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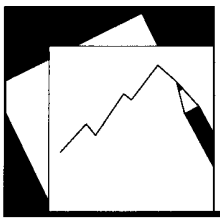

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Did the Euro Crisis Affect Non-financial Firm Stock Prices through a Financial or Trade Channel?

Stijn Claessens, Hui Tong, and Igor Zuccardi

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Abstract

This paper analyzes through what channels the euro crisis has affected firm valuations globally. It examines stock price responses over the past year for 3045 non-financial firms in 16 countries to three key crisis events. Using pre-crisis benchmarks, it separates effects arising from changes in external financing and trade conditions and examines how bank and trade linkages propagated effects across borders. It finds that policy measures announced impacted financially-constrained firms more, particularly in creditor countries with greater bank exposure to peripheral euro countries. Trade linkages with peripheral countries also played a role, with euro exchange rate movements causing differential effects.

JEL Classification Numbers: F3

Keywords: Euro crisis; non-financial firms; financial channel; trade channel

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I. INTRODUCTION

Since late 2009, developments concerning the sovereign debt of Greece and other euro-zone peripheral countries have occupied financial markets.[2] While the Greece debt problems were initially contained, fears of more wide-spread sovereign debt crises have subsequently developed and affected many financial markets. Events have led to a significant widening of sovereign bond yield spreads and higher risk premium on credit default swaps for many sovereigns in Europe, especially in peripheral euro countries (Greece, Ireland, Portugal, Italy and Spain, or PEC). And policy makers and financial markets have since become concerned whether the crisis will spill-over to other euro-zone countries through various channels and affect the viability of the euro more generally.

Concerned about the impact of sovereign crises and contagion effects, European countries and international organizations have since early 2010 taken a number of measures, often coordinated. Examples are the support packages of the EU and the IMF, coordinated with the ECB, for three individual countries, Greece, Ireland, and Portugal. Important region-wide steps were taken on May 10, 2010, when Europe's Finance Ministers approved a comprehensive rescue package worth €750 billion aimed at ensuring financial stability across Europe, including by creating the European Financial Stability Facility (EFSF). This boosted stock market indexes for periphery and core euro-zone countries by 10% and 8% respectively. But differences in objectives and approaches among policy makers have also arisen, making markets question at times the overall strategy. In June 2011, the crisis became even more intense with many concerns regarding the refinancing of Greek public debts. Political instabilities and inconsistent approaches towards resolutions then surfaced and market concerns peaked again. Coordinated steps aimed to resolve the debt crisis were subsequently taken by the leaders of the euro-zone member countries. An important date was July 21, 2011, when the Heads of Governments of the euro area reached an agreement on the terms for the second bail-out loan to Greece.

The aim of this paper is to analyze through what channels the euro sovereign crisis may have spilled over to the real sectors of various countries and how effective policies announced were in mitigating (or not) spillovers through these channels. In theory, the crisis may have spilled over to firms through two channels: a financial channel and a trade channel. The financial channel arises as banks in creditor countries exposed to sovereign risk, directly and indirectly, see their balance sheets impaired and have to cut back on lending ("deleverage") or, more generally, become reluctant to lend to firms in the face of uncertainty. This in turn will hurt the performance and valuation of firms, especially those dependent on (bank) financing. The trade channel arise as affected countries cut back on imports, with that reduced demand in turn implying lower firm sales and profitability in exporting countries.

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[2] One can date the start of the euro crisis as October 16, 2009, when incoming Greek Prime Minister George Papandreou told parliament "We have large hidden debts and spending," with the previous government's deficit of 6% GDP for 2009 revealed to have been massively underestimated.

Policy measures can aim to mitigate (or reverse) each (or several) of these channels. Public financial support for affected sovereigns and others can help creditor banks as their asset values are enhanced. It can thereby help maintain the flow of financing to domestic firms in supporting and other countries. Support can also serve to boost demand in affected countries, help to maintain their imports, and thereby help the exports of firms in various countries. Our objective is to investigate through which of these channels and to what degree policy measures have affected firms around the world. This way we can learn more about the channels of cross-border contagion in general.

Empirical work on the real impacts of the euro crisis has been limited to date, in large part as the crisis is still evolving. There is, however, a related small and recently emerging literature that studies the transmission of the U.S. subprime crisis across national borders, which offers some lessons as well as (methodological) guidance. The evidence from these studies is mixed, however. For example, Claessens et al. (2010) and Milesi-Ferretti and Tille (2010) find a role for pre-crisis financial integration as to how the crisis impacted individual countries in terms of the depth of their economic recession. In contrast, Cetorelli and Goldberg (2009) and Rose and Spiegel (2010a, 2010b) fail to find roles for country factors, including trade and financial linkages, in how countries were affected. A common feature of these studies, however, is the reliance on aggregate data. The mixed evidence on the role of country factors and individual contagion channels is thus perhaps no surprise since the macro data reflect the aggregation of multiple underlying factors.

To separate the importance of various channels, one could go to firm-level, micro data and use actual balance sheet and profitability statements (see Claessens, Tong and Wei 2011).[3] For the current euro debt crisis, however, micro firm-level evidence is limited, mainly because firm-level performance data on indicators such as profitability and sales are released at low frequency with a long lag. Besides the lack of actual firm data, individual bank-level data on indicators such as exposure to affected countries are often missing as well. And details on how policy measures are implemented are sometimes also lacking. The lack of suitable data in turn prevents the examination of actual responses of firms to the crisis and policy measures, including possible differences across countries and the channels through which firms are affected.

We overcome the lack of actual firm and bank data and measures by using firm-level stock price data and key event dates at which policy changes were announced, as well as benchmark characteristics of firms. Since stock prices are forward-looking, they can be expected to reflect the markets' reactions as to how firms may be affected by policies announced. This approach has also been used to investigate similar questions, as in Tong and

[3] There has been analysis of the drivers of the trade retrenchment in the 2008-2009 crisis, also using micro data. For example, Levchenko, Lewis and Tesar (2010), Alessandria, Kaboski and Midrigan (2010), and Bems, Johnson and Yi (2010). Moreover, Bricongne et al (2009) and Behrens et al (2010) use firm-level data for France and Belgium to examine the impact of crisis on firm exports.

Wei (2011), which examined the cross-country impact of the US subprime crisis.[4] And the benchmark characteristics allow one to trace the channels through which firms are affected.

We focus our analysis on key events during the euro crisis. Specifically, we focus on three important events and the related stock market responses. One is May 10, 2010, when the European Financial Stability Facility (EFSF) was established. This event was widely regarded as positive, with general, albeit not uniform increases in stock and other asset prices and an appreciation of the euro. On average, stock market indexes for periphery and core euro-zone countries increased by 10% and 8% respectively, while Sovereign Credit Default Swaps (CDS) dropped by 162 basis points and 11 basis points for periphery and core euro-zone countries respectively (Figure 1). And the euro appreciated on May 10, 2010 by 2% against the dollar, from 1.265$/€ to 1.284$/€.

The second period is from June 8 to 10, 2011, when there appeared to be a public disagreement among core euro-zone countries on the private sector participation in the resolution for Greek crisis, which created large turbulence in global financial markets.[5] Over this period, there was a general decrease in stock and other asset prices and a depreciation of the euro. On average, the stock market indexes for periphery and core euro-zone countries decreased by 2.3% and 1.3% respectively, while Sovereign CDS went up by 74 basis points and 4 basis points for periphery and core euro-zone countries respectively (Figure 2). And the euro depreciated by 2.2% between June 7 and June 10, 2011.

The third event is July 21, 2011, when leaders of the euro zone announced the terms of the second bail-out loan to Greece of €109 billion and the voluntary participation of private creditors, with a net contribution of €37 billion. In addition, they announced that the EFSF would be adapted so that it could intervene in the secondary markets to avoid contagion from the Greek debt crisis to other economies of the euro-zone. This agreement was welcomed by financial markets, in part because it eliminated the uncertainty generated by the contrasting public positions of the German government and the ECB about private participation in the program. Since some elements of the agreement already became known the day before the summit, we use the event window July 19 to 21, 2011.[6] The average increase in stock indexes between July 19 and 21 was some 5% for core euro area and 6% for peripheral euro countries (Figure 3).

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[4] They show evidence of liquidity crunches across emerging market economies by reporting that stock prices declined more for firms intrinsically more dependent on external finance for working capital.

[5] On June 8, 2011, German Finance Minister Schäuble called for a Greek debt rollover into 7-year maturities. But on June 10, 2011, ECB president Trichet ruled out ECB participation in any debt rollover constituting default. Analysts noted the entrenched stand-off in the positions laid down by Germany and the ECB, and were unsure what the outcome would be for the Greece crisis resolution.

[6] The official announcement of the second rescue package for Greece was on the evening of July 21, 2011. However, capital markets anticipated some of the terms of the agreement starting July 19, 2011 due to two news: i) a comment of Mr. Ewald Nowotny, governor of the Austria's Central Bank, that a short-term selective default situation would not have major negative consequences, appearing to signal a softening of the ECB position about default scenario; and ii) reports on July 20, 2011 that euro-zone policymakers were in talks with private holders of Greek debt and the former requested a delay of the Euro-zone Summit in order to agree on private participation in the bail-out package. In addition, there were rumors regarding the possibility that the EFSF could buy euro-zone government bonds in the secondary market.

We then examine whether and how the policy measures (or reversal thereof) at these key event dates affected firm-level stock returns in the EU and other countries. We do this for 3045 firms in 16 countries, with a focus on firms in the EU. For May 10, 2010, we find that stock prices particularly increased for more financially–constrained firms and in countries where banks had large pre-crisis claims on peripheral euro-zone countries. Stock prices also increased significantly for pairs of sectors and countries with heavy pre-crisis trade exposure to peripheral euro-zone countries, particularly so for non-euro-zone countries, possibly as they benefited from the concurrent euro appreciation. For the June 8-10, 2011 event, we find the effects to parallel those of May 10, 2010, but with the opposite signs: financially-constrained firms in countries with banks more exposed suffered more as did firms in sectors that exported more to the peripheral countries. Finally, regarding the July 19-21, 2011 event, we find, like for the May 2010 event, that stock prices increased more for non-financial firms with high external financial dependence and from countries with larger banking exposure to peripheral euro countries.

Collectively, our findings confirm that the European sovereign debt crisis spilled over to the real economy in other countries mostly through financial channels and somewhat through trade channels, and more so for EU firms. Policy measures at various dates helped (or failed) to support creditor banks and mitigate the drop in demand in and consequently trade from periphery countries. These results show that policy makers need to consider cross-border spillovers among closely-integrated countries and suggest that a coordinated approach to address the crisis would benefit both debtor and creditor countries.

Our paper relates to studies on pre-crisis euro-zone integration since it highlights the possible costs of and risks in a unified currency zone during periods of financial stress. Some of these studies focus on how a common currency can influence financial integration (e.g., Codogno et al (2003), Manganelli and Wolswijk (2004), and Sgherri and Zoli (2009)). They document a converge of sovereign bond spreads among euro countries between 1999 and 2008, with the decline in spreads associated with increased international market liquidity and risk diversification, but little with country-specific factors, such as public debt. On the channels of integration, Kalemli-Ozcan et al. (2010) find that the euro's impact on financial integration is mainly through the elimination of currency risk, but not through trade. Bris, Koskinen and Nilsson (2009) find that the euro increased corporate valuation more for firms from euro countries with less credibility in their previous exchange rate policy.[7]

Our paper contributes to this literature on euro-zone integration by examining the other side of the story, that is, whether the euro debt crisis risks reversing some of the earlier, positive effects of the introduction of the euro, and, if so, through which channels. Our preliminary findings suggest that the euro crisis could have negatively affected other euro-zone countries, mainly through a financial and to some lesser degree through a trade channel.

[7] These were mainly the countries that devalued during the Exchange Rate Mechanism crisis of 1992/93: Finland, Italy, Ireland, Portugal, and Spain.

Our paper also relates to the literature on links between sovereign and private borrowing costs. Earlier empirical studies documented negative "spillover" effects of sovereign government's credit risk on firms' access to international capital markets, mainly for emerging markets (e.g., Ferri et al (2001), Borensztein et al (2007), and Arteta and Hale (2008)).[8] So far, this literature focused largely on the effects of government's actions on corporations in their own country. Our paper contributes to this literature by showing that sovereign crises can also affect foreign firms with financial and trade linkages with the countries in crises, and shows the specific effects of a currency union.

Some earlier studies of the 2007-2009 crisis have focused on explaining the evolution of risk in the banking sector and its spillover effect onto sovereign sectors (Eichengreen et al (2009) and Mody (2009)). In this paper, we focus instead on the channels through which sovereign risk is transferred to the non-financial sector, allowing the creditor banking sector to work as an amplification channel. Related work on cross-border banking spillovers but using aggregate data, is Kaminsky and Reinhart (2003), who studied how a common lender propagated problems across multiple countries during the East Asian crisis.

Finally, our paper relates to the recent literature on crisis contagion through equity markets. For instance, Bekaert et al (2011) analyze the transmission of the 2007-2009 financial crisis by examining country-industry equity portfolios in 55 countries. Hau and Lai (2011) examine the role played by equity funds in the propagation of the 2007-2009 crisis. They did not study the spillover of the Euro sovereign crisis, however, which started only in 2010. We also explore higher-frequency (daily) movements at the firm level, which allows us to more directly identify the effects of policy announcements.

The rest of the paper is structured as follows. We describe our data and methodology in Section 2. Section 3 presents results for the two key events during the Euro crisis. Section 4 reports results for robustness check of our main results. Section 5 then concludes.

II. THE FRAMEWORK

Building on the existing literature, we aim to distinguish, by using firm-level stock price data, the transmission channels through which the crisis in peripheral euro countries spilled over to the rest of the world. We examine two channels through which the crisis may have spilled over: a financial channel and a trade channel. We employ a consistent framework to distinguish the impacts of these two channels. To isolate transmission through the finance channel, we make use of the following idea: if the availability of credit plays an important role for firm performance, a shock to the supply of external financing should be reflected in the performance of those firms that rely more on external finance (for investment) relative to those firms that rely less on external financing. Similarly, if trade were to be an important

[8]According to this literature, the main channels through which governments may transmit credit risks to the private sector are: reduced public spending, increases in taxes, and the implementation of capital controls or other administrative measures that effectively prevent private borrowers from servicing their external obligations. These government actions can affect firms' expected returns and reduce their collateral value, which is then reflected in higher interest rates and tighter borrowing constraints.

factor, a shock to demand leading to a change in trade should be reflected in the performance of those firms that rely more heavily on exports to peripheral euro countries relative to those firms that rely less on such exports. And the stock markets should reflect these relative performance differences in firms' stock prices whenever there is news (positive or negative) about the supply of external financing or trade prospects.

A. Basic Specification

The basic empirical strategy is to check whether *ex ante* classifications of firms in terms of their intrinsic characteristics – degree of financial dependence and exposure to trade - help to explain changes in their stock price performance following key events of the European sovereign debt crisis. To proxy the intrinsic financial dependence, we use the approach of relying on the sector characteristics of U.S. firms, which are arguably exogenous to our sample of firms (see Rajan and Zingales, 1998; note that we do not include U.S. firms in our regressions). And for trade linkage, we use pre-crisis actual trade exposures at the country-sector level.

To be precise, our specification is given by the following equation:

$$(1)\ \text{StockReturn}_{i,j,k} = \beta * FinancialDependence_j + \lambda * TradeLinkage_{j,k} + \text{Control}_{\text{i,k,j}} + \varepsilon_{\text{i,k,j}}$$

where *i* stands for company, *j* for sector, and *k* for country. Note that this is a pure cross-sectional regression for each event during the European sovereign crisis and that the key regressors are pre-determined (in 2006). We add firm size (log assets in US dollar) as our base control variable.

We start by assuming the same β and λ for all countries in order to estimate average effects, but next allow for variations across countries. To study how the pattern of pre-crisis financial exposure to peripheral euro countries affects the extent of a liquidity crunch, we consider the interaction between a country's financial exposure and its firms' dependence on external finance. In other words,

$$(2)\ \beta_{\text{k}} = \beta_1 + \beta_2 * Financial\ Exposure_k$$

where Financial Exposure $_{\text{k}}$ is country k's banking sector exposure to peripheral euro countries. The slope coefficient, β_2, then captures the extent to which financial exposure affects the severity of the external-financing supply shock.

Related to the trade channel, we include an interaction term of trade linkage with the Euro dummy. That is,

$$(3)\ \lambda_k = \lambda_1 + \lambda_2 * Eurozone_k$$

The slope coefficient, λ_2, then captures the extent to which the severity of the trade shock depends on euro-zone membership.

B. Key Data

We describe here first our dependent variable, the change in stock price, and then the two sectoral benchmark indicators for external financing and trade sensitivity. We lastly discuss the data used to measure the financial linkages of countries with peripheral euro countries.

Percentage change in stock price

The stock price index is retrieved from Datastream, which is the total rate of return index, i.e., adjusted for dividends and capital actions such as stock splits and reverse splits. Table 2 presents raw statistics for the log difference in stock prices (i.e., stock returns) for non-financial firms in 16 countries for the three events of May 10, 2010, June 8-10, 2011, and July 19-21, 2011 (non-financial sectors are those with U.S. 3-digit SIC codes ranging between 0 and 399).

Financial dependence index

We construct a sector-level approximation of a firm's intrinsic dependence on external finance for capital investment following a methodology of Rajan and Zingales (1998):

$$(4) \quad Dependence\ on\ external\ finance\ for\ investment = \frac{capital\ expenditures - cash\ flow}{capital\ expenditures},$$

where Cash flow = cash flow from operations + decreases in inventories + decreases in receivables + increases in payables. All the numbers are based on U.S. firms, which are judged to be least likely to suffer from financing constraints (during normal times) relative to firms in other countries. While the original Rajan and Zingales (1998) paper covers only 40 (mainly 2-digit SIC) sectors, we expand the coverage to around 110 3-digit SIC sectors.

To calculate the benchmark, we take the following steps. First, every firm in the COMPUSTA USA is sorted into one of the 3-digit SIC sectors. Second, we calculate the ratio of actual dependence on external finance for each firm from 1990-2006. Third, we calculate the sector-level median from firm ratios for each 3-digit SIC sector that contains at least 5 firms. The median value is then chosen to be the index of demand for external financing in that sector. Conceptually, the Rajan-Zingales index (DEF_INV) aims to identify sector-level features, i.e., which sectors are naturally more dependent on external financing for their business operation. The index could be seen as a "technical feature" of a sector, almost like a part of the production function. It does not consider which firms are more or less liquidity constrained within a sector.

Trade Exposure

Trade exposure captures a country's exports to peripheral euro countries (Greece, Ireland, Portugal, Italy and Spain), core euro countries (Germany and France), other EU

countries, and the rest of the world. To construct this variable, we use data on bilateral exports at the 4-digit SIC sector-level for year 2006. Then trade exposure is defined as:

$$(5)\ TradeExposure_{j,k,cg} = \frac{Sector\ j's\ total\ exports\ from\ country\ k\ to\ country\ cg}{(Sector\ j's\ total\ exports\ from\ country\ k)}$$

for exports of sector *j* in country *k* to country group *cg*. Exports data for 2006 are retrieved from the United Nations Commodity Trade Statistics Database (UN Comtrade). As shown in Figure 4, the trade exposure to peripheral euro countries varies across countries. For instance, 22% of French exports went to those five countries, compared to only 13.6% of German exports.

Bank Lending Exposure

Banking lending exposure captures the pre-crisis linkage of country *k* with peripheral euro countries through creditor bank exposure. In order to construct this variable, we use information on the "consolidated foreign claims by nationality of reporting banks, immediate borrower basis", as published by the Bank of International Settlements (BIS), for the fourth quarter of 2006. We then calculate a creditor country's relative banking system exposure as:

$$(6)\ Bank\ Exposure_{k,cg} = \frac{Total\ foreign\ claims\ of\ country\ k\ on\ country\ cg}{Total\ foreign\ claims\ of\ country\ k}$$

where *k* is a credit country in our sample, and *cg* is the debtor country group of interest, such as peripheral euro countries. We use a relative measure to account for the fact that some countries are more active in international lending. Our sample includes a total of 16 reporting countries. As shown in Figure 5, bank exposure to peripheral euro countries is quite heterogeneous, ranging from 11.3% for the United Kingdom to 18% for Germany and 20% for France.

Control Variables

As noted, we include variables to control for basic firm characteristics. One is firm size, as measured by the log of book assets, all in US dollars. Note that size may also proxy for the degree to which the firm is active internationally through trade and FDI in periphery countries.[9]

[9] We also included a proxy for demand sensitivity as an additional control variable in order to capture a firm's relative sensitivity to a contraction in aggregate consumer demand. However, we found this variable to be always insignificant and therefore did not include it in our estimations.

C. Key Hypotheses

With this framework and data, we aim to test the following three hypotheses:

H1: News about the Euro crisis will change the stock returns of financially-dependent firms more. That is, $\beta > 0$ when there is positive, and $\beta < 0$ when there is negative news

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H2: News about the Euro crisis will change the stock returns of financially-dependent firms more in countries with larger bank exposure to peripheral euro countries. That is, $\beta_2 > 0$ when there is positive, and $\beta_2 < 0$ when there is negative news.

H3: News about the Euro crisis will change the stock returns more of firms with more trade exposure to peripheral euro countries. That is, $\lambda_1 > 0$ when there is positive, and $\lambda_1 < 0$ when there is negative news.

H4: News about the Euro crisis will change relatively more the stock returns of firms from euro-zone countries with trade exposure to peripheral euro countries. That is, $\lambda_2 < 0$ when there is positive news, and $\lambda_2 > 0$ when there is negative news. For example, if the bailout helps stabilizing the crisis in peripheral euro countries, it may cause the euro to appreciate and consequently reduce the competitiveness of exporting firms from euro area.

D. Basic Statistics

Table 1 shows the number of non-financial firms included in the sample, classified by country of origin. Our sample includes 3045 firms from 16 advanced and emerging economies.

Table 2 reports summary statistics for key dependent and explanatory variables. The statistics show that, on average, the stock prices of individual firms increase when positive events happened, such as the announcement of the €750 billion bail-out fund for countries in crisis (May 10, 2010) and the announcement of the second bail-out for Greece (July 19-21, 2011). In contrast, firms' stock prices dropped in general when there was public disagreement among core euro countries on private sector participation in further Greek assistance (June 8-10, 2011). Table 2 also shows the heterogeneous response of prices to those events: during May 10, 2010, the change in prices ranges from -13.3 to 13.7 percent; during June 8-10, 2011, from -15.6 to 17.19 percent; and during July 19-21, 2011, from -13.7 percent to 17.2 percent.

Table 2 also shows some of the heterogeneity in the firms we study, with large variations in size. For example, the firm at the 75th percentage is eight times larger than that at the 25th percentile. There is also much variation in our sectoral and country variables. For example, the external financing sensitivity varies between 0 and 1, with a standard deviation of 0.32. The trade exposure to peripheral euro countries varies between 0 and 0.96 across sector-pair pairs, with a standard deviation of 0.1. This makes these variables good indicators to identify the channels by which the firm-specific responses in stock prices may arise.

III. EMPIRICAL RESULTS

We start with our basic regression in Table 3, which examines how various firm and sector features affect changes in firm's stock price around the announcement of the €750 billion bail-out fund (May 10 2010). We cluster standard errors at the US SIC 3-digit sector.[10]

In Column 1, we show that the coefficient on external financial dependence is positive, albeit insignificant. This means that the event had more impact on firms from industries with higher financing needs for capital expenditures. This suggest that the announcement led banks to more willing supply external financing to local firms as they had less concerns about their balance sheets. We also find strong evidence that the impact of the event is more pronounced for large firms and firms with larger trade exposure to peripheral euro countries. This suggests that the announcement of the bail-out fund implied improved expectations about the pace of the recovery of aggregate demand in those countries. Therefore, large firms and firms from countries and sectors that have larger trade linkages to peripheral euro countries might benefit more, reflected in a large increase of their stock prices.

To evaluate the importance of the cross-border financial channel, we add the interaction of the financial dependence index with bank exposure in Column 2. We find this interaction to be positive and significant. That is, the stock returns are higher for firms with higher natural external financial dependence located in those countries whose banking systems are more exposed to peripheral euro countries. This suggests that, because the creation of the €750 billion bail-out fund was expected to enhance the value of claims on the peripheral euro countries, banks' balance sheets were strengthened, which in turn allowed banks to more easily finance local firms. The average effect on financially-constrained firms can be evaluated taking into account, in addition to the direct effect, the coefficient for financial dependence (0.10) and the average bank exposure (7.7 percent).

In Column 3, we explore further the importance of trade as a transmission channel. Here we include in our regression a dummy variable "Euro dummy" which equals 1 if the country is part of the euro-zone and zero otherwise. In addition, we add an interaction between the Euro dummy and the trade exposure to peripheral euro countries. We expect differences between the euro and non-euro-zone countries in the importance of trade for two reasons. On the one hand, euro countries are more closely integrated with peripheral euro countries through trade and financial linkages and these firms and their stock prices could thus be expected to gain more at the time of the event. On the other hand, since the euro appreciated around the time of the event, non-euro firms could be expected to experience higher stock price movements as they did not lose competitiveness at the same time.

We find the coefficient on the Euro dummy to be positive and significant, suggesting that markets expected the policy measures to improve economic prospects. However, the coefficient on the interaction between the Euro dummy and the country's trade exposure is

[10] R-squared values in our estimations are generally low. However, this is typical for event studies as it is hard to explain stock prices.

significantly negative. That is, stock prices of euro-zone firms with trade exposure to peripheral euro countries increased less than those of non-euro-zone firms with similar trade exposure (the overall effect for euro-zone firms is actually about zero, 6.6 - 6.51). This could be due to the adverse effect of the concurrent euro appreciation. So, while the policy measures benefited firms from say both Japan and France that export to peripheral euro countries, as reflected by the positive coefficient of trade exposure, because of the simultaneous appreciation of the euro, this event benefitted Japanese exporters more than French exporters.

In Columns 4, 5 and 6, we include sector fixed effects, country fixed effects, and both sector and country fixed effects, respectively, in order to control for unobserved characteristics at industry and country levels (but then we drop the respective sector and country benchmark characteristics). The main result is that the financial channel remains statistically very significant: firms from industries with higher external financial dependence in countries whose banking system is more exposed to peripheral euro countries tend to have larger stock price increases in response to the event. With respect to the trade channel, we find the coefficient of the Euro dummy to be positive and significant and the coefficient of the interaction between this dummy and trade exposure to be negative (although, perhaps not surprising, it becomes insignificant when country fixed effects are included). This result suggests that the euro-appreciation effect becomes less important after controlling for country characteristics.

Based on the results in Column 6, the stock price of a firm from the "Manufacturing of Medical and Surgical instruments" sector (with financial dependence at the 75th percentile) in the United Kingdom (with bank exposure at the 75th percentile) was 0.22 percent higher than that of a firm from the "Pulp, Paper, and Paperboard Mills" sector (with financial dependence at the 25th percentile) in Canada (with bank exposure at the 25th percentile). The difference (0.22 percent) is large compared to the average increase in stock prices (2.26 percent). In contrast, the trade channel is neither statistically nor economically significant.

In Table 4, we repeat the analyses of Table 3, but focus on non-financial firms from the EU, as these firms can be expected to be more affected by the events, both as they have closer financial and trade links with the affected countries and as support may disproportionally help their own banking systems. In Column 1, we find a positive and significant coefficient for external financial dependence, suggesting that EU firms from sectors with higher external financial dependence experience larger increases in stock prices.[11] In Column 2, we include the interaction between financial dependence and bank exposure to peripheral euro countries. Similar to the results of Table 3, we find a positive and significant coefficient for this variable. In fact, the coefficient on the interaction term is larger for the EU sample than for the general sample (compare with Table 3, Column 2). Together,

[11] The countries included in this sample are: Austria (29 firms), Belgium (43 firms), Denmark (43 firms), France (169 firms), Germany (236 firms), Netherlands (50 firms), Sweden (120 firms), and the United Kingdom (335 firms). About 56 percent of firms in this sample comes from euro-zone countries (we include here Denmark as it has a fixed exchange regime against Euro, which suggests that Euro fluctuations effectively affect Danish firms).

these results suggest that the financial channel is a very important transmission mechanism inside the EU.

In Columns 3, 4, and 5, we include again sector fixed effects, country fixed effects, and both sector and country fixed effects, respectively, in order to control for unobserved characteristics at industry and country levels. The interaction between financial dependence and bank exposure remains positive and significant in all specifications. The coefficient of trade exposure is negative, but it becomes insignificant again when country and sector effects are included. Firm size remains statistically significant positive. These results suggest that the policy measures were most effective in mitigating the financial channel, which appears as the main transmission mechanism of shocks from peripheral euro countries to non-financial corporations in the rest of the EU through the bank exposure channel.

According to the results of Column 5 in Table 4, the stock return of an European firm from the "Manufacturing of Medical and Surgical instruments" sector (with financial dependence at the 75th percentile) in Germany (with bank exposure at the 75th percentile) will be 0.66 percent larger than that of a firm from the "Pulp, Paper, and Paperboard Mills" sector (with dependence at the 25th percentile) in Austria (with bank exposure at the 25th percentile). The difference (0.66 percent) is large compared with the average increase in stock prices in the EU (3.4 percent).

In Table 5, we report for the full sample the results of our estimations for the second event: Germany's proposal for more private sector participation in Greek assistance (June 8-10, 2011), which was generally perceived negatively by markets. In Column 1, we find a negative and significant coefficient for external financial dependence, suggesting that firms from sectors with larger external financial needs are, in general, more vulnerable to these kinds of negative events, and therefore show larger drops in their stock prices.

In Column 2, we add the interaction between financial dependence and bank exposure to peripheral euro countries. Again, the drop in stock prices is more pronounced for firms from industries with greater financial dependence, particularly in countries whose banking systems are more exposed to those countries. This suggests that these events led to concerns about the ability of banks in creditor countries to continue to finance local firms, especially those with greater external financing needs. In addition, trade exposure is negative and significant in Column 2. That is, firms from countries and sectors with larger trade linkages to peripheral euro countries were thought to be more vulnerable, with their stock prices falling more.

In Column 3, we examine further the trade channel by including the interaction between the Euro dummy and trade exposure. The coefficient for the Euro dummy is significantly negative (-3.63), as is the coefficient of trade exposure (-5.08). The coefficient for the interaction term is significantly positive (6.59), probably because the euro depreciation around the event improved the competitiveness of firms from the euro-zone over

other firms.[12] Consequently, markets might have expected relatively higher profits for euro-zone area firms compared to non euro-zone firms.

In Columns 4, 5, and 6 we include sector, country and both sector and country fixed effects, respectively, to control for unobserved characteristics at country and industry levels. In all specifications, we find that the financial channel (i.e., the interaction between external financing and bank exposure to peripheral euro countries) is important in explaining the behavior of stock prices around the event, with coefficients all negative and significant. In addition, and different from the results in Table 3, trade exposure is negative and significant in all three specifications, and the coefficient for the interaction of trade exposure and Euro dummy is positive and significant. The main message of Table 5 is that both financial and trade channels are important mechanisms for transmitting shocks from peripheral euro countries to the real sectors of other economies.

Based on the results of Column 6, the stock price of a firm from, for instance, the "Manufacturing of Medical and Surgical Instruments" sector (with financial dependence at the 75th percentile) in the United Kingdom (with bank exposure at the 75th percentile) falls 0.27 percent more than that of a firm from the "Pulp, Paper, and Paperboard Mills" sector (with dependence at the 25th percentile) in Canada (with bank exposure at the 25th percentile). This difference (0.27 percent) is again large compared with the average fall in stock prices (0.43 percent).

The economic impact of the trade channel is similar to that of the financial channel for non-euro firms. For instance, based on the results of Column 6, the stock price of a firm from the "Manufacturing of Equipment for Construction" sector in Switzerland (with a trade exposure at the 75th percentile of 9.9 percent) was 0.34 percent lower than that of a firm from the "Rolling, Drawing, and Extruding Nonferrous Metals" sector in Australia (with a trade exposure at the 25th percentile of 0.6 percent). For firms from the euro area, however, the economic impact of the trade channel is much less important (actually it switches sign). For instance, the stock price of a firm from the "Production of Electronic Components" sector in Netherlands (with a trade exposure at the 75th percentile of 18.5 percent) was only 0.08 percent higher than that of a firm from the "Production of Industrial Inorganic Chemicals" sector in Belgium (with a trade exposure at the 25th percentile of 8.4 percent).

Table 6 reports the results of the June 8-10, 2011 event for the EU sample. In general, Table 6 confirms the financial channel to be the main transmission channel of shocks from peripheral euro countries to the rest of the EU: stock prices fall more for financially-constrained firms, especially in countries whose banking system is more exposed to peripheral euro countries. The trade channel though appears to be less important in transmitting shocks from peripheral euro countries to the real sectors of other economies, as it is never statistically significant.

[12] The overall effect of trade exposure is positive but insignificant for euro-zone firms (i.e., 1.51 = -5.08+6.59, with an F-test of 0.28).

According to the results of Table 6, the stock price of, for instance, a firm from the "Manufacturing of Medical and Surgical instruments" sector (with financial dependence at the 75th percentile) in Germany (with bank exposure at 75th percentile) will fall 0.46 percent more than that of a firm from the "Pulp, Paper, and Paperboard Mills" sector (with dependence at the 25th percentile) in Austria (with bank exposure at the 25th percentile). The difference (0.46 percent) is very large compared with the average drop in stock prices in the EU (1.15 percent).

In Table 7, we report for the full sample the results of our estimations for the third event, the approval of the second bail-out package for Greece (July 19-21 2011), which was generally perceived positively by financial markets. Similar to the results for the first event (the creation of the €750-billion bail-out fund), we find positive effects for the financial channel in all specifications, and they remain significant when we include country and sector fixed effects. With respect to the trade channel, we find a positive and significant coefficient for the Euro dummy, suggesting that capital markets expected this decision to improve economic prospects of the euro area especially. However, the interaction term between trade exposure and the Euro dummy is insignificant, suggesting that, for this event, the trade channel was not a key transmission mechanism.

Based on Column 6 of Table 7, the return of a firm from the "Manufacturing of Medical and Surgical instruments" sector (with financial dependence at the 75th percentile) in the United Kingdom (with bank exposure at the 75th percentile) will be 0.29 percent larger than that of a firm from the ""Pulp, Paper, and Paperboard Mills" sector (with dependence at the 25th percentile) in Canada (with bank exposure at the 25th percentile). The difference (1.24 percent) is very large compared with the average increase in stock prices (0.45 percent). In contrast, the trade channel is neither statistically nor economically significant.

Finally, in Table 8, we report the same analysis as in Table 7, but with now only the non-financial firms from the EU. Similar to the result in Table 7, we find the interaction term between the financial dependence index and the country's banking system exposure to be positive and significant. Taking into account the coefficient of financial dependence (-3.1) and the average exposure (13.5 percent), the result suggests the average effect of the announcement on financially-constrained firms to be positive. In other words, the stock prices increased more for those firms with higher natural external financial dependence and located in those countries whose banking systems are more exposed to peripheral euro countries. With respect to the trade channel, we find the coefficient of trade exposure to be insignificant in all specifications, similar to the result of Table 7, where we also found the trade channel not to be a key transmission mechanism of this event.

In terms of economic significance, we find the return of a firm from the "Manufacturing of Medical and Surgical instruments" sector (with financial dependence at the 25th percentile) in Germany (with bank exposure at the 75th percentile) to be 1 percent more than that of a firm from the "Pulp, Paper, and Paperboard Mills" sector (with financial dependence at the 25th percentile) in Austria (with bank exposure at the 25th percentile).

IV. ROBUSTNESS CHECKS

In this section, we explore some robustness checks, including examining abnormal stock returns and performing weighted regressions. In addition, we revisit our main results taking into account financial and trade exposure to only Greece, Ireland and Portugal, and evaluating the financial channel using information of bank exposure to the public sector only.

A. Abnormal Returns

In order to evaluate the robustness of our results, we also conduct the same analysis using abnormal returns. We construct abnormal returns employing the market model, which assumes a stable linear relation between the market and individual stock returns. Consequently, abnormal returns are calculated as:

$$(7)\quad Abnormal\ Return_{i,j,k} = Stock\ Return_{i,j,k} - Alpha_i - Beta_i * Market\ Return_k$$

where *i* stands for company, *j* for sector, and *k* for country. We construct each firm's beta based on the correlation of weekly firm-level stock returns and local market returns. We then construct each firm's alpha as the average of the firm's weekly average return minus the beta multiplied by the average market return. In constructing the abnormal returns, we use alpha and beta estimated for normal times (i.e., year 2006) to avoid any impact of the crisis on the beta estimations. We also winsorize the generated abnormal returns at the 1 percent level.[13]

In Column 1 of Table 9, we report the results using abnormal returns for the first event (May 10, 2010). We find the coefficient for the interaction between financial dependence and bank exposure to be positive and significant. Consequently, this result confirms the importance of the financial channel in explaining the behavior of non-financial firms' stock prices. In addition, Column 1 shows the coefficient for the interaction term between trade exposure and Euro dummy to be negative and significant. Similar to Table 3, this result suggests that capital markets expected the policy measures to improve economic prospects in the euro-zone, but euro-zone firms benefited less from these measures, possibly due to the drop in their relative competitiveness with respect to non-euro-zone firms caused by the concurrent euro appreciation. In Column 2, we examine the EU sample and again find financial dependence interacted with bank exposure to have a positive coefficient, albeit insignificant.

In Column 3, we examine results for the second event (June 8-10, 2011) using abnormal returns. Similar to the results of Table 5, we find the coefficient for the interaction between financial dependence and bank exposure to be negative and significant, suggesting that the financial channel is an important transmission mechanism of this shock to non-financial corporations around the world. In addition, we find that the coefficient of trade

[13] As *Alpha* is constructed from weekly stock data, we used (1/5)**Alpha* in constructing the abnormal stock return for the first event (May 10, 2010), and (3/5)**Alpha* for the second (June 8-10, 2011) and third events (July 19-21, 2011).

exposure is negative and significant, confirming the negative effect that uncertainty regarding the public positions of economic policymakers produced on capital markets' expectations about economic prospects in the euro zone. However, the interaction term between the Euro dummy and trade exposure is positive and significant, suggesting that euro-zone firms are less affected by this shock, possibly due to their competitiveness improvement generated by the concurrent depreciation of the euro. In short, results confirm that both financial and trade channels are important mechanisms for transmitting shocks from peripheral euro countries to the real sectors of other economies.

In Column 4, we reexamine the EU sample for the second event (June 8-10, 2011). Again, financial dependence interacted with bank exposure is significantly negative. In Columns 5 and 6, we also investigate the third event (July 19-21, 2011) using abnormal returns. They confirm our previous results of Tables 7 and 8. Overall, results with abnormal stock returns strongly support our earlier findings for both the general and EU sample.

B. Weighted Regression

Our sample of non-financial firms is so far unequally distributed across countries (see Table 1). In order to avoid our estimations to be biased by overrepresentation of some countries in the sample, we next conduct estimations controlling for the number of firms in each country. Specifically, we weight our sample by the inverse of the square root of the number of companies per country, which makes observations from countries overrepresented in the sample to have less influence in the estimations.

Table 10, Column 1 shows the results of these weighted regressions for the first event (May 10, 2010). As in Tables 3 and 4, we find that the coefficient of the interaction term between financial dependence and bank exposure to peripheral euro countries is positive and significant. Moreover, we find the interaction term between the Euro dummy and trade exposure to be negative (although it loses significance when controlling for country and sector fixed effects). These results thus confirm our previous findings for this event. Column 2 focuses on the EU sample and further confirms the role of financial exposure.

Column 3 reports the results of these weighted regressions for the second event (June 8-10, 2011). Here we find similar results as in Tables 5 and 6: the financial channel is negative and significant. This result suggests that this event produced larger stock price falls for companies that are more financially constrained in countries whose banking system is more exposed to peripheral euro countries. Results carry through when we limit the regression to the EU sample (Column 4).

Finally, Columns 5 and 6 report the results for the third event (July 19-21, 2011). Similar to the results in Tables 7 and 8, we find the financial channel to be the key transmission mechanism of this event to countries around the world and inside the EU. Overall, the weighted regressions confirm the importance of the financial channel, but they show the trade channel to be less pronounced.

C. Financial and trade exposure to Greece, Ireland and Portugal

So far, policies have largely focused on dealing with the (sovereign debt) problems of Greece, Ireland, and Portugal (GIP).[14] To evaluate the robustness of our main results, we redo our analysis evaluating how bank and trade exposures to GIP only impacted the stock prices of non-financial firms. We also limit bank exposure to the public sector only and define it as the ratio of banking sector's foreign claims on GIP's public sector over the Tier-1 capital of the banking sector. Data for banks' foreign claims on GIP's public sector come from the BIS (see Cerutti (2011) for more details), and data for Tier-1 capital come from Bankscope.[15]

In Table 11, we show the results for our base regressions for the general sample, including bank exposure to the public sector in GIP.[16] Column 1 shows that for the first event of May 10, 2010, the interaction term between financial dependence and bank exposure to GIP is positive and significant, suggesting that the financial channel is an important transmission mechanism. Taking into account this interaction term and the positive coefficient for financial dependence (0.17), we find the average effect of this event to be larger for firms that are more financially-constrained. And taking into account the positive and significant coefficient for bank exposure to GIP's public sector, the average effect is larger for firms from countries whose banking system is more exposed to the public sector of GIP. In Column 2, we include country and sector fixed effects. Reassuringly, financial dependence interacted with bank exposure is still positive and significant, and actually larger.

Columns 3 and 4 report the results for the second event of June 8-10, 2011. In column 3, we find the interaction term between financial dependence and bank exposure to GIP to be negative and significant. The average effect of financial dependence is negative, i.e., more financially-constrained firms experienced larger falls in stock prices. And the average effect of bank exposure to GIP is negative, i.e., firms from countries with larger bank exposure to GIP's public sector displayed larger drops in prices. In Column 4, when we include country and sector fixed effects, the interaction term between financial dependence and bank exposure becomes even more pronounced.

Columns 5 and 6 report the results for the third event of July 19-21, 2011. We find the interaction term between financial dependence and bank exposure to be positive and significant, and the average effect of financial dependence and bank exposure to GIP to be positive.

Finally, for all three events, the coefficients for trade exposure to GIP and the interaction term between the Euro dummy and trade exposure have both the expected sign (albeit not significant), in line with previous results.

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[14] In particular, the three events analyzed in this study are mainly related to actions (or lack of action) implemented by EU policymakers to handle the Greek debt crisis, but those actions can be considered as guidelines to deal with the problems of other Euro-zone economies in distress, such as Ireland and Portugal, which also undergo EU-Fund programs.

[15] Data used for these calculations is based on Q2, 2009 due to data availability.

[16] We have to drop five countries (Australia, Brazil, Chile, Mexico and Turkey), but we also include Italy and Spain, which gives us 13 countries.

As countries with higher bank exposure to GIP tend to be euro area countries, our results so far raise an interpretation question: have we identified a banking channel or just an euro area effect (such as market-wide risk aversion towards euro companies)? In Table 12, we therefore replicate our baseline regressions including country and sector fixed effects, but restrict the sample to euro-zone countries plus Denmark.[17] We use this sample to evaluate whether there are heterogeneous responses across the euro area based on bank exposure to GIP. By exploring the heterogeneity within the euro area, we then shed light on whether our earlier results indeed reflect the bank exposure channel.

In Table 12, we find the interaction term between financial dependence and bank exposure to GIP to be positive and significant for both the first and the third events (columns 1 and 3), and negative (albeit insignificant) for the second event (column 2). That is, stock prices of financially-constrained firms from euro countries with larger bank exposure to GIP's public sectors are more sensitive to changes in policies during the crisis. This confirms the importance of the banking exposure channel even after we control for potential euro-area effects.

V. CONCLUSIONS

In this paper, we study how the ongoing euro crisis affects global corporate valuation, particularly for EU firms. We analyze two channels through which the crisis may have affected firms: a financial channel and a trade channel. To investigate the financial channel, we asked the question: if we classify manufacturing firms into different baskets based on their ex-ante sensitivity to shocks to external financing (in terms of investment needs), does this classification help us to explain the ex-post stock performance of these firms? Similarly, if we classify these firms based on their ex-ante exposure to trade, do firms in different groups perform differently during the crisis? To investigate the role of cross-border linkages, we include country-level financial linkages with peripheral euro-zone countries and euro-zone dummies, and interactions with our proxies for the financial and trade channels, into our regression framework.

We conduct our tests by examining stock price responses to key events during the 2010-2011 euro crisis for 3045 non-financial firms from 16 countries. We find that the crisis had a larger impact on firms with greater ex-ante financial constraints, and particularly so in creditor countries more financially exposed to peripheral euro countries through bank claims. Trade linkages with periphery euro-countries also played a role by affecting export demand, with differential effects across firms in euro vs. non-euro areas, possibly because of the effects of euro exchange rate changes vis-à-vis third (non-euro) countries. On balance, we conclude that policy makers need to take into account potential effects on both the soundness of their local banks as well trade with peripheral euro countries when they plan (or revert course on) various support measures.

[17] Denmark has a fixed-exchange-rate policy vis-à-vis the Euro within the framework of ERM II. Under this framework, the Danish Krone moves inside a band with central rate of Dkr. 746.0348 per 100 euros, with fluctuations of +/- 2.25 percent. In practice, during the 2010-11 Euro crisis, the central rate of Krone/Euro rate stayed almost the same.

It is important to point out that the current paper is not meant to be a comprehensive assessment of the welfare effects of the euro or of the types of support measures being considered. To do that, we need to evaluate not only the effects of the support measures announced on firms, but also the costs of the measures, such as their effects on households and others through say higher tax burdens. Furthermore, there can be differences between short and long-run effects, which would require analysis of both tranquil and crisis times to make a full assessment. We leave these questions as fruitful topics for future research.

Table 1: Number of Listed Firms

Country	# of firms	Country	# of firms
AUSTRALIA	182	GERMANY	236
AUSTRIA	29	JAPAN	1296
BELGIUM	43	MEXICO	22
BRAZIL	63	NETHERLANDS	50
CANADA	283	SWEDEN	120
CHILE	13	SWITZERLAND	93
DENMARK	43	TURKEY	68
FRANCE	169	UNITED KINGDOM	335
TOTAL			3045

Source: Worldscope

Table 2: Summary Statistics

Variables	Obs	Mean	St Dev	Med	p25	p75	Min	Max
Firm level								
Change in Stock Price								
1. Event May 10 2010	3045	2.26	3.91	1.72	0.00	4.26	-13.35	13.74
2. Event June 8-10 2011	3045	-0.43	3.87	0.00	-2.03	1.09	-15.62	17.19
3. Event July 19-21 2011	3045	0.45	4.25	0.00	-1.19	1.98	-13.72	17.24
Firm Size (log in US Dollars)	3045	12.51	2.08	12.39	11.25	13.79	2.64	19.49
Sector level								
External Financial Dependence	110	0.29	0.32	0.23	0.00	0.42	0.00	1.00
Country-sector level								
Trade Exposure to PEC	1130	0.07	0.10	0.03	0.01	0.11	0.00	0.96
Country level								
Bank Exposure to PEC	16	0.08	0.05	0.06	0.06	0.11	0.01	0.20

Bank exposure is defined as a country's bank foreign claims on peripheral euro countries (PEC) over the country's total bank foreign claims.

Trade exposure is defined as a country's exports of a certain sector to peripheral euro countries (PEC) over the country's total exports in the same sector.

Table 3: Event Analysis, Financial and Trade Channels
Event: Launch of a €750 bn economic package from the EU and the IMF (May 10 2010).

General Sample

VARIABLES	(1) No interaction	(2) Bank Exposure	(3) Trade Exposure	(4) Sector Fixed Effects	(5) Country Fixed Effects	(6) Country & Sector Fixed Effects
Financial Dependence (Rajan and Zingales (1998))	0.57	0.10	-0.43		-0.027	
	[0.36]	[0.55]	[0.49]		[0.55]	
Financial Dependence*Bank Exposure to PEC		6.97*	11.9***	13.0***	7.13*	7.77*
		[4.14]	[3.53]	[3.99]	[4.11]	[4.00]
Firm Size (Total Assets)	0.32***	0.30***	0.31***	0.29***	0.38***	0.36***
	[0.033]	[0.037]	[0.036]	[0.037]	[0.034]	[0.034]
Trade Exposure to PEC	5.25***	3.74***	6.51***	5.54***	0.36	-0.98
	[1.09]	[1.34]	[1.40]	[1.44]	[1.54]	[1.55]
Euro Dummy (euro=1 if country is part of Euro zone)			3.59***	3.40***		
			[0.70]	[0.63]		
Euro Dummy*Trade Exposure to PEC			-6.60***	-6.04***	-2.12	-1.41
			[1.94]	[2.14]	[2.21]	[2.23]
Bank Exposure to PEC		4.04**	-16.1***	-13.6***		
		[1.97]	[4.75]	[4.35]		
Constant	-2.31***	-2.27***	-1.46**			
	[0.48]	[0.51]	[0.58]			
Observations	3,045	3,045	3,045	3,045	3,045	3,045
R-squared	0.047	0.054	0.072	0.119	0.165	0.205

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Clustering by sector

Bank exposure is defined as a country's bank foreign claims on peripheral euro countries (PEC) over the country's total bank foreign claims.

Trade exposure is defined as a country's exports of a certain sector to peripheral euro countries (PEC) over the country's total exports in the same sector.

No. of countries: 16

Table 4: Event Analysis, Financial and Trade Channels

Event: Launch of a €750 bn economic package from the EU and the IMF (May 10 2010).

EU Sample

VARIABLES	(1) No interaction	(2) Bank Exposure	(3) Sector Fixed Effects	(4) Country Fixed Effects	(5) Country & Sector Fixed Effects
Financial Dependence (Rajan and Zingales (1998))	0.93**	-1.40*		-1.63**	
	[0.45]	[0.79]		[0.80]	
Financial Dependence*Bank Exposure to PEC		18.0***	17.8***	19.4***	19.8***
		[5.70]	[5.96]	[5.79]	[6.15]
Firm Size (Total Assets)	0.60***	0.62***	0.63***	0.58***	0.58***
	[0.060]	[0.066]	[0.079]	[0.067]	[0.082]
Trade Exposure to PEC	-3.99***	-3.63***	-3.64*	-1.92*	-1.19
	[1.25]	[1.18]	[1.84]	[1.12]	[1.82]
Bank Exposure to PEC		-10.3***	-10.5***		
		[2.34]	[2.65]		
Constant	-3.76***	-2.59***			
	[0.90]	[0.97]			
Observations	1,025	1,025	1,025	1,025	1,025
R-squared	0.106	0.114	0.193	0.149	0.233

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Clustering by sector

Bank exposure is defined as a country's bank foreign claims on peripheral euro countries (PEC) over the country's total bank foreign claims.

Trade exposure is defined as a country's exports of a certain sector to peripheral euro countries (PEC) over the country's total exports in the same sector.

No. of countries with Bank exposure: 8

Table 5: Event Analysis, Financial and Trade Channels
Event: public disagreement among core euro-zone countries on the resolution for Greek crisis (June 8-10 2011).

General Sample

VARIABLES	(1) No interaction	(2) Bank Exposure	(3) Trade Exposure	(4) Sector Fixed Effects	(5) Country Fixed Effects	(6) Country & Sector Fixed Effects
Financial Dependence (Rajan and Zingales (1998))	-0.37*	0.19	0.73*		0.41	
	[0.21]	[0.35]	[0.40]		[0.46]	
Financial Dependence*Bank Exposure to PEC		-7.81**	-12.9***	-12.9***	-8.62*	-9.31*
		[3.63]	[3.79]	[4.15]	[4.53]	[4.78]
Firm Size (Total Assets)	-0.0041	0.0074	-0.0048	-0.0042	-0.053	-0.047
	[0.046]	[0.043]	[0.045]	[0.044]	[0.040]	[0.044]
Trade Exposure to PEC	-2.84***	-2.29***	-5.08***	-7.08***	-2.21**	-3.69***
	[0.83]	[0.76]	[0.91]	[1.13]	[0.92]	[1.37]
Euro Dummy (euro=1 if country is part of Euro zone)			-3.63***	-4.23***		
			[0.47]	[0.51]		
Euro Dummy*Trade Exposure to PEC			6.59***	8.30***	3.25*	4.47**
			[1.72]	[1.78]	[1.65]	[1.89]
Bank Exposure to PEC		-0.25	20.2***	25.0***		
		[2.10]	[3.74]	[4.07]		
Constant	-0.071	-0.23	-1.05			
	[0.64]	[0.65]	[0.68]			
Observations	3,043	3,043	3,043	3,043	3,043	3,043
R-squared	0.007	0.009	0.028	0.073	0.079	0.109

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Clustering by sector

Bank exposure is defined as a country's bank foreign claims on peripheral euro countries (PEC) over the country's total bank foreign claims.

Trade exposure is defined as a country's exports of a certain sector to peripheral euro countries (PEC) over the country's total exports in the same sector.

No. of countries: 16

Table 6: Event Analysis, Financial and Trade Channels

Event: public disagreement among core euro-zone countries on the resolution for Greek crisis (June 8-10 2011).

EU Sample

VARIABLES	(1) No interaction	(2) Bank Exposure	(3) Sector Fixed Effects	(4) Country Fixed Effects	(5) Country & Sector Fixed Effects
Financial Dependence (Rajan and Zingales (1998))	-0.42	1.29*		1.27	
	[0.40]	[0.78]		[0.77]	
Financial Dependence*Bank Exposure to PEC		-13.2***	-11.9**	-13.7***	-14.0***
		[4.76]	[5.12]	[4.91]	[5.15]
Firm Size (Total Assets)	-0.15**	-0.16***	-0.17**	-0.14**	-0.15**
	[0.056]	[0.057]	[0.070]	[0.059]	[0.075]
Trade Exposure to PEC	1.56	1.28	1.77	-1.31	-1.21
	[1.10]	[1.03]	[1.49]	[0.94]	[1.37]
Bank Exposure to PEC		7.77***	7.95***		
		[2.30]	[2.93]		
Constant	0.56	-0.31			
	[0.80]	[0.81]			
Observations	1,025	1,025	1,025	1,025	1,025
R-squared	0.011	0.017	0.116	0.052	0.145

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Clustering by sector

Bank exposure is defined as a country's bank foreign claims on peripheral euro countries (PEC) over the country's total bank foreign claims.

Trade exposure is defined as a country's exports of a certain sector to peripheral euro countries (PEC) over the country's total exports in the same sector.

No. of countries with Bank exposure: 8

Table 7: Event Analysis, Financial and Trade Channels

Event: Approval of second bail-out for Greece (July 19-21 2011).

General Sample

VARIABLES	(1) No Interaction	(2) Bank Exposure	(3) Trade Exposure	(4) Sector Fixed Effects	(5) Country Fixed Effects	(6) Country & Sector Fixed Effects
Financial Dependence (Rajan and Zingales (1998))	0.64***	0.55	0.20		-0.46	
	[0.23]	[0.62]	[0.55]		[0.45]	
Financial Dependence*Bank Exposure to PEC		2.30	5.83	7.47	9.46*	9.87*
		[6.45]	[5.65]	[6.01]	[5.22]	[5.60]
Firm Size (Total Assets)	0.14***	0.11***	0.12***	0.15***	0.15***	0.15***
	[0.039]	[0.042]	[0.039]	[0.048]	[0.042]	[0.044]
Trade Exposure to PEC	3.07***	0.81	1.67	0.75	1.27	0.25
	[1.06]	[1.26]	[1.60]	[1.33]	[1.38]	[1.26]
Euro Dummy (euro=1 if country is part of Euro zone)			1.86***	1.64**		
			[0.69]	[0.79]		
Euro Dummy*Trade Exposure to PEC			1.37	2.31	-1.08	-0.036
			[2.33]	[2.70]	[2.01]	[2.10]
Bank Exposure to PEC		7.89***	-6.76	-5.70		
		[2.59]	[4.70]	[4.99]		
Constant	-1.70***	-1.86***	-1.15*			
	[0.53]	[0.56]	[0.60]			
Observations	3,042	3,042	3,042	3,042	3,042	3,042
R-squared	0.011	0.020	0.028	0.073	0.085	0.119

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Clustering by sector

Bank exposure is defined as a country's bank foreign claims on peripheral euro countries (PEC) over the country's total bank foreign claims.

Trade exposure is defined as a country's exports of a certain sector to peripheral euro countries (PEC) over the country's total exports in the same sector.

No. of countries: 16

Table 8: Event Analysis, Financial and Trade Channels

Event: Approval of second bail-out for Greece (July 19-21 2011).

EU Sample

VARIABLES	(1) No Interaction	(2) Bank Exposure	(3) Sector Fixed Effects	(4) Country Fixed Effects	(5) Country & Sector Fixed Effects
Financial Dependence (Rajan and Zingales (1998))	0.28	-3.09**		-3.46***	
	[0.31]	[1.28]		[1.27]	
Financial Dependence*Bank Exposure to PEC		26.3**	25.6**	29.0***	28.5**
		[10.4]	[11.5]	[10.2]	[11.2]
Firm Size (Total Assets)	0.31***	0.28***	0.31***	0.24***	0.26***
	[0.057]	[0.063]	[0.079]	[0.060]	[0.076]
Trade Exposure to PEC	0.098	-0.30	-0.16	0.25	0.59
	[0.98]	[0.92]	[1.18]	[0.81]	[1.02]
Bank Exposure to PEC		-1.01	-0.89		
		[2.98]	[3.22]		
Constant	-2.73***	-2.09**			
	[0.81]	[0.83]			
Observations	1,024	1,024	1,024	1,024	1,024
R-squared	0.025	0.040	0.125	0.065	0.152

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Clustering by sector

Bank exposure is defined as a country's bank foreign claims on peripheral euro countries (PEC) over the country's total bank foreign claims.

Trade exposure is defined as a country's exports of a certain sector to peripheral euro countries (PEC) over the country's total exports in the same sector. No. of countries with Bank exposure: 8

Table 9: Event Analysis, Financial and Trade Channels
Abnormal Returns

	First Event: March 10, 2010		Second Event: June 8-10, 2011		Third Event: July 19-21, 2011	
VARIABLES	General Sample	EU Sample	General Sample	EU Sample	General Sample	EU Sample
Financial Dependence (Rajan and Zingales (1998))	-1.07***	-1.64*	0.84**	1.47**	-0.47	-3.00*
	[0.40]	[0.94]	[0.42]	[0.66]	[0.47]	[1.60]
Financial Dependence*Bank Exposure to PEC	10.2**	12.3	-12.9***	-14.3***	7.34	22.8**
	[4.44]	[7.61]	[4.45]	[4.89]	[4.75]	[10.8]
Firm Size (Total Assets)	0.050	0.0026	0.0011	-0.017	-0.025	-0.042
	[0.040]	[0.071]	[0.044]	[0.065]	[0.041]	[0.060]
Trade Exposure to PEC	2.28***	-0.44	-3.98***	0.47	-2.21*	1.01
	[0.85]	[1.17]	[0.75]	[1.14]	[1.27]	[0.94]
Euro Dummy	1.46**		-3.59***		-0.42	
	[0.57]		[0.43]		[0.78]	
Euro Dummy*Trade Exposure to PEC	-5.16**		6.79***		3.49	
	[1.98]		[1.74]		[2.30]	
Bank Exposure to PEC	-10.8**	-4.97	19.9***	0.68	0.59	-0.58
	[4.19]	[3.17]	[3.86]	[2.63]	[5.19]	[3.42]
Constant	0.14	0.73	-0.81	-0.17	0.063	0.035
	[0.49]	[0.98]	[0.61]	[0.93]	[0.63]	[0.93]
Observations	2,926	961	2,924	961	2,923	960
R-squared	0.006	0.002	0.025	0.007	0.004	0.013

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
Clustering by sector
General Sample: 16 countries; EU Sample: 8 countries

Table 10: Event Analysis, Financial and Trade Channels
Weighted Regression. Normal Returns.

	First Event: March 10, 2010		Second Event: June 8-10, 2011		Third Event: July 19-21, 2011	
VARIABLES	General Sample	EU Sample	General Sample	EU Sample	General Sample	EU Sample
Financial Dependence*Bank Exposure to PEC	13.2***	17.9**	-8.81**	-5.24	16.7***	32.1***
	[4.66]	[7.59]	[4.42]	[6.68]	[5.38]	[9.31]
Firm Size (Total Assets)	0.47***	0.62***	-0.063	-0.11	0.28***	0.28***
	[0.072]	[0.10]	[0.064]	[0.092]	[0.069]	[0.11]
Trade Exposure to PEC	-0.11	-2.97	-2.87*	-1.14	0.28	0.68
	[1.93]	[2.51]	[1.71]	[1.65]	[1.74]	[1.35]
Euro Dummy*Trade Exposure to PEC	-3.87		3.27		-0.90	
	[3.19]		[3.89]		[2.77]	
Observations	3,045	1,025	3,043	1,025	3,042	1,024
R-squared	0.288	0.283	0.125	0.167	0.237	0.190

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
Clustering by sector
Country and sector fixed effects
General Sample: 16 countries
EU Sample: 8 countries

Table 11: Exposure to GIP (Financial and Trade)
Bank Exposure to GIP's Public Sector. Normal Returns

General Sample

VARIABLES	First Event: May 10, 2010		Second Event: June 8-10, 2011		Third Event: July 19-21, 2011	
	Bank Exposure	Country and Sector Fixed Effects	Bank Exposure	Country and Sector Fixed Effects	Bank Exposure	Country and Sector Fixed Effects
Financial Dependence (Rajan and Zingales (1998))	0.17		-0.14		-0.29	
	[0.37]		[0.33]		[0.32]	
Financial Dependence*Bank Exposure to GIP	9.86*	14.2***	-8.63*	-12.2**	14.6*	15.8**
	[5.49]	[4.72]	[4.60]	[4.73]	[7.38]	[7.62]
Firm Size (Total Assets)	0.38***	0.41***	0.0091	-0.061	0.13***	0.15***
	[0.043]	[0.035]	[0.044]	[0.047]	[0.047]	[0.048]
Trade Exposure to GIP	2.60**	0.64	-2.27**	-2.99	1.43	0.59
	[1.04]	[2.48]	[0.89]	[1.81]	[1.03]	[1.10]
Euro Dummy*Trade Exposure to GIP		-4.88		4.16		-4.60
		[4.40]		[3.69]		[4.44]
Bank Exposure to GIP's Sovereign Debt	9.51***		-4.05		5.94***	
	[2.41]		[2.46]		[1.81]	
Constant	-3.11***		-0.29		-1.39**	
	[0.59]		[0.61]		[0.61]	
Observations	2,693	2,693	2,691	2,691	2,690	2,690
R-squared	0.072	0.215	0.012	0.127	0.026	0.119

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
GIP: Greece, Ireland and Portugal
Clustering by sector
No. of countries: 13

Table 12: Exposure to GIP (Financial and Trade)

Bank Exposure to GIP's Public Sector. Normal Returns

Euro Sample

VARIABLES	(1) First Event: May 10. 2010	(2) Second Event: June 8-10, 2011	(3) Third Event: July 19-21, 2011
Financial Dependence*Bank Exposure to GIP	20.5***	-8.24	16.9*
	[7.44]	[5.82]	[9.48]
Firm Size (Total Assets)	0.54***	-0.040	0.32***
	[0.12]	[0.078]	[0.086]
Trade Exposure to GIP	-6.39	5.75	-2.20
	[4.48]	[4.51]	[4.53]
Observations	684	684	683
R-squared	0.256	0.199	0.221

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

GIP: Greece, Ireland and Portugal

Clustering by sector

No. of countries: 8

Figure 1: CDS Spreads for Sovereign Government and Banks, Stock Price Index
Event May 10 2010

Left axis: CDS spreads for Government (in basis points)
Right axis: Stock Price Index

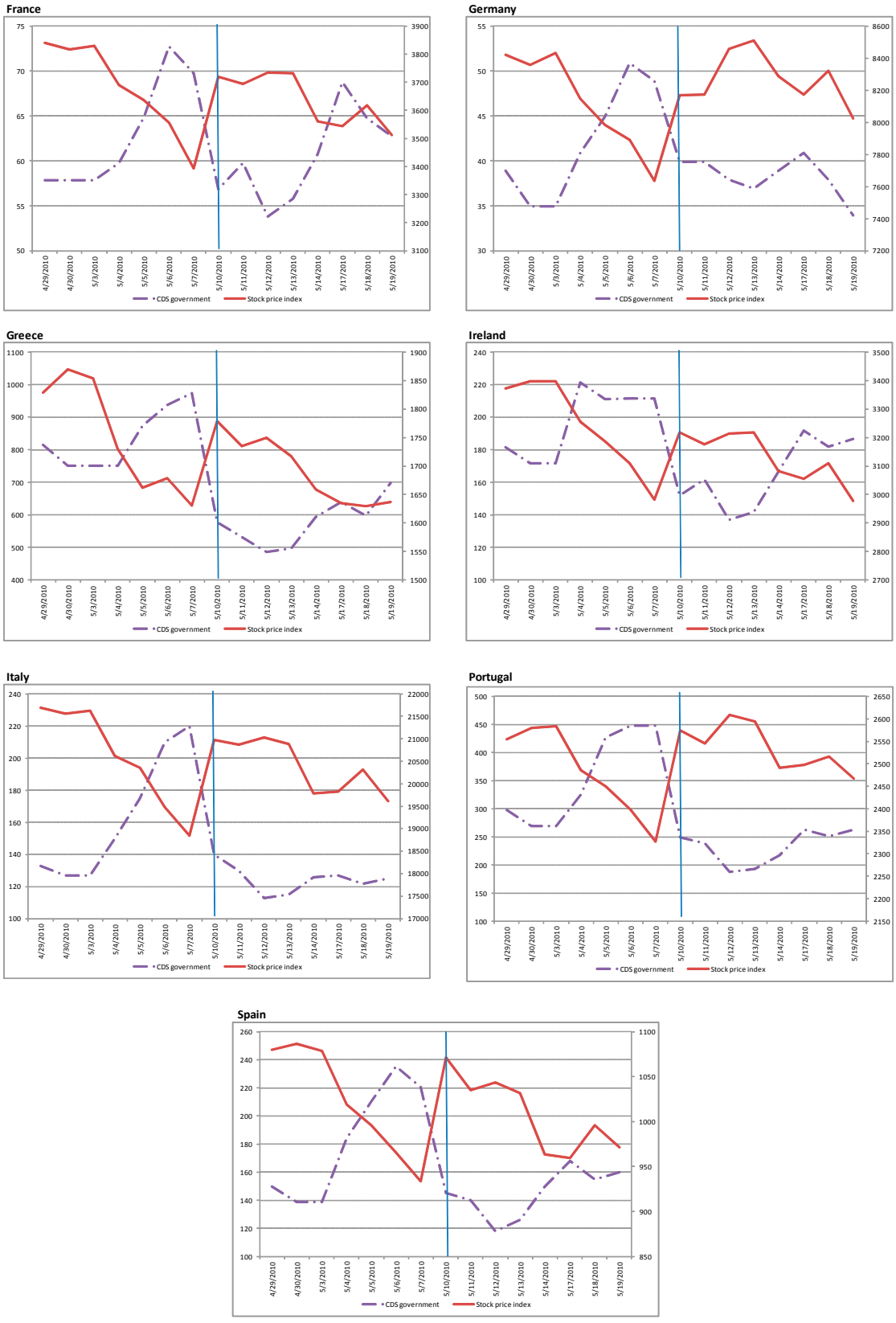


Figure 2: CDS Spreads for Sovereign Government, Stock Price Index
Event June 8-10 2011

Left axis: CDS spreads for Government (basis points)
Right axis: Stock Price Index

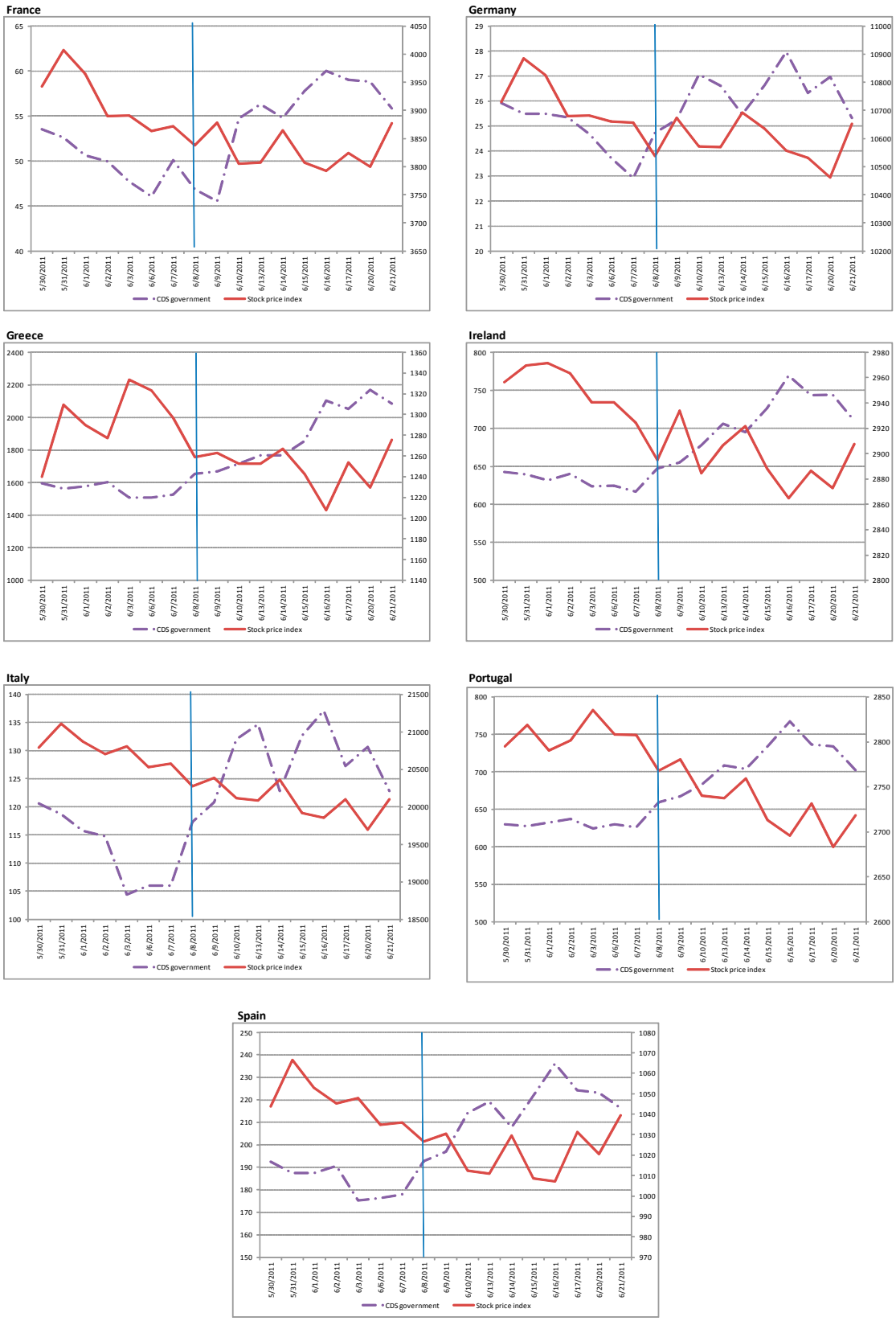


Figure 3: CDS Spreads for Sovereign Government, Stock Price Index
Event July 19-21 2011

Left axis: CDS spreads for Government (basis points)
Right axis: Stock Price Index

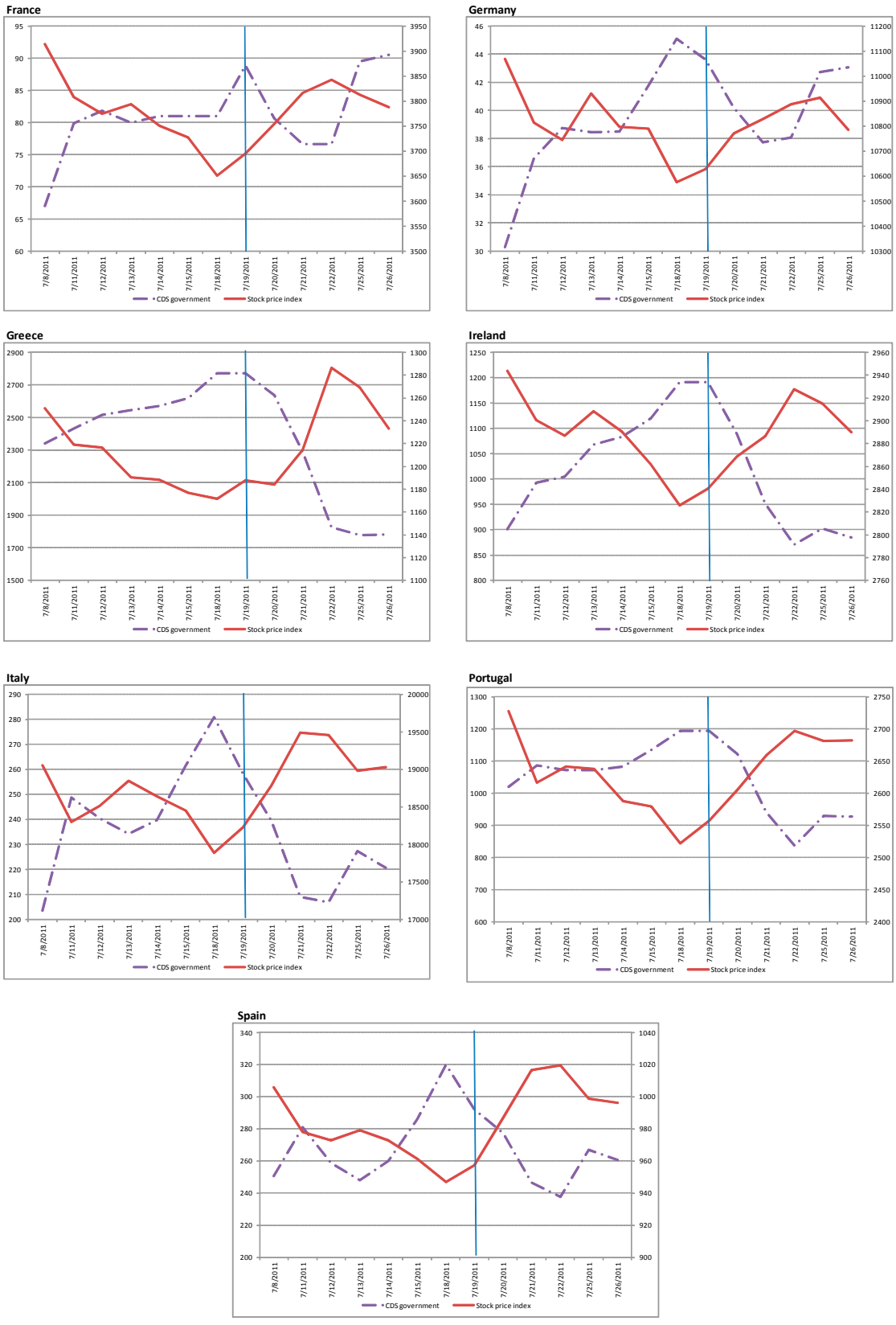
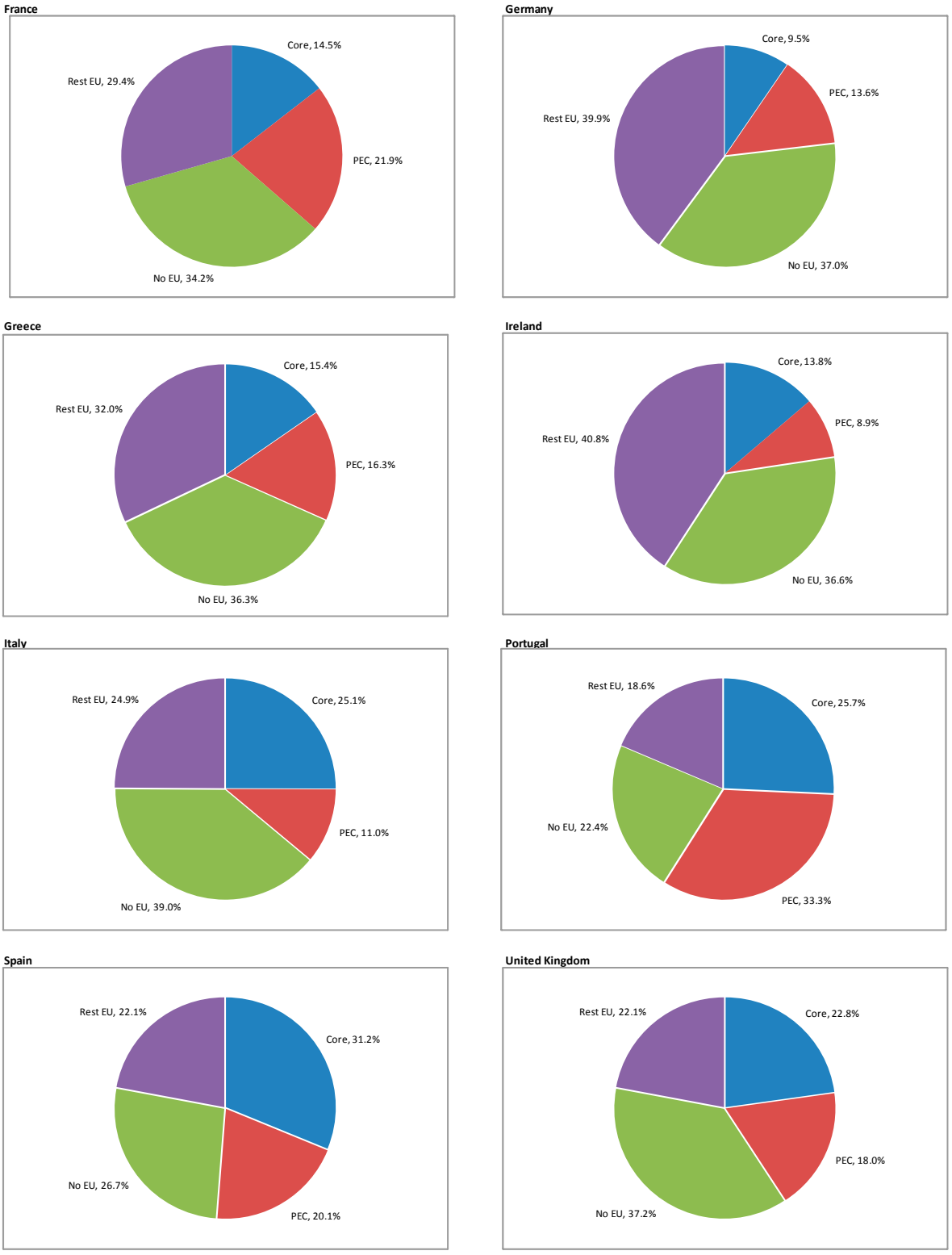
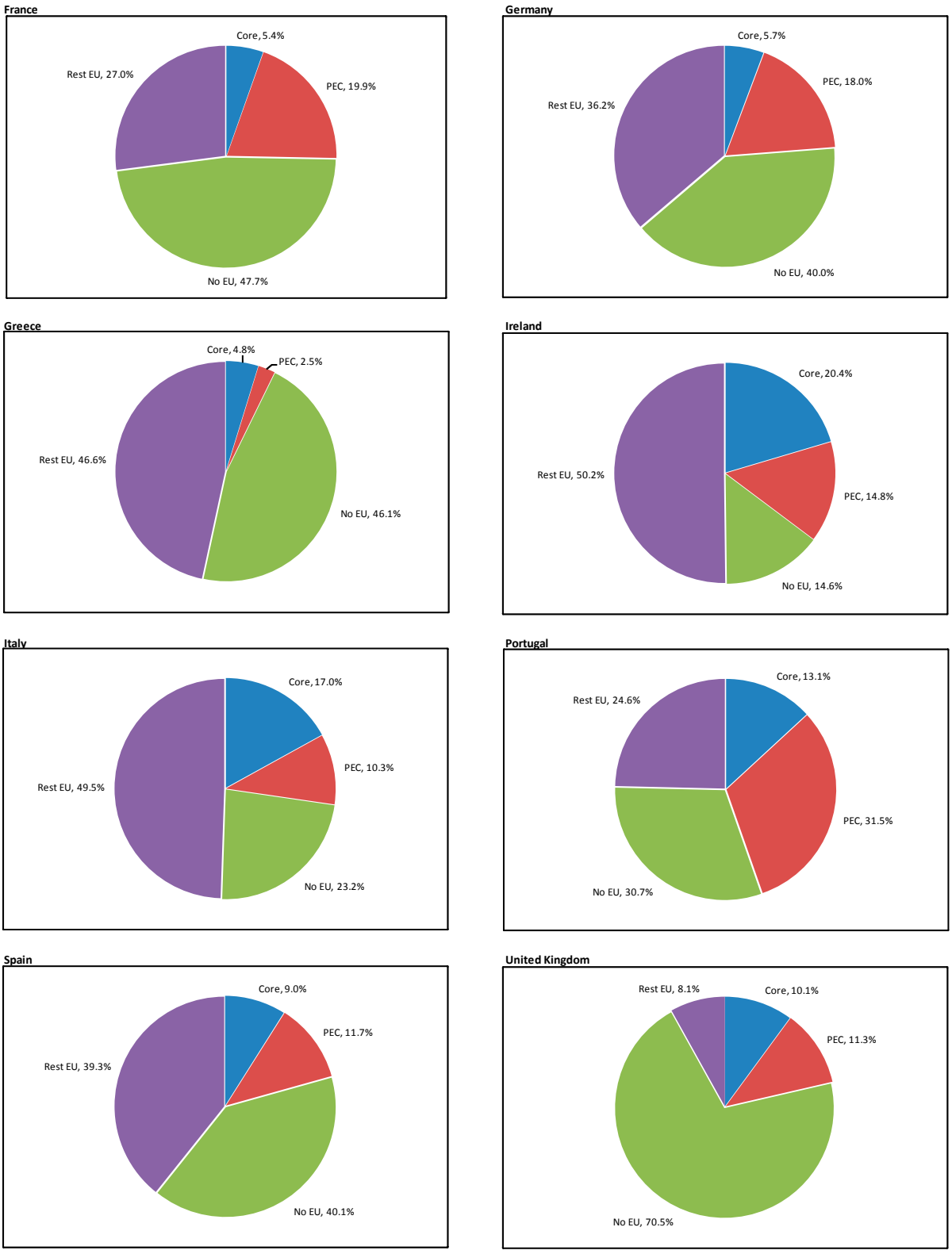


Figure 4: Trade Exposure



Note: Trade exposure is defined as a country's exports to a country group over the country's total exports.

Figure 5: Bank Exposure



Note: Bank exposure is defined as a country's bank foreign claims on a country group over the country's total bank foreign claims.

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