A European Hangover*

Preliminary and Incomplete

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November 26, 2012

Abstract

We use daily stock returns to investigate the consequences of various European bailouts. We ask four questions: (i) Were the bailout dates associated with systematic abnormal returns? (ii) Do abnormal returns depend on firms' ability to relocate profits (and thus tax liabilities) abroad? (iii) Are they different in financial sectors? And (iv) Are they different for sectors that depend on government consumption? We consider four bailouts: Ireland in September 2008, the United Kingdom in October 2008, Greece in May 2010, and Portugal in May 2011. Ireland and the UK announced bailouts that were targeted to the financial sector. Greece and Portugal announced economywide bailouts, financed by the IMF and EU in exchange of fiscal consolidation. We find the Irish and British bailouts were clearly beneficial to large firms in the financial sector, but overall returns fell - especially for real estate agencies or insurance companies in the UK. In contrast, both bailouts were detrimental to firms that depend on government consumption. There is only weak evidence that firms with large foreign assets displayed a muted response to the bailout. Greece and Portugal barely experienced any abnormal returns to their bailouts. If anything, the performance of Greek companies improved.

JEL Classification Numbers: E62, F34, F43, H63

Keywords: Debt Overhang, European Bailouts, Stock Returns.

*A previous version of this paper was entitled "The Overhang Hangover", and was funded by the Research Department, and the Debt and Growth Department at the World Bank. Our special thanks go to Aart Kraay who got us started on this project. Corresponding author. Imbs: Paris School of Economics, 106 boulevard de l'Hopital, 75013 Paris France. www.jeanimbs.com, Jean.Imbs@parisschoolofeconomics.eu. Rancière: Paris School of Economics, 48 boulevard Jourdan, 75014 Paris France. www.romainranciere.com, romainranciere@gmail.com.

1 Introduction

On 29 September 2008, the Irish Minister for Finance announced a government decision to guarantee all deposits and debts of six Irish banks and their subsidiaries located abroad. The decision ushered in an era of government bailouts, sometimes financed by multi-lateral agencies, that plague European economies to this day. This paper uses daily stock return data to investigate the real consequences of these policy moves, as expressed by market expectations of firm performance. We consider four events: the bailouts of the banking sectors in Ireland and the UK, both happening during the Fall of 2008. These were financed domestically (at least initially for Ireland). And the bailouts of the Portugal and Greek economies in May 2010 and May 2011, that were both financed externally by the IMF and the European Union.

Sector-specific bailouts represent a transfer of tax liabilities: from a specific set of financial firms, to the economy at large. A firm not benefiting from the bailout should see its tax liability increase in present value, even if the bailout is just a guarantee, and thus merely notional. Its returns should fall upon the announcement of a bailout. In fact, returns should fall disproportionately amongst those firms whose activity depends on the sovereign. On the other hand, those benefiting from the bailout should see their returns increase, perhaps because some uncertainty is resolved, or perhaps because they exit an overhang zone. In the latter case, a simple government guarantee suffices to create incentives for investment, and firms are expected to grow, instead of preparing for default. Separating out the two mechanisms requires a measure of risk, that captures the former.

External bailouts, and the accompanying fiscal shocks, are different. They affect all firms indiscriminately. Inasmuch as they amount to a pure reallocation of existing liabilities, external bailouts should have muted consequences on returns, provided they are anticipated, and/or no information is revealed about the country's aggregate situation in the process of the bailout itself. If abnormal returns do appear, the question remains whether any effect on stock returns is caused by a change in the perception of risk at firm level, or by the revelation of information about future prospects of the bailed out macroeconomy. The Greek bailout in particular is widely construed to have prevented a Greek exit from the Euro zone.

This paper asks four questions. First in case of targeted bailouts, did some firms take advantage of their international perimeter to limit the detrimental consequences of increased tax liabilities? Google, Starbucks or Amazon have all recently been accused of relocating profit across locations, in a way that limits their overall tax liabiltity. If such practices are commonplace, the consequences of the bailout should be muted for firms with an international dimension. Second, in the case of Ireland and the UK, bailouts were targeted to the financial sector, whose returns should therefore display different behavior relative to the rest of the economy. Third, with the bailout, the sovereign's

increased commitments should have consequences on the expected performance of firms that depend particularly on public demand. While bailed out firms experience less negative abnormal returns, those depending on government demand should experience the opposite. This would be illustrative of the redistributive consequences of targeted bailouts. Fourth and finally, provided they do not reveal hidden information, macroeconomic bailouts are not expected to have any consequences on firms returns, let alone heterogeneous ones. That is not to say that firms are not affected differently, but rather that the bailout does not change the perimeter of the economy's fiscal liabilities. For instance ,some international firms may still seek to dodge tax liabilities, but they had been doing it prior to the bailout annoucement. This was incorporated in the market assessment of their performance prior to the bailout.

There are several advantages to using stock return data. First, there is sufficient information to track the economic consequences of very recent developments, at least as viewed by financial markets. Second, endogeneity is less of a problem than in conventional macroeconomic studies, especially those seeking to identify the correlation between aggregate debt and economic growth. While high levels of debt (or indeed debt relief) may well have macroeconomic consequences, it is hard to differentiate them from the opposite direction of causality, going from GDP to the level of debt as a percentage of that very same GDP. A large macroeconomic literature has deployed sophisticated econometrics to address this concern, including work by Patillo, Poirson and Ricci (2002, 2003), Clements, Bhattacharya and Nguyen (2003), Chauvin and Kraay (2005), and most recently Panizza and Presbitero (2012).

Reverse causality is not an immediate issue in financial data. It is hard to think that a bailout would be decided in anticipation of future abnormal stock returns.[1] It is harder still if such abnormal returns are heterogeneous across sectors: banks were not bailed out because they were expected to experience positive abnormal returns. The use of disaggregated financial data is therefore commonplace in the literature on debt and its consequences on the real economy. A non-exhaustive list includes work by Arslanalp and Henry (2005, 2006), or more recently by Raddatz (2011), who implements an event study methodology close to this paper's.

A third advantage of these data is that asset prices are forward looking. Prices capture the expected future consequences of a bailout. Thus, movements in stock prices around bailout announcement dates summarize all there is to know at the time about the bailout's consequences on the economy. Since stock prices are observed for a broad range of sectors, a potentially informative cross-sectional dispersion is also available, which this paper exploits. Of course, an immediate

[1] One could perhaps argue that a bailout is decided to avoid future abornmal negative returns. But that constitutes an attenuating bias, since it makes it harder to estimate a significant negative coefficient in a regression of returns on a bailout date. In other words, it works against the paper's results.

corollary is that all results are predicated on the assumption that financial markets are efficient, and quickly incorporate information that is relevant for asset prices.

The methodology is inspired from conventional event studies. Daily stock returns are obtained from Worldscope to estimate a traditional factor return model. Returns are abnormal if the days following announcement of the bailout are characterized by significantly different returns, allowing for market factor loadings. To exploit the dispersion in firm characteristics, stock returns are combined with accounting information on foreign assets as a percentage of total assets, and with sector-level classification measured at Standard Indutry Classification 2-digit level. Both are provided directly by Worldscope. In addition, we introduce a measure of each sector's output that is consumed by the government sector, as implied by US input-output tables. The Bureau of Economic Analysis compiles data on Input Output linkages, from which we isolate the production of each NAICS sector that is consumed by the government sector. We collect this information for 2002, and apply it to the event studies considered in this paper. We measure government consumption in the US for two reasons. First, the sectoral allocation of government demand in the US is not influenced by developments in the countries we are considering. The same would not necessarily be true if we used Input Output data directly from Ireland, the UK, Greece and Portugal. Second, government spending in the US is motivated by different considerations than it is in Europe: if its sectoral allocation in the US displays explanatory power in Europe, it is tempting to conclude it is because of systematic reasons that apply anywhere, probably of a technological nature. Military spending is one example; infrastructure another.

We implement a correction for default risk, introduced by Atkeson, Eisfeldt, and Weill (2012). These authors show that a measure of a firm's financial soundness, labeled "Distance from Insolvency" can be captured by the (inverse of the) volatility of that firm's equity returns. The intuition is straighforward, and general. Distance to insolvency is the percentage gap between the values of assets and of liabilities, normalized by the volatility of assets value: The ratio captures the fall in assets value that would render the firm insolvent. Atkeson et al (2012) show that the ratio can be approximated by the inverse of the firm's equity volatility. They do so in Leland's (1994) model of credit risk, but the result is general. All that is required is that a firm's distance to default is well captured by its distance to insolvency. That will be true if creditors force an insolvent firm into bankruptcy as soon as possible. We compute the distance to insolvency implied by our data, and include the measure as a control for each firm's stock returns. The correction is meant to account for changes in firm-specific risk around the bailout announcement.

Our results confirm the bailouts of the financial sectors in Ireland and the UK had redistributive consequences. Large financial firms saw a net improvement in their stock returns after the bailouts. But economywide stock returns were abnormally low after the bailout. Financial firms were the

exception. In fact, in the UK, *specific* financial firms were the exception: returns were only positive for commercial and investment banks. The rest of the economy saw its prospects worsen. They worsened particularly in sectors that, in the US, tend to cater for the government: In both countries, stock returns fell disproportionately more in sectors that (in the US) tend to depend on government demand, just as the sovereign announced an increase in its other commitments. This cannot reflect an increase in tax liabilities, since there is no reason why firms that cater for the government should face especially high future taxes.

The Greek and Portuguese bailouts did not result in any significant negative abnormal returns - and no differential responses across sectors either. All activities seem to have responded identically to what was effectively a macroeconomic shock. Interestingly, economywide Greek returns improved with the bailout, which could reflect improved prospects as an exit of the Euro became less likely.

A correction for insolvency risk changes little to these results. In particular, the asymmetric responses of returns across sectors in the UK and Ireland persist. And positive economywide response persists in Greece. This suggests the redistributive effects documented in the British Isles were not the reflection of changes in firm-specific risk, but improved performance in the financial sector, at the cost of a withdrawal of the government from traditional sectors. Since an improvement in banks risk was not the reason for the increase in returns, it is tempting to assimilate the change to an exit from an overhang zone, where banks were preparing for default, rather than investing. Similarly, increased prospects in Greece were not caused by an observable fall in firm-specific risk: they may instead have been caused by a return to firm investment post-bailout.

The rest of the paper is structured as follows. Next section describes the methodology and details the data needed for the study. Section 3 presents the results. Section 4 concludes.

2 Methodology and Data

This section provides the details of the methodology, then turns to a description of the data.

2.1 Methodology

Abnormal returns are defined relative to a conventional factor model. We estimate

$$R_{i,t} = \alpha_i + \beta_i \; RM_t + \sum_{\tau=t_1}^{t_2} \delta_\tau \; D_{\tau,t} + \varepsilon_{i,t} \tag{1}$$

where $R_{i,t}$ denotes the stock return of firm i at time t, RM_t is the market return at time t, and $D_{\tau,t}$ is an event-time indicator variable that takes value 1 whenever $\tau \in [t_1, t_2]$. The bailout is

announced at time t_1, and we allow for the announcement to effect returns for a (short) time span that ends at time t_2. Equation (1) is a conventional one-factor model, where companies are allowed to have different β_i with market returns. There is no industry-specific factor, because this is the very cross-section this paper exploits to identify the effects of the bailouts across European economies. Allowances are however made for heterogeneity in average firm-level returns, via the fixed effects α_i.

Estimates of δ_τ evaluate if stock returns display anomalous behavior on the day of the announcement of a bailout, and on the ones that follow.[2] Following Raddatz (2011), we evaluate the significance of cumulated abnormal returns, defined as:

$$CAR_t = \sum_{\tau=t_1}^{t} \delta_\tau$$

The date t_2 is the first working day that the bailout announcement has no significant effect on returns, that is $\delta_{t_2} = 0$. The paper reports CAR_{t_2}, i.e., abnormal returns cumulated over the whole period that the bailout has significant consequences. In practice, the factor model is estimated company by company. The residuals are then used in equation (1), which is estimated using Ordinary Least Squares.

The paper's main contribution is to establish systematic heterogeneity in abnormal returns across different activities. Three interactions are analyzed; first, according to the percentage of foreign assets; second, whether a company belongs to the financial sector; and third, reflecting the extent its production is consumed by the government. In each case, equation (1) is augmented with interacted terms involving specific characteristics X, which can be rewritten

$$R_{i,t} = \alpha_i + \beta_i \; RM_t + \sum_{\tau=t_1}^{t_2} \delta_\tau \; D_{\tau,t} + \sum_{\tau=t_1}^{t_2} \gamma_\tau \; D_{\tau,t} \bullet X + \varepsilon_{i,t} \tag{2}$$

For the first split, $X = FA_i$, the size of foreign assets as a percentage of total assets in firm i, on the year of the bailout. The frequency is yearly since accounting data (and thus foreign assets) are only reported once per accounting exercise. The second split uses $X = FIRE_2$, which takes value 1 whenever firm i belongs to the Finance, Insurance and Real Estate (FIRE) sector. The sector classification is measured at the 2-digit SIC level. The third and final split uses $X = GOV_3$, a measure of the amount of output that is typically consumed by the government in the NAICS sector category where firm i belongs. This is purely cross-sectional, and measured in 2002. The paper reports the cumulated coefficients on the interaction terms over the whole event, i.e. estimates of

[2] Some announcements were made during weekends. When this happens, t_1 represents the first working day after the announcement.

$\sum_{\tau=t_1}^{t_2} \gamma_\tau$ for each value of X.

European bailouts were at least partly triggered by a concern with the solvency of financial firms (Ireland, the UK), or indeed that of the sovereign (Greece, Portugal). So the bailout is likely to have altered the risk profile of some firms, perhaps all of them. It is important to correct for such changes, for they can have direct consequences on stock returns. Measuring solvency risk is challenging because the conventional approach (following, e.g., Merton (1974) or Leland (1994)) requires the market value and volatility of a firm's underlying assets, as well as the value of its liabilities. Both are difficult to observe. Atkeson et al (2012) introduce a simple sufficient statistic, labeled "Distance to Insolvency", DOI, that measures insolvency risk with the (inverse of) volatility in the firm's equity. The measure is valid in a broad range of credit risk models – all that is needed are aggressive creditors, and adequate institutions, making sure an insolvent firm is forced into bankruptcy. Thus we augment equation (2) with that additional control and estimate

$$R_{i,t} = \alpha_i + \beta_i \; RM_t + \sum_{\tau=t_1}^{t_2} \delta_\tau \; D_{\tau,t} + \sum_{\tau=t_1}^{t_2} \gamma_\tau \; D_{\tau,t} \bullet X + \theta \; DOI_{i,t} + + \varepsilon_{i,t} \tag{3}$$

where distance to insolvency is measured as

$$DOI_{i,t} = \left[\sum_{\tau=t-30}^{t} \left(R_{i,\tau} - R_{i,t} \right)^2 \right]^{-1},$$

and $R_{i,t} = \sum_{\tau=t-30}^{t} R_{i,\tau}$ is the firm's average return over 30 working days periods ending on t.

2.2 Data

Daily data on stock prices are obtained from Thomson Reuters' Worldscope. For the four European countries, the universe of stock quotes is collected between January 1^{st} 2007 and December 31^{st} 2011. Returns are measured as the log-difference in market values (MV in Worldscope). Market value is the share price multiplied by the number of ordinary shares in issue. The number of shares is updated whenever new tranches of stock are issued or after a capital change. Results are similar if we use instead one of three altenative measures: (i) the share price (P), or (ii) a price index (PI), that measures the price of equity as a percentage of its value on a base date, adjusted for capital changes, or (iii) a return index (RI), that captures the theoretical growth in value assuming dividends are re-invested.

For a sub-sample of stocks, Worldscope reports annual financial accounts.[3] Accounts data are used to compute the share of foreign assets (FA) held by the firm. There is a substantial number

[3] The inclusion of data from annual reports varies across countries. One issue is standardization. Another is that some firms are listed in multiple exchanges.

of firms for which annual accounts are not collected in Worldscope, which affects the sample size as regards information on the international perimeter of each company. We also extract information on each firm's activity, measured by the SIC code corresponding to its primary source of revenues.[4]

We use each firm's SIC code to create a variable equal to one when the firm's primary activity falls under the FIRE heading (finance, insurance, and real estate).[5] The sector classification is also necessary to compute a measure of each firm's dependence on government demand. With the 2002 input-output table constructed by the Bureau of Economic Analysis (BEA) for the US, we compute the share of output in each 4-digit industry that is consumed, either as final or as intermediate input use, by the government sector. Government is defined as the sum of: Federal Government Enterprises, State and Local Government Enterprises, General Federal Defense Government Services, General Federal Nondefense Government Services, and General State and Local Government Services. The share is available from the BEA at the 4-digit NAICS classification. It is aggregated up to 3-digit, and made compatible with the 3-digit SIC classification used in Worldscope. Thus, each firm (with available SIC classification) can be matched with a (2002, US) measure of dependence from government demand. Sample size is determined by the availability of a SIC classification, and by the concordance between the NAICS and SIC classifications.

The paper considers four bailout announcements: two are sector-specific, and financed domestically; two are economywide, and financed externally. On September 29, 2008, Ireland announced that it would implement a "guarantee arrangement to safeguard all deposits (retail, commercial, institutional and inter-bank), covered bonds, senior debt and dated subordinated debt (lower tier II)" of six Irish banks: Allied Irish Banks, Bank of Ireland, Anglo Irish Bank, Irish Life and Permanent, Irish Nationwide and the EBS Building Society. The potential liability was evaluated at $400 billion, about twice Irish GDP.

On October 8, 2008, the UK announced a rescue package of its financial system, aimed at facilitating inter-bank lending. The plan included direct capital injections from the Treasury, short-term lending by the Bank of England, and government guarantees. Participation to the scheme required a formal agreement with the Financial Service Authority, which was signed by three banks: Royal Bank of Scotland, Lloyd TSB and HBOS. The package was evaluated at $850 billion, about 130 percent of British GDP.

On Sunday May 2, 2010, the IMF and the EU agreed on a three-year, $145 billion rescue package to bail out the debt-ridden Greek economy. According to the package, the Greek government agreed

[4] Worldscope classifies firms into sectors according to the 1997, 4-digit SIC code. Since the "primary source of revenue" is only affected when annual accounts are available, the SIC classification is only available for firms that do have financial accounts in Worldscope.

[5] These include two-digit SIC codes between 60 and 67.

to a brutal fiscal contraction in order to benefit from the low-interest loan package.[6] The package was equal to about 50% of Greek GDP in 2009. On May 17, 2011, Portugal asked for IMF and EU support for a total amount of EUR78 billion, in exchange of stringent policy steps towards a fiscal consolidation. The facility represented about 45% of the Portuguese economy.

The paper estimates the cumulated response of stock returns from the date of the announcement, measured over the subsequent working days. We experimented with up to five working days, but the last two were never significant. The results in the paper focus therefore on three working days, i.e., $t_2 - t_1 = 3$.

3 Results

This section first presents the results of the sector-specific bailouts in Ireland and the UK. The economywide bailouts in Greece and Portugal are then discussed.

All tables in the paper have the same format: specification (i) corresponds to equation (1): it evaluates whether economywide abnormal returns occur in response to the bailout announcement. The sample covers the universe of listed companies. Specification (ii) includes an interaction between the bailout date and the percentage of foreign assets, which are reported as part of yearly accounts. Since not all firms report accounting data in Worldscope, the sample is reduced, sometimes considerably. But there is no reason to expect the availability of accounting data in Worldscope to be random: for instance, large firms are probably more likely to report. As a result, we let sample size vary in the presentation of our results: specifications (ii), (iv) and (vi) focus on a sub-sample of firms with reported accounting data, i.e. presumably large ones. Since bailouts are likely to have affected (small?) firms that are listed, but do not report accounting data in Worldscope, we include them in the samples for specifications (i), (iii) and (v), which are therefore larger.

Column (iii) investigates whether returns in the FIRE sector behaved any differently from the rest of the economy, while specification (iv) includes both the percentage of foreign assets and an indicator variable for FIRE activities. The last two specifications in each Table include an interaction with government demand, measured at NAICS level from US input-output tables. The sample size is also affected, since not all companies listed in Worldscope report a sector classification that is compatible with the definition of a sector in input-output tables. Specification (vi) includes all three interacted terms, with foreign assets, a binary variable for FIRE sectors, and government demand. Specification (v) only includes the last one.

[6] Among the measures agreed to were cuts in defense spending, a hike in value-added tax, a new business tax, a freeze in public-sector salaries and pensions, and a cap on annual holiday bonuses.

For each table, Panel A reports results for equations (1) and (2), with bailout dates and interacted variables. Panel B includes controls for "Distance to Insolvency", as in equation (3).

Tables 1 and 2 report the results for Ireland and the UK, two cases of bailouts targeted to the financial sector. Ireland experienced negative abnormal returns in the days that followed September 28, 2008: on average, stock returns fell by 5%. across the economy. Specification (iii) shows this average masks opposite responses across the economy: companies in the FIRE sector actually saw their returns rise with the bailout, by 8.25%. Firms in the FIRE saw a net increase in their returns with the bailout.

Specification (iv) is conditioned on a sample of firms with accounting data, where the asymmetry between FIRE companies and the rest of the economy is even more pronounced. FIRE companies experienced an increase in returns equal to 14.2%, whereas the rest of the economy experienced lower returns, by 12.3%. In other words, the bailout affected particularly those firms that have accounting data in Worldscope: we speculate they are large ones. Small firms were less affected.

Columns (v) and (vi) suggests the bailing out of (large) financial companies came at a cost: those firms whose output is consumed by the government suffered from the bailout, as manifested by negative abnormal returns. The sample in column (vi) is restricted to firms with accounting data in Worldscope, and a NAICS classification: this is considerably reduced relative to all other specifications, which explains why some coefficients lose significance. For instance, returns are not different for FIRE companies anymore: but since they are everywhere else, this probably happens because there are few FIRE companies left in the sample column (vi).

These results suggests government resources were (at least implicitly, or in expectations) redistributed towards the financial sector in Ireland, at the expense of activities that rely on government demand. In the fall of 2008, the foremost intention of the authorities was to lift concerns about the solvency of Irish banks by announcing government guarantees. Thus, returns in the FIRE sector could have been abnormally high simply because insolvency became suddenly less of a concern, and the risk premium fell. Put differently, "Distance to Insolvency" fell just as returns increased. Panel B of Table 1 controls for DOI for Irish returns. DOI displays a clear downward shift in the days that follow the bailout announcement in Ireland: but as is apparent from Panel B, that makes little difference for the estimates of abnormal returns, and their distribution across firms. The same asymmetry prevails in Panel B of Table 1 between FIRE companies and those that depend on government demand. The innocuity of a control for insolvency risk in the present instance is consistent with the finding in Atkeson et al (2012) that "the timing and the magnitude of the financial soundness collapse is almost exactly the same for financial firms as it is for all firms, both

financial and non-fiinancial" (page 1). Insolvency risk mattered, but not in any clearly asymmetric manner across firms or sectors.

If it is not because of a change in the risk profile of financial firms, what can explain an increase in the returns of FIRE companies? Their prospects were construed to have improved with the bailout, but not because of a change in risk. It is tempting to conclude these firms started investing again thanks to the bailout, rather than preparing for default, as they would have if they had been in an overhang zone. The exit of overhang was not for free: it came at a cost to other firms that depended on the government to sell their product.

Table 2 reports results for the UK bailout. The results are very similar, with a few interesting exceptions. Cumulated returns were abnormally low around the bailout date, with a fall equal to 0.45% across the economy. That is a much smaller percentage than in Ireland. But specification (iii) shows the negative returns are concentrated in FIRE sectors, where they are more than five times larger, i.e., 2.7%. In fact, from column (iii), there are no negative returns outside of FIRE, a reflection of the fact that the UK was highly specialized in financial activities in 2008. Comparing specifications (iii) and (iv) is especially interesting: while returns were negative across all FIRE sectors, they were in fact positive, like in Ireland, for those FIRE companies that collect accounting data. Column (iv) paints a picture that is very similar to Ireland: in the sample of firms with data on Foreign Assets, FIRE firms experienced positive returns (1.46%), whereas the rest of the economy experienced negative returns (-1.46%). In other words, the UK bailout helped large financial firms, but at the expense of smaller ones – presumably real estate companies or insurance companies. This is the key asymmetry as regards the effects of the bailout in the UK: it holds within FIRE companies.

Another asymmetry, similar to Ireland, holds as well in the UK: Specification (v) shows that once again firms that cater to the government saw their returns fall. But that is only true in the broad sample of firms, including those without collected accounting data. Thus, the redistributive effects present in Ireland are also at play in the UK: large financial firms benefited from the bailout, but at the expense of other firms in the FIRE sector, and at the expense of companies dependent on government puchases. These conclusions are still present in Panel B of Table 2, which suggests they cannot be explained by changes in firms' risk profiles. Once again, it is tempting to conclude bailed out firms started investing (or at least, were expected by markets to start investing).

Tables 3 and 4 present results for Greece and Portugal. No negative abnormal returns are observed anywhere - either economywide, or for specific sectors. This is consistent with both bailouts being macroeconomic in nature, and largely anticipated by markets. The liabilities were that of the Greek and Portuguese governments all along. The intervention of the EU and the IMF did not

worsen the market assessment of these liabilities and of their impact on firm performance. Interestingly, abnormal returns were positive in the Greek economy at large: in the universe of Greek listed companies, cumulated returns increased by 0.6% with the announcement of the IMF/EU bailout. This increase survives in panel B, where changes in firm-level risk are accounted for "Distance to Insolvency". Two interpretations are possible. First, the Greek bailout was perceived to usher in subsequent restructurating, effectively pardoning some of the debt - which is what happened subseqently. Second, the bailout helped lower the probability of a Greek exit of the Euro. This improved the real prospects of Greek firms, holding default risk constant .Given the ubiquitous references to market confidence and contagion at the time of the bailout, it is likely the latter explanation played an important role.

4 Conclusion

We present evidence on the response of stock returns to four bailouts announced by European countries since 2008. Two bailouts were specific to the financial sector, in Ireland and the UK. Two others were financed by the IMF and the EU, and were macroeconomic in nature, in Portugal and Greece. We show the Irish and British bailouts redistributed resources towards financial companies, at the expense of firms that depend on government demand. This improved prospects in Irish and British financial firms, not because their insolvency risk diminished, but presumably because they started investing again. In the UK, the bailout was beneficial to a small category of financial firms only: the bulk of companies listed as part of the FIRE sector did in fact suffer from the bailout. In contrast, European bailouts in Portugal and Greece did not have much effect on returns, and had no differential consequences across sectors. In fact, Greek returns improved across the board with the announcement, but not because insolvency risk was altered. We conjecture the prospects of Greek firms improved as the specter of an Euro exit receded.

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Table 1: Ireland (29 September 2008)

Panel A	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Bailout	-5.082*** (-9.12)	-10.057*** (-4.45)	-5.502*** (-9.62)	-12.267*** (-5.24)	-4.746** (-2.32)	-10.565*** (-3.68)
Foreign Assets		0.446 (1.17)		0.542 (1.42)		0.692* (1.86)
FIRE sector			8.248*** (3.26)	14.215*** (3.63)		3.728 (0.72)
Gov. inputs					-0.471* (-1.83)	-0.471* (-1.65)
Obs.	205,230	62,883	205,230	62,883	77,049	50,375

Panel B	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Bailout	-4.796*** (-8.56)	-7.524*** (-3.27)	-5.201*** (-9.04)	-9.492*** (-3.98)	-3.580* (-1.73)	-6.954** (-2.38)
Foreign Assets		0.102 (0.26)		0.181 (0.47)		0.303 (0.80)
FIRE sector			7.990*** (3.14)	13.031*** (3.31)		2.159 (0.41)
Gov. inputs					-0.548** (-2.12)	-0.568** (-1.98)
Obs.	200,845	61,542	200,845	61,542	75,204	49,200

Notes: All estimations include market factor loadings and firm-specific intercepts, as described in the text. The dependent variable is the log-change in Market Value (MV) in panel A, and the residual of a regression of the log-change in MV on the Distance to Insolvency (defined in the text) in panel B. "Bailout" reports the percentage Cumulated Abnormal Return (CAR). "Foreign Assets" denotes the cumulated response to an interaction between the bailout date and the percentage of Foreign Assets computed on the year of the bailout. Coefficients are multiplied by 10^3. "FIRE Sector" denotes the percentage cumulated response to an interaction between the bailout date and an indicator variable that takes value one when the SIC sector is part of FIRE (i.e. SIC2=60, 61, 62, 63, 64, 65, 66, and 67). "Gov. Inputs" denotes the cumulated response to an interaction between the bailout date and the consumption of each NAICS3 industry used by the government sector. F-statistics associated with the joint significance of the coefficients in CAR are reported between parentheses. *** (**,*) denotes significance at 1% (5%, 10%) confidence level.

Table 2: UK (8 October 2008)

Panel A	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Bailout	-0.452*** (-5.59)	-1.166*** (-4.06)	-0.376 (-0.43)	-1.460*** (-4.69)	-2.156*** (-8.92)	-2.027*** (-3.73)
Foreign Assets		-0.108* (-1.74)		-0.088 (-1.40)		-0.43 (-0.65)
FIRE sector			-2.667*** (-11.94)	1.459** (2.46)		1.629** (2.26)
Gov. inputs					-0.065** (-2.25)	0.009 (0.20)
Obs.	5,984,314	1,471,039	5,984,314	1,471,039	2,422,171	1,201,799

Panel B	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Bailout	-0.451*** (-5.55)	-1.159*** (-4.01)	-0.035 (-0.40)	-1.454*** (-4.65)	-2.144*** (-8.82)	-2.019*** (-3.70)
Foreign Assets		-0.109* (-1.74)		-0.088 (-1.40)		-0.043 (-0.64)
FIRE sector			-2.663*** (-11.89)	1.459** (2.44)		1.629** (2.25)
Gov. inputs					-0.067** (-2.31)	0.009 (0.20)
Obs.	5,822,658	1,437,474	5,822,658	1,437,474	2,536,770	1,172,801

Notes: All estimations include market factor loadings and firm-specific intercepts, as described in the text. The dependent variable is the log-change in Market Value (MV) in panel A, and the residual of a regression of the log-change in MV on the Distance to Insolvency (defined in the text) in panel B. "Bailout" reports the percentage Cumulated Abnormal Return (CAR). "Foreign Assets" denotes the cumulated response to an interaction between the bailout date and the percentage of Foreign Assets computed on the year of the bailout. Coefficients are multiplied by 10^3. "FIRE Sector" denotes the percentage cumulated response to an interaction between the bailout date and an indicator variable that takes value one when the SIC sector is part of FIRE (i.e. SIC2=60, 61, 62, 63, 64, 65, 66, and 67). "Gov. Inputs" denotes the cumulated response to an interaction between the bailout date and the consumption of each NAICS3 industry used by the government sector. F-statistics associated with the joint significance of the coefficients in CAR are reported between parentheses. *** (**,*) denotes significance at 1% (5%, 10%) confidence level.

Table 3: Greece (3 May 2010)

Panel A	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Bailout	0.664**	0.766	0.662**	0.708	1.062	0.814
	(2.33)	(0.92)	(2.21)	(0.78)	(1.57)	(0.53)
Foreign Assets		-0.035		-0.041		-0.044
		(-0.10)		(-0.12)		(-0.10)
FIRE sector			0.0191	0.287		0.251
			(0.02)	(0.17)		(0.10)
Gov. inputs					0.086	0.052
					(0.83)	(0.25)
Obs.	564,594	130,461	564,594	130,461	310,617	86,096

Panel B	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Bailout	0.655**	0.731	0.653**	0.664	1.056	0.783
	(2.27)	(0.86)	(2.16)	(0.72)	(1.55)	(0.51)
Foreign Assets		-0.028		-0.035		-0.034
		(-0.08)		(-0.10)		(-0.08)
FIRE sector			0.025	0.315		0.275
			(0.02)	(0.18)		(0.11)
Gov. inputs					0.086	0.049
					(0.81)	(0.23)
Obs.	549,061	127,381	549,061	127,381	303,046	83,977

Notes: All estimations include market factor loadings and firm-specific intercepts, as described in the text. The dependent variable is the log-change in Market Value (MV) in panel A, and the residual of a regression of the log-change in MV on the Distance to Insolvency (defined in the text) in panel B. "Bailout" reports the percentage Cumulated Abnormal Return (CAR). "Foreign Assets" denotes the cumulated response to an interaction between the bailout date and the percentage of Foreign Assets computed on the year of the bailout. Coefficients are multiplied by 10^3. "FIRE Sector" denotes the percentage cumulated response to an interaction between the bailout date and an indicator variable that takes value one when the SIC sector is part of FIRE (i.e. SIC2=60, 61, 62, 63, 64, 65, 66, and 67). "Gov. Inputs" denotes the cumulated response to an interaction between the bailout date and the consumption of each NAICS3 industry used by the government sector. F-statistics associated with the joint significance of the coefficients in CAR are reported between parentheses. *** (**,*) denotes significance at 1% (5%, 10%) confidence level.

Table 4: Portugal (17 May 2011)

Panel A	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Bailout	0.395 (0.87)	-1.876 (-1.50)	0.443 (0.96)	-1.776 (-1.32)	-0.414 (-0.18)	-3.167 (-1.30)
Foreign Assets		0.498 (1.61)		0.492 (1.58)		0.606* (1.67)
FIRE sector			-1.709 (-0.62)	-0.498 (-0.20)		
Gov. inputs					0.052 (0.19)	0.088 (0.28)
Obs.	182,814	29,437	182,814	29,437	47,337	17,470

Panel B	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Bailout	0.402 (0.88)	-1.864 (-1.48)	0.450 (0.97)	-1.763 (-1.30)	-0.403 (-0.18)	-3.155 (-1.29)
Foreign Assets		0.498 (1.60)		0.491 (1.57)		0.606* (1.66)
FIRE sector			-1.704 (-0.62)	-0.495 (-0.20)		
Gov. inputs					0.052 (0.19)	0.088 (0.28)
Obs.	178,087	28,862	178,087	28,862	46,113	17,137

Notes: All estimations include market factor loadings and firm-specific intercepts, as described in the text. The dependent variable is the log-change in Market Value (MV) in panel A, and the residual of a regression of the log-change in MV on the Distance to Insolvency (defined in the text) in panel B. "Bailout" reports the percentage Cumulated Abnormal Return (CAR). "Foreign Assets" denotes the cumulated response to an interaction between the bailout date and the percentage of Foreign Assets computed on the year of the bailout. Coefficients are multiplied by 10^3. "FIRE Sector" denotes the percentage cumulated response to an interaction between the bailout date and an indicator variable that takes value one when the SIC sector is part of FIRE (i.e. SIC2=60, 61, 62, 63, 64, 65, 66, and 67). "Gov. Inputs" denotes the cumulated response to an interaction between the bailout date and the consumption of each NAICS3 industry used by the government sector. F-statistics associated with the joint significance of the coefficients in CAR are reported between parentheses. *** (**,*) denotes significance at 1% (5%, 10%) confidence level.