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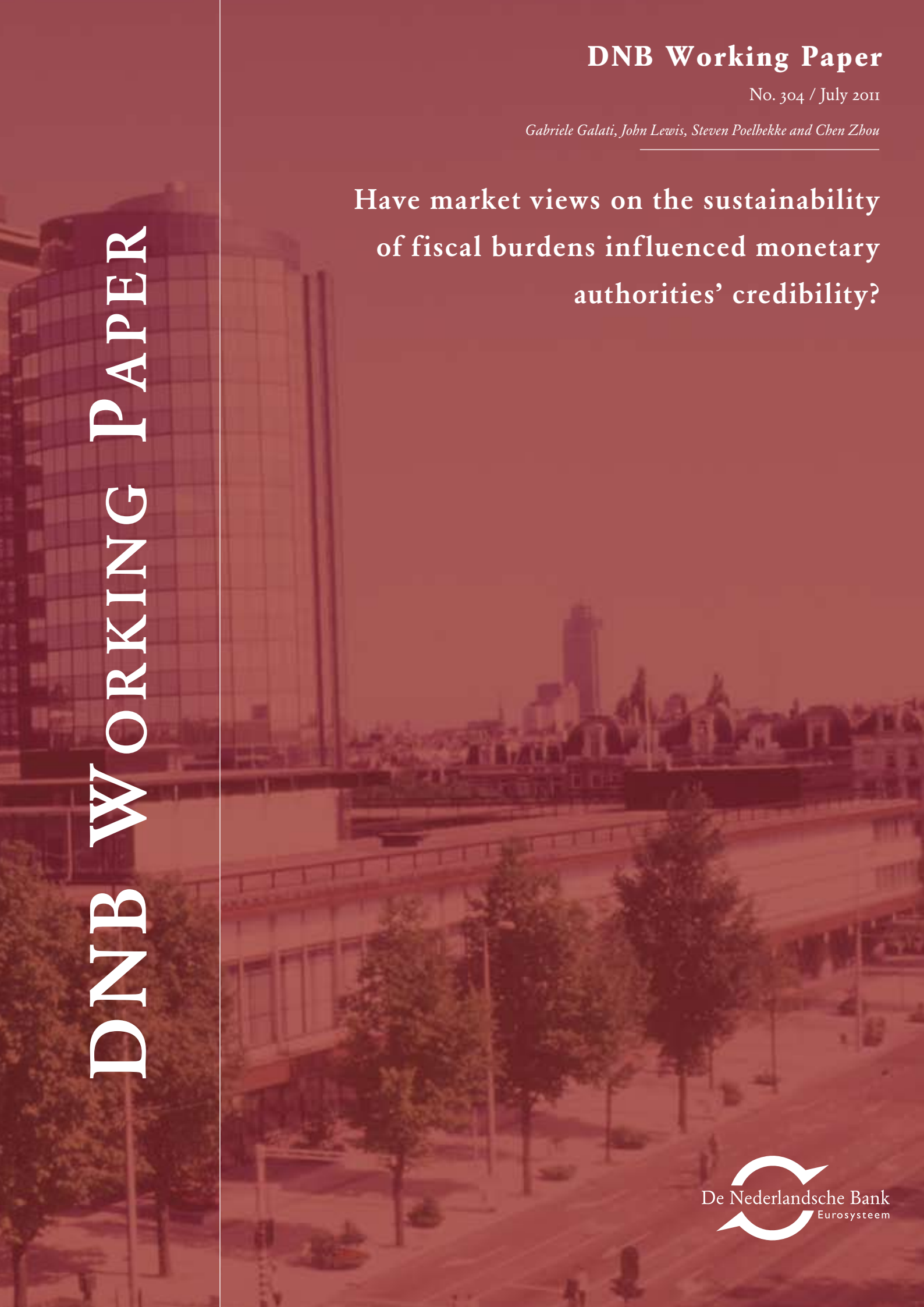

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* Views expressed are those of the authors and do not necessarily reflect official positions of De Nederlandsche Bank.

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Have market views on the sustainability of fiscal burdens influenced monetary authorities' credibility?

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Abstract

During the Great Crisis, most governments in industrial countries supported their domestic financial sector under stress and responded to strong declines in output growth with fiscal stimulus packages. Starting in 2010, attention focused on the sustainability of the resulting debt burdens. We conduct an empirical study to test whether in the United States, the euro area and the United Kingdom, views on the sustainability of fiscal burdens have influenced markets' assessment of central banks' commitment to price stability. Using a daily measure of inflation expectations extracted from nominal and indexed-linked government bonds, or inflation swaps, we test whether these react to alternative measures of fiscal burdens. These include rescue package announcements, credit default swap (CDS) spreads and changes in either the outlook or the credit rating of governments. We find no evidence of a significant effect of market participants' perceptions of fiscal burdens on long-term inflation expectations in the United States, the euro area and the United Kingdom. These results are broadly consistent with the view that long term inflation expectations have remained well anchored.

JEL Codes:

E31, E44, E52, H63, H68.

Key words: fiscal policy, monetary policy, inflation and inflation compensation, anchors for expectations, crisis.

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1. Introduction

Following the intensifying of the crisis after the collapse of Lehman Brothers in September 2008, governments in advanced countries supported their domestic financial sectors – through measures directed at individual institutions as well as system-wide programmes – and responded to a strong decline in output growth with fiscal stimuli. As a result, the government budget deficit in the United States, the euro area and the United Kingdom more than quadrupled between 2006 and 2010, and government debt increased sharply (Table 1). These rising debt burdens attracted increasing attention and culminated in the fiscal crisis that hit Greece and other euro area economies in 2010 and 2011.

As Reinhart and Sbrancia (2011) note, inflation played an important role in reducing high levels of debt in the period following WWII, in combination with "financial repression" (i.e. directed lending to the government by domestic financial institutions and other constraints on the domestic financial sector). That has led some to suggest reducing public debt through a period of moderate inflation as one way out of the fiscal crisis.[1]

One conjecture is that the accumulation of a large public debt, coupled with an unprecedented monetary easing through both conventional and non-standard monetary policies, may have affected market participants' confidence in the ability of central banks to keep inflation at target in the longer-run. Indeed, since the outbreak of the crisis, market commentary has pointed to the risk that central banks will be forced in the future to monetize at least part of governments' debt.[2] As William Dudley, President of the New York Fed, said in 2009:

"*There is some anxiety about the fiscal outlook. The fear is the Fed is going to monetise the debt, but that's just not going to happen. For now, I just don't see much in inflation expectations (in things like TIPS breakevens or the survey data).*"[3]

In this paper, we conduct an empirical analysis of this conjecture. We test whether the announcements of fiscal rescue packages or market views on fiscal sustainability proxied by credit default swap (CDS) spreads have influenced inflation expectations since the start of the crisis. In addition, we test whether sovereign credit rating changes have affected inflation expectations. We find no evidence of a significant effect of market participants' perceptions of fiscal burdens on long-term inflation expectations in the three currency areas we consider – the United States, the euro area and the United Kingdom. These results are broadly consistent with the view that long term inflation expectations have remained well anchored.

Our methodology is based on that of Gürkaynak et al. (2005) and Gürkaynak et al. (2010). The key hypothesis is that if long-run inflation expectations are perfectly anchored, they should not react to the arrival of news, but rather be stable around the central bank's target for inflation. A statistically

1 See e.g. Rogoff (2008).
2 See RGE Monitor (2010) for a useful summary.
3 Dudley (2009).

and economically significant reaction to fiscal news would instead indicate that the crisis has influenced market participants' perceptions of central banks' commitment to price stability in the light of increasing debt burdens.

We construct a database with daily frequency on announcements of rescue packages, CDS spreads and changes in credit rating agencies' assessments for the United States, the United Kingdom and countries in the euro area over the period 2007–2011. High frequency data has the twin advantages of generating a high number of observations, which enable the analysis of a relatively short period; and of allowing us to test for the reactions to specific policy measures which occurred within the short space of time that one might expect markets to respond to such news.

We gauge the effects of these fiscal measures or perceived fiscal burdens on measures of inflation expectations extracted from financial market instruments, which are now commonly used in the literature. Markets for inflation-indexed bonds and inflation swaps in these economies are very liquid in "normal" times and during the crisis have enjoyed sufficient liquidity to allow extracting "reasonable" measures of inflation compensation from them (Galati, Poelhekke and Zhou, 2011).

Our main empirical results are as follows. First, in all three economies, the impact of news on macroeconomic developments is generally very small in absolute terms and not statistically significant. Second, we find little evidence that market participants' perceptions of fiscal burdens had a negative impact on their views on monetary authorities' credibility in pursuing low and stable inflation. In particular, announcements of rescue packages, changes in CDS spreads, and changes in either the outlook or the credit rating of governments appear not to have pushed up long-term inflation expectations in a significant way. These results are consistent with the idea that long-term inflation expectations have remained well-anchored during the crisis, in line with the conclusions in Galati, Poelhekke and Zhou (2011).

The remainder of the paper is organised as follows. Section 2 provides a brief overview of the relevant literature on the relationship between fiscal policy and monetary policy, and on the anchoring of inflation expectations. Section 3 describes our data set on fiscal rescue packages, CDS spreads and rating agencies' assessments, as well as our measures of long-run inflation expectations backed out from financial instruments. Section 4 presents our empirical model and the main results. Section 5 concludes.

2. Literature review

This paper is related to three strands of research – the interaction of fiscal and monetary policy; the impact on asset prices of fiscal responses to the ongoing crisis; and studies on the anchoring of inflation expectations as measured by their sensitivity to economic news.

Fiscal and monetary policy interactions

The theoretical literature on fiscal threats to price stability can be traced back to Sargent and Wallace's seminal "Unpleasant Monetarist Arithmetic" (1981) article. In their model, the price level is always determined by monetary conditions, but either monetary or fiscal policy may be "dominant". If monetary policy dominates fiscal policy, the central bank follows a money supply rule, and hence the fiscal authorities' behaviour is constrained by the (exogenous) seignorage revenue and the amount they are able to borrow from the public. On the other hand, if fiscal policy dominates then inflation is ultimately related to the state of public finances – monetary policy must passively adjust to provide the sufficient seignorage revenue needed to keep government finances solvent. This provides a clear prediction we can test using our methodology – namely that under fiscal dominance, looser fiscal generates higher expected inflation in the longer run.

A different strand originated mostly in the 1990s which was centred on the Fiscal Theory of the Price Level (FTPL). This argued that unsustainable government finances lead to a situation in which the price level is fiscally determined and that even the most independent central bank can be powerless to control the price level (Leeper, 1991; Sims, 1994; Woodford 1994, 1995, 2001). In this paradigm, the equilibrium price level is that which deflates the nominal debt stock sufficiently to ensure the solvency of government finances. If the net present value of expected future real primary surpluses is less than real value of government debt, the price level then rises to ensure government solvency – regardless of the actions of the monetary authority.

Despite the well developed theoretical rationale(s) for fiscal threats to price stability, it is notable that the empirical literature on this topic is (to the best of our knowledge) rather scarce. There have been some attempts to test empirically the predictions of the Fiscal Theory of the Price Level (e.g. Canzoneri et al, 2001; Afonso, 2005, Bajo-Rubio et al, 2009), however these typically test for a reaction in current primary surpluses to expected future liabilities (i.e. whether fiscal policy appears to be Ricardian), rather than directly analysing the link between fiscal variables and longer term inflation expectations. Accordingly, our methodology provides a direct test of one of the central predictions of the FTPL.

The FTPL is not without its critics. In the context of this work, one pertinent criticism is that the FTPL does not admit the possibility of default. In a world where default is possible, a $100 T-bill would not necessarily exchange at par with $100 of currency issued by the government. For that reason, our empirical analysis also explicitly considers market perceptions of default risk as expressed in CDS spreads.

Another strand of the literature uses game theoretic tools to explore the ability of fiscal policy to affect the degree of commitment via the monetary authority. These studies typically use an optimizing framework, and assume complete cooperation with well defined social objectives (e.g. Benigno and Woodford, 2003; Schmitt-Grohe and Uribe, 2007; Dixit and Lambertini, 2003; Beetsma

and Jensen, 2004, 2005). Beetsma and Debrun (2004) provide an overview of the literature of monetary and fiscal interactions within a monetary union.

As Fragetta and Kirsanova (2010) note, the assumption of complete cooperation is not innocuous, as monetary authority might for example be more inflation-conservative than fiscal authorities. Papers based on non-cooperative models find that possible divergences between fiscal and monetary targets can lead to an interaction between monetary and fiscal authorities whose welfare implications depend on the leadership structure of the game between the two authorities. For example, an inflation-conservative central bank (Dixit and Lambertini, 2003) or non-leading fiscal authorities tilted towards output stabilization (Kirsanova et al., 2005) can lead to bad outcomes in a Nash game. The bottom line is that policy flexibility can be welfare reducing. In particular, a discretionary fiscal policy can offset the benefits to monetary commitment (Dixit and Lambertini, 2003), while the lack of monetary commitment can lead to looser fiscal policies in countries in a monetary union (Chari and Kehoe, 2003; Beetsma and Uhlig, 2003). An important aspect of this research for motivating our paper is that market participants may interpret a loosening of fiscal policies as undermining the credibility of the central bank, which in turn can lead to drifting inflation expectations.

Asset market reactions to fiscal responses to the crisis

The second line of research that is relevant for our paper is the fast growing literature on the impact of policy responses to the crisis on asset prices. These papers mostly have focused on the reaction of variables such as long-term bond yields or liquidity premia to announcements of large asset purchases by central banks or fiscal authorities' interventions in domestic banking systems.[4] They provide evidence on three main channels – announcement effects, a portfolio rebalancing channel, and the impact on market functioning and the liquidity premium.

There is general consensus that central bank and government actions tended to ease strains in financial markets.[5] One important transmission channel is announcement effects. D'Amico and King (2010) use a panel of daily Committee on Uniform Security Identification Procedures (CUSIP)-level data to investigate the impact of the Federal Reserve's program to purchase $300 billion of US Treasury coupon securities, which was announced and implemented during 2009. They find that each of the large-scale asset purchases (LSAP) tended to reduce overall yields by 3.5 basis points. Moreover, interventions in the Treasury market were followed by a persistent downward shift in the yield curve by 50 basis points – mostly for paper with a maturity between 10 and 15 years.

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4 See Attinasi et al. (2009) for an overview of the literature. For a recent analysis of the response of commodity prices to large asset purchases in the United States on commodity prices, see Glick and Leduc (2011).

5 Note that the empirical literature that looks at longer sample periods that include both crises and tranquil periods – summarized in Baldacci and Kumar (2010) – generally finds that fiscal deterioration tends to raise bond yields. Baldacci and Kumar (2010), e.g., document that over the period 1980–2008, fiscal deficit and fiscal debt systematically influenced long-term interest rates in both advanced and emerging market economies, with the precise magnitude dependent on initial fiscal, institutional and other structural conditions, as well as spillovers from global financial markets.

Attinasi et al. (2009) use a dynamic panel approach to show how the widening sovereign bond yield spreads vis-à-vis Germany in a number of euro area countries was influenced *inter alia* by government announcements of substantial bank rescue packages. They find that the announcements of bank rescue packages induced investors to reassess sovereign credit risk, mostly through a transfer of risk from the private financial sector to the government.

Aït-Sahalia et al. (2010) examine how interbank credit and liquidity risk premia responded to announcements of measures to support the financial sector or the domestic economy in the United States, the United Kingdom, the euro area and Japan during the recent crisis. They find that announcements of interest rate cuts, liquidity support, liability guarantees and recapitalization were associated with a reduction of interbank risk premia. The size of this impact is found to differ across the different phases of the crisis. By contrast, announcements of decisions not to ease policy rates or announcements of "ad hoc" bail-outs of individual banks were reflected in larger risk premia.

McAndrews et al. (2008) examine the effects of the Federal Reserve's Term Auction Facility (TAF) on the London Inter-Bank Offered Rate (LIBOR), and distinguish the role of announcements and of actual operations. They find that both announcements and actual operations are associated with downward shifts of the LIBOR, consistent with the idea that the TAF contributed to mitigating liquidity problems in the interbank funding market.

Greatrex and Rengifo (2010) analyze the response of US firms' CDS spreads to government interventions in the financial sector and the domestic economy. They find that announcements of financial sector policies and interest rate cuts tended to reduce perceived credit risk across a broad cross-section of firms. Using cross-sectional regressions, they also find that size, recent performance, profitability, and stock returns are main drivers of the response of financial markets to government actions.

There is also empirical evidence in support of a portfolio rebalancing channel. Joyce et al. (2010) analyses the reaction of financial markets to the Bank of England's quantitative easing policy on asset prices. They find that the quantitative easing programme may have reduced gilt yields by about 100 basis points. On balance, this reduction seems to have come mainly through a portfolio rebalancing channel.

Gagnon et al. (2011) present evidence that in the United States, the market functioning channel appears to have been important at the start of the LSAPs, while the primary long-run effects likely result from the portfolio channel. Neely (2010) also presents empirical results supporting the importance of a portfolio channel in United States. He documents that the Federal Reserve's LSAP of agency debt, MBSs and long-term US Treasuries were followed by lower long-term US bond yields and long-term foreign bond yields. This response of bond yields is arguably consistent with a simple portfolio choice model. He finds a significant influence on the dollar's exchange rate, which appears in line with the prediction of a UIP-PPP based model.

Shino and Takahashi (2010) document the rapid expansion of the sovereign CDS market in the wake of the fiscal crisis that erupted in early 2010, and investigate the link between CDS spreads and measures of fiscal burden. Interestingly, they find evidence that such a link is present but that its intensity varies across countries. In particular, in countries with a small amount outstanding of sovereign CDS – such as the United States, Japan and the United Kingdom – CDS premia did not affect government bond yields or fiscal premia (measured by the spread between the government bond yield and the overnight index swap rate). Shino and Takahashi infer that CDS premia in these countries are rather driven by speculative flows. By contrast, they find evidence of a strong link between CDS spreads and fiscal risk for Greece and Portugal, and, to a lesser extent, Italy and Spain. In addition, they also find that the co-movement of CDS premia among major countries has increased, suggesting that sovereign risk in some continental European countries may have spilled over to other countries.

In the context of this literature, our work complements these papers by examining whether the rescue packages carried at a cost of higher long-term inflation expectations.

Anchoring of inflation expectations

The third relevant line of research looks at the response of measures of inflation expectations to economic and policy news. Inflation expectations are extracted from inflation-indexed financial market instruments, and regressed on macroeconomic and policy variables at daily or intraday frequency (Swanson, 2006; Gürkaynak et al., 2005; Gürkaynak et al., 2006; Gürkaynak et al., 2010, Beechey et al., 2007). To the extent that short term news doesn't affect long term inflation expectations, expectations are said to be anchored.

One important advantage of measures of expectations extracted from financial instruments is their high frequency, which allows a detailed examination of how expectations have evolved over a relatively short horizon. Galati, Poelhekke and Zhou (2011) applied this empirical strategy to investigate whether the behaviour of long-term inflation expectations changed around the crisis.

One potential shortcoming of inflation measures based on financial instruments is that backing out the expectation component requires strong assumptions. The reason is that break-even rates, i.e. the difference between the yields of conventional and inflation-indexed bonds, can be decomposed into four main factors: expected inflation, an inflation risk premium, a liquidity premium, and technical factors (Hördahl, 2009).

In a short article that is closely related to our work, Guidolin and Neely (2010) test whether the announcements of the large-scale asset purchases of Treasuries and mortgage-backed securities by the Federal Reserve raised inflation expectations. They back out long-term inflation expectations from 10-year nominal government bonds yields and yields on Treasury Inflation-Protected Securities (TIPS), and examine their behaviour in two-day window around three announcements of LSAPs. They find on average a modest increase (by 7–18 basis points per annum) in inflation expectations

following these announcements. Guidolin and Neely argue that the total impact on inflation expectations may be larger but that it is difficult to identify this effect because of the role of liquidity factors. They conclude that to avoid the adverse consequences of deflation, a large monetary stimulus through unconventional tools can contribute to creating "healthy" (positive) inflation expectations, which may reduce real interest rates and thus promote growth.[6]

Our work adds to this literature by considering the role of fiscal news and rescue package announcements alongside the more traditional economic variables which typically feature in such work.

3. Data

Fiscal burden

We use three indicators to capture the fiscal burdens that result from measures in support of domestic financial institutions or fiscal stimuli to counter a strong decline in output growth.[7]

The first measure captures the announcement effect of financial rescue packages that result in an increased fiscal burden. This is derived from a new data set on announcements of support measures introduced by governments or central banks in the United States, the euro area and the United Kingdom between 15 September 2008 and 23 March 2011.[8] Information on these announcements was gathered mainly from events listed in Panetta et al. (2009), King (2009) and CGFS (2011), and from reports by Bloomberg, Reuters and the Financial Times. We use this to construct a s simple country specific dummy variable, coded to one on the day that a rescue package is announced, and zero otherwise. We then also construct a set of dummy variables which capture the type of rescue package – asset purchase, guarantee, contingent liability, capital injections, credit lines, and insurance.

Ideally one would like to have a measure which captures the size of financial commitment, but in practice that is difficult since the actual fiscal cost of a given measure is typically different from the headline amount.[9] To get round this possible shortcoming we also use two alternative measures of fiscal burdens, which are explained below.

The second measure is the CDS spreads on sovereign bonds, which more broadly reflects market views on the sustainability of fiscal burdens (see Figure 1).[10] As emphasised by Oh and Reis (2011), fiscal stimuli used to counter a strong decline in output growth rather than interventions in domestic financial sectors account for the bulk of the rapid rise in OECD countries' fiscal burden

6 For a general discussion on the desirability of unconventional monetary policy in preventing deflation, see Bullard (2010).
7 Ideally, we would have liked to also use the unexpected component of data releases on fiscal variables, similarly to the unexpected component of data releases for major macroeconomic variables. However, such data are not available.
8 Details about this data set are reported in Appendix 1.
9 For example the cost to a taxpayer of an asset purchase is the difference between the eventual value of the assets and the amount paid. Collecting data on even the expected costs was not practicable.
10 For a description of sovereign credit default swaps, see Packer and Suthipongchai (2003). Shino and Takahashi (2010) and Acharya et al. (2011) analyze the dynamics of sovereign CDS spreads during the crisis.

during the crisis years.[11] For the euro area, we look at both euro area CDS spreads and spreads of individual countries in the euro area. These data are taken from Datastream.

To the extent that CDS spreads broadly capture the risk of fiscal problems, a widening of CDS spreads would be associated with an increase in inflation expectations, which reflect increasing concerns about the central bank at least in part monetizing debt. There is however one important caveat in relying on this interpretation. Taken at face value, CDS spreads measure financial markets' pricing of sovereign default risk. An increased likelihood of default translates in a larger spread over the safe asset. Since default is one – albeit radical – way to reduce debt, it may be expected that higher probability of default translates to a lower probability of alternative ways of reducing debt, such as credible austerity measures or monetization. A widening CDS spread would then lead to lower inflation expectations. One justification for using CDS spreads as broad measures of fiscal burdens that capture also the risk of monetization is that historically, policymakers have tended to follow both monetization of debt and default at different stages during fiscal crises.

The third variable is the change in rating agencies' assessment of the credit-worthiness of governments of the United States, euro area countries and the United Kingdom. Information on these events is taken from Bloomberg.[12]

Measures of inflation expectations

For inflation expectations, we use a market based measure derived from inflation-indexed bonds or interest swaps, which are linked to a measure of domestic inflation. The main advantage over survey based measures of such a measure is that it permits inflation expectations to be measured at a very high frequency and hence permits the examination of market reactions to announcements of rescue packages or changes in CDS spreads.

To derive this measure we use Treasury Inflation Protected Securities (TIPS) and nominal bonds for the United States, and inflation-linked gilts and nominal gilts for the United Kingdom. For the euro area, we use inflation swaps because the market for inflation indexed bonds for different maturities is not as liquid as in the United States and the United Kingdom. These are among the most liquid inflation linked products (JP Morgan, 2008). For the United Kingdom, break-even rates are available from the Bank of England. For the euro area and the United States, underlying data were obtained from Bloomberg.

The method followed to extract long-term inflation expectations from inflation swaps for the euro area is similar that used in Galati, Poelhekke and Zhou (2011).[13] For long-run inflation

[11] A detailed account of the rise in public debt in OECD countries is provided by Furceri and Zdzienicka (2010).

[12] Aretzki et al. (2011) assess the impact of rating changes on European stock markets during the crisis, and find evidence of statistically and economically significant spillover effects of sovereign rating downgrades both across countries and financial markets.

[13] The approach for extracting inflation expectations from inflation indexed bonds in the United States or the United Kingdom is very similar. The main difference is that these are measured as the difference between zero-coupon forward rates of inflation-indexed bonds and those on nominal bonds.

expectations, we take the expected annual inflation rate from five to ten years out and measure expectations by the five-year zero coupon forward rate of inflation swaps. Formally, inflation expectations, ***f,*** from five to ten years out at time t, are given by:

$$(1) \qquad f_t = \left(\frac{(1+y_{10})^{10}}{(1+y_5)^5} \right)^{1/5} - 1 = \frac{(1+y_{10})^2}{1+y_5} - 1,$$

where y_5 and y_{10} are the 5-year and 10-year inflation swap rates, respectively.

This measure of long-term inflation expectations is now commonly used in monitoring markets for inflation indexed products. Compared to forward rates calculated from swap rates with 9- and 10-year maturities, it is less sensitive to noise introduced by differences in market liquidity across the yield curve.[14] Using daily data from September 2007 to March 2011, we obtain a daily measure of long-term inflation expectations. Figure 2 shows this measure together with announcements of rescue packages.

To capture economic "news", we follow a standard approach used in the literature and take the difference between the actual value of the first release of data and the markets prior forecast. Since markets should already have priced-in the expected value of the data release, the "forecast error" represents the additional information revealed by the publication of data. Data on surveys of market participants' expectations and data releases are taken from Bloomberg or JP Morgan Global Data Watch. To facilitate interpretation of the coefficients, surprises are normalised by the standard deviation of each series. Thus the coefficients in our tables represent the impact of a one standard deviation sized surprise in a given data release.

Since theory gives little guidance on which variables to include besides inflation, we use similar macroeconomic variables to Beechey et al. (2011) and Galati, Poelhekke and Zhou (2011). These include inflation, GDP growth, business confidence indicators, unemployment wage and wage growth. For the euro area we use data from the largest three economies – France, Germany and Italy – which together constitute more than half of the euro area's GDP. For a full description of variables used, please see Appendix 2.

4. Empirical methodology and results

In this section, we provide empirical evidence on whether the crisis has led long-term inflation expectations to drift in the wake of unsurpassed monetary and fiscal expansion. We estimate a regression equation that explains long-run inflation expectations in terms of a constant, measures of fiscal burdens, macroeconomic news and a set of control variables:

[14] Galati, Poelhekke and Zhou (2011) use forward rates calculated from swap rates with 9- and 10-year maturities and filter out this noise by estimating a yield curve model based on the method of Nelson and Siegel (1987).

(2) $$\Delta f_t = \alpha + \beta_1 RP_t + \beta_2 CDS_t + \beta_3 X_t + \beta_4 Z_t + \varepsilon_t$$

where our dependent variable $\Delta f_t = f_t - f_{t-1}$ is the change in inflation compensation five to ten years ahead. The change is computed between 5 p.m. at day *t-1* and 5 p.m. on day *t*. Since macroeconomic data are typically released at 8:30 am, before financial markets open, this measure captures the market reaction to the news releases on that day. RP_t is a binary variable that takes the value one on a day on which there is an announcement of a fiscal measures in support of the domestic financial sector, and zero otherwise. CDS_t is the change in the sovereign CDS spread on day t. For the euro area, we consider CDS spreads for the whole euro area or individual euro area countries. The explanatory variables X_t are a vector of macroeconomic news variables.

Z_t is a vector of control variables that captures the impact of short-term changes in drivers of inflation swap rates, nominal or inflation-index bonds – such as liquidity premia and technical factors – that are not related to inflation expectations. As in Galati, Poelhekke and Zhou (2011), we express these variables in first differences.[15] Our main control variable is the implied volatility of bond yields but we checked that our results were robust to using the Chicago Board Options Exchange Volatility Index (VIX); the euro bund implied volatility; the on-the-run off-the-run spread; and analogously for the euro area, the KfU-bund spread.[16]

We verified that all variables used in the regressions are stationary. Equation (4) is estimated using conventional OLS for the sample period 1 July 2007 – 23 March 2011. We chose OLS over heteroskedasticity-consistent standard errors because the latter can be misleading in the presence of explanatory variables – such as our macroeconomic news variables and our variable capturing rescue packages – which have a low proportion of non-zero values.[17]

Tables 2–4 report the estimates of equation (2) for the United States, the euro area and the United Kingdom, respectively.[18] Several important results stand out. First, the estimated coefficients of economic data releases are generally very small in absolute terms and not statistically significant, and the measures of fit are low (the R^2s range between 0.01 and 0.05).[19] This is consistent with the idea that long-term inflation expectations in the three economies have remained well-anchored during the crisis, as shown in Galati, Poelhekke and Zhou (2011).

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15 We also controlled for day-of-the-week effects but these turned out not to be statistically significant. For reasons of space, the results for these dummies are not reported here.

16 See Galati, Poelhekke and Zhou (2011) for details.

17 In any case, heteroscedasticity consistent standard errors are larger than OLS ones, and hence choosing OLS standard errors makes it more likely that we will find evidence of a significant reaction to fiscal news. Given that we find no evidence of a significant reaction, using heteroscedasticity consistent standard errors would reinforce our results.

18 All regression coefficients in the tables (except in Table 4) are multiplied by 100 to facilitate reading them. They show the response in basis points, rather than percentage points.

19 One exception is news on retail and food services in the United States, which have coefficients that are statistically significant at the 99% level, albeit very small.

Second, we find no evidence that announcements of rescue packages had an economically or statistically significant impact on long-run inflation expectations in the euro area or the United Kingdom. For the United States, we find a small statistically significant positive coefficient on rescue packages which suggests that on average, measures to support the domestic financial system or the macroeconomy were associated with slightly higher long-term inflation expectations. When we split interventions in support of financial institutions into large rescue packages and institution-specific interventions, we find that the former are mainly responsible for the overall impact on inflation expectations (see column 6 in Tables 2–4). Both the sign and the magnitude of this effect are in line with the impact of announcements of the Federal Reserve's large-scale asset purchases on long-term inflation expectations in the United States which is documented by Guidolin and Neely (2010).

Overall however, inflation expectations extracted from inflation-indexed bonds or inflation swaps appear to be much less responsive to the announcement of rescue packages compared to other financial variables examined in the literature, such as bond spreads, short-term interest rates or equity prices. One explanation for this is that, as emphasised by Oh and Reis (2011), most of the fiscal burdens that accumulated during the crisis came from automatic stabilizers rather than financial rescue packages. Another conjecture is that if markets were expecting larger packages than those announced, then the measures included in our data set implied a fiscal burden that was lower than what markets had previously expected and thereby provided "positive news" on fiscal policy.

Third, we find some evidence that a widening of CDS spreads – suggesting more negative market views on the sustainability of fiscal burdens – is associated with a decline in long-term inflation expectations in the three economies. This effect is statistically significant at the 95% level for the euro area and the United Kingdom, and at the 99% level for the United States. The finding of a statistically significant negative impact of CDS spreads on long-term inflation expectations in all three economic areas is puzzling but in economic terms it is very small (a fraction of a basis point). What is puzzling in the case of the euro area is that only the coefficients on CDS spreads for France are statistically significant, even though France does not stand out for its fiscal burden. By contrast, average CDS spreads of countries most affected by the fiscal crisis (Greece, Ireland and Portugal) are not statistically significant.[20] One conjecture is that a prolonged period of higher inflation in countries most affected by the crisis – Greece, Ireland and Portugal – would be unlikely to affect euro area inflation, given their small share in euro area GDP.

The lack of a response of inflation expectations to a change in CDS spreads that is both economically and statistically significant could reflect either a fundamental unresponsiveness of expectations to news about fiscal burdens or a mismeasurement of these news. To distinguish between the two interpretations, we tested whether our fiscal news measure is responded to by financial markets, and in particular whether changes in CDS spreads are associated with changes in equity

[20] CDS spreads for individual euro area countries are statistically significant (at the 95% or 99% level) but very small when we introduce them one by one in equation (2), as is the euro zone GDP weighted average CDS spread.

prices. Table 5 shows that in all three economic areas, stock markets react negatively to a widening of CDS spreads. This effect is highly statistically significant and much larger than the impact of CDS spreads on inflation expectations.

Fourth, changes in either the outlook or the credit rating of governments in the United States, the United Kingdom or countries in the euro area did not influence inflation expectations in a significant way (Tables 5–6). We do get a statistically significant (albeit economically small), positive coefficient on the first change in outlook for Greece, which occurred in October 2008, more than a year before turmoil in Greek sovereign bond markets erupted. We also get a statistically significant negative coefficient on the change of the outlook on Spain's sovereign debt from AA+ stable to AA+ negative on 30 June 2010 although this may reflect the influence of unexpectedly low euro area HICP data that were released on that day. Note that Aretzki et al. (2011) find that downgrades to near speculative grade ratings for economies such as Greece do have a significant effect on financial markets in the euro area. However, we are assessing the impact of rating changes on expectations of inflation for the whole euro area, which might be negligible because of the small share of countries like Greece in euro area GDP.

We then perform three robustness checks.[21] First, in line with the empirical set-up in Guidolin and Neely (2010), we allow for news on fiscal measures, as well as macroeconomic developments, to take more than one business day to influence market participants' perceptions. Tables 6–8 reports results for regressions for the three currency areas, where we allow news to affect inflation expectations for up to 6 days. In these regressions, our left hand side variable and all differenced explanatory variables represent the cumulative change over *n* days. For example, in columns (2) and (9) we take the difference of inflation expectations – and explanatory variables that are differenced – between the closing of the trading day before the morning when news arrives and the closing of the day after news arrives. In columns (3) and (10) we leave three days for the news to affect expectations, and so on. Tables 6–8 show that our conclusions are robust to allowing for a delayed response to any of the three measure of fiscal burden.

Second, for the euro area we check whether results change if CDS spreads of individual euro area countries are included one by one in regression equation (2). We find that estimating regressions with CDS spreads for one country at a time produces coefficients on CDS spreads that are very small, although sometimes statistically significant.[22] We conclude that in our sample, CDS spreads did not have a relevant influence on inflation expectations.

Finally, we also run our regressions over the shorter sample period January 2010 – March 2011, which coincides with a period of intensified pressure in sovereign debt markets in the euro area.

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21 In addition, since surprises in macro data releases tend to have heavy-tailed distributions, we checked that the results are not driven by the presence of outliers.

22 These results are not reported for reasons of space and are available upon request from the authors.

The results (not reported in detail here for reasons of space) are very similar to those we obtained for the full sample.

Overall, our results suggest that in July 2007–June 2011, measures taken by governments in support of their domestic financial sector under stress, and more generally the growing debt burdens that resulted from fiscal authorities' actions, did not lead markets to question monetary authorities' commitment to price stability. This is in line with market views that at the current juncture, "Inflation market valuations do not reflect the upside risks [in inflation]" (Heider, 2011). It suggests that discrete fiscal policy measures taken during the crisis did not offset the benefits to monetary commitment, as argued in papers that rely on non-cooperative models of monetary-fiscal interactions (e.g. Dixit and Lambertini, 2003).

5. Conclusions

In this paper we investigated whether the buildup of government debt, coupled with an unprecedented monetary easing through both conventional and non-standard monetary policies, may have affected market participants' confidence in the ability of central banks to keep inflation at target in the longer-run.

We followed the methodology of Gürkaynak et al. (2005) and Gürkaynak et al. (2010), who argue that if long-run inflation expectations are perfectly anchored, they should not react to the arrival of news but rather be stable around the central banks target for inflation. Statistically and economically significant evidence of a reaction to fiscal news would then indicate that the crisis has influenced market participants' perceptions of central banks' commitment to price stability in the light of the increasing debt burden in these economies.

Our approach consisted in testing whether the sensitivity of long-term inflation expectations to indicators of fiscal pressure in the United States, the euro area and the United Kingdom between 2007 and 2011. We constructed a data base of announcements of fiscal rescue packages, market views on fiscal sustainability proxied by CDS spreads, and changes in rating agencies' outlook or rating of government debt for the United States, the United Kingdom or countries in the euro area. We then gauged the effects of these fiscal measures or perceived fiscal burdens on measures of inflation expectations extracted from financial market instruments, which are now commonly used in the literature.

We found that news on macroeconomic developments did not have any sizeable impact on long-term inflation expectations in all three economies, consistently with the idea that expectations have remained well-anchored during the crisis. Moreover, we find no significant evidence that market participants' perceptions of fiscal burdens – proxied by announcements of rescue packages, CDS spreads, and changes in either the outlook or the credit rating of governments – led market participants to question monetary authorities' credibility in pursuing low and stable inflation. Our results suggest

that, in contrast to a pattern observed in many crises in the past, inflation appears not to be seen as playing an important role in reducing high levels of debt.

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Tables and Graphs

Table 1 Fiscal burdens, 2006–10

	United States		Euro area		United Kingdom	
	Fiscal balance	**Net debt**	**Fiscal balance**	**Net debt**	**Fiscal balance**	**Net debt**
2006	-2.0	41.9	-1.3	53.1	-2.6	43.1
2007	-2.7	42.6	-0.6	50.7	-2.7	43.9
2008	-6.5	48.4	-2.1	52.9	-4.9	52.0
2009	-12.7	59.9	-6.4	61.0	-10.3	68.3
2010	-10.6	64.8	-6.0	64.4	-10.4	77.2
Sources: IMF WEO and Fiscal Monitor.						

Table 2 Euro area long-term inflation expectations

1 July 2007 – 31 March 2011

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	inflation compensation 5-10 years ahead					
France Business Confidence overall indicator	0.17	0.17	0.17	0.10	0.10	0.10
	(0.61)	(0.61)	(0.61)	(0.61)	(0.61)	(0.61)
France GDP QoQ	0.40	0.40	0.40	0.35	0.37	0.36
	(1.06)	(1.06)	(1.06)	(1.05)	(1.05)	(1.05)
France Industrial Production MoM SA 2000=100	-1.24**	-1.23**	-1.24**	-1.27**	-1.27**	-1.27**
	(0.62)	(0.62)	(0.62)	(0.62)	(0.62)	(0.62)
France PPI MoM 2000=100	-0.15	-0.16	-0.16	-0.12	-0.06	-0.07
	(0.60)	(0.60)	(0.60)	(0.60)	(0.60)	(0.60)
France Unemployment rate SA	-0.76	-0.76	-0.75	-0.76	-0.78	-0.77
	(2.69)	(2.69)	(2.69)	(2.67)	(2.67)	(2.67)
France CPI 1 MoM European harmonized NSA	0.07	0.08	0.07	0.06	0.07	0.07
	(0.58)	(0.58)	(0.59)	(0.58)	(0.58)	(0.58)
Bundesbank Germany Current Account EUR SA	0.16	0.19	0.18	0.18	0.19	0.18
	(0.61)	(0.61)	(0.61)	(0.61)	(0.61)	(0.61)
Germany HICP MoN 2005=100	-0.03	-0.06	-0.07	-0.10	-0.10	-0.10
	(0.62)	(0.62)	(0.62)	(0.61)	(0.61)	(0.61)
IFO pan Germany business climate 2000=100	0.86	0.86	0.86	0.73	0.74	0.74
	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)
Germany Industrial production MoM SA 2000=100	0.59	0.60	0.60	0.55	0.55	0.55
	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)
Germany PPI MoM 1995=100	0.04	0.04	0.06	0.21	0.21	0.24
	(0.58)	(0.58)	(0.58)	(0.58)	(0.57)	(0.57)
Germany Unemployment rate SA	-0.89*	-0.88*	-0.89*	-0.92*	-0.92*	-0.91*
	(0.53)	(0.53)	(0.53)	(0.52)	(0.52)	(0.52)
ZEW Germany assessment of current situation	-0.32	-0.32	-0.37	-0.39	-0.33	-0.32
	(0.58)	(0.58)	(0.58)	(0.58)	(0.58)	(0.58)
Italy Business confidence 2000=100	-0.22	-0.22	-0.23	-0.20	-0.18	-0.21
	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)	(0.57)
Italy HICP MoM NSA 2005=100	0.34	0.34	0.39	0.32	0.28	0.30
	(0.58)	(0.58)	(0.58)	(0.58)	(0.58)	(0.58)
Italy Industrial Production MoM SA 2000=100	0.28	0.31	0.31	0.29	0.28	0.28
	(0.63)	(0.63)	(0.63)	(0.62)	(0.62)	(0.62)
Italy PPI manufacturing MoM 2000=100	-0.03	-0.03	-0.03	-0.02	-0.08	-0.07
	(0.58)	(0.58)	(0.58)	(0.57)	(0.58)	(0.58)
Italy Real GDP QoQ SA WDA	0.66	0.65	0.65	0.91	0.91	0.91
	(1.13)	(1.13)	(1.13)	(1.12)	(1.12)	(1.12)
Δ Implied Volatility (Euro-bund future continuous call)		0.34	0.34	0.32	0.31	0.32
		(0.35)	(0.35)	(0.35)	(0.35)	(0.35)
Δ VIX (CBOE SPX Volatility (New) – price index)		-0.30	-0.31	-0.20	-0.19	-0.19
		(0.35)	(0.35)	(0.35)	(0.35)	(0.35)
Rescue Packages euro area(DE, FR, IT, NL)	1.11	1.08				
	(0.97)	(0.97)				
Rescue Packages euro area (DE, FR, IT)			0.39	0.53		
			(1.16)	(1.15)		
Rescue Packages euro area (DE, FR, IT, NL, GR, IR, EU, ES)					0.99	
					(0.73)	
Large Rescue Packages euro area (DE, FR, IT, NL, GR, IR, EU, ES)						0.96
						(1.00)
Δ CDS spread Germany				0.11	0.11	0.11
				(0.11)	(0.11)	(0.11)
Δ CDS spread France				-0.24**	-0.24**	-0.24**
				(0.10)	(0.10)	(0.10)
Δ CDS spread Italy				-0.03	-0.03	-0.03
				(0.03)	(0.03)	(0.03)
Constant	-0.03	-0.02	-0.01	0.00	-0.02	-0.00
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Observations	979	979	979	979	979	979
R-squared	0.014	0.015	0.014	0.032	0.034	0.033

Notes: Coefficients of a regression explaining the day-to-day change in inflation compensation 5–10 years ahead. The coefficients denote the impact of each variable measured in basis points. Macroeconomic news variables are normalized by their full-sample standard deviation. Rescue packages are represented by a binary variable that takes the value one on a day on which there is an announcement of a fiscal measure in support of the domestic financial sector, and zero otherwise. CDS spreads are expressed as changes. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 3 US inflation expectations

1 July 2007 – 31 March 2011

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	inflation compensation 5-10 years ahead						
ISM Manufacturing PMI SA (value)	1.16	1.17	1.15	1.16	1.03	1.04	1.03
	(0.91)	(0.91)	(0.92)	(0.92)	(0.97)	(0.97)	(0.97)
US Personal Consumption Expenditure Core Price Index MoM SA	-0.23	-0.23	-0.22	-0.23	-0.38	-0.38	-0.38
	(0.93)	(0.93)	(0.94)	(0.94)	(1.05)	(1.05)	(1.05)
US Capacity Utilization % of Total Capacity SA	0.73	0.73	0.55	0.55	0.15	0.33	0.15
	(1.57)	(1.58)	(1.58)	(1.57)	(1.70)	(1.70)	(1.70)
Conference board consumer confidence SA 1985=100	0.31	0.31	0.32	0.31	0.36	0.36	0.36
	(0.93)	(0.93)	(0.93)	(0.93)	(1.02)	(1.01)	(1.01)
US Industrial Production MoM 2002=100 SA (rate)	-2.46	-2.46	-2.48	-2.48	-2.11	-2.09	-2.11
	(1.56)	(1.56)	(1.57)	(1.56)	(1.70)	(1.69)	(1.70)
US initial jobless claims SA	-1.58*	-1.59*	-1.60*	-1.59*	-1.82*	-1.81*	-1.81*
	(0.92)	(0.92)	(0.92)	(0.92)	(0.97)	(0.97)	(0.97)
Conference board US leading index MoM	0.78	0.78	0.73	0.73	0.97	1.03	0.98
	(0.93)	(0.93)	(0.93)	(0.93)	(1.01)	(1.01)	(1.01)
Federal Funds Target Rate	1.18	1.25	1.27	1.26	2.40*	2.38*	2.39*
	(1.10)	(1.12)	(1.13)	(1.12)	(1.30)	(1.30)	(1.30)
US new privately owned housing units started by structure total SAAR (units/thou	-0.85	-0.86	-0.86	-0.86	-1.03	-1.03	-1.03
	(0.93)	(0.93)	(0.94)	(0.93)	(1.03)	(1.03)	(1.03)
US Employees on Nonfarm payrolls total MoM Net Change SA (thousands)	-0.06	-0.04	-0.09	-0.10	-0.48	-0.42	-0.48
	(0.93)	(0.93)	(0.93)	(0.93)	(1.03)	(1.02)	(1.03)
Adjusted retail & food services SA total monthly % change	3.44***	3.47***	3.47***	3.47***	3.74***	3.74***	3.74***
	(0.93)	(0.94)	(0.94)	(0.94)	(1.01)	(1.01)	(1.01)
US unemployment rate total in labor force SA	0.24	0.27	0.27	0.28	0.54	0.53	0.54
	(0.95)	(0.95)	(0.95)	(0.95)	(1.01)	(1.01)	(1.01)
Δ Implied Volatility (Euro-bund future continuous call)		-0.17	-0.17	-0.19	-0.31	-0.29	-0.31
		(0.60)	(0.60)	(0.60)	(0.65)	(0.65)	(0.65)
Δ VIX (CBOE SPX Volatility (New) – price index)		0.32	0.27	0.28	0.54	0.58	0.54
		(0.60)	(0.60)	(0.60)	(0.65)	(0.64)	(0.65)
Rescue Packages US	3.86**	3.89**				3.87**	
	(1.68)	(1.68)				(1.77)	
Withdrawal of Rescue Packages US			-3.18				
			(3.12)				
Large Rescue Packages US				7.17**			7.11*
				(3.59)			(3.77)
Δ CDS spread US					-0.35***	-0.35***	-0.35***
					(0.10)	(0.10)	(0.10)
Constant	-0.03	-0.04	0.03	-0.00	0.02	-0.04	-0.00
	(0.20)	(0.21)	(0.20)	(0.20)	(0.23)	(0.23)	(0.23)
Observations	939	939	939	939	827	827	827
R-squared	0.032	0.033	0.028	0.031	0.045	0.050	0.049

Notes: Coefficients of a regression explaining the day-to-day change in inflation compensation 5–10 years ahead. The coefficients denote the impact of each variable measured in basis points. Macroeconomic news variables are normalized by their full-sample standard deviation. Rescue packages are represented by a binary variable that takes the value one on a day on which there is an announcement of a fiscal measure in support of the domestic financial sector, and zero otherwise. CDS spreads are expressed as changes. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 4 UK inflation expectations

1 July 2007 – 31 May 2011

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	inflation compensation 5-10 years ahead						
UK Manufacturing PMI Markit survey ticker	-0.45	-0.46	-0.48	-0.48	-0.50	-0.48	-0.50
	(0.51)	(0.51)	(0.51)	(0.51)	(0.54)	(0.54)	(0.54)
UK industrial production MoM SA	0.15	0.18	0.18	0.18	0.22	0.22	0.22
	(0.50)	(0.50)	(0.50)	(0.50)	(0.53)	(0.53)	(0.53)
UK CPI EU harmonized MoM NSA	0.46	0.46	0.46	0.46	0.75	0.75	0.75
	(0.71)	(0.71)	(0.71)	(0.71)	(0.75)	(0.75)	(0.75)
UK retail prices index MoM NSA	0.61	0.60	0.60	0.60	0.77	0.77	0.77
	(0.68)	(0.68)	(0.68)	(0.68)	(0.74)	(0.74)	(0.74)
UK Nationwide consumer confidence Index SA	-0.08	0.04	0.04	0.04	-0.01	-0.02	-0.01
	(0.63)	(0.64)	(0.64)	(0.64)	(0.66)	(0.66)	(0.66)
UK unemployment claimant count monthly change SA	-0.73	-0.74	-0.74	-0.74	-0.81	-0.81	-0.81
	(0.75)	(0.75)	(0.75)	(0.75)	(0.81)	(0.81)	(0.81)
UK claimant count (unemployment) rate SA	0.61	0.62	0.62	0.62	0.71	0.71	0.71
	(0.78)	(0.78)	(0.78)	(0.78)	(0.86)	(0.86)	(0.86)
BoE official bank rate	0.19	0.21	0.24	0.19	0.19	0.16	0.19
	(0.51)	(0.51)	(0.51)	(0.56)	(0.52)	(0.53)	(0.58)
UK chained GDP at market prices QoQ	1.37	1.37	1.37	1.37	1.49	1.49	1.49
	(1.00)	(1.00)	(1.00)	(1.00)	(1.04)	(1.04)	(1.04)
UK Retail Sales All Retailing	0.99**	0.99**	0.99**	0.99**	1.02*	1.02*	1.02*
	(0.50)	(0.50)	(0.50)	(0.50)	(0.52)	(0.52)	(0.52)
UK PPI Manufactured Products M	0.09	0.11	0.11	0.11	0.12	0.12	0.12
	(0.50)	(0.50)	(0.50)	(0.50)	(0.53)	(0.53)	(0.53)
UK Avg Earnings Whole Economy	-0.63	-0.65	-0.65	-0.65	-0.66	-0.66	-0.66
	(0.66)	(0.66)	(0.66)	(0.66)	(0.70)	(0.70)	(0.70)
Δ Implied Volatility (Euro-bund future continuous call)		0.62*	0.63*	0.63*	0.67*	0.67*	0.67*
		(0.33)	(0.33)	(0.33)	(0.34)	(0.35)	(0.35)
Δ VIX (CBOE SPX Volatility (New) – price index)		-0.27	-0.27	-0.28	-0.26	-0.25	-0.26
		(0.33)	(0.33)	(0.33)	(0.35)	(0.35)	(0.35)
Rescue Packages UK	-0.69	-0.54				-0.51	
	(1.17)	(1.17)				(1.21)	
Withdrawal of Rescue Packages UK			0.21				
			(1.54)				
Large Rescue Package UK				-0.78			-0.06
				(3.82)			(3.98)
Δ CDS spread UK					-0.09**	-0.09**	-0.09**
					(0.04)	(0.04)	(0.04)
Constant	0.02	0.02	0.01	0.01	0.00	0.01	0.00
	(0.11)	(0.11)	(0.11)	(0.11)	(0.12)	(0.12)	(0.12)
Observations	951	951	951	951	855	855	855
R-squared	0.015	0.019	0.018	0.018	0.027	0.027	0.027

Notes: Coefficients of a regression explaining the day-to-day change in inflation compensation 5–10 years ahead. The coefficients denote the impact of each variable measured in basis points. Macroeconomic news variables are normalized by their full-sample standard deviation. Rescue packages are represented by a binary variable that takes the value one on a day on which there is an announcement of a fiscal measure in support of the domestic financial sector, and zero otherwise. CDS spreads are expressed as changes. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5 Equity prices, rescue packages and CDS spreads

	Euro area	US	UK
Dependent variable	DAX	DJ COMP	FTSE
Rescue Packages EZ (DE, FR, IT)	-7.68		
	(26.90)		
Rescue Packages US		-5.31	
		(15.07)	
Rescue Packages UK			-3.89
			(12.77)
Δ CDS spread Germany	-2.06		
	(2.64)		
Δ CDS spread France	-6.14***		
	(2.34)		
Δ CDS spread Italy	-2.61***		
	(0.64)		
Δ CDS spread US		-2.99***	
		(0.88)	
Δ CDS spread UK			-3.11***
			(0.41)
Constant	-0.37	-0.17	0.13
	(2.85)	(1.92)	(1.29)
Observations	979	862	882
R-squared	0.120	0.040	0.099

Notes: Coefficients of a regression explaining the day-to-day change in equity price indices in the euro area (DAX), the United States (Dow Jones Composite) or the United Kingdom (FTSE). The coefficients denote the impact of each variable measured in percentage points. Macroeconomic news variables – not reported – are normalized by their full-sample standard deviation. Rescue packages are represented by a binary variable that takes the value one on a day on which there is an announcement of a fiscal measure in support of the domestic financial sector, and zero otherwise. CDS spreads are expressed as changes. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6 Euro area inflation expectations, regressions with changes in ratings and outlook

1 July 2007 – 31 March 2011

VARIABLES	(1)	(2)	(3)	(4)	(5)
	inflation compensation 5-10 years ahead				
Δ CDS spread de	0.12	0.14		0.14	0.17
	(0.11)	(0.11)		(0.11)	(0.11)
Δ CDS spread fr	-0.24**	-0.23**		-0.26***	-0.25**
	(0.10)	(0.10)		(0.10)	(0.10)
Δ CDS spread it	-0.03	-0.00		-0.03	0.00
	(0.03)	(0.04)		(0.03)	(0.04)
Δ CDS spread es		-0.02			-0.04
		(0.04)			(0.04)
Δ CDS spread pt		0.01			0.01
		(0.02)			(0.02)
Δ CDS spread gr		0.00			0.00
		(0.01)			(0.01)
Δ CDS spread ir		-0.03			-0.03
		(0.02)			(0.02)
GR-, A pos A stable (20-10-2008)			14.87***	15.14***	15.19***
			(3.84)	(3.81)	(3.81)
GR-, A stable to A neg			-4.12	-4.19	-4.32
			(3.90)	(3.87)	(3.87)
GR-, A neg to A- neg			-0.65	-0.41	-0.35
			(3.79)	(3.76)	(3.76)
GR-, A- neg to BBB+ neg			-1.50	-1.13	-1.29
			(3.88)	(3.85)	(3.85)
GR-, BBB+ neg to BBB- neg			-3.92	-4.49	-4.63
			(3.77)	(3.74)	(3.75)
GR-, BBB- neg to BBB- rate watch negative			-0.19	0.16	0.04
			(3.76)	(3.73)	(3.75)
GR-, BBB- rate watch negativeg to BB+ neg			-0.90	-1.54	-1.78
			(3.80)	(3.77)	(3.79)
IR-, AAA stable to AAA rate watch negative			5.33	5.53	5.32
			(3.76)	(3.73)	(3.74)
IR-, AA+ neg to AA- stable			2.31	2.25	2.30
			(3.76)	(3.72)	(3.72)
IR-, AA- stable to A+ neg			2.97	2.73	3.03
			(3.76)	(3.72)	(3.73)
IR-, A+ neg to BBB+ stable			1.81	2.96	3.33
			(3.76)	(3.74)	(3.76)
PRT-, AA stable to AA neg			2.84	2.87	3.11
			(3.77)	(3.74)	(3.75)
PRT-, AA neg to AA- neg			-2.91	-2.48	-2.62
			(3.86)	(3.83)	(3.83)
PRT-, AA- neg to A+ neg			1.01	1.47	1.31
			(3.76)	(3.72)	(3.74)
PRT-, A+ neg to A- rate watch negative			-4.01	-4.03	-3.93
			(3.88)	(3.85)	(3.86)
ES-, AAA stable to AA+ stable			3.68	2.69	2.70
			(3.76)	(3.74)	(3.75)
ES-, AA+ stable to AA+ neg			-16.01***	-16.30***	-16.55***
			(3.76)	(3.73)	(3.74)
Constant	0.01	0.02	-0.01	0.01	0.02
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Observations	979	979	979	979	979
R-squared	0.032	0.034	0.056	0.076	0.079

Notes: Coefficients of a regression explaining the day-to-day change in inflation compensation 5–10 years ahead. The coefficients denote the impact of each variable measured in basis points. The regressions also include macroeconomic news variables (normalized by their full-sample standard deviation) and variables capturing volatility in bond and stock markets. CDS spreads are expressed as changes. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7 Euro area inflation expectations

1 July 2007 – 23 March 2011

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	inflation compensation 5-10 years ahead													
Differencing on number of days:	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Rescue Packages euro area (DE, FR, IT)	0.39	1.93	2.25	1.84	0.50	3.22	3.80							
	(1.16)	(1.46)	(1.71)	(1.95)	(2.12)	(2.26)	(2.42)							
GR-, A pos A stable								15.19***	14.29***	19.95***	15.16**	12.33*	9.18	0.63
								(3.81)	(4.80)	(5.62)	(6.45)	(6.99)	(7.47)	(7.98)
GR-, A stable to A neg								-4.32	-8.99*	-11.46**	-14.98**	-14.80**	-12.14	-12.19
								(3.87)	(4.90)	(5.74)	(6.54)	(7.05)	(7.56)	(8.10)
GR-, A neg to A- neg								-0.35	-0.40	-1.47	-3.05	-3.60	-1.45	-0.39
								(3.76)	(4.73)	(5.53)	(6.32)	(6.81)	(7.32)	(7.85)
GR-, A- neg to BBB+ neg								-1.29	-0.96	-2.39	1.62	0.39	0.21	1.70
								(3.85)	(4.86)	(5.67)	(6.48)	(6.99)	(7.51)	(8.05)
GR-, BBB+ neg to BBB- neg								-4.63	-2.61	-6.90	-4.15	-4.55	-6.86	-9.19
								(3.75)	(4.74)	(5.53)	(6.32)	(6.82)	(7.35)	(7.87)
GR-, BBB- neg to BBB- rate watch negative								0.04	0.66	2.19	2.32	-0.45	1.23	5.64
								(3.75)	(4.71)	(5.51)	(6.30)	(6.78)	(7.29)	(7.81)
GR-, BBB- rate watch negativeg to BB+ neg								-1.78	0.46	12.81**	-6.72	-4.41	-0.62	-2.54
								(3.79)	(4.77)	(5.57)	(6.37)	(6.87)	(7.39)	(7.95)
IR-, AAA stable to AAA rate watch negative								5.32	9.35**	6.71	7.14	11.24*	12.03*	6.67
								(3.74)	(4.71)	(5.50)	(6.30)	(6.78)	(7.30)	(7.86)
IR-, AA+ neg to AA- stable								2.30	4.14	5.90	2.59	1.94	0.93	1.62
								(3.72)	(4.71)	(5.52)	(6.32)	(6.75)	(7.36)	(7.89)
IR-, AA- stable to A+ neg								3.03	3.51	6.56	7.13	8.69	13.52*	13.12*
								(3.73)	(4.70)	(5.51)	(6.30)	(6.90)	(7.28)	(7.81)
IR-, A+ neg to BBB+ stable								3.33	7.12	3.97	5.33	2.12	5.29	9.91
								(3.76)	(4.77)	(5.52)	(6.28)	(6.77)	(7.27)	(7.80)
PRT-, AA stable to AA neg								3.11	2.32	0.95	3.14	5.70	2.66	0.06
								(3.75)	(4.77)	(5.58)	(6.27)	(6.91)	(7.36)	(7.98)
PRT-, AA neg to AA- neg								-2.62	-3.34	-2.86	-6.83	-7.32	-6.67	-6.33
								(3.83)	(4.83)	(5.65)	(6.46)	(6.95)	(7.48)	(8.02)
PRT-, AA- neg to A+ neg								1.31	1.69	-0.77	0.73	4.98	-2.35	6.10
								(3.74)	(4.71)	(5.50)	(6.27)	(6.77)	(7.28)	(7.80)
PRT-, A+ neg to A- rate watch negative								-3.93	-2.31	-7.06	-5.02	9.63	13.59*	
								(3.86)	(4.86)	(5.67)	(6.49)	(7.01)	(7.53)	
ES-, AAA stable to AA+ stable								2.70	-1.78	7.51	9.52	7.32	9.67	8.29
								(3.75)	(4.71)	(5.50)	(6.30)	(6.81)	(7.37)	(7.94)

Table 7 (continued) Euro area inflation expectations

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	inflation compensation 5-10 years ahead													
Differencing on number of days:	1	2	3	4	5	6	7	1	2	3	4	5	6	7
ES-, AA+ stable to AA+ neg								-16.55***	-15.17***	-15.70***	-17.61***	-21.92***	-18.66**	-23.37***
								(3.74)	(4.73)	(5.52)	(6.28)	(6.78)	(7.28)	(7.81)
Δ CDS spread de								0.17	0.01	0.09	0.21**	0.25**	0.19*	0.27***
								(0.11)	(0.11)	(0.10)	(0.11)	(0.10)	(0.10)	(0.10)
Δ CDS spread fr								-0.25**	-0.19**	-0.21**	-0.30***	-0.32***	-0.25***	-0.31***
								(0.10)	(0.09)	(0.09)	(0.10)	(0.10)	(0.10)	(0.10)
Δ CDS spread it								0.00	-0.00	-0.00	0.01	0.03	0.03	0.03
								(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Δ CDS spread es								-0.04	-0.01	-0.00	0.00	-0.01	-0.02	-0.01
								(0.04)	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
Δ CDS spread pt								0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02
								(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Δ CDS spread gr								0.00	0.00	0.00	0.00	0.00	0.00	0.00
								(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Δ CDS spread ir								-0.03	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02
								(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	-0.01	-0.05	-0.04	-0.04	-0.05	-0.07	-0.11	0.02	0.01	0.04	0.11	0.10	0.13	0.19
	(0.12)	(0.16)	(0.18)	(0.21)	(0.23)	(0.24)	(0.26)	(0.12)	(0.15)	(0.18)	(0.21)	(0.22)	(0.24)	(0.26)
Observations	979	978	977	976	975	974	973	979	978	977	976	975	974	973
R-squared	0.014	0.026	0.034	0.032	0.039	0.046	0.033	0.079	0.085	0.106	0.100	0.113	0.109	0.098

Notes: Coefficients of a regression explaining the day-to-day change in inflation compensation 5–10 years ahead. The coefficients denote the impact of each variable measured in basis points. The regressions also include macroeconomic news variables (normalized by their full-sample standard deviation) and variables capturing volatility in bond and stock markets. CDS spreads are expressed as changes. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Differencing on number of days: the numbers mean the amount of days we allow for the news to affect inflation expectations. All differenced variables are changed accordingly. For example, in columns (2) and (9) we take the difference of inflation expectations between the closing of the trading day before the morning when news arrives and the closing of the day after news arrives. The RHS variables are differences in the same way. In columns (3) and (10) we take as closing day the day two days after news arrives leaving three days for the news to affect expectations, and so on. The sample end date is 22 April when differencing on 7 business days.

Table 8 US inflation expectations, 1 July 2007 – 23 March 2011

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	inflation compensation 5-10 years ahead													
Differencing on number of days:	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Rescue Packages US	3.89**	6.38**	7.16**	9.86***	9.76**	11.24**	13.43***							
	(1.68)	(2.54)	(3.25)	(3.77)	(4.27)	(4.65)	(4.97)							
Δ CDS spread US								-0.35***	-0.55***	-0.63***	-0.57***	-0.52***	-0.45***	-0.37***
								(0.10)	(0.11)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Constant	-0.04	-0.03	-0.02	-0.05	-0.05	-0.09	-0.10	0.02	0.09	0.16	0.19	0.20	0.18	0.20
	(0.21)	(0.31)	(0.40)	(0.46)	(0.52)	(0.57)	(0.61)	(0.23)	(0.34)	(0.44)	(0.51)	(0.58)	(0.64)	(0.69)
Observations	939	938	937	936	935	934	933	827	826	825	824	823	822	821
R-squared	0.033	0.042	0.028	0.053	0.050	0.049	0.043	0.045	0.065	0.057	0.074	0.067	0.061	0.048

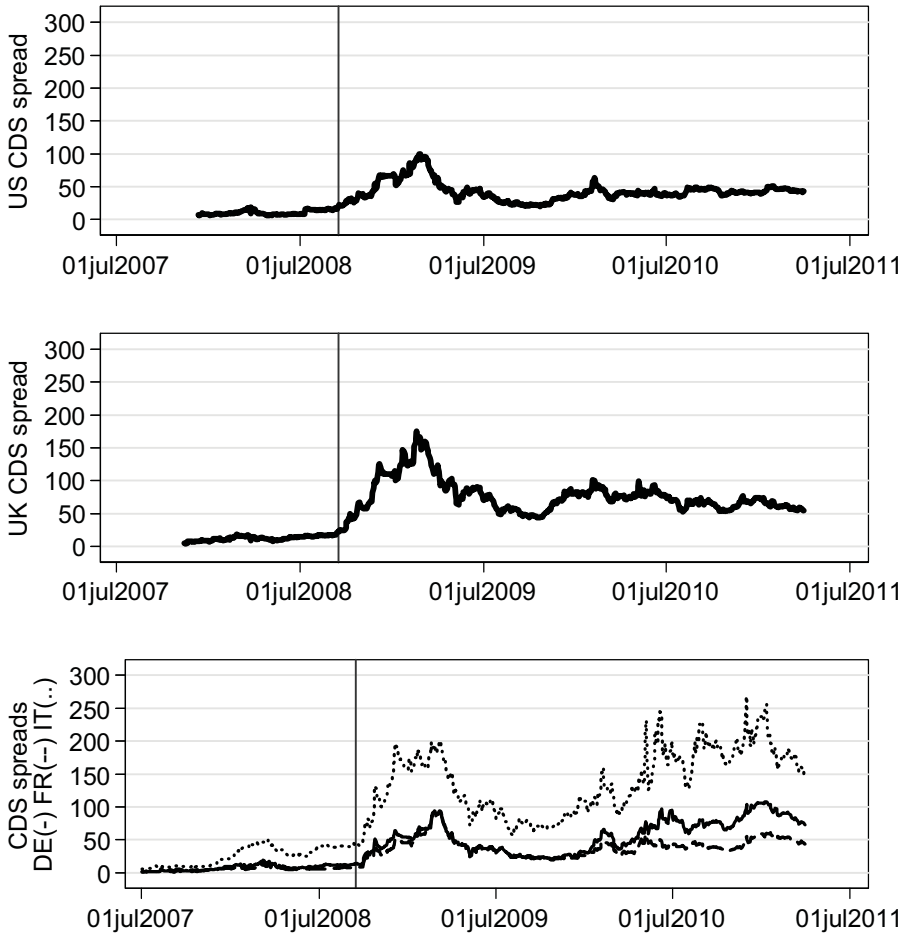
Notes: Coefficients of a regression explaining the day-to-day change in inflation compensation 5–10 years ahead. The coefficients denote the impact of each variable measured in basis points. The regressions also include macroeconomic news variables (normalized by their full-sample standard deviation) and variables capturing volatility in bond and stock markets. CDS spreads are expressed as changes. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Differencing on number of days: see notes in Table 5. The sample end date is 27 April when differencing on 7 business days.

Table 9 UK inflation expectations, 30 June 2007–23 March 2011

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	inflation compensation 5-10 years ahead													
Differencing on number of days:	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Rescue Packages UK	-0.54	0.60	-1.20	-0.25	-1.92	-3.29	-8.70*							
	(1.17)	(1.93)	(2.58)	(3.13)	(3.59)	(4.05)	(4.45)							
Δ CDS spread UK								-0.09**	-0.10**	-0.10**	-0.09*	-0.08	-0.07	-0.06
								(0.04)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Constant	0.02	0.02	0.09	0.11	0.12	0.15	0.24	0.00	0.00	0.05	0.08	0.07	0.06	0.09
	(0.11)	(0.19)	(0.25)	(0.30)	(0.35)	(0.40)	(0.43)	(0.12)	(0.21)	(0.28)	(0.34)	(0.39)	(0.44)	(0.48)
Observations	951	950	949	948	947	946	945	855	854	853	852	851	850	849
R-squared	0.019	0.027	0.024	0.017	0.028	0.021	0.023	0.027	0.034	0.030	0.023	0.032	0.024	0.022

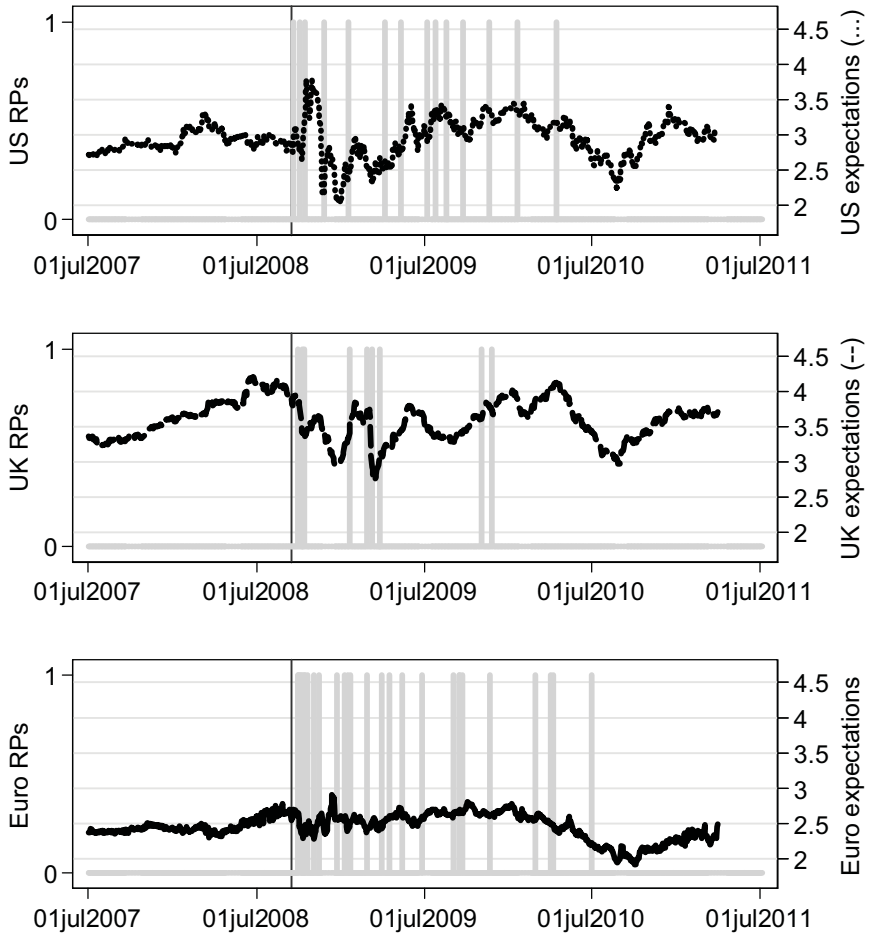
Notes: Coefficients of a regression explaining the day-to-day change in inflation compensation 5–10 years ahead. The coefficients denote the impact of each variable measured in basis points. The regressions also include macroeconomic news variables (normalized by their full-sample standard deviation) and variables capturing volatility in bond and stock markets. CDS spreads are expressed as changes. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Differencing on number of days: see notes in Table 5. The sample end date is 22 April when differencing on 7 business days.

Figure 1 Credit default swap spreads



Notes: Credit default swap spreads on sovereign bonds. The vertical line is drawn at 15 September 2008, when Lehman Brothers filed for Chapter 11 bankruptcy protection.
Source: Datastream.

Figure 2 Inflation expectations and rescue packages



Notes: Long-term inflation expectations are derived from TIPS and nominal bonds for the United States, from inflation-linked gilts and nominal gilts for the United Kingdom, and from inflation swaps for the euro area. For the United Kingdom, break-even rates are taken from the Bank of England's website. For the euro area and the United States, underlying data were obtained from Bloomberg. The vertical line is drawn at 15 September 2008, when Lehman Brothers filed for Chapter 11 bankruptcy protection. A list of rescue packages is provided in Appendix 1.

Appendix 1: Rescue packages

Date	Amount	Currency	Country	Remark	Large	AP	CI	CL	FG	DG	IN
9/19/2008		USD	US	US Treasury announces purchase of illiquid assets from banks under TARP	1	0	1	0	0	0	0
9/29/2008	16bn	USD	EM	NL, BE, LX Fortis injection		0	1	0	0	0	0
9/29/2008		GBP	UK	Bradford & Bingley is nationalised by the UK government		0	1	0	0	0	0
9/30/2008		EUR	IE	Irish Government enacts legislation on bank liability guarantees	1	0	0	0	1	0	0
9/30/2008	6bn	EUR	EM	FR, LX Dexia injection		0	1	0	0	0	0
10/3/2008	700bn	USD	US	US Congress approves the revised TARP.	1	0	1	0	0	0	0
10/3/2008		EUR	NL	Dutch assets of Fortis are nationalised.		0	1	0	0	0	0
10/6/2008	50bn	EUR	DE	German government provides emergency credit facility to Hypo Real Estate Group		0	0	1	0	0	0
10/8/2008		GBP	UK	UK government announces recapitalisations and debt guarantees for banks	1	0	1	0	1	0	0
10/9/2008		EUR	NL	Dutch government announces recapitalisation of banks		0	1	0	0	0	0
10/9/2008	150bn	EUR	EM	BE, FR, LX debt guarantee for Dexia		0	0	0	1	0	0
10/13/2008		EUR	DE	Recapitalisation of banks and fund to purchase bank assets	1	1	1	0	1	0	0
10/13/2008		EUR	FR	Recapitalisation of banks	1	0	1	0	1	0	0
10/13/2008		GBP	UK	Recapitalisation for 3 banks		0	1	0	0	0	0
10/14/2008		EUR	NL	Dutch govt announced debt guarantee scheme	1	0	0	0	1	0	0
10/14/2008	250bn	USD	US	Recapitalisation with TARP funds, Temporary Liquidity Guarantee Program, purchase preferred shares	1	0	1	0	1	0	0
10/20/2008	10bn	EUR	NL	Dutch government buys preferred shares in ING		0	1	0	0	0	0
10/20/2008		EUR	FR	French government announces plans to buy subordinated debt of six banks	1	0	1	0	0	0	0
11/3/2008	8.2bn	EUR	DE	German government buys preferred shares in Commerzbank		0	1	0	0	0	0
11/13/2008	750mn	EUR	NL	Dutch government buys preferred shares in SNS Reaal		0	1	0	0	0	0
11/24/2008	30.6bn	USD	US	Loss protection on assets Citigroup		0	0	0	1	0	0
11/24/2008	20bn	USD	US	US Treasury buys preferred shares Citigroup		0	1	0	1	0	0
12/22/2008	550mn	EUR	IE	Irish Government injects funds into 3 largest Irish Banks	1	0	1	0	0	0	0
1/8/2009	10bn	EUR	DE	German government buys preferred shares Commerzbank		0	1	0	0	0	0
1/15/2009		EUR	IE	Irish government nationalises Anglo-Irish Bank		0	1	0	0	0	0
1/16/2009	11.8bn	USD	US	Loss protection on assets Bank of America		0	0	0	1	0	0

Sources: Panetta et al. (2009), King (2009) and CGFS (2011); Bloomberg, Reuters, Financial Times.
Notes: Key to category abbreviations: AP= Asset Purchase, CI=Capital Injection, CL=Credit Line, FG=Financial Guarantee, DG=Deposit Guarantee, IN=Insurance. Key to country abbreviations: UK=United Kingdom, US=United States, NL=Netherlands, FR=France, DE=Germany, IE=Ireland, GR=Greece, EU=European Union, EM=more than one euro country. Entries coded in red involve repayments or withdrawal of support measures.

Appendix 1: Rescue packages (cont'd)

Date	Amount	Currency	Country	Remark	Large	AP	CI	CL	FG	DG	IN
1/16/2009	20bn	USD	US	Preferred shares Bank of America		0	1	0	1	0	0
1/19/2009		GBP	UK	UK announces asset protection plan and converts its preferred shares in RBS into ordinary		0	1	0	1	0	0
1/20/2009		EUR	IE	Irish Parliament approves emergency nationalisation of Anglo-Irish Bank	1	1	0	0	0	0	0
2/26/2009		EUR	NL	Dutch government creates € 35.1 billion back-up facility for ING's Alt-A mortgage securities.		0	0	0	1	0	0
2/26/2009	32.5bn	GBP	UK	UK Asset Protection Scheme (APS) updated: participation of RBS		0	0	0	0	0	1
3/7/2009	26bn	GBP	UK	Lloyds Banking Group participation in APS		0	0	0	0	0	1
3/25/2009	10bn	GBP	UK	EC Approval for loan guarantees	1	0	0	0	1	0	0
3/30/2009		EUR	DE	Government stake in Hypo Real Estate Holding AG		0	1	0	0	0	0
3/30/2009	9bn	EUR	ES	Spanish Government rescues Caja Castilla La Mancha		0	0	0	1	0	0
4/6/2009		USD	US	Scope of Public Private Investment Programme expanded		0	0	1	0	0	0
4/15/2009	52bn	EUR	DE	SoFFin guarantees to Hypo Real Estate		0	0	0	1	0	0
5/11/2009	19bn	USD	US	Fannie Mae loan request to US Treasury under Senior preferred stock plan		0	0	1	0	0	0
5/14/2009	200bn	EUR	DE	Germany approves "Bad bank" plan	1	1	0	0	0	0	0
6/9/2009	68bn	USD	US	TARP repayments from banks approved by US Treasury		1	0	0	0	0	0
6/25/2009		USD	US	Fed scales down lending programs		0	0	1	0	0	0
6/26/2009	99bn	EUR	ES	Bank rescue fund approved	1	0	1	1	0	0	0
7/7/2009	5.4bn	USD	US	Term Asset-Backed Securities Loan Facility	1	0	0	1	0	0	0
7/24/2009	58bn	USD	US	US Gov. Participation of 34% in Citigroup		0	1	0	0	0	0
8/17/2009		USD	US	TALF programme extended by 3 to 6 months	1	0	0	1	0	0	0
9/1/2009	7.5bn	EUR	DE	German government garantees for bad debt risks to banks and credit insurers	1	0	0	0	1	0	0
9/10/2009		USD	US	US Treasury announces withdrawal of guarantee to mutual funds		0	0	0	1	0	0
9/14/2009		EUR	FR	French government extends loan guarantees for French banks	1	0	0	0	1	0	0
9/16/2009		EUR	IE	Extension of state guarantees for bank liabilities	1	0	0	0	1	0	0
9/18/2009	1.2bn	USD	US	US Treasury announces expiration of guarantee of money market mutual funds		0	0	0	1	0	0
9/21/2009	500mn	EUR	IT	State backed capital injection for Banco Popolare di Milano		0	1	0	0	0	0
9/23/2009		USD	US	Fed announces extension of the buy up of mortgage related debt to 2010Q1		1	0	0	0	0	0
11/2/2009	25.5bn	GBP	UK	UK government plan to inject 25.5bn into RBS		0	1	0	0	0	0

Sources: Panetta et al. (2009), King (2009) and CGFS (2011); Bloomberg, Reuters, Financial Times.
Notes: Key to category abbreviations: AP= Asset Purchase, CI=Capital Injection, CL=Credit Line, FG=Financial Guarantee, DG=Deposit Guarantee, IN=Insurance. Key to country abbreviations: UK=United Kingdom, US=United States, NL=Netherlands, FR=France, DE=Germany, IE=Ireland, GR=Greece, EU=European Union, EM=more than one euro country. Entries coded in red involve repayments or withdrawal of support measures.

Appendix 1: Rescue packages (cont'd)

Date	Amount	Currency	Country	Remark	Large	AP	CI	CL	FG	DG	IN
11/19/2009	150bn	USD	US	US House approves systemic dissolution fund to finance unwinding firms		0	0	0	0	0	1
11/20/2009	54bn	EUR	IE	Launch NAMA	1	1	0	0	0	0	0
11/24/2009		GBP	UK	Treasury guarantees BoE against losses on emergency liquidity operations		0	0	0	0	0	1
11/26/2009	22.5bn	GBP	UK	Lloyds shareholders support plans to break free of govt support		0	0	0	1	0	0
1/19/2010		USD	US	Banks repurchase warrants received from government		0	0	1	0	0	0
2/26/2010	54bn	EUR	IE	EC approval for NAMA scheme	1	1	0	0	0	0	0
4/1/2010		EUR	IE	Ireland announces "Bad Bank" plan		1	0	0	0	0	0
4/7/2010	28bn	EUR	GR	4 largest banks ask Greek government for access to remaining credit line	1	0	0	1	0	0	0
4/13/2010		USD	US	Extension of Transactional Account Guarantee-program		0	0	0	1	0	0
6/30/2010	11bn	EUR	ES	Spanish Central Bank announces capital injection into merged savings banks		0	1	0	0	0	0

Sources: Panetta et al. (2009), King (2009) and CGFS (2011); Bloomberg, Reuters, Financial Times.
Notes: Key to category abbreviations: AP= Asset Purchase, CI=Capital Injection, CL=Credit Line, FG=Financial Guarantee, DG=Deposit Guarantee, IN=Insurance. Key to country abbreviations: UK=United Kingdom, US=United States, NL=Netherlands, FR=France, DE=Germany, IE=Ireland, GR=Greece, EU=European Union, EM=more than one euro country. Entries coded in red involve repayments or withdrawal of support measures.

Appendix 2: Macroeconomic data releases

United States
ISM Manufacturing PMI SA (value; NAPM)
Personal Consumption Exp. CPI MoM SA
Capacity Utilization % of Total Capacity SA
Conference board consumer confidence SA
Industrial Production MoM SA (rate)
Initial jobless claims SA
Conference board US leading index MoM
Federal Funds Target Rate
New privately owned housing units started by structure total SAAR
Employees on Nonfarm payrolls MoM SA
Adjusted retail & food services SA MoM
Unemployment rate total in labor force SA

United Kingdom
Manufacturing PMI Markit survey ticker
Industrial production MoM SA
CPI EU harmonized MoM NSA
Retail prices index MoM NSA
Nationwide consumer confidence Index
Unemployment claimant count MoM SA
Claimant count (unemployment) rate SA
BoE official bank rate
Chained GDP at market prices QoQ
Retail Sales All Retailing
PPI Manufactured Products M
Avg Earnings Whole Economy

Euro area
France
France Business confidence overall indicator
France GDP QoQ
France Industrial production MoM SA 2000=100
France PPI MoM 2000=100
France Unemployment rate SA
France CPI MoM European harmonized NSA

Germany
Germany Current Account EUR SA
Germany HICP MoN 2005=100
IFO pan Germany business climate 2000=100
Germany Industrial production MoM SA 2000=100
Germany PPI MoM 1995=100
Germany Unemployment rate SA

Italy
Business confidence 2000=100
Italy HICP MoM NSA 2005=100
Italy Industrial Production MoM SA 2000=100
Italy PPI manufacturing MoM 2000=100
Italy Real GDP QoQ SA WDA

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