-0.10	-0.77	-0.29
Positive	0.39	0.58	-0.53	0.41	0.22
Strong	0.41	0.30	0.83	0.20	0.07
Weak	0.46	-0.47	-0.10	0.41	-0.61
Uncertain	0.45	-0.54	-0.06	-0.11	0.69

IMF sentiment

	Comp1	Comp2	Comp3	Comp4	Comp5
Negative	0.46	0.21	-0.78	0.34 -	0.02
Positive	0.35	0.51	0.00	0.77 -	0.01
Strong	0.19	0.64	0.52	0.51	0.10
Weak	0.54	-0.39	0.17	-0.03	0.71
Uncertain	0.56	-0.33	0.28	0.04 -	0.6946

Notes: 232 EU observations and 210 IMF observations from 1997-2014. Language Categories from Loughran and McDonald's(2011) Financial Sentiment Dictionary.

Figure 2 below illustrates the average pessimism in our corpus over-time and across institutions.[6] It shows that incoherence is a problem in international economic surveillance. On average, the IMF is more pessimistic than the EU but this masks variation over-time. While the IMF is more pessimistic on average, it has been the less pessimistic of the two since the global financial crisis. Before the crisis, a typical IMF assessment contained 34 per cent more pessimistic language than an EU assessment. Since the crisis, EU assessments have contained 53 per cent more pessimistic language.[7] Although the EU has moderated its language since 2010, it continues to be more pessimistic than its IMF counterpart.

The type of language used in surveillance documents is best thought of as a controlled natural language, where grammar and vocabulary is restricted to remove ambiguity. This raises the possibility that the EU and IMF may use different procedures to control their use of sentimental words. However, an Independent-Samples t Test shows that the difference of means in the use of sentiment-charged words between the EU and the IMF is not different from zero, suggesting that we can compare the sentiment produced by both institutions. In short, treating differences in the sentiment of surveillance as a proxy for the obligations imposed on states by the IMF and EU, our data reveal a degree of incoherence in this regime complex over time.

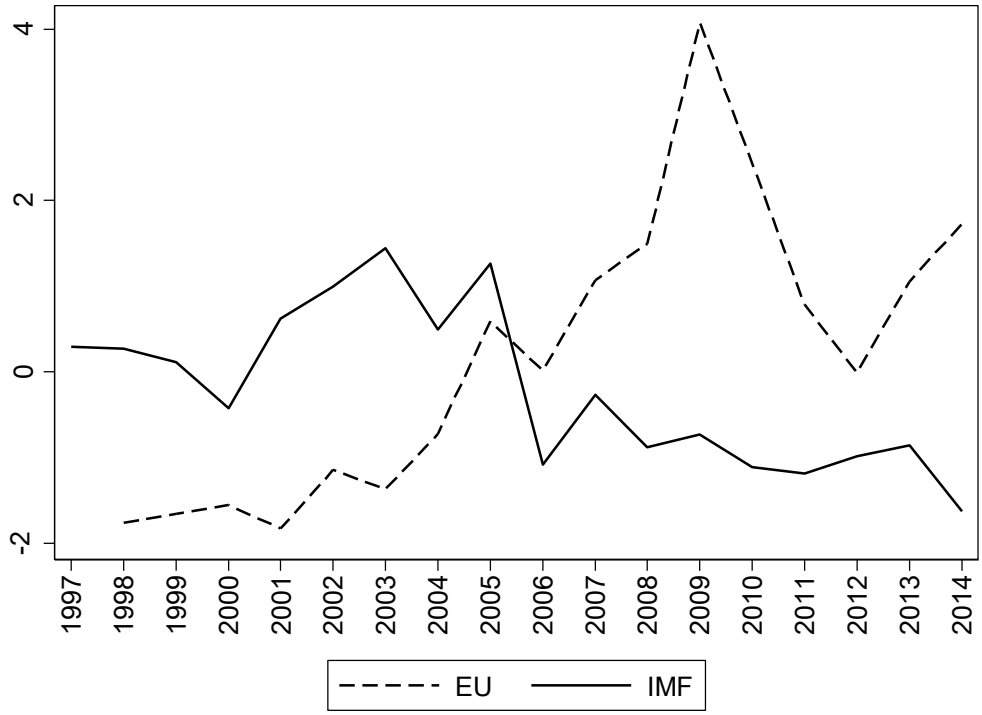

Figure 2. Median Pessimism in Surveillance Assessments

Explaining Incoherence between IMF and EU surveillance

Having presented evidence on the degree of incoherence between IMF and EU surveillance, this section moves on to explore the factors that explain differences in

sentiment between the two sides using linear regression analysis. Our general approach is to ask whether differences in the tone of IMF and EU surveillance across EU member states are driven by differences in the distribution of power within the EU and IMF or in the discretionary authority granted to these institutions. To measure differences in tone, we subtract the EU's pessimism score for a given country in a given year from the IMF's pessimism score pertaining to the same country in the same year. This exercise yields 156 observations of incoherence from 312 surveillance missions between 1997 and 2012. During this period, there were 397 episodes of EU-15 surveillance, including 206 EU Council reports and 191 IMF reports. We dropped 85 of these episodes because surveillance was delayed or deferred by at least one organization.[8] Table 2 provides summary statistics for this, and all of the variables in our empirical tests.

Table 2. Descriptive Statistics and Data Sources

	N	Mean	Min	Max	SD	Source
Incoherence	156	0.50	-6.54	6.44	2.61	(1)
EU tone	206	-0.16	-2.56	5.50	1.77	(1)
IMF tone	191	0.11	-2.41	4.23	1.47	(2)
Power Difference Index	156	-0.63	-2.49	0.64	1.03	(4)
EU Penrose Index	240	0.08	0.00	0.27	0.09	(4)
IMF Penrose Index	240	0.06	0.00	0.17	0.05	(4)
Ex. Deficit Pro.	240	0.25	0.00	1.00	0.43	(3)
WEO	215	0.03	-5.71	8.03	3.21	(3)
Fiscal space	240	0.92	-5.60	24.41	2.02	(1)
◘ Debt/GDP	240	0.01	-69.51	122.92	35.37	(3)
◘ Current account/GDP	240	-0.06	-18.44	19.01	6.92	(3)
Inflation (%)	240	0.03	-5.71	6.80	1.28	(3)
Growth (%)	240	2.28	-8.86	10.78	2.83	(3)
VIX Index	240	22.37	12.78	32.58	5.68	(7)
Spread (%)	233	0.62	-1.30	21.00	2.03	(6)
Austerity	224	0.35	0.00	1.00	0.48	(8)
GDP (log)	240	6.19	3.02	8.17	1.30	(5)
Deficit	230	0.03	-18.70	18.70	2.38	(3)
GDP forecast	157	2.58	-3.00	8.80	1.71	(5)

Notes: Variables collected for the period from 1997-2012. (1) EU Commission, (2) www.imf.org, (3) European Commission's AMECO Database, (4) Leech and Leech (2005) (5) World Economic Outlook, (6) OECD, (7) Chicago Board Options Exchange, (8) IMF database of action-based fiscal consolidation; A◘ca and Igan (2013) for 2010 and 2011, authors' own calculations for 2012.

To test our conjectures concerning state power and discretionary authority, our independent variables are operationalized as follows:

Differences in the distribution of power: To measure decisional power we use Leech and Leech's (2005) Penrose index of the voting power of EU member states in the IMF Board of Governors. This index measures the proportion of all IMF Governing Board decisions in which a state could have a decisive say. A similar index is constructed for qualified majority votes within the EU's Council of Ministers. We subtract the IMF and EU values of the Penrose indexes to create a single index which measures a state's ability to exert leverage over at least one organization within the regime complex. In further robustness tests we use the separate indexes. Economic power is measured using the natural log of gross domestic product (GDP). This is an appropriate measure of economic power in the EU-15, which are all considered wealthy advanced economies but differ considerably in economic size.

Differences in Discretionary Authority: The degree of discretionary authority granted to the EU and IMF via the rules underpinning economic surveillance varies. The Maastricht Treaty's excessive deficit procedure not only sets out numerical targets for budget deficits and general government debt that member states are expected to meet but the steps that the European Commission and Council of Ministers must take to monitor and enforce these targets.[9] The Stability and Growth Pact is designed to clarify and expedite this degree of discretionary authority available to EU institutions narrows once a member state reports deficit and debt levels that breach the aforementioned numerical targets. For instance, the Council has four months, as a rule, from the date of this reporting to decide on whether an excessive deficit exists in this

member state.[10] IMF surveillance is more open endedbut it does not take place in an institutional vacuum, with the recent literature suggesting that fiscal space is a key indicator for IMF surveillance (Ostry et al., 2010). Simply put, fiscal space refers to the room that states have to undertake discretionary policy without raising concerns about the sustainability of public debt or market access. Developed by the Fund in the 1990s, fiscal space relies on 'qualitative evaluations of a government's reputation and track record…[with] assessments of quantitative fiscal data' (Clift, 2018: 107) As a state's room for fiscal space narrows so too, we assume, will the IMF's discretionary authority. Fiscal space may not be as prescriptive as the EU's fiscal rules but the former puts the onus on the Fund to steps up its interactions with the state in question. .

To test whether differences in discretionary authority can explain incoherence in our regime complex, we ask the degree of pessimism expressed by the EU or IMF changes as the rules underpinning their respective surveillance regimes begin to bite. An EU treaty protocol establishes two reference values for assessing excessive deficits: a ratio of the planned or actual government deficit to GDP at market prices of 3 per cent and ratio of government debt to GDP of 60 per cent.[11] We code separate debt and deficit dummy variables to record years where a state has breached one of the critical thresholds. Temporary breaches of these thresholds are allowed in some cases. Therefore, we code an additional dummy variable which takes a value of '1' only when an EU member state is subject to an excessive deficit procedure. We follow Botev et al. (2016) by using two simple alternative measures of fiscal space. The first is the differential between interest rates and growth, which captures the extent to which the pace of economic growth can offset the impact of the interest rate on the debt ratio. The second is the ratio of government debt to tax revenue, which captures the tax years that it would take to repay government debt. In both cases, an increase in the indicator can

be read as a reduction in fiscal space.

Table 3 presents the findings from our linear regressions. The first column shows estimates that measure the impact of decisional and economic power. The second column includes our proxies for design features. The third column combines both power and institutional constraint variables in a single specification. The fourth column adds an interactive term to capture potential interactions between our rule indicators and the last column adds alternative rule indicators.

Table 3. The Determinants of Incoherence

	(1)	(2)	(3)	(4)	(5)
Power Index	-0.15		-0.35	-0.35**	-0.45
	(0.175)		(0.165)	(0.159)	(0.213)
GDP (log)	0.06		0.05	0.05	0.14
	(0.189)		(0.164)	(0.161)	(0.195)
Ex. Deficit Pro.		-2.52***	-2.72***	-2.86***	-2.36***
		(0.426)	(0.440)	(0.501)	(0.498)
Fiscal space *a*		0.37**	0.33**	0.21	0.33**
		(0.127)	(0.118)	(0.281)	(0.124)
EDP*Fiscal space *a*				0.16	
				(0.301)	
Deficit > 3					-1.11
					(0.662)
Debt > 60					0.16
					(0.351)
Fiscal space *b*					0.37
					(0.473)
Observations	156	156	156	156	156
R-squared	0.006	0.209	0.231	0.232	0.264

Robust standard errors clustered by country in parentheses
*** p<0.01, ** p<0.05

First of all, we find no support for the argument that differences in the distribution of power within the EU and IMF drive incoherence in the surveillance efforts of these organizations. The F-test associated with column 1 is low, indicating that our first model does not provide a better fit to the data than a model that contains no independent variable. Thus, it would seem that state power within the surveillance

regime complex has little to do with incoherence, as measured by differences in the tone of surveillance reports.

Our second major finding is that differences in discretionary authority drive incoherence between the IMF and EU (H3). Where the rules underpinning EU and IMF surveillance bite – and so reduce discretionary authority – we find a bifurcated impact on the incoherence of economic surveillance. When an excessive deficit procedure is in effect, thus requiring EU institutions to initiate disciplinary proceedings, we detect a large and statistically significant decrease in incoherence. Specifically, the excessive deficit procedure is associated with an 96.5 per cent decrease in standard deviations of our incoherence variable.Our fiscal space indicator is also statistically significant and correlated with more incoherence. A unit increase in this indicator corresponds with less fiscal space. Therefore, less fiscal space is associated with greater incoherence. Specifically, a one standard deviation increase in fiscal space is associated with 28 per cent of a standard deviation increase in incoherence. Column 3, which combines our power and discretionary authority variables, largely supports these findings. In this column, the substantive and statistical significance of the excessive deficit procedure and fiscal space are broadly similar.

Column 4 introduces an interaction term between our EU and IMF institutional constraints. When considered separately, these indicators demonstrate the additive effect of changes in discretionary authority on incoherence; when interacted, however, the interaction term captures the possibility that different combinations of discretionary authority have compound effects that are greater than the sum of their separate effects. For example, in cases where fiscal space is increasing while the excessive deficit procedure holds, the EU is constrained while the IMF enjoys discretion. In such cases, we would expect a synergy that produces more incoherence than if both organizations

enjoyed the same amount of discretion. However, the interaction term in column 4 which captures this possibility is not statistically significant while the constitutive term – the excessive deficit procedure – is significant and substantively important. Thus, we find no evidence of compound effects in our sample. Rather, the evidence points towards the importance of the excessive deficit procedure as the most important factor in determining the extent to which the sentiment of both institutions is aligned or not, followed by fiscal space.

In column 5, we introduce alternative rule measures, including separate debt and deficit dummy variables to record years where a state has breached one of the critical thresholds, and an alternative measure of fiscal space. These alternative measures are not statistically significant and our earlier findings regarding the excessive deficit procedure and fiscal space hold.[12]

EU and IMF panel data tests

To unpack these results, we explore the determinants of the pessimism scores produced separately by each organization using panel data techniques. The data consists of separate EU and IMF unbalanced panels of 15 countries between 1997 and 2012. There were 397 episodes of surveillance during this period, including 206 EU assessments and 191 IMF assessments. We are missing data on some independent variables, described in Table 2, which reduces our IMF sample to 171 assessments across 14 countries.

For our EU sample, we use the EU Penrose Index as our power variable and the excessive deficit procedure as our discretionary authority variable. For our IMF sample, we use the IMF Penrose Index and our two measures of fiscal space. Both of these latter measures are narrow, theoretically-informed proxies for the importance of discretionary

authority. However, the literature also suggests that IMF assessments are broad and flexible and that they change dynamically (see Heller, 2002). Therefore, we complement our narrow measures with a broad measure of macroeconomic performance based on the World Economic Outlook (WEO) database, the IMF's own formal assessment of economic performance. To construct our broad indicator, we aggregate all of the WEO's 43 sub-indicators. First, we standardize the WEO to obtain Z scores for each of the 43 sub-indicators. Then we extract the first component using principal components analysis. The first component is loaded primarily with positive developments in the economy, including growth, government revenue, and employment. Therefore, an increase in the WEO measure can be read as a broad improvement in a country under surveillance, according to the IMF's own methodology for measuring economic performance.

Finally, in both samples we control for general macroeconomic conditions, including consumer price inflation, GDP growth, the fiscal deficit, government debt, the current account balance, and the VIX Volatility Index, a measure of market expectations of near-term stock market volatility.

We detected heteroskedasticity using the Breusch-Pagan Cook Weisberg test and therefore estimate Prais-Winsten models with panel-corrected standard errors. The Wooldridge test indicates autocorrelation, so we use the AR1 correction. We do not include country fixed effects because of the time invariant nature of some of our key independent variables.[13] The Wald test indicates no need to include dummy variables for each year.[14] Inspection of the correlation matrix and variance inflation factors show that multicollinearity is not a cause for concern.

Table 4 presents our findings. Columns 1-5 relate to EU sentiment. The first column presents our base specification, which includes proxies for decisional power,

discretionary authority, and economic controls. The next column adds a variable measuring whether a state has exceeded the 3 percent deficit threshold. Column 3 adds a variable measuring whether a state has exceeded the 60 per cent debt threshold. Column 4 substitutes the log of GDP for the Penrose Index. Column 5 introduces the fiscal deficit to our base specification, reducing our sample by 9 observations.

Columns 6-9 relate to IMF sentiment. Column 6 is the base specification, which includes proxies for decisional power, discretionary authority, and economic controls. Column 7 adds our measure of variation in the IMF's own WEO Database. Column 8 substitutes the log of GDP for the Penrose Index. Column 9 adds the fiscal deficit, reducing our sample by 7 observations.

Our results show that that no one factor is driving incoherence in this regime complex. The economic control variables suggest that the EU attaches greater weight to past economic performance than the IMF. A one standard deviation increase in economic performance, as measured by growth, is associated with a 0.24 standard deviation reduction in EU pessimism, according to Model 1. The current account balance and government debt are also associated with small spikes in pessimistic language.[15] Neither the fiscal deficit as a percentage of GDP, inflation, nor global economic conditions as captured by the VIX index are associated with the tone of EU or IMF assessments.

In line with our earlier findings, there is no support for the argument that differences in the power of member states are responsible for incoherence in the tone of surveillance. The EU Penrose Index and the log of GDP are statistically insignificant. The IMF Penrose Index is significant but, contrary to expectations, an increase is associated with more pessimistic language in IMF surveillance. All other things being equal, EU member states with high degrees of economic and decision making power

do not receive more favorable assessments under international economic surveillance, with the Fund but not the EU more likely to take a tougher line against such countries.

Table 4 confirm differences in the degree of discretionary authority are driving incoherence. The triggering of the excessive deficit procedure is associated with a large and statistically significant spike in pessimistic language. The effect is large in the first year and persists for the time that a member state is under the procedure. Substantively, it is associated with a 0.94 standard deviation increase in pessimistic language, all else being equal. The evidence linking IMF surveillance to discretionary authority is weaker but not inconsistent with our earlier findings regarding discretionary authority. Neither of our primary or secondary indicators of fiscal space are statistically significant, suggesting that the IMF may take a less rigid interpretation of surveillance.[16] However, our measure of variation in the WEO indicator is statistically significant and correlated with a reduction in pessimistic language (See Column 7). This measure captures primarily good economic performance across multiple indicators as defined by the IMF's own criteria for measuring performance.[17] Substantively, an increase in this indicator is associated with a 0.41 standard deviation decrease in pessimistic language. This is less than the excessive deficit procedure but it increases by almost 50 per cent when we drop our economic control variables from the specification.[18] However, this measure of fiscal space is not robust to the substitution of the Penrose index by the log of GDP (see Column 8).

Overall, these findings speak to the fact that differences in the degree of discretionary authority enjoyed by the EU and IMF linked to underlying rules drives incoherence in the regime complex. Rule breaches from member states, in other words, push the EU and IMF to change the tone of their assessment of national economic policies. The fact that the institutions work under different rules and respond to them in

different ways is a key driver of incoherence. Overall, these findings underline the importance of discretionary authority in the surveillance regime. EU surveillance is influenced by compliance with the Treaty's fiscal rules; it becomes systematically more pessimistic when states are not in compliance with these rules. This greater pessimism may push it closer to the IMF, which tends to be more pessimistic overall, thus reducing overall incoherence. Of course, it takes more than one organization to create a problem of incoherence. We found some evidence that IMF surveillance is responsive to fiscal space, occasionally pushing it closer to EU surveillance.

Table 4. The Determinants of Pessimism in EU and IMF surveillance

	(1) EU	(2) EU	(3) EU	(4) EU	(5) EU	(6) IMF	(7) IMF	(8) IMF	(9) IMF
Δ Debt	0.00**	0.00**	0.00	0.00**	0.00	0.00	0.00	0.00	0.00
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Δ Current account	0.03***	0.03***	0.03***	0.03***	0.03***	0.01	0.01	0.01	0.01
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.014)	(0.014)	(0.015)	(0.015)
Δ Inflation	-0.05	-0.05	-0.06	-0.05	-0.05	0.08	0.09	0.09	0.07
	(0.039)	(0.039)	(0.041)	(0.039)	(0.052)	(0.081)	(0.079)	(0.082)	(0.081)
Growth t-1	-0.15**	-0.14**	-0.15**	-0.15**	-0.15	0.13**	0.06	0.10	0.13**
	(0.068)	(0.068)	(0.067)	(0.068)	(0.089)	(0.063)	(0.064)	(0.067)	(0.064)
VIX	0.05	0.05	0.05	0.05	0.05	0.02	0.01	0.02	0.02
	(0.035)	(0.036)	(0.035)	(0.035)	(0.046)	(0.031)	(0.027)	(0.031)	(0.031)
Penrose Index	1.97	1.84	2.06		1.28	7.45***	15.86***		8.21***
	(1.766)	(1.708)	(1.727)		(1.966)	(2.146)	(3.988)		(2.263)
Ex. Deficit Pro.	1.57***	1.55***	1.57***	1.59***	1.74***				
	(0.346)	(0.342)	(0.344)	(0.344)	(0.458)				
Deficit > 3		0.22							
		(0.226)							
Debt > 60			0.11						
			(0.147)						
GDP (log)				0.11				0.33	
				(0.110)				(0.255)	
Deficit					-0.11				-0.05
					(0.062)				(0.067)
Fiscal space						0.01	0.01	0.02	0.01
						(0.035)	(0.030)	(0.038)	(0.035)
WEO							-0.19**	-0.07	
							(0.075)	(0.106)	
Observations	206	206	206	206	197	171	171	171	164
R-squared	0.305	0.312	0.307	0.305	0.367	0.108	0.147	0.074	0.117
No. of countries	15	15	15	15	15	14	14	14	14

Panel-corrected standard errors in parentheses (AR1)
***p<0.01,**p<0.05

Robustness checks

We also performed a series of further robustness checks, which are available as part of the replication materials.

First, we repeated our analysis in Table 3 using country and year dummies. We also tested a variant of our incoherence variable, which subtracts the EU's pessimism score in year *t* from the IMF's score in year *t*-1, as well as repeating our Table 2 specifications with the WEO indicator. In all cases our findings are broadly in line with those already in Table 3.

Second, we added a lagged dependent variable to our base specification of our panel data analysis. This specification is likely to yield biased estimates because the lagged dependent variable is correlated with the error terms for earlier periods. Nevertheless, our core results are robust to this specification. The lagged dependent variable is not a statistically significant predictor of EU assessments but it is associated with negative language in IMF sentiment.

Third, we tested our theory using an alternative dependent variable in our panel analysis: the number of negative words from Loughran and McDonald's (2011) financial sentiment dictionary. This measure is easier to interpret than our primary dependent variable but it sacrifices potentially valuable information in the many other types of language that appear in surveillance texts. The results are broadly similar in terms of statistical significance and magnitude.

Fourth, we added additional economic controls to the base specification of our panel analysis. Since the tone of surveillance may respond to both the level of economic performance as well as changes from one period to the next, we added both level and differenced economic performance variables. Because it is possible that changes in tone may be even greater during particularly good or bad times, we also included quadratic

terms to capture the possibility of a curvilinear relationship between sentiment and economic performance. To capture relative economic performance we added the difference between a country's growth and average growth in the EU-15. In separate tests we added two variables which reduce substantially our sample size. The first is the spread against the ten-year German benchmark bond to control for a country's position in financial markets.[19] The second is a dummy variable measuring whether a country implemented an austere budget in the previous calendar year as calculated by the IMF's own database of action-based fiscal consolidation. These variables did not alter our core findings.

Fifth, we tested the effect of the IMF's GDP forecast on EU and IMF sentiment in our panel analysis. We lose approximately one third of our observations when this measure is included but we find that IMF assessments are more circumspect during periods of good performance: an increase in forecast GDP is statistically significant and associated with an increase in pessimistic language.

Finally, we tested in our panel analysis an alternative measure of the deficit generated by the OECD but this did not yield a statistically significant result or alter the substance of our core findings.

Conclusion

Over the last two decades, the field of international relations has moved on from the study of individual institutions and regimes in isolation to study the interaction between them. Regime complexity is at the cutting edge of efforts to understand this new politics of global governance although further work needs to be done to understand the character and causes of incoherence within regime complexes. This article has examined the extent of – and factors driving – incoherence between two key players in the regime complex surrounding international economic surveillance: the IMF and the

EU. Our findings – based on a sentiment analysis of more than 400 surveillance documents between 1997 and 2014 – points to the presence of incoherence in this regime complex. Tone serves as a proxy for coherence, with a pessimistic assessment imposing a soft obligation on states to change their economic policies and an optimistic assessment validating the status quo. Our results show that the IMF was more pessimistic than the EU about EU member states' economic policies before the global financial crisis hit but that this trend was reversed thereafter. We find little evidence that differences in the distribution of power within the elemental components of this regime was decisive. Neither the IMF nor the EU treaded softly when dealing with economically or politically powerful states. Instead, our results point towards differences in discretionary authority as the key driver of incoherence. When the rules underpinning EU and IMF fiscal surveillance bite and reduce these institutions' room for discretion, each institution tends to be more pessimistic. But the two institutions are responding to different rules with differing degrees of intensity, leading to incoherent assessments of member states' economic policies.

These results shed new light on the EU and IMF as institutions as well as the interaction between them. First, our findings challenge the idea that these institutions are dominated by large states (see Hallerberg and Bridwell, 2008). In their surveillance activities, at least, the EU and the IMF are willing to stand up to the most powerful states. Second, our analysis, confirms that rules matter for EU and IMF surveillance while encouraging a more nuanced interpretation thereof. The Stability and Growth Pact emerges in our account not as a rigid instrument of austerity but one that swings between more and less pessimistic assessments of member states' economic policies (Scharpf, 2015). The IMF, though critical of the EU's approach to surveillance, is more beholden to rules than it looks (Annett et al, 2005).

The focus of this article is on the causes rather than the consequences of incoherence in regime complexes but our findings invite reflection about the latter. The lack of coherence between EU and IMF surveillance, the regime complexity literature conjectures, will impede the effectiveness of economic surveillance by making it easier for EU member states to wriggle out of their obligations. Precisely what EU member states could and should have done prior to the global financial crisis is a matter of economic judgement but the IMF's greater pessimism during this period lends weight to the view that it was the more vigilant economic watchdog and that the EU's fiscal rules, as originally conceived, made the EU more rather than less attentive to the policy mistakes made by member states at this time. Since the global financial crisis hit, the EU has become bad cop to the IMF's good cop. It is too soon to say whether this constitutes a case of over-vigilance by the EU or under-vigilance by the IMF but what is clear is that the problem of incoherence in relation to international economic surveillance persists.

Our analysis is also relevant for wider debates in EU studies and international relations. The methodology and findings of this article respond to Henning's call for a deeper study of regime complexity and institutional interaction, particularly as it relates to the role of non-European forces in European integration and governance (Henning, 2017: 28 and 258). It also chimes with ongoing debates about the importance of state size for influence in EU policy-making (Thorhallsson, 2017) and the constraining power of institutions in this domain (Heipertz and Verdun, 2011). Turning to the wider international relations literature, our findings may help to refine explanations of why some regime complexes enhance the effectiveness of international cooperation while others do not (see also Gomez-Mera, 2016). The headline message of this article is that assumptions about the degree of coherence within a regime complex is a matter for

empirical investigation rather than something to assume *a priori* or explore through case studies alone. Finally, the methods employed in this article have wider application for EU and international relations scholars alike. While content analysis is now part of the political science tool kit, our analysis demonstrates the potential of sentiment analysis to generate new empirical insights concerning textually rich areas of international cooperation such as economic surveillance.

Notes

[1] Our definition builds on the definition of coherence provided by Keohane and Victor (2011, 16) according to whom "A regime whose components are compatible and mutually reinforcing is coherent."
[2] The closest EU policy-makers have come to imposing such penalties was in August 2016 when the Council of Ministers cancelled proposed fines against Portugal and Spain.
[3] Since July 2013, PINs have been replaced by a Press Release that serves much the same purpose.
[4] One reason is that, before 1997, the number of published surveillance documents was limited.
[5] The whole dictionary can be downloaded from Loughran and McDonald's website at http://www3.nd.edu/~mcdonald/Word_Lists_files/LoughranMcDonald_MasterDictionary_2014.xlsx As per this dictionary, positive words include 'always' and 'definitely'. Weak words include 'almost' and 'might'. Uncertain words also capture no sentiment but they are neither positive nor negative.
[6] To calculate this figure we pool all of our documents and perform a principal component analysis of sentiment across our categories of language. A separate principal components analysis on each institution's documents produces an almost identical figure.
[7] This finding resonates with Baerg and Hallerberg (2016: 975), who find that during the euro crisis the Council's tendency to moderate the Commission's assessment of Stability and Convergence Programme reduced.
[8] The EU reports begin in 1998 and the IMF reports begin in 1997. There were 19 country-years where EU surveillance was delayed or deferred between 1998 and 2012, and 49 country-years between 1997 and 2012 where IMF surveillance was delayed or deferred.
[9] Protocol (No 12) on the Excessive Deficit Procedure, Treaty on the Functioning of the European Union.
[10] Article 3(3), Council Regulation (EC) No 1467/97 of 7 July 1997, amended by Council Regulation (EU) No 1177/2011 of 8 November 2011
[11] Protocol (No 12) on the Excessive Deficit Procedure, Treaty on the Functioning of the European Union.
[12] Although we do not theorise interactions between power and discretionary authority, we tested models that involve interactions between our power and rules variables. In all cases, the interaction terms were not statistically significant and had weak explanatory power.
[13] The Hausman test rejects the use of fixed effects in a specification that excludes time invariant independent variables.
[14] However, our findings are robust to the inclusion of time dummies.
[15] A one standard deviation increase in the current account balance as a percentage of GDP is associated with a 0.08 standard deviation increase in pessimistic language.
[16] Our secondary measure of fiscal space is not displayed in Table 3. Results available in the replication set.
[17] More specifically, the WEO variable is the first component from principal components analysis (PCA) of the WEO dataset. The first component explains 23.8 per cent of the variation in this dataset. Approximately 10 of the 43 WEO variables contribute the most to this component particularly growth, government revenue and employment.
[18] Models without economic controls are available in the replication set.
[19] This is because the German bond is usually regarded as the main driver of the price of all other bonds in the EU-15.

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