The Political Economy under Monetary Union: Has the Euro Made a Difference?

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Abstract

Economic and Monetary Union (EMU) has transformed Europe and has created an integrated pan-European economy. Much research has focused on understanding this integration process and what benefits and costs it entails. This paper identifies a political economy channel of EMU related to the fact that EMU implies that member states had to transfer or at least curtail their policy autonomy in several areas, such as monetary policy and fiscal policy. The paper shows that EMU has helped reduce the impact of political shocks on the domestic economy of member states but magnified the transmission of political shocks within the euro area. Equally importantly, economies with weak domestic policies and institutions exhibited a significantly higher sensitivity to domestic political shocks before EMU, but not thereafter. While this may entail that EMU has brought benefits to countries with weaker policies and institutions by insulating them from adverse political developments at home, a potential drawback is that it may provide weaker incentives for domestic political stability.

Keywords: EMU, political economy, political news, monetary policy, fiscal policy, stock markets, transmission.

JEL codes: F31; F33; G14.

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1 Introduction

In the context of the tenth anniversary of the euro, the question of the economic costs and benefits of the monetary union has resurfaced.[1] Especially before the start of the monetary union, the concern had been repeatedly voiced that the loss of policy autonomy at the national level (not only monetary policy, but also to some degree fiscal and structural policies) would make countries less able to withstand adverse idiosyncratic shocks.[2] On the other hand, and this is an observation that has received scant attention in the literature, the constraints imposed by EMU on domestic economic policies have also removed a source of uncertainty as regards the future conduct of such policies in response to *shocks emanating from the political sphere*, especially in countries with weak institutions and troubled political systems. For example, it can be argued that under EMU the election of a weak or populist government should have much less of an adverse impact on the domestic economy than with EMU. In other words, the loss in policy autonomy associated with the disappearance of domestic policies is directly proportional to their quality and predictability. If domestic policies are more a *source* of shocks and uncertainty than are shock *absorbers*, then it may be desirable to impose constraints on them.

The objective of the paper is to explore this political economy channel through which EMU may have affected its member countries. Economic policies are born in the political system, and there is a large literature suggesting that political institutions matter for economic performance. For example, there is a relatively large literature on the effects of political instability on economic growth (e.g., Barro 1991), investment (e.g., Alesina and Perotti 1996), monetary and fiscal policies (e.g., Grilli et al. 1991, Alesina et al. 1997, Alesina and Rosenthal 1995). Other papers have emphasised the nexus between the quality of institutions and long run economic growth (e.g., Rodrick et al. 2004). This literature clearly establishes that events happening in the political sphere and political institutions have important implications for economic policies and outcomes. At the same time, testing for the impact of political variables on economic performance is not easy due to the problem of reverse causation (Alesina and Perotti 1996).[3]

Therefore, evaluating the impact of political events on economic outcomes and the nexus with EMU is not a straightforward matter. Our empirical strategy in this paper is to analyse how EMU has altered the transmission of political shocks to financial markets. We use the reaction of financial markets as a proxy for the economic impact of political shocks because it allows us both to cleanly identify the transmission mechanism as well as avoid the problem of reverse causality in the chain of events. We are primarily interested in the role of political economy factors through which EMU has altered the transmission process. In particular, by committing to and joining EMU, member countries have given up or at least significantly

[1] See the recent reports by the European Commission and the ECB (European Commission 2008, ECB 2008).

[2] See, among others, Giavazzi and Torres (1993), Feldstein (1997) and Frankel and Rose (1997).

[3] See Carmignani (2003) for a literature survey.

curtailed their domestic policy autonomy in several areas. For monetary policy, member countries have transferred their policy autonomy to a single entity, the European Central Bank, which means that domestic policymakers can no longer set interest rates according to their domestic preferences. Similarly, fiscal policy autonomy has been limited through the Stability and Growth Pact, though this applies to the EU as a whole.

What does this transfer or reduction of policy autonomy imply for the transmission of shocks and the integration of markets? Overall, the shift in policy autonomy with EMU and the pooling of economic policy at the Community level should mean that country-specific shocks become relatively less important and foreign or common shocks more relevant. There are two main reasons for this. First, the higher degree of policy centralisation itself. Second, the higher trade and financial integration brought about by the monetary union.[4]

Importantly, as outlined above, the policy channel may function asymmetrically across countries. Take the example of a political shock that might have an adverse inflationary impact; think of the election of a populist party in government. Such a shock should have a larger effect on the domestic economy – and thus on financial markets – if institutions are weak and policy already has a poor track record. An improvement in policy and institutions should therefore mean a smaller sensitivity of domestic markets to such shocks. In addition, the transfer of policy autonomy or the policy convergence across economies should imply that markets react more homogeneously across countries. These are some of the mechanisms and implications we attempt to identify empirically.

The paper employs an event-study approach to identify the channels through which EMU has altered the transmission of political shocks.[5] We build a novel dataset of important political events in 12 euro area and 4 non-euro area European countries from 1989 to 2008. These include political elections, government collapses outside elections, terrorist attacks, natural catastrophes (which often have some political fallout), and other shocks such as political scandals. We then address the question of whether the expected consequences of these shocks for economic growth depend on whether a country is in the monetary union or not, by running a panel regression of stock returns on the identified political news. As in Zussman and Zussman (2006), we consider the stock market as a forward-looking summary measure of the expected consequence of a given political news on the domestic economy, bearing in mind that the stock market may also be subject to some over-reaction in the short term through a confidence channel.[6] The focus on stock markets as opposed to other asset prices such as long-term yields and the exchange rate is also related to data availability and to the fact that EMU does not mechanically imply, in itself, a change in the dynamics

[4] On the impact of EMU on trade and financial integration within EMU see respectively Chapters 3 and 7 of European Commission (2008) and the references quoted therein.

[5] An early seminal paper in the event-study literature is Brown and Warner (1985). One of the few event studies that focuses on the impact of political events on financial markets in order to gauge the overall implications for the domestic economy is Zussman and Zussman (2006), who evaluate the stock market reaction to Israeli counterterrorism policy of targeted killings of opponents.

[6] See also Rigobon and Sack (2005) and Guidolin and La Ferrara (2005) applying this type of event study approach to stock markets.

of stock prices (as is instead the case notably for the exchange rate). Since political events can be safely considered to be orthogonal to stock market developments on the same day, we are able to minimise the risk of reverse causation.

As to our empirical results, we find strong evidence that European stock markets react significantly to news emanating from the political sphere, but that there is a distinct change over time in the way they do. Generally, stock markets in euro area countries have reacted less over time to domestic shocks and more to shocks in other euro area countries. Interestingly, the decline in the responsiveness to domestic shocks is significantly more pronounced for countries in the so-called "EMU periphery" (Finland, Greece, Ireland, Italy, Portugal, and Spain). Over time, there is a sharp convergence among euro area countries towards the "EMU core" countries (Austria, Belgium, France, Germany, Luxembourg, and the Netherlands) in the way stock markets react to domestic political shocks. All in all, therefore, we find evidence that EMU has indeed reduced the sensitiveness of stock markets – and hence arguably of expectations of future economic outcomes – in the peripheral countries, but not in the "core" countries.

In the second part of the analysis, we try to identify the channels through which this convergence process (over time and across countries) has taken place. We are primarily interested in the role that monetary policy and fiscal policy have played, in addition to the more general financial and trade integration process of European economies. We find that higher inflation (in level or volatility), a higher fiscal deficit and an increase in government debt had made countries significantly more sensitive to political shocks *before* the creation of EMU. However, with the creation of EMU differences in inflation and in fiscal policies no longer discriminate countries in the way their markets react to political shocks.

We believe that these are important findings because they identify a *political economy channel* through which EMU has affected member countries. This political economy channel suggests that economies inside EMU have become increasingly insulated to domestic political shocks, yet increasingly exposed to political shocks in the euro area as a whole, strengthening the financial and economic interdependency across member countries. From a normative perspective, this finding may suggest that member countries with relatively weaker institutions and policies may benefit from EMU by constraining their domestic policy autonomy and by making their economies less sensitive to adverse idiosyncratic shocks. We should also add, however, that there may also be costs arising through this channel. In particular, member countries with relatively weaker institutions and policies may have less incentives to reform and improve policies as the immediate costs for the domestic economy are less apparent.

Our paper is related to three strands of literature on the effects of EMU on European countries and one additional strand of literature on the "fear of floating". The first strand is the literature on the convergence in inflation and output growth volatility in the euro area; see, for example, Canova, Ciccarelli and Ortega (2006), Engel and Rose (2002), and

Rogers (2007).[7] This literature generally finds that there was an increase in business cycle synchronisation and inflation outcomes in the run up to EMU, though it is less clear whether there has been further progress from 1999 onwards. Second, there is a literature on whether the euro has made European countries more integrated, be it in trade (Baldwin 2006) and in finance, e.g. by facilitating cross border financial investment within the euro area (Lane 2006; Coeurdacier and Martin 2007). Third, and related to this second strand, some recent papers have emphasised how asset prices in European countries co-move more as a result of EMU. For instance, Baele et al. (2004) find evidence for the convergence in euro area government bond markets due to EMU. It is notable, in particular, that our findings on the intra-euro area convergence in the response to political news and the increased relevance of area wide news as opposed to domestic news echoes a recent analysis by Ehrmann et al. (2007), who find that the reaction of far-ahead forward interest rates to macroeconomic announcements has converged across euro area countries.

Fourth, and finally, our findings are also consistent with the idea that countries with a lower degree of credibility and quality of institutions find it more difficult to use economic policy, such as monetary policy, for domestic stabilization purposes; for example, Calvo and Reinhart (2002) have pointed out that many emerging countries have "fear of floating" due to low credibility of monetary policy. Our results are, in some sense, complementary to those of Calvo and Reinhart, as they show that countries with weaker monetary and fiscal institutions may be more prone to experience shocks to economic growth as a consequence of gyrations in their internal politics. This represents an additional, "political economy" channel pointing to the same conclusions of Calvo and Reinhart, i.e. that some limits to domestic policy discretion may be desirable and realistic in countries with weaker institutions.

The paper is organised as follows. Section 2 describes the construction of the database on important political news, as well as other variables used in the empirical analysis. Section 3 outlines our main hypotheses and presents the econometric model and baseline results. The political economy channel and the role of monetary policy and fiscal policy in the process is explored in Section 4. Section 5 concludes with a discussion policy implications.

2 Data

This section describes the data, including the construction of our database of political economy shocks.

2.1 Political news

We collect daily data for political news for 12 euro area countries (namely all euro area countries excluding the late entrants Slovenia, Malta and Cyprus) as well as 4 non euro area European countries (United Kingdom, Sweden, Switzerland and Denmark) that represent

[7] European Commission (2008) and ECB (2008) provide excellent surveys.

the control group (see Table A.1). The data have been collected between January 1989 and April 2008. The political news are of two types. The first type concerns political events proper (i.e. having a direct connection to the exercise of political power), namely political elections (presidential and legislative) and government collapses outside elections. For example, among the latter we include, say, the resignation of Mrs. Thatcher in November 1990, the collapse of the Balkenende government in the Netherlands in October 2002, the no confidence vote on the Prodi government in January 2008, and so forth. The second, 'non-standardised' type comprises events that do not affect the political sphere directly, but that are nevertheless of political importance. These include terrorist attacks and violence (such as the killing of a Deutsche Bank board member in November 1989 in Germany, the March 2004 bombings in Madrid, the killing of Pim Fortuyn in May 2002 in the Netherlands, and so forth); natural catastrophes and accidents (such as floods, earthquakes, major plane crashes, major train collisions); and other political scandals and shocks (such as, for example, the resignation of Helmut Kohl from CDU party leader due to a scandal in January 2000, or episodes of general strike and mass demonstrations).

We should clarify from the outset that the list for the first type of events is meant to be exhaustive, implying that we have collected data for every political election and government collapse (defined as the resignation of the chief government executive – the president or the prime minister depending on the political system). On the other hand, the list of the events of the second type is *not* necessarily exhaustive, nor does it necessarily include only the most relevant events, even though we have done our best effort in this direction. This second list should rather be interpreted as a random selection of events over the sample period and country coverage that we consider. Moreover, we have tried to collect a comparable number of events across countries, even though the actual numbers unavoidably vary somewhat from country to country.

In practice, the search for the events in the second category has been conducted following objective criteria as much as possible. We have searched in various news databases in English (BBC news being the chief source) for a fixed set of keywords for each country. In case of doubt, the dating has been cross checked with other sources. It should be noted that in collecting the data we have not explicitly searched for evidence of stock market reaction; in any case, this type of information is not very often reported by news agencies. Moreover, it would have biased the analysis in favour of finding a significant impact of the news on the stock market.

Overall, we collect 174 such events, 128 for euro area and 46 for non euro area countries (see Table A.2). Among the euro area events, 54 take place before the launch of the euro, and 74 thereafter (the respective numbers are 21 and 25 for the non euro area countries). Table A.3 reports a synthetic description of the data collected and the sources; Table A.4 reports a selection of 'non-standardised' political news in different countries.

Two further clarifications are in order at this point. First, even if we call the dababase that we put together "political news", this is only a short-cut since some of these events are well anticipated – think for example of political elections (whose outcome is often sealed in

advance). Second, we are assuming that the political news that we collect are exogenous with respect to stock market developments on the same day, controlling for stock market developments up to the previous day. Although this is in a way a restrictive assumption, we believe that it is quite plausible that political events are not decided by daily changes in the stock market, even if they can certainly be influenced by stock market developments over a longer period of time (something which, however, would not invalidate our analysis). For some of the events, such as terrorist attacks and natural catastrophes, a reverse causality can be excluded altogether.

Finally, for our empirical analysis, we need to "sign" the political shocks, which means that we need to classify whether we would expect a particular piece of news to have a negative, positive or ambiguous effect on the domestic economy through the stocks market. In most instance, such a classification is straightforward - e.g. government collapses are always classified as a priori having a negative effect on domestic financial markets. However, there are some instances where this classification is difficult; for instance, an election may be considered as positive or as negative by domestic markets. Some events are thus classified as neutral, while overall there are relatively fewer political news that are expected to have a positive market impact.

2.2 Stock market data and other variables

Daily data on equity returns are in local currency and have been drawn from MSCI and Bloomberg (see Table A.3). We also use measures of central bank transparency and independence drawing from Crowe and Meade (2008), who build their classification of a broad set of central banks based on the work by Cukierman et al. (1992) and which covers a through and broad set of institutional indicators of central banks. Finally, data on the macroeconomic variables that we use (inflation, real GDP, fiscal balance, government debt, stock market capitalisation, financial openness and trade openness) are annual and have been drawn from the IMF, the World Economic Outlook database, or from MSCI/Bloomberg, as outlined in Table A.3.

3 The transmission of political shocks on stock markets and EMU

This section starts by sketching the overall channels through which EMU may affect the interdependency across member countries, and how we can use the analysis of the transmission of political shocks to identify these channels. We then present our empirical approach and the findings for the baseline specification.

3.1 The role of EMU

In essence, our empirical approach is to test for the role of EMU by analysing how it has altered the transmission of political shocks to financial markets. We are primarily interested in the role of political economy factors through which EMU has changed the transmission process. In particular, by committing to and joining EMU, member countries have given up or at least significantly curtailed their domestic policy autonomy in several areas. For monetary policy, member countries have transferred their policy autonomy to a single entity, the European Central Bank, which means that domestic policymakers can no longer set policy rates according to their domestic preferences. Similarly, for fiscal policy the degree of autonomy has been limited through the Stability and Growth Pact. Finally, structural policies remain set at a country level, but are increasingly subject to some form of coordination at the EU level, for example through the Broad Economic Policy Guidelines and the Lisbon Agenda. In the future, structural policies in the euro area may also be more tightly coordinated.

What does this transfer or reduction of policy autonomy imply for the transmission of shocks and the integration of markets? Overall, the pooling of policy-making at the EMU level should mean that country-specific shocks become relatively less important and foreign or common shocks more relevant. One of the channels is policy itself, as e.g. monetary policy is conducted for the euro area as a whole and not for individual countries any more. A second channel is through the integration of markets. Market integration, both for goods and for financial services, implies that shocks are transmitted more easily across border, and in turn, that domestic shocks become relatively less important for the domestic economy.

Moreover, the functioning of such a policy channel may not be the same for all countries and may be more important for and benefit more those that have relatively weaker institutions. Take the example of a shock that has an adverse inflationary impact. Such a shock should have a larger effect on the domestic economy – and thus on stock markets – if institutions are weak and expectations are that policy will not succeed in dealing with it effectively. An improvement in policy and institutions should therefore mean a smaller sensitivity of domestic markets to such shocks. In addition, the transfer of policy autonomy or the policy convergence across economies should imply that markets react more homogeneously across countries. These are the mechanisms we attempt to test empirically.

Before moving on to the empirical analysis, it may be worthwhile illustrating one key implication of this integration process; which is that not only the policy process, but also economic outcomes should have become more homogenous across countries through EMU. Figures 1 and 2 provide some stylised facts regarding the convergence process in inflation, growth and fiscal policy. Figure 1 shows the unweighted average (in percent) and the dispersion (measured as the annual standard deviation) across the 12 euro area countries, for CPI inflation, GDP growth and both of their volatilities (measured as the 5-year moving standard deviation). Figure 2 does the same for the fiscal balance to GDP ratio and the government debt to GDP ratio.

The evidence points at two central conclusions. First, in particular inflation and to some extent also fiscal policies have improved markedly in the euro area: average inflation has declined from about 6% in the early 1990 to about 2% in the 2000s, and its volatility over time has dropped. But also fiscal deficits and government debt have been reduced in most euro area countries over the past decade. Second, there has been a substantial macroeconomic convergence process across EMU countries, which is indicated by the strong decrease in the dispersion across countries in inflation, growth and fiscal policies in the two figures. For instance, inflation convergence across euro area countries has fallen to levels that are comparable to that of individual states within the US.[8]

In the remainder of this section we focus on analysing and describing how political economy shocks have been affecting European economies and how this process has changed over time. The subsequent section then turns to explaining these changes and the question how EMU and the convergence process have affected the transmission of shocks across countries and over time.

3.2 Baseline results

We now turn to the empirical analysis, first outlining the empirical strategy and then presenting the baseline results. The sub-section also discusses various extensions and the robustness of the findings.

For the benchmark model specification the objective is to test how political economy shocks affect equity market returns in the 12 euro area countries and the 4 other European economies. As explained above, we distinguish between domestic or idiosyncratic shocks, S^{dom}, and common shocks emanating either from another country within the euro area, S^{ea} or from one of the four non-euro area EU countries, S^{nea}. The benchmark specification is thus

$$r_{it} = \alpha + \beta \; S_{i,t} + \omega \; Z_t + \varepsilon_{it} \tag{1}$$

where r_{it} are the daily equity returns, $S = [S^{dom}, S^{ea}, S^{nea}]$ is a vector of the three types of shocks and Z_t is a vector of controls. In our preferred specification, this term includes only day-of-the-week dummies, but in the robustness analysis below we will discuss in detail alternative specifications with additional controls. The model is estimated in a balanced panel, so that r_{it} represents a vector of daily returns for the 16 countries in our sample.

As mentioned above, the shocks are "signed", i.e. $S^{dom} = 1$ if a shock is expected to have a positive effect and is domestic in origin from a particular country's perspective, and $S^{dom} = -1$ if it is expected to have a negative impact on the domestic economy. Note that the shocks are country-specific in the sense that what constitutes a domestic and what a foreign shock is different across countries. For instance, a shock occurring in France is coded as a domestic shock for France but as a euro area event for all other countries; a shock in the UK as a domestic one for the UK and a non-euro area one for all others. We make this distinction

[8] See European Commission (2008).

as we are interested in the differences of the transmission process between domestic shocks and foreign shocks occurring elsewhere in Europe. Finally, heteroskedasticity is a problem when using daily data, which we need to account for. We do so by allowing for clustering across residuals over time by country. Including country-specific fixed effects in the model does not prove relevant as the mean of daily equity returns does indeed not differ across countries over such a long time horizon from 1989 to 2008. However, there may be distinct variations over time in returns as well as in the shock transmission, and we return below in detail about how to model such time variations.

Our main interest is in the role EMU has played in the transmission of shocks, both across countries and over time. As a first step to gauge the potential role of EMU in altering the transmission mechanism of political shocks, we modify equation (1) to allow for three time-varying interaction terms in the following way:

$$r_{it} = \alpha + \beta\ S_{i,t} + \gamma\ (S_{i,t}\ CU_{i,t}) + \omega\ Z_t + \varepsilon_{it} \tag{2}$$

where $CU_{it} = 1$ if a country is inside EMU, i.e. for the 12 euro area countries since 1999, and zero otherwise; and Z_t includes the linear effects of $CU_{i,t}$.

We have two sets of priors for our empirical analysis that derive directly from the discussion in the previous sub-section A first, obvious prior is that political shocks should matter not just for the domestic economy, but also for other, closely integrated countries. Hence we would expect that $\beta^{dom} > \beta^{ea}, \beta^{nea} > 0$, implying that all shocks have an impact, but that this effect is stronger for the domestic market than for foreign markets. Second, we would expect that with EMU, shocks become less important for the domestic market and more relevant for foreign markets over time, i.e. that $\gamma^{dom} < 0$; $\gamma^{ea}, \gamma^{nea} > 0$.

Table 1 presents the benchmark results of equations (1) and (2), distinguishing between different country samples. Overall, our two priors are confirmed. First, all types of shocks exert a statistically significant and economically meaningful effect on domestic and foreign equity returns. The magnitude of the coefficients indicates that shocks on average move domestic markets between 1% and 1.6% in the expected direction. This is sizeable, but does not seem excessively large compared to a median equity return of 0.7% and a standard deviation of 1% for the 16 EU countries over the sample period. It confirms that the identified shocks in our sample are indeed important ones.

The transmission across markets is also significant and sizeable. On average, the identified political economy shocks move foreign equity markets in the other 15 EU countries by about 0.5% to 0.8%, with the effect of euro area shocks being somewhat larger than those in non-euro area markets.

The second finding refers to the change in the transmission of shocks with EMU, shown in the models of column (2) and (4) of Table 1. For the group of all 16 EU countries, i.e. combining those that joined EMU and those that did not, the impact of euro area shocks has increased significantly with EMU. The magnitude of this increase is large, rising with 0.35% by more than half from 0.61% in the non-EMU sample to 0.96% in the EMU sample.

By contrast, the effect of shocks from the four non-euro area countries as a control group has not changed over time and across countries.

As to the effect of political shocks on domestic markets, this effect has indeed become smaller with EMU. For the 12 EMU countries (column (4)), this lower impact of 0.49% is indeed sizeable. However, for the full sample of 16 countries the coefficient is still negative but no longer statistically significant. This is intriguing as it suggests that while there is indeed a reduction in the effect of shocks on domestic markets after 1999, this by no means applies only for the 12 countries that joined EMU, but also for the four non-euro area countries in our control group. However, what is different across euro area versus non-euro area countries is that shocks from within the euro area are transmitted more strongly to other euro area markets than markets outside the euro area.

To better understand these differences, Figures 3-5 present several empirical tests for the time variations of the transmission process. Figure 3 shows the evolution of the domestic transmission β^{dom} and the transmission of euro area shocks $\beta^{ea}$of equation (1) for all 16 countries in the sample, using recursive estimations in which one year of data at a time is added sequentially. It confirms the overall decline in the effect of domestic shocks and the growing importance of euro area shocks over time, and in particular since 2000.

As a next step, one would like to gauge the differences in the transmission process *across countries*. We do so by first splitting the countries into different groups. Figures 4.A and 4.B focus on the 12 euro area countries, distinguishing between "core" countries (Austria, Belgium, France, Germany, Luxembourg, Netherlands) and "periphery" countries (Finland, Greece, Ireland, Italy, Portugal, Spain). This distinction may be somewhat arbitrary, but the objective is to distinguish between countries that have been at the core of the European integration process from those that have economies, economic policies and institutions that are relatively more different from the regime prevailing after the introduction of the euro. Figure 4.A for the domestic transmission coefficient β^{dom} and Figure 4.B for the spillover of euro area shocks β^{ea} show indeed that there is a marked difference across these two country groups. Countries in the periphery exhibit a much more dramatic decline in the transmission of domestic shocks and a stronger increase in the exposure to euro area shocks. For the effect of domestic shocks, there seems to be a clear convergence process in that markets nowadays react in a very similar extent to domestic political economy shocks.

To illustrate this cross-country heterogeneity, Figure 5 presents a dispersion measure in the transmission process. This dispersion measure is the standard deviation across the domestic transmission coefficients β^{dom} and euro area transmission coefficients β^{ea} across the 12 euro area countries at any point in time. Each of these coefficients is obtained by estimating equation (1) recursively for each of the 12 euro area countries, which are then taken to construct the dispersion index. Figure 5 indicates that there is a strong decline in the cross-country heterogeneity to domestic shocks, from more than 1.5 standard deviations in the early 1990s to less than 0.5 standard deviations in 2007. By contrast, cross-country differences for the transmission of euro area shocks have remained relatively stable, confirming that the increase in the importance of shocks elsewhere in the euro area

is similar across countries.

The next section will investigate these differences and similarities, and in particular their explanations, in detail. Before doing so, we conduct various extensions and modifications in order to check for the robustness of the findings. A first point to note is the high goodness-of-fit of the empirical model. The baseline models of Table 1 explain about 25% to 30% of the variations in equity returns. However, note that we include in the estimation only days when a shock occurred in one of the countries in our sample. Nevertheless, it underscores that the shocks we identify are indeed important ones for European equity markets.

Table 2 splits the political economy shocks into different categories. The market impact of the different types is quite similar, and confirms that the results are not driven by a few outliers in one category. For Table 3, we have extended the empirical model to include a much more comprehensive set of controls, and specifically macroeconomic news emanating from the United States and euro area countries, euro area monetary policy shocks and a proxy for risk aversion. Our global risk aversion proxy is the VIX, which is derived from option prices of the S&P500. For monetary policy and macroeconomic news, we follow the approach of Andersen et al. (2003, 2007) and Fratzscher (2008) and use the surprise component of macroeconomic and monetary policy announcements. The surprise is the unexpected element, measured as the difference between the announcement and prior market expectations which come from surveys of investors conducted by MMS International and Bloomberg.

Overall, the results of Table 3 confirm that while these controls mostly do exhibit a significant effect on equity returns, the effect of political economy shocks on domestic and foreign equity markets is virtually unchanged when adding these controls. This is what one would expect as it confirms that the timing of the political shocks we identify is truly exogenous to other factors. We again emphasise that the occurrence of political shocks may not be entirely exogenous, as e.g. a government collapse may be influenced e.g. by deteriorating economic conditions, but the precise timing is as the day on which they take place should be largely independent of such factors. As we have discussed above, this point is important for the validity of the identification of political shocks and their impact on equity markets.

In summary, political economy shocks in Europe exert a significant effect not only on the domestic economy but also on other economies across Europe. This section has presented evidence that suggests that EMU may have played an important role in integrating European markets by lowering the relative importance of domestic shocks and raising the relevance of shocks occurring elsewhere within the euro area. In particular, there appears to have been a large degree of heterogeneity across euro area countries in the way domestic markets reacted to shocks before EMU but a strong convergence in the transmission process with EMU. The next section turns to potential explanations of this convergence process and how EMU may have contributed to it.

4 The role of monetary and fiscal policy

The evidence of the previous section shows that there has been a significant convergence process in the way European and in particular euro area economies respond to political economy shocks. What explains this convergence; and how has EMU contributed to this process?

Our main focus is on the role of policy and of institutions, and the question whether the transfer of policy autonomy in areas such as monetary policy and fiscal policy has played a role. As discussed in section 3.1, in particular for countries with relatively weaker policies and institutions, such a transfer of or constraints on policy autonomy may imply that domestic factors become less important for the domestic economy. Accordingly, our prior is that the convergence process in the transmission of political shocks described in section 3 is at least in part explained by this convergence process in policy and the quality of institutions.

Our empirical strategy to get at this question is first of all to extend the model of equation (2) through the inclusion of variables $X_{i,t}$ that proxy the quality of domestic policy and institutions at any point in time and in each of the 16 European economies in the sample:

$$r_{it} = \alpha + \beta\ S_{i,t} + \gamma\ (S_{i,t}\ CU_{i,t}) + \delta\ (S_{i,t}\ X_{i,t}) + \omega\ Z_t + \varepsilon_{it} \tag{3}$$

where all other variables are defined as before (recall, $CU_{i,t} = 1$ if a country is inside EMU and zero otherwise) and $Z_{i,t}$ includes the linear effects of $CU_{i,t}$. The final step of the empirical analysis is to ask whether EMU has changed this transmission process, which we test by including a further interaction term for the role of policy and institutions with the completion of EMU ($X_{i,t} * CU_{i,t}$):

$$r_{it} = \alpha + \beta\ S_{i,t} + \gamma\ (S_{i,t}\ CU_{i,t}) + \delta\ (S_{i,t}\ X_{i,t}) + \lambda\ (S_{i,t}\ X_{i,t}\ CU_{i,t}) + \omega\ Z_t + \varepsilon_{it} \tag{4}$$

where $Z_{i,t}$ includes the linear effects of $CU_{i,t}$ and $X_{i,t}$. In other words, in what we call the "full model" of equation (4) we ask not only whether the quality of policy and institutions matters for the transmission process, but also whether EMU has changed this relationship, and in particular whether the sensitivity to domestic institutions has declined with EMU. Hence, our priors are (if a higher X indicates better institutions/policy) for domestic shocks that $\delta^{dom} < 0$ and $\lambda^{dom} > 0$, and for foreign shocks that $\delta^{ea}, \delta^{nea} > 0$ and $\lambda^{ea}, \lambda^{nea} < 0$. The opposite should be implied if a higher $X_{i,t}$ indicates worse policy or institutional quality.

Starting with the role of monetary policy, we proxy the quality of domestic monetary policy in two ways; first, through the degree of independence and transparency of the domestic central bank. We use the proxies of Crowe and Meade (2008), which builds on the work by Cukierman et al. (1992), and covers a broad set of central banks and builds measures of central bank transparency and independence based on various institutional characteristics. For both of these proxies, a higher value indicates a larger degree of independence or transparency. Second, we use the actual outcome in terms of the level of inflation and the

volatility of inflation – measured as the standard deviation of CPI inflation over the past five years – to proxy the performance of a country's central bank.

Table 4 shows the estimates for these four monetary policy proxies for the model of equation (3) and the full model of equation (4). Overall, there is significant evidence in favour of the above-mentioned hypotheses. For instance, countries with higher inflation tend to be significantly more sensitive to domestic political shocks ($\delta^{dom} > 0$) and less responsive to foreign political shocks ($\delta^{ea}, \delta^{nea} < 0$). Importantly, this relationship only holds before or if countries are not part of EMU. Countries inside EMU do not respond differently, either to domestic shocks or to foreign shocks, if they have relatively high or low inflation. A similar conclusion also applies to the other proxies, including the institutional proxies of central bank independence and transparency.

We next turn to the role of fiscal policy, and use two proxies to assess the policy stance of countries. The first one is the fiscal position, measured as the ratio of a countries fiscal position to GDP; the second is the level of government debt to GDP. Table 5 provides the estimates and suggests an equally strong break in the relationship between fiscal policy and the transmission of political economy shocks through the introduction of EMU. Financial markets in countries with a good fiscal position or a low level of government debt are less sensitive to domestic shocks and more responsive to foreign shocks before EMU.

However, the introduction of EMU has eliminated this relationship entirely. In none of the models and specifications is $(\delta + \lambda)$ statistically significant. Moreover, the last set of rows of Table 5 show whether this shift from non-EMU to EMU is statistically significant, i.e. whether $\lambda = 0$. For domestic shocks, this hypothesis is rejected for both the fiscal position and the level of government debt, underlining that there has been a marked break in the relationship with the introduction of EMU.

One has to be careful in drawing a causal inference from these findings as many other changes occurred with EMU, which may to some extent be correlated with the shift and changes in monetary policy and fiscal policy. One such factor is the increase in financial integration, in particular across EMU countries, as well as the higher degree of real integration. Higher financial and real integration may play a similar role as a transfer and unification of policy autonomy with the euro area in that they raise the interdependence of the economies, thus implying that domestic shocks become relatively less important for the domestic economy and are more strongly transmitted across borders to other European economies. It is obviously difficult to capture the many facets of European financial and real integration. We try to do so (partially) through three proxies. As our focus is in particular on equity markets, we use the size of the domestic stock market – measured as the domestic equity market capitalisation to GDP ratio – and the cross-border holdings of portfolio investment (assets plus liabilities) to GDP as two measures of financial openness and integration. As to real integration, we proxy this through the ratio of trade with the other European countries to a country's GDP. Again, we emphasise that all these measures capture certain aspects of European financial and real integration, and are by no means exhaustive.

Table 6 indicates that countries with a higher stock market capitalisation and more

trade integration have tended to react less to domestic shocks and more to foreign shocks before EMU, but that this link has disappeared with EMU. The last set of columns confirms that several of the coefficients change significantly with the introduction of EMU. Overall, this evidence suggests that EMU has implied a structural break, not just trough the transfer and conduct of monetary policy and fiscal policy, but also through the integration of the European economies, both financially and through trade.

We cannot emphasise enough that EMU has many dimensions and that it is difficult to capture them all. We take a limited step in this direction by gauging the robustness of the above findings by extending the models of equations (3) and (4) by including multiple determinants. As our primary interest is in the role of monetary policy and fiscal policy, Table 7 shows the empirical estimates for some of the policy proxies when controlling for financial market integration (the parameters for the latter are not shown for brevity reasons, but are qualitatively similar to those shown in Table 6). The table indicates that the results for monetary policy and fiscal policy of Tables 4 and 5 are qualitatively robust to this extension, though the size of the point estimates do change somewhat.

A further issue is the definition of EMU. As discussed above, our measure $CU_{i,t}$ is equal to one for EMU countries since 1999. However, the true structural break may have taken place earlier, e.g. when it became clear that EMU takes place and which countries participate. In fact, Figures 3-5 on the time variations of the transmission of shocks indeed suggests that the convergence process started already in the mid-1990s. It is hard to determine the precise timing of such a break, which moreover may differ across countries.[9] Table 8 shows the model estimates when using 1 January 1997 as an alternative break and starting point of EMU. The results confirm those of Tables 4-6 in that EMU indeed has brought about a break in the relationship between policy and institutions, on the one hand, and the transmission of shocks, on the other.

To sum up, the section has presented evidence that the completion of EMU has fundamentally altered the transmission of political economy shocks in Europe. This evidence of a political economy channel suggests that a worse quality of monetary and fiscal policy used to imply that the domestic economy is more exposed to domestic political shocks. But with EMU, differences in policy and institutions across countries seem to have become much smaller, and we find no evidence that financial markets discriminate in their sensitivity to different policies under EMU.

5 Conclusions and policy implications

The paper has attempted to identify a political economy channel through which EMU has influenced European integration. Specifically, the paper has analysed the transmission process

[9] Ehrmann et al. (2007) find structural breaks in the relationship across European bond markets, using break-point tests of daily data, between late 1996 and late 1998, but that the precise timing differs across countries.

through which important political events are transmitted to the domestic and foreign financial markets. The main focus has been on understanding how this transmission process has evolved over time, and what the regime change in monetary policy and in fiscal policy with EMU has meant for EMU member states.

Two main findings have emerged from our empirical analysis, which is based on data of important political events in 16 EU countries since 1989. First, we find that political news do move domestic stock markets, and increasingly other markets in the EU. In particular, with the introduction of EMU there has been a significant convergence process in that political shocks have increasingly less influence on domestic markets and more and more relevance for foreign markets, underlining the overall financial integration process in Europe. However, there has been a distinct shift over time in the influence of domestic news as opposed to news happening in other euro area and EU countries, with the countries in the so-called "EMU periphery" being affected the most.

The second main finding of the paper is that monetary policy and fiscal policy have played an important role in this convergence process. Before EMU, economies with relatively weaker policies and institutions were much more sensitive to domestic political shocks. However, EMU has helped insulate such economies from adverse domestic shocks as domestic policies and institutions have become less relevant as domestic policy autonomy in several areas, and in particular in monetary policy and fiscal policy, were transferred or at least curtailed.

We emphasise that the fact that EMU appears to have a dampening impact on the effect of national politics on domestic economies entails both costs and benefits. An important benefit is that countries with relatively weaker policies and institutions have gained stability and become less affected by domestic shocks. Moreover, the transfer and harmonisation of economic policies appear to have contributed to a marked convergence both in policies and economic structures across the euro area. However, the process may also entail a cost for member states as the diminished importance of national politics could mean that financial markets lose some of their disciplinary role for politicians, who may face fewer incentives to reform or behave responsibly. This, in turn, may create or exacerbate the coordination challenge at an EU-wide level to provide incentives to reform and reduce adverse effects of domestic policy failures that are nowadays more strongly externalised to other EMU member states.

One important issue that this paper has not addressed is how EMU may have affected the making of domestic politics itself. Figure 6 reports the World Bank indicator for Political Stability between 1996 and 2006 (see Kaufmann et al. 2007). The figure tells something interesting: also in this field, there appears to have been a convergence of the euro "periphery" countries to the "core" countries, even though to levels somewhat below that of the control group, which includes very politically stable countries (the UK, Sweden, Denmark and Switzerland). It is also interesting that since 2002 there appears to have been a fall in political stability in both core and periphery countries. One might almost be tempted to see evidence of the fact that EMU has reduced incentives for political stability, although

one notes that a similar dynamics can be seen for the countries in the control group and short-term flucatuations in such an index should certainly not be over-interpreted. Finally, the new EU member countries that have not adopted the euro have a relatively low reading for political stability, which implies that their domestic politics may be less stable than those of member states, and that uncertainty from the political sphere may be more frequent. If this remains the case in the future, one may expect that the euro adoption will play a particularly important role in how political shocks are transmitted to their economies. Overall, these appear to be intriguing issues for future research.

References

[1] Alesina, A., and H. Rosenthal. (1995) *Partisan politics, divided government and the economy*, New York: Cambridge University Press.

[2] Alesina, A. and R. Perotti. (1996) "Income distribution, political instability, and investment," European Economic Review, 40, 6, pp. 1203-12.

[3] Alesina, A., Roubini, N. and G. Cohen. (1997) *Political cycles and the macroeconomy*, Cambridge: The MIT Press.

[4] Andersen, T., T. Bollerslev, F. Diebold and C. Vega. (2003) "Micro Effects of Macro Announcements: Real-Time Price Discovery in Foreign Exchange," *American Economic Review* 39(1), 38-62.

[5] Andersen, T., T. Bollerslev, F. Diebold and C. Vega. (2007) "Real Time Price Discovery in Global Stock, Bond, and Foreign Exchange Markets" *Journal of International Economics*.

[6] Baele, L., A. Ferrando, P. Hördahl, E. Krylova and C. Monnet. (2004) "Measuring Financial Integration in the Euro Area" ECB Occasional Paper #14.

[7] Baldwin, R.E.. (2006) *In or Out: Does It Matter? An Evidence-Based Analysis of the Euro's Trade Effects*, CEPR.

[8] Barro, R. J.. (1991) "Economic growth in a cross-section of countries", Quarterly Journal of Economics, 106, pp. 407-443.

[9] Bertola, G. and R. Caballero (1992): "Target Zones and Realignments", American Economic Review 82:3, pp.520-536.

[10] Brown, S. J. and J. B. Warner. (1985) "Using daily stock returns: the case of event studies", Journal of Financial Economics, 14, pp. 3-31.

[11] Calvo, C. A. and C. M. Reinhart. (2002) "Fear Of Floating", Quarterly Journal of Economics, 117, 2, pp. 379-408.

[12] Canova, F., M. Ciccarelli and E. Ortega. (2006) "Similarities and Convergence of G-7 Cycles," *Journal of Monetary Economics*.

[13] Carmignani, F.. (2003) "Political instability, uncertainty and economics", Journal of Economic Surveys, 17, 1, pp. 1-54.

[14] Coeurdacier, N. and P. Martin. (2007) "The Geography of Asset Trade and the Euro: Insiders and Outsiders", CEPR Discussion Paper No. 6032.

[15] Crowe, C. and E. Meade. (2008) "Central Bank Independence and Transparency: Evolution and Effectiveness," IMF Working Paper 08/119.

[16] Cukierman, A., S. B. Webb, and B. Neyapti. (1992) "Measuring the Independence of Central Banks and Its Effect on Policy Outcomes," *World Bank Economic Review* 6, 353–398.

[17] Ehrmann, M. and M. Fratzscher. (2005) "Equal size, equal role? Interest rate interdependence between the euro area and the United States," *Economic Journal* 115: 930-50.

[18] Ehrmann, M., M. Fratzscher, R. Gürkaynak and E. Swanson (2007). "Convergence and anchoring of yield curves in the euro area", CEPR Discussion Paper No. 6456.

[19] Engel, C. and J. H. Rogers. (2002) "European product market integration after the euro", Economic Policy, July, pp. 347-384.

[20] European Central Bank. (2008) *1998-2008*, Monthly Bulletin, 10th Anniversary of the ECB.

[21] European Commission. (2008) *EMU@10: Successes and challenges after 10 years of Economic and Monetary Union*, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Central Bank.

[22] Feldstein, M.. (1997) "The political economy of the European Economic and Monetary Union: political sources of an economic liability", Journal of Economic Perspectives, 11, 4, pp. 23-42.

[23] Frankel, J. and A. Rose. (1997) "Is EMU more justifiable ex post than ex ante?", European Economic Review, 41, pp. 753-760.

[24] Fratzscher, M. (2008) "US shocks and global exchange rate configurations," Economic Policy, April 2008, 363–409.

[25] Giavazzi, F. and F. Torres eds. (1993) *Adjustment and growth in the European Monetary Union*, Cambridge: Cambridge University Press.

[26] Guidolin, M. and E. La Ferrara. (2005) "The economic effects of violent conflict: evidence from asset market reactions", Federal Reserve of St. Louis, Working Paper n. 05/066A.

[27] Gürkaynak, R., B. Sack, and E. Swanson. (2005) "The Sensitivity of Long-Term Interest Rates to Economic News: Evidence and Implications for Macroeconomic Models" *American Economic Review* 95(1), 425-36.

[28] Kaufmann, D., Kraay, A. and M. Mastruzzi. (2007) "Governance Matters VI: Governance Indicators for 1996-2006", World Bank Research Working Paper No. 4280.

[29] Lane, P.. (2006) "Global Bond Portfolios and EMU", International Journal of Central Banking, 2, 2, pp. 1-23.

[30] Rigobon, R. and B. Sack. (2005) "The effects of war risk on US financial markets", Journal of Banking and Finance, 29, pp. 1769-1789.

[31] Rodrik, D., A. Subramanian and F. Trebbi. (2004) "Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development", Journal of Economic Growth, 9(2), pp.131-165.

[32] Rogers, J.. (2007) "Monetary union, price level convergence, and inflation: How close is Europe to the USA?" *Journal of Monetary Economics* 53(3), 785-796.

[33] Zussman, A. and N. Zussman. (2006) "Assassinations: evaluating the effectiveness of an Israeli counter-terrorism policy using stock market data", Journal of Economic Perspectives 20, pp. 193-206.

APPENDIX

Table A.1: Country sample

Austria	Ireland	Denmark
Belgium	Italy	Sweden
Finland	Luxembourg	Switzerland
France	Netherlands	UK
Germany	Portugal	
Greece	Spain	

Table A.2: Summary of identified shocks

	Total	Political	Natural	Conflict
All	196	114	24	36
Euro area	143	87	20	21
Pre-EMU	61	39	4	11
Post-EMU	82	48	16	10
Non - euro area	53	27	4	15
Pre-EMU	24	13	2	6
Post-EMU	29	14	2	9

Table A.3: Definitions and sources of determinants

Variable	Definition	Source
Elections	Parliamentary and presidential elections, dates	Elections Guide (http://www.electionguide.org/);
Executive changes outside elections	Resignation of the government and / or of the chief executive	Various news agencies; mainly BBC news
Other relevant political events and natural catastrophes	Dates for major terrorist attacks and violence, natural catastrophes, wars, political scandals	Various news agencies; main source BBC news
Stock price indices	Daily equity market returns, in local currency	MSCI, Bloomberg
Central bank transparency	institutional measure of various sub-components for a central bank's transparency, available for 1998 and 2006	Crowe and Meade (2008)
Central bank independence	institutional measure of various sub-components for a central bank's independence from political influence, available for 1980-89 and 2003	Crowe and Meade (2008)
Growth	Annual real GDP growth	WEO
Inflation	Annual CPI inflation rate	WEO
Inflation volatility	5-year standard deviation of CPI inflation	WEO
Fiscal balance	General government balance to GDP ratio	WEO
Government debt	Government debt to GDP ratio	WEO
Stock market cap.	Stock market capitalisation to GDP ratio	MSCI, Bloomberg
Financial openness	Stock of portfolio investment assets plus liabilities to GDP ratio	IMF
Trade openness	Exports plus imports of goods and services to GDP ratio	WEO

Table A.4: Examples of political news

Event	Country affected	Date
Kaprun fire, 155 die	Austria	11/09/00
White March	Belgium	20/10/96
Suicide of Pierre Beregovoy	France	01/05/93
SPD loses election in North-Rhine Westfalia	Germany	22/05/05
Attack on US embassy in Athens	Greece	11/01/07
Murder of judge Giovanni Falcone	Italy	23/05/92
Murder of politician Fortyun	Netherlands	06/05/02
President Sampaio calls for early elections	Portugal	30/11/04
Madrid bombings	Spain	11/03/04
Shipwreck of Estonia, death of >500 Swedes	Sweden	28/09/94
Crash of Swissair 111	Switzerland	02/09/98
Scandal over leak of Iraq-related documents	United Kingdom	18/09/04

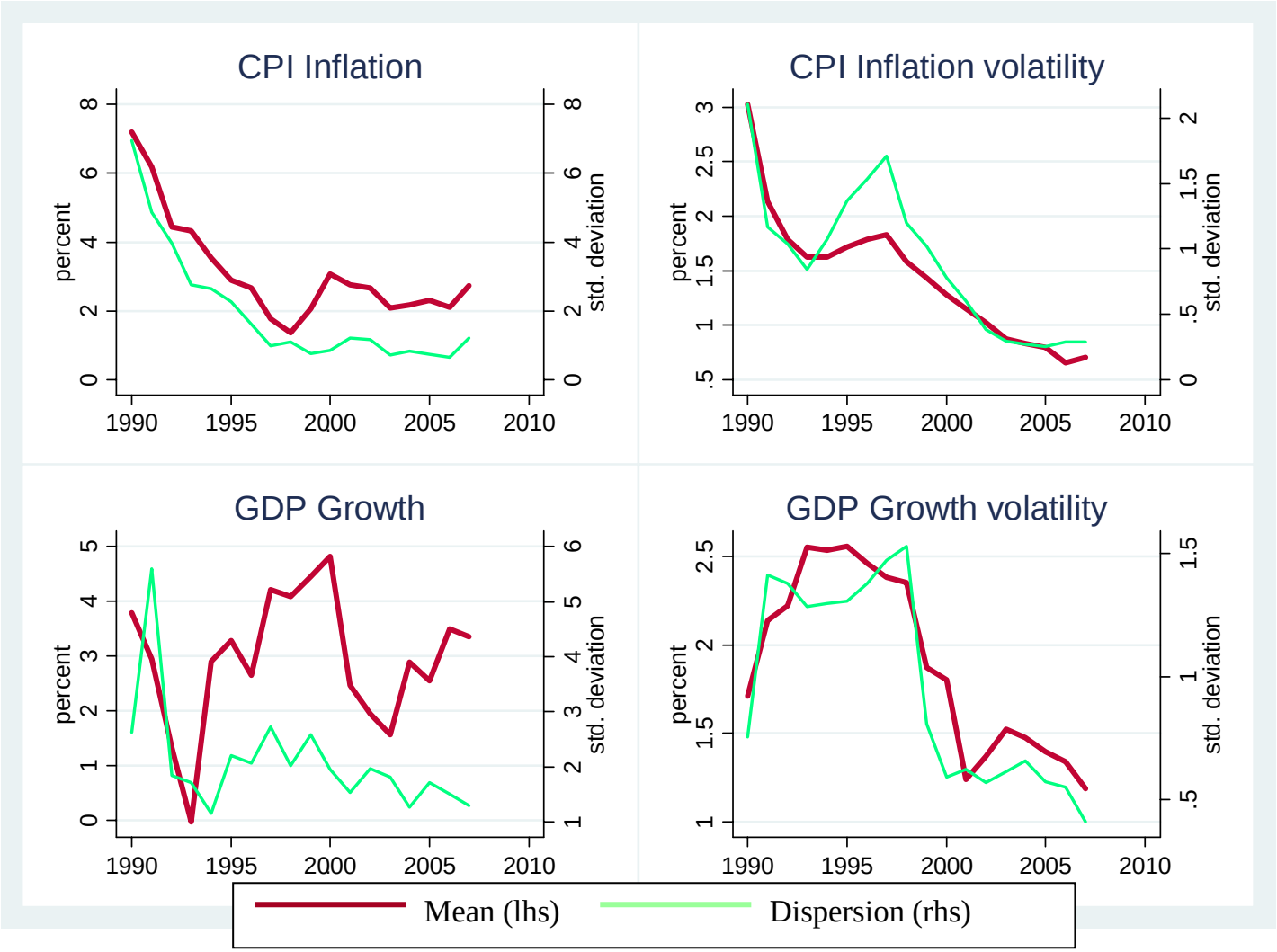
Table A.5: Summary statistics of determinants

	Mean	Std. Dev.	Min	Max
Central bank transparency	0.557	0.179	0.200	1
Central bank independence	0.696	0.121	0.385	1
Inflation	2.983	2.535	-0.404	22.95
Inflation volatility	1.403	1.032	0.263	8.101
Fiscal balance	-2.128	3.576	-14.516	6.933
Government debt	0.445	0.354	-0.442	1.242
Stock market cap.	0.738	0.728	0.027	3.024
Financial openness	6.339	31.566	0.216	1.858
Trade openness	0.257	0.129	0.080	0.712

Table A.6: Correlations across determinants

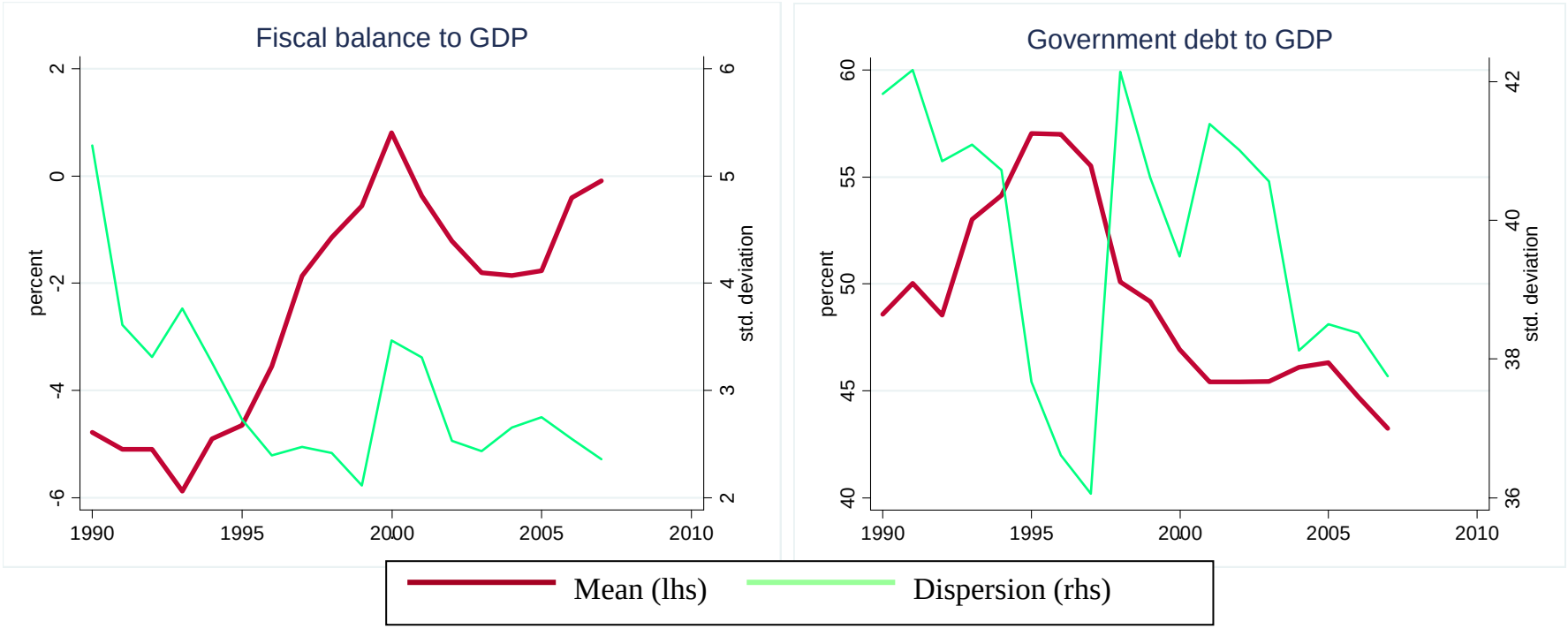
	CB transp.	CB independ.	Inflation	Inflation volatility	Fiscal balance	Govern. debt	Stock mkt cap.	Financial openness
Central bank transparency	1							
Central bank independence	0.398	1						
Inflation	-0.160	-0.087	1					
Inflation volatility	-0.108	-0.195	0.573	1				
Fiscal balance	0.173	0.046	-0.485	-0.467	1			
Government debt	-0.273	0.049	0.114	0.048	-0.453	1		
Stock market cap.	0.356	0.284	-0.286	-0.317	0.361	-0.062	1	
Financial openness	0.154	0.073	-0.044	-0.002	0.378	-0.486	0.181	1
Trade openness	0.158	0.533	-0.298	-0.446	0.229	0.230	0.227	-0.137

Figure 1: Mean and dispersion of inflation and growth across euro area countries



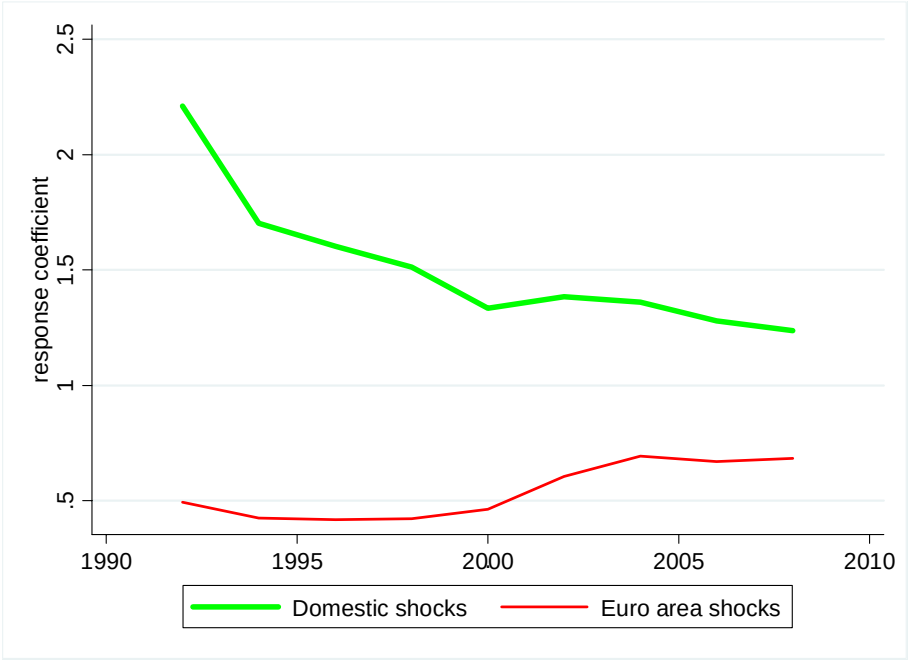
Notes: The figures show the unweighted average (in percent) and the dispersion (measured as the annual standard deviation) across the 12 euro area countries, for CPI inflation, GDP growth and both of their volatilities (measured as the 5-year moving standard deviation).

Figure 2: Mean and dispersion of fiscal balance and government debt across euro area countries



Notes: The figures show the unweighted average (in percent) and the dispersion (measured as the annual standard deviation) across the 12 euro area countries, for the fiscal balance to GDP ration and the government debt to GDP ratio.

Figure 3: Time-varying equity market responses to shocks – euro area countries



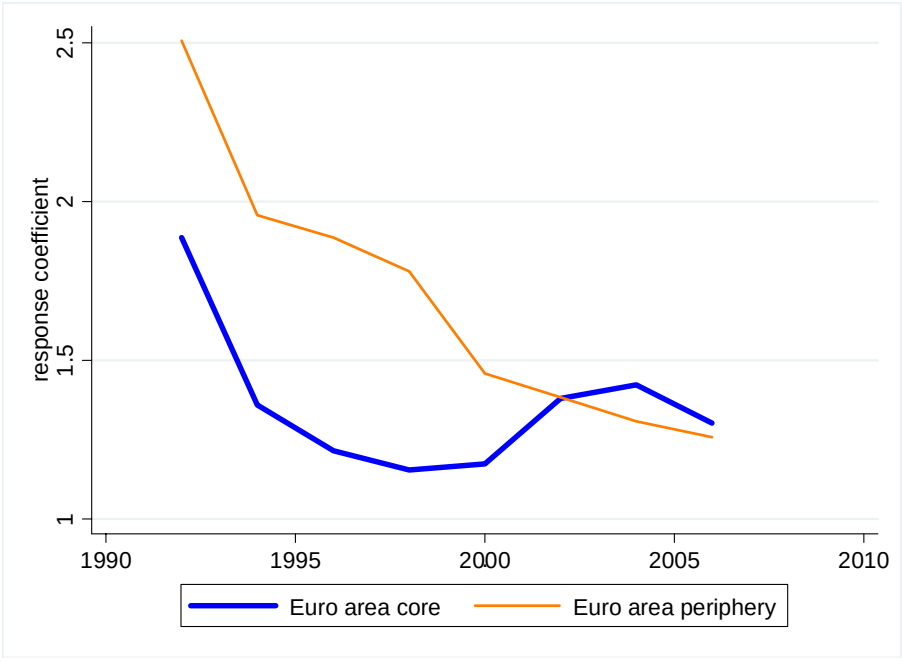
Notes: The figure show the equity market response of the euro area 12 countries to domestic shocks and shocks in other euro area countries, using recursive panel estimations by adding one year of data sequentially. The model specification is that of equation (1):

$$r_{i,t} = \alpha + \beta\, S_{i,t} + \omega\, Z_t + \varepsilon_{i,t} \qquad (1)$$

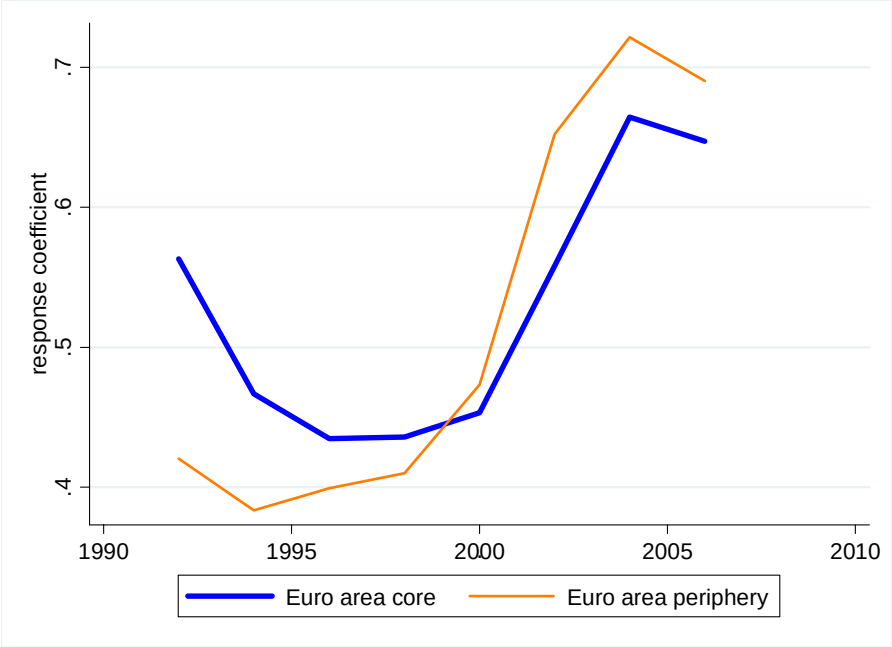
where $r_{i,t}$ are the daily equity returns, $S=[S^{dom},S^{ea},S^{nea}]$ is a vector of the three types of shocks and Z_t is a vector of controls.

Figure 4: Time-varying responses – euro area core versus periphery

A. Equity market response to domestic shocks



B. Equity market response to euro area shocks

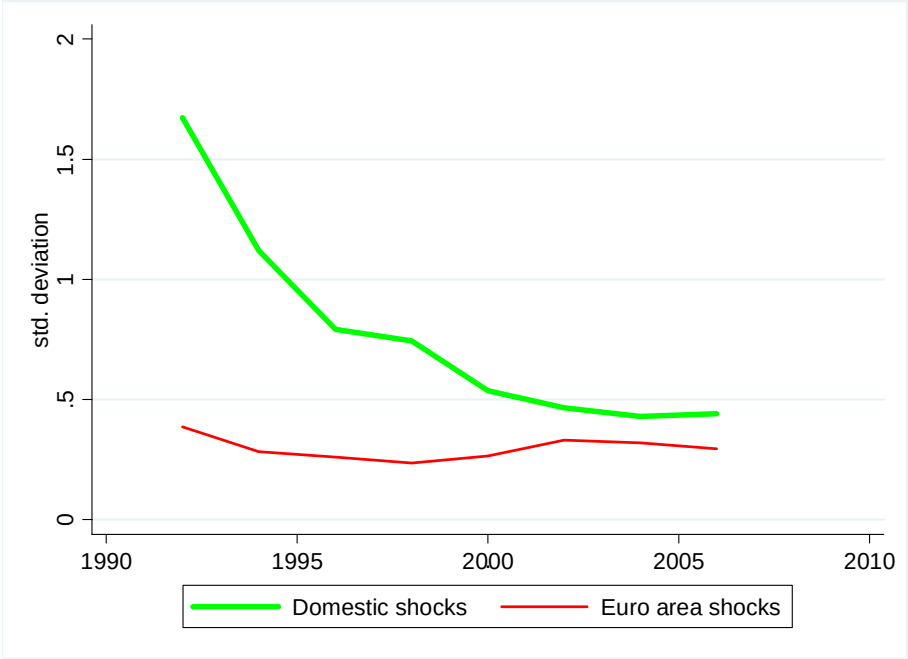


Notes: The figures show the equity market response of the euro area "core" countries versus the "periphery" countries to domestic shocks (Panel A) and shocks in other euro area countries (Panel B), using recursive panel estimations. The model specification is that of equation (1):

$$r_{i,t} = \alpha + \beta\, S_{i,t} + \omega\, Z_t + \varepsilon_{i,t} \qquad (1)$$

where $r_{i,t}$ are the daily equity returns, $S=[S^{dom},S^{ea},S^{nea}]$ is a vector of the three types of shocks and Z_t is a vector of controls, only that the panel is split into two country samples.

Figure 5: Time-varying heterogeneity in equity market responses to shocks – euro area countries

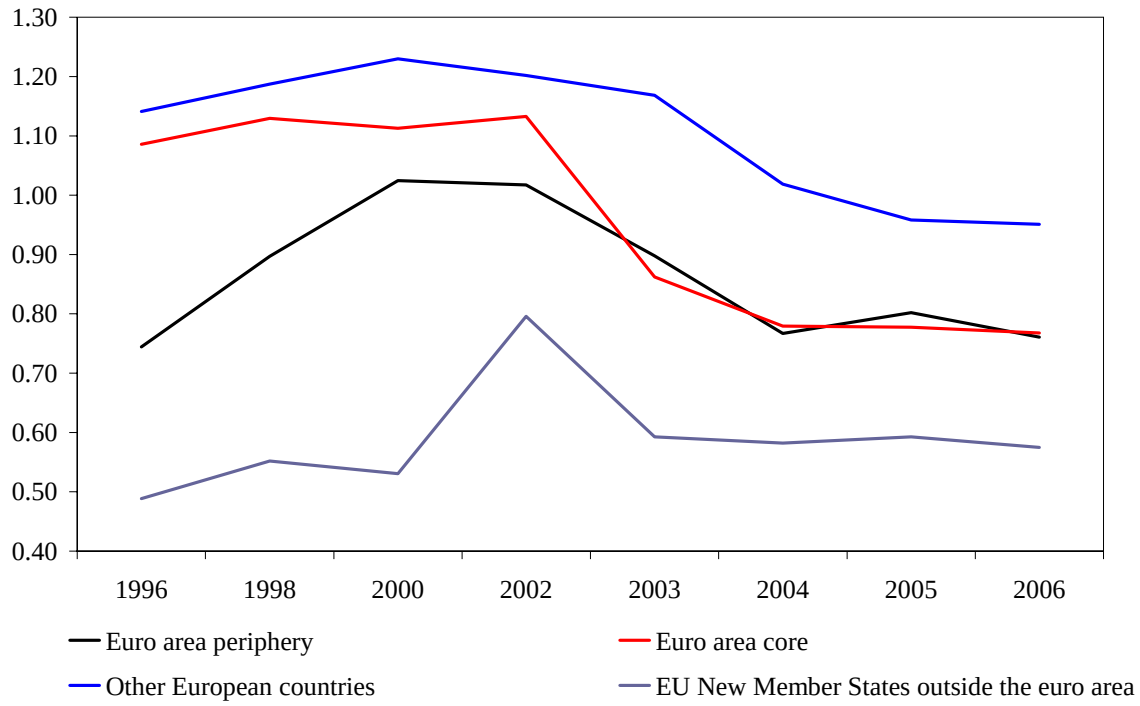


Notes: The figure show the dispersion – measured as the annual standard deviation across the response coefficients – in the equity market responses across the euro area 12 countries to domestic shocks and to shocks in other euro area countries, using recursive estimations for each country separately, using a model specification akin to that of equation (1):

$$r_{i,t} = \alpha + \beta\, S_{i,t} + \omega\, Z_t + \varepsilon_{i,t} \qquad (1)$$

only that here the model is estimated separately for each euro area country.

Figure 6: World Bank indicator for political stability in selected country groups



Notes: The figure shows the indicator for Political Stability and Absence of Violence in the selected country groups. A higher reading of the indicator implies a more politically stable country. The indicator measures, inter alia, perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including domestic violence and terrorism. See Kaufmann et al. (2007) for further explanations. New EU Member States outside the euro area include Poland, the Czech Republic, Hungary, Romania, Bulgaria, Latvia, Estonia, and Lithuania.

Table 1: Baseline results – transmission of shocks to domestic equity markets

	EU 16				Euro area 12				Non-euro area 4	
	(1)		(2)		(3)		(4)		(5)	
Market reaction to:	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*
Shocks: β S_t										
Domestic	1.162 ***	*0.098*	1.257 ***	*0.203*	1.249 ***	*0.105*	1.566 ***	*0.210*	0.926 ***	*0.103*
Euro area	0.714 ***	*0.058*	0.612 ***	*0.068*	0.719 ***	*0.074*	0.454 ***	*0.072*	0.799 ***	*0.064*
Non - euro area	0.498 ***	*0.050*	0.513 ***	*0.057*	0.528 ***	*0.059*	0.536 ***	*0.088*	0.473 ***	*0.044*
Interaction EMU: γ (S_t * $CU_{i,t}$)										
Domestic			-0.183	*0.242*			-0.492 *	*0.246*		
Euro area			0.355 **	*0.134*			0.513 ***	*0.123*		
Non - euro area			0.002	*0.076*			-0.021	*0.099*		
Countries	16		16		12		12		4	
Obs.	1656		1656		1231		1231		425	
R^2	0.257		0.277		0.257		0.281		0.296	

Notes: The table shows the effect of political shocks from various origins on equity markets. Models (1), (3) and (5) are based on equation (1):

$$r_{i,t} = \alpha + \beta\, S_{i,t} + \omega\, Z_t + \varepsilon_{i,t} \quad (1)$$

while models (2) and (4) use equation (2):

$$r_{i,t} = \alpha + \beta\, S_{i,t} + \gamma\left(S_{i,t} * CU_{i,t}\right) + \omega\, Z_t + \varepsilon_{i,t} \quad (2)$$

where $CU_{i,,t}$ = 1 if a country is inside EMU and zero otherwise. The OLS estimator takes into account clustering across residuals by country. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 2: Transmission of shocks – by type of shock

	EU 16				Euro area 12				Non-euro area 4	
	(1)		(2)		(3)		(4)		(5)	
	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*
Political	0.663 ***	*0.052*			0.681 ***	*0.069*			0.695 ***	*0.064*
Euro area			1.198 ***	*0.128*			1.317 ***	*0.148*		
Non - euro area			0.609 ***	*0.056*			0.612 ***	*0.075*		
Natural	0.852 ***	*0.082*			0.877 ***	*0.079*			0.888 **	*0.271*
Euro area			1.197 ***	*0.160*			1.121 ***	*0.116*		
Non - euro area			0.808 ***	*0.084*			0.840 ***	*0.085*		
Conflict	0.712 ***	*0.051*			0.735 ***	*0.052*			0.765 ***	*0.050*
Euro area			1.066 ***	*0.149*			1.177 ***	*0.229*		
Non - euro area			0.680 ***	*0.054*			0.703 ***	*0.054*		
Countries	16		16		12		12		4	
Obs.	1656		1656		1231		1231		425	
R^2	0.246		0.258		0.244		0.260		0.292	

Notes: The table shows the effect of political shocks from various origins on equity markets, making a further split by distinguishing between different types of shocks. Models (1), (3) and (5) are based on equation (1):

$$r_{i,t} = \alpha + \beta\, S_{i,t} + \omega\, Z_t + \varepsilon_{i,t} \qquad (1)$$

while models (2) and (4) use equation (2):

$$r_{i,t} = \alpha + \beta\, S_{i,t} + \gamma\left(S_{i,t} * CU_{i,t}\right) + \omega\, Z_t + \varepsilon_{i,t} \qquad (2)$$

where $CU_{i,,t} = 1$ if a country is inside EMU and zero otherwise. The OLS estimator takes into account clustering across residuals by country. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3: Robustness tests – control for risk aversion, monetary policy shocks and macro shocks

	Benchmark		with all controls		with VIX & int. rates		with macro news	
	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*
Shock to:								
Domestic	1.162 ***	*0.098*	1.169 ***	*0.108*	1.150 ***	*0.098*	1.189 ***	*0.110*
Euro area	0.714 ***	*0.058*	0.686 ***	*0.061*	0.692 ***	*0.055*	0.724 ***	*0.066*
Non - euro area	0.498 ***	*0.050*	0.484 ***	*0.054*	0.504 ***	*0.051*	0.475 ***	*0.052*
Controls:								
1. VIX			-0.155 ***	*0.026*	-0.149 ***	*0.025*		
2. EA interest rates			0.447	*1.011*	0.248	*0.965*		
3. US & EA macro news:								
US news								
Industrial production			-0.147	*0.628*			-0.789	*0.640*
ISM - NAPM			-0.118 *	*0.058*			-0.118 *	*0.058*
Nonfarm payroll			0.005 ***	*0.001*			0.006 ***	*0.002*
Unemployment			7.148 ***	*1.194*			7.692 ***	*1.372*
Consumer confidence			0.011	*0.021*			0.004	*0.021*
Trade balance			0.049	*0.044*			0.074	*0.045*
Advance GDP			-0.938 **	*0.428*			-1.107 **	*0.424*
CPI			3.403 *	*1.717*			3.984 **	*1.673*
PPI			-0.588	*2.003*			0.326	*1.940*
Housing starts			0.003	*0.002*			0.002	*0.002*
Retail sales			0.490	*0.478*			0.477	*0.478*
Workweek			0.000				0.000	
Euro area news								
CPI Ger			1.898 **	*0.706*			1.056	*0.702*
Trade balance Ger			1.722 ***	*0.175*			1.620 ***	*0.170*
Current account Fra			0.000 **	*0.000*			0.000 ***	*0.000*
Consumer confid. Fra			-0.051	*0.049*			-0.066	*0.048*
GDP Ita			-3.574 ***	*0.814*			-5.050 ***	*0.798*
CPI euro area			-4.047 **	*1.617*			-1.550	*1.658*
GDP euro area			6.223 ***	*1.212*			7.236 ***	*1.241*
Retail sales euro area			-0.264 ***	*0.087*			-0.296 ***	*0.083*
Unemployment euro area			-2.788	*1.768*			-3.247 *	*1.754*
Cty.	16		16		16		16	
Obs.	1656		1656		1656		1656	
R^2	0.26		0.29		0.27		0.27	

Notes: The table shows the effect of political shocks from various origins on equity markets, while controlling for risk aversion, monetary policy shocks and various US and euro area macro news, based on equation (1):

$$r_{i,t} = \alpha + \beta\, S_{i,t} + \omega\, Z_{t} + \varepsilon_{i,t} \qquad (1)$$

The OLS estimator takes into account clustering across residuals by country. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4: The role of monetary policy – institutions and performance

Determinant:	**CB transparency**				**CB independence**				**Inflation**				**Inflation volatility**			
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
Market reaction to:	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*
Shocks: β S_t																
Domestic	2.253 ***	*0.398*	2.179 ***	*0.501*	2.879 ***	*0.478*	3.281 ***	*0.624*	0.792 ***	*0.210*	0.721 ***	*0.201*	1.131 ***	*0.327*	0.973 **	*0.370*
Euro area	0.336 **	*0.151*	0.417 **	*0.156*	0.344	*0.315*	0.337	*0.329*	0.838 ***	*0.085*	0.835 ***	*0.085*	0.938 ***	*0.101*	0.953 ***	*0.101*
Non - euro area	0.455 *	*0.240*	0.466 *	*0.250*	0.635 ***	*0.102*	0.648 ***	*0.069*	0.720 ***	*0.086*	0.717 ***	*0.084*	0.660 ***	*0.120*	0.738 ***	*0.099*
EMU: γ (S_t * $CU_{i,t}$)																
Domestic	-0.373 *	*0.217*	0.191	*1.221*	-0.115	*0.171*	-2.730	*1.721*	-0.013	*0.213*	0.833 **	*0.372*	-0.119	*0.287*	0.293	*0.431*
Euro area	0.380 **	*0.131*	-0.388	*0.592*	0.310 *	*0.149*	0.409	*1.098*	0.265 *	*0.145*	0.300	*0.260*	0.212	*0.146*	0.146	*0.190*
Non - euro area	0.002	*0.076*	-0.087	*0.492*	0.025	*0.091*	-0.065	*0.665*	-0.056	*0.078*	-0.014	*0.147*	-0.063	*0.094*	-0.359 ***	*0.103*
Determinants (full model - when <u>outside</u> EMU): δ (S_t * $X_{i,t}$)																
Domestic	-1.458 ***	*0.411*	-1.350 **	*0.571*	-2.205 ***	*0.570*	-2.751 ***	*0.707*	0.137 **	*0.052*	0.158 ***	*0.048*	0.071	*0.098*	0.168	*0.144*
Euro area	0.462 **	*0.198*	0.327	*0.215*	0.409	*0.454*	0.421	*0.479*	-0.065 ***	*0.017*	-0.064 ***	*0.017*	-0.189 ***	*0.042*	-0.197 ***	*0.041*
Non - euro area	0.109	*0.377*	0.087	*0.391*	-0.193	*0.167*	-0.213 *	*0.119*	-0.067 ***	*0.013*	-0.066 ***	*0.013*	-0.083	*0.052*	-0.128 **	*0.045*
Determinants (full model - when <u>inside</u> EMU): λ (S_t * $X_{i,t}$ * $CU_{i,t}$) + δ (S_t * $X_{i,t}$)																
Domestic			-2.357	*1.555*			0.701	*1.666*			-0.175	*0.110*			-0.176 ***	*0.036*
Euro area			1.727 *	*0.959*			0.290	*1.296*			-0.078	*0.078*			-0.136	*0.096*
Non - euro area			0.251	*0.819*			-0.090	*0.804*			-0.084	*0.052*			0.137	*0.095*
Significance																
Domestic: $\lambda^{dom} = 0$			*0.62*				*0.12*				*0.00* ***				*0.03* **	
Euro area: $\lambda^{ea} = 0$			*0.18*				*0.93*				*0.86*				*0.53*	
Non-euro area: $\lambda^{nea} = 0$			*0.85*				*0.88*				*0.73*				*0.02* **	
Countries	16		16		16		16		16		16		16		16	
Obs.	1655		1655		1655		1655		1655		1655		1578		1578	
R^2	0.282		0.284		0.280		0.281		0.293		0.295		0.291		0.294	

Notes: The table shows the effect of political shocks, interacted with EMU ($CU_{i,t}$) and policy proxies $X_{i,t}$, for (1), (3), (5) and (7) based on equation (3):

$$r_{i,t} = \alpha + \beta\, S_{i,t} + \gamma \left(S_{i,t} * CU_{i,t}\right) + \delta \left(S_{i,t} * X_{i,t}\right) + \omega\, Z_t + \varepsilon_{i,t} \qquad (3)$$

and for (2), (4), (6) and (8) based on equation (4): $r_{i,t} = \alpha + \beta\, S_{i,t} + \gamma \left(S_{i,t} * CU_{i,t}\right) + \delta \left(S_{i,t} * X_{i,t}\right) + \lambda \left(S_{i,t} * X_{i,t} * CU_{i,t}\right) + \omega\, Z_t + \varepsilon_{i,t}$ (4)

where $Z_{i,t}$ includes the linear effects of $CU_{i,t}$ and $X_{i,t}$. The OLS estimator takes into account clustering across residuals by country. ***, **, and * indicates statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5: The role of fiscal policy

Determinant:	**Fiscal balance**				**Government debt**			
	(1)		(2)		(3)		(4)	
Market reaction to:	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*
Shocks: β S_t								
Domestic	0.749 ***	*0.151*	0.651 ***	*0.168*	0.961 ***	*0.170*	0.786 ***	*0.138*
Euro area	0.676 ***	*0.069*	0.707 ***	*0.063*	0.635 ***	*0.111*	0.749 ***	*0.081*
Non - euro area	0.629 ***	*0.070*	0.673 ***	*0.082*	0.493 ***	*0.093*	0.557 ***	*0.071*
EMU: γ $(S_t * CU_{i,t})$								
Domestic	0.075	*0.155*	0.372	*0.223*	-0.250	*0.203*	0.422	*0.350*
Euro area	0.305 **	*0.133*	0.252	*0.173*	0.357 **	*0.144*	0.131	*0.293*
Non - euro area	-0.077	*0.084*	-0.158	*0.100*	-0.018	*0.073*	-0.141	*0.110*
Determinants (full model - when <u>outside</u> EMU): δ $(S_t * X_{i,t})$								
Domestic	-0.117 ***	*0.028*	-0.140 ***	*0.036*	0.604 ***	*0.162*	0.959 ***	*0.144*
Euro area	0.023	*0.016*	0.034 **	*0.015*	-0.062	*0.253*	-0.355 *	*0.185*
Non - euro area	0.045 ***	*0.014*	0.061 ***	*0.014*	0.086	*0.173*	-0.063	*0.141*
Determinants (full model - when <u>inside</u> EMU): λ $(S_t * X_{i,t} * CU_{i,t})$ + δ $(S_t * X_{i,t})$								
Domestic			-0.029	*0.039*			-0.182	*0.483*
Euro area			-0.009	*0.056*			0.192	*0.373*
Non - euro area			-0.002	*0.028*			0.214	*0.193*
Significance								
Domestic: $\lambda^{dom} = 0$			*0.07* *				*0.05* **	
Euro area: $\lambda^{ea} = 0$			*0.51*				*0.24*	
Non-euro area: $\lambda^{nea} = 0$			*0.04* **				*0.10* *	
Countries	16		16		16		16	
Obs.	1655		1655		1627		1627	
R^2	0.289		0.293		0.285		0.289	

Notes: See Table 4.

Table 6: The role of financial and trade openness

Determinant:	**Stock market capitalisation**				**Financial openness**				**Trade openness**			
	(1)		(2)		(3)		(4)		(5)		(6)	
Market reaction to:	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*
Shocks: β S_t												
Domestic	1.354 ***	*0.162*	1.590 ***	*0.227*	1.314 ***	*0.218*	1.318 ***	*0.295*	1.413 ***	*0.275*	2.336 ***	*0.427*
Euro area	0.476 ***	*0.067*	0.427 ***	*0.069*	0.616 ***	*0.068*	0.614 ***	*0.080*	0.422 ***	*0.119*	0.286 **	*0.120*
Non - euro area	0.442 ***	*0.067*	0.386 ***	*0.092*	0.514 ***	*0.057*	0.444 ***	*0.077*	0.394 ***	*0.073*	0.367 **	*0.160*
EMU: γ $(S_t * CU_{i,t})$												
Domestic	-0.123	*0.240*	-0.701 *	*0.353*	-0.171	*0.233*	-0.178	*0.377*	-0.105	*0.274*	-1.541 **	*0.580*
Euro area	0.256 **	*0.114*	0.415 **	*0.194*	0.424 ***	*0.119*	0.425 ***	*0.129*	0.285 *	*0.160*	0.544 *	*0.268*
Non - euro area	-0.032	*0.086*	0.133	*0.160*	0.040	*0.069*	0.110	*0.085*	-0.047	*0.071*	-0.001	*0.241*
Determinants (full model - when <u>outside</u> EMU): δ $(S_t * X_{i,t})$												
Domestic	-0.132	*0.151*	-0.459 *	*0.267*	-0.119	*0.145*	-0.128	*0.346*	-0.645	*0.942*	-4.492 ***	*1.421*
Euro area	0.246 **	*0.083*	0.333 ***	*0.047*	-0.004 ***	*0.001*	-0.003	*0.033*	0.954 *	*0.465*	1.638 ***	*0.520*
Non - euro area	0.129	*0.081*	0.229	*0.163*	-0.002 ***	*0.000*	0.088 **	*0.038*	0.607 ***	*0.195*	0.743	*0.635*
Determinants (full model - when <u>inside</u> EMU): λ $(S_t * X_{i,t} * CU_{i,t})$ + δ $(S_t * X_{i,t})$												
Domestic			0.202 *	*0.110*			-0.112	*0.170*			0.843	*0.839*
Euro area			0.136	*0.193*			-0.004 ***	*0.001*			0.597	*0.599*
Non - euro area			0.017	*0.126*			-0.002 ***	*0.000*			0.551 *	*0.289*
Significance												
Domestic: $\lambda^{dom} = 0$			*0.04* **				*0.97*				*0.01* **	
Euro area: $\lambda^{ea} = 0$			*0.36*				*0.97*				*0.18*	
Non-euro area: $\lambda^{nea} = 0$			*0.33*				*0.03* **				*0.82*	
Countries	16		16		16		16		16		16	
Obs.	1643		1643		1643		1643		1603		1603	
R^2	0.290		0.295		0.285		0.286		0.292		0.297	

Notes: See Table 4.

Table 7: Robustness – multiple determinants: controlling for financial openness

Determinant:	**Inflation**				**Fiscal balance**				**Government debt**			
	(1)		(2)		(3)		(4)		(5)		(6)	
Market reaction to:	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*
Shocks: β S_t												
Domestic	0.829 **	*0.289*	0.637 *	*0.347*	0.683 ***	*0.172*	0.496 *	*0.266*	1.039 ***	*0.159*	0.845 ***	*0.160*
Euro area	0.656 ***	*0.082*	0.636 ***	*0.081*	0.518 ***	*0.081*	0.540 ***	*0.096*	0.466 ***	*0.102*	0.581 ***	*0.084*
Non - euro area	0.656 ***	*0.111*	0.646 ***	*0.106*	0.598 ***	*0.081*	0.631 ***	*0.100*	0.419 ***	*0.082*	0.468 ***	*0.076*
EMU: γ $(S_t * CU_{i,t})$												
Domestic	0.005	*0.227*	0.893 *	*0.438*	0.065	*0.129*	0.412 *	*0.226*	-0.207	*0.232*	0.433	*0.379*
Euro area	0.199	*0.122*	0.339	*0.275*	0.227 **	*0.087*	0.195	*0.139*	0.256 *	*0.121*	-0.040	*0.255*
Non - euro area	-0.061	*0.087*	0.012	*0.151*	0.063	*0.075*	-0.144	*0.098*	-0.055	*0.088*	-0.175	*0.117*
Determinants (full model - when <u>outside</u> EMU): δ $(S_t * X_{i,t})$												
Domestic	0.134 **	*0.061*	0.166 **	*0.064*	-0.122 ***	*0.028*	-0.154 ***	*0.043*	0.558 **	*0.195*	0.917 ***	*0.200*
Euro area	-0.050 ***	*0.015*	-0.046 ***	*0.014*	0.011	*0.018*	0.020	*0.018*	0.012	*0.259*	-0.323 **	*0.142*
Non - euro area	-0.062 ***	*0.013*	-0.060 ***	*0.012*	0.045 ***	*0.011*	0.058 ***	*0.014*	0.089	*0.154*	-0.037	*0.145*
Determinants (full model - when <u>inside</u> EMU): λ $(S_t * X_{i,t} * CU_{i,t})$ + δ $(S_t * X_{i,t})$												
Domestic			-0.193 *	*0.110*			-0.025	*0.043*			-0.187	*0.542*
Euro area			-0.104	*0.088*			-0.015	*0.053*			0.350	*0.402*
Non - euro area			-0.092 *	*0.050*			0.010	*0.017*			0.219	*0.165*
Significance												
Domestic: $\lambda^{dom} = 0$			*0.02* **				*0.09* *				*0.07* *	
Euro area: $\lambda^{ea} = 0$			*0.52*				*0.56*				*0.13*	
Non-euro area: $\lambda^{nea} = 0$			*0.50*				*0.03* **				*0.07* *	
Countries	16		16		16		16		16		16	
Obs.	1643		1643		1643		1643		1615		1615	
R^2	0.303		0.305		0.300		0.303		0.298		0.303	

Notes: See Table 4, only that for the estimations for this table all models control, in a linear and a non-linear way, for the degree of financial market openness based on stock market capitalisation as shown in Table 6.

Table 8: Robustness – alternative starting point for EMU

Determinant:	**Inflation**				**Fiscal balance**				**Government debt**			
	(1)		(2)		(3)		(4)		(5)		(6)	
Market reaction to:	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*	coef.	*s.e.*
Shocks: β S_t												
Domestic	0.802 ***	*0.232*	0.729 ***	*0.223*	0.766 ***	*0.170*	0.661 ***	*0.183*	0.975 ***	*0.187*	0.754 ***	*0.148*
Euro area	0.845 ***	*0.090*	0.851 ***	*0.091*	0.684 ***	*0.071*	0.716 ***	*0.064*	0.642 ***	*0.109*	0.766 ***	*0.088*
Non - euro area	0.503 ***	*0.075*	0.467 ***	*0.073*	0.412 ***	*0.046*	0.461 ***	*0.034*	0.330 ***	*0.096*	0.469 ***	*0.081*
EMU: γ $(S_t * CU_{i,t})$												
Domestic	-0.027	*0.220*	0.663 *	*0.313*	0.046	*0.155*	0.350	*0.227*	-0.315	*0.217*	0.417	*0.310*
Euro area	0.229	*0.147*	0.163	*0.250*	0.272 *	*0.133*	0.214	*0.173*	0.330 **	*0.149*	0.096	*0.296*
Non - euro area	0.275 ***	*0.078*	0.572 ***	*0.152*	0.296 ***	*0.064*	0.210 *	*0.098*	0.343 ***	*0.099*	0.112	*0.232*
Determinants (full model - when <u>outside</u> EMU): δ $(S_t * X_{i,t})$												
Domestic	0.136 **	*0.053*	0.157 ***	*0.049*	-0.116 ***	*0.029*	-0.139 ***	*0.037*	0.657 ***	*0.168*	1.124 ***	*0.162*
Euro area	-0.065 ***	*0.018*	-0.066 ***	*0.018*	0.024	*0.016*	0.036 **	*0.015*	-0.076	*0.253*	-0.407 *	*0.221*
Non - euro area	-0.052 ***	*0.011*	-0.042 ***	*0.009*	0.030 **	*0.013*	0.047 ***	*0.007*	0.021	*0.214*	-0.329 *	*0.183*
Determinants (full model - when <u>inside</u> EMU): λ $(S_t * X_{i,t} * CU_{i,t})$ + δ $(S_t * X_{i,t})$												
Domestic			-0.120	*0.080*			-0.028	*0.038*			-0.142	*0.412*
Euro area			-0.039	*0.072*			-0.007	*0.054*			0.164	*0.353*
Non - euro area			-0.173 ***	*0.057*			-0.008	*0.034*			0.211	*0.277*
Significance												
Domestic: $\lambda^{dom} = 0$			*0.00* ***				*0.06* *				*0.02* **	
Euro area: $\lambda^{ea} = 0$			*0.72*				*0.50*				*0.23*	
Non-euro area: $\lambda^{nea} = 0$			*0.04* **				*0.12*				*0.16*	
Countries	16		16		16		16		16		16	
Obs.	1655		1655		1655		1655		1627		1627	
R^2	0.294		0.297		0.291		0.294		0.289		0.294	

Notes: See Table 4, only that the variable for EMU membership $CU_{i,t}$ is shifted to 1 January 1997 for the 12 euro area countries in the sample.