Firm Stock Returns' Sensitivities to Crisis Shocks*

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Abstract

We identify three "crisis shocks" related to key features of the 2007-2008 crisis: (1) the collapse of global demand, (2) the contraction of credit supply, and (3) selling pressure on firms' equity. Using an international cross-section of firms, we analyze whether firms' sensitivities to these shocks are reflected in stock returns over the period of the global financial crisis of 2007-2008. Firms' sensitivities to these three "crisis shocks" result in large and statistically significant influences on residual equity returns during the crisis period (after controlling for normal risk factors that are associated with expected returns). Similar analysis for the placebo period of August 2005-December 2006 shows that the influences identified during the 2007-2008 sample period are not significant. A month-by-month analysis shows that the time variation of the importance of each of the sensitivities to shocks tracks related changes in the global economic environment.

Keywords: stock returns, crisis

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I. Introduction

The financial crisis of 2007-2008, which started in the US mortgage market, was characterized by three types of global shocks: a sharp contraction in the supply of credit, distressed sales of risky assets as banks and investors scrambled to shore up their liquidity and capital ratios, and a significant contraction in global trade. In this paper, we examine the extent to which the sensitivities of firms to these shocks explain the behavior of firm-level stock returns during the crisis.

Stock returns are a unique measure of performance that is comparable across firms and countries, forward-looking, comprehensive in scope, and insensitive to differences in accounting rules. In normal times, a firm's stock returns reflect a combination of expected returns (its loadings on risk factors) and residual returns that are associated with firm-specific news. At times of significant economy-wide shocks, however, the cross-section of residual returns can be understood as reflecting the exposure or sensitivity of firms to unexpected shocks.

Our strategy is to construct measures of firm-level sensitivity to each of the three categories of "crisis shocks" described above and then identify their relative contribution to the observed declines in equity returns. As a measure of sensitivity to global product demand shocks, we employ a measure of global trade exposure. The sensitivity to selling pressure is captured by the amount of stock trading in each stock prior to the crisis. We measure firms' sensitivity to credit supply shocks through a combination of variables relating to the capital structure, its dividend behavior, and the ability of the firm to cover its debt obligations.

We collect data on over 17,000 firms in 44 countries around the world to study whether cross-sectional stock returns over the period of August 2007 to December 2008 can be explained by firms' sensitivities to the "crisis shocks" described above. In our baseline estimations, we

exclude US firms in order to focus on factors that were associated with the global spread of the crisis. However, for comparison, we also report separate results for US firms. We use a methodology similar to Tong and Wei (2011) which employs a cross-sectional model of stock returns and captures expected returns with a standard set of control variables.[1] In this framework, our sensitivities to shocks capture unexpected influences of crisis-related shocks on residual stock returns. Empirically, we use values from 2006 to construct our measures of sensitivities, which are based on firm characteristics observed prior to the crisis. We then compare our results for the crisis period with a similarly structured model of the "placebo" period that runs from August 2005 to December 2006 and uses predetermined values from 2004 to construct firms' sensitivities to shocks.

To preview our results, we find that firms' sensitivities to credit supply shocks, global demand shocks, and selling pressures in the equity market had negative influences on stock returns during the crisis, but positive or not significant effects during the placebo period. Our results are robust to three ways of modeling the sensitivity to credit supply shocks: (1) as four individual variables that enter separately as regressors in the model of residual returns, (2) as the first principle component of the set of individual regressors used to measure credit supply sensitivity, and (3) as dummy variables that divide firms in groups according to combinations of regressor values. Furthermore, our results do not change if we use a local instead of a global measure of beta as a control or if we conduct weighted estimations to reduce the importance of countries that have many firms in our sample. Finally, our main findings are similar if we conduct separate estimations for firms in developed and developing countries.

[1] Tong and Wei (2011) follows Whited and Wu (2006) in incorporating Fama and French (1992) factors directly in cross-sectional regressions of returns.

A month-by-month analysis shows that the time variation of the importance of each of the sensitivities to "crisis shocks" tracks related changes in the global economic environment. The magnitude of the negative coefficient associated with the sensitivity to a global demand shock rises during times of greatest decline in exports. Time variation in the coefficients associated with the sensitivity to a credit-supply shock is similar to that observed in credit risk spreads that reflect the timing of credit-supply shocks. The variation over time in the coefficient that measures sensitivity to a stock market selling pressure shock closely tracks the variation in the returns to the stock market.

While our methodology builds on Tong and Wei (2011), our focus is different. Tong and Wei explore the role of country-level exposure to financial globalization, specifically through the composition of capital flows. They also find an important firm-specific factor in cross-sectional returns related to financial dependence (specifically, working capital financing needs). Our focus is entirely on firm-specific sensitivities to shocks, which arise as a result of an unexpected crisis event. We abstract from the effect of country characteristics by using country fixed effects. Didier, Love, and Martinez Peria (2010) provides a detailed analysis of country-specific factors in aggregate equity returns during the crisis. In considering the significance of firm-specific variables, we explore a broader range of firm characteristics, both relating to financing structure and other characteristics of firms than did Tong and Wei.

We find that firm sensitivity to each of the three categories of crisis-related shocks accounts for significant proportions of the declines in equity prices observed during the crisis. Of course, it is not possible to completely disentangle the influences of global demand contraction, credit scarcity, and selling pressure through our measures of firms' sensitivities. Each of our measures of firm sensitivity to shocks is likely to have been influenced by all three sources of

shock. Nevertheless, we argue that the dominant influences on each of the measures of firm sensitivity are likely to be primarily traceable to one of the three categories of shocks.

This paper is related to the growing literature on the origin and consequences of the crisis. Most of the existing papers have focused on the causes and consequences of the crisis and, thus, have mostly analyzed its epicenter, the United States.[2] A few others have studied the global transmission of this crisis. For instance, Fratzscher (2009) and Obstfeld, Shambaugh, and Taylor (2009) focus on the transmission via exchange rates. Dooley and Hutchison (2009) provides evidence of transmission to credit default swap spreads in emerging markets. Rose and Spiegel (2009a and 2009b) conduct an analysis of the international propagation of the crisis based on a measure of crisis incidence and severity which combines changes in real GDP, stock markets, credit ratings, and exchange rates. However, these papers use macro data to analyze the incidence and determinants of the propagation of the crisis. Ehrmann, Fratzscher, and Mehl (2009) studies the transmission of the US 2007-2008 crisis to stock markets around the world by focusing on the performance of about 450 industry-equity portfolios across 64 countries. That paper primarily emphasizes the role of macro factors on the performance of industry portfolios rather than the role of the micro sensitivities to crisis shocks we consider here.

The rest of our paper is organized as follows. Section II explains our approach to identifying firms' sensitivities to crisis shocks. Section III describes the data and empirical model. Section IV presents our main empirical results for the global cross-section of stock returns during the crisis, and shows that our identified sensitivities to crisis shocks played a uniquely important role in explaining equity returns during the crisis, as compared with the pre-crisis "placebo" period. Section V presents a number of robustness checks on our baseline results

[2] See Caprio, Demirguc-Kunt, and Kane (2008), Reinhart and Rogoff (2008), Brunnermeier (2009), Calomiris (2009), Cecchetti (2009), and Taylor (2009), among many others.

and confirms that our main findings do not change. Section VI examines the cross-section of returns during the crisis period in more detail, performing a month-by-month analysis of the changing importance of firms' sensitivities to crisis shocks over time. Section VII concludes.

II. Identifying Firms' Sensitivities to Crisis Shocks

Global Demand Shock

The financial crisis was associated with a remarkable decline in global trade. World exports fell by 9 percent between July 2007 and December 2008. This decline reflected a variety of potential influences, including the sensitivity of export financing to credit supply contraction (Amiti and Weinstein 2009, Chor and Manova 2009). Our interest, of course, is not in explaining export decline, but rather examining firms' differing sensitivity to the decline in global demand during the crisis. In particular, we want to assess whether firms that had positioned themselves prior to the crisis to be more dependent on trade were relatively more vulnerable to global demand shocks during the financial crisis. We, therefore, measure global demand shock sensitivity using a firm-specific measure that captures the exposure of a firm to global trade. Our measure is the firm's pre-crisis proportion of sales outside the company's home country (i.e., the ratio of foreign to total sales).[3]

Stock Market Selling Pressure Shock

[3] In a prior draft of this paper, we also tried using the proportion of foreign assets held by the firm as a measure of exposure to global trade. However, because the effects associated with that variable were not as robustly significantly as effects associated with the proportion of foreign sales, we ended up dropping this variable in this version of the paper. Including it in the analysis would not affect the other results reported here.

There have been numerous studies of the effects of the crisis and the role of credit contraction and illiquidity crisis-induced selling on the redemptions of money market debts and the widening of bond spreads. These studies identify important effects of correlated selling pressure traceable to illiquidity problems in generating the contraction of quantities and the declines in prices in different debt markets.[4]

In publicly traded equity markets, crisis-related shocks could have even greater effects than in debt markets, given the consequences of the crisis for firms' immediate and future incomes and their debt financing options. Just as in debt markets, problems of "funding illiquidity" for investors in publicly traded firms (due to declines in investor equity, rising market volatility, and the decline in available credit), could have been transformed into "market illiquidity" as owners of publicly traded shares were forced to liquidate their shares. Billio, Pelizzon, Getmansky, and Lo (2010) examines correlations in returns across different equity investors and document apparent crisis-specific linkages in returns that they argue reflect this selling pressure.[5] Additionally, publicly traded firms' expected performance was itself affected by declining expected sales and by contraction in the supply of credit. Equity selling pressure, therefore, could have magnified declines in share prices that reflected the influences of declining demand and tight credit in reducing the discounted expected future cash flows of firms.

[4] See Schwarz (2009) on the Libor market, Heider, Hoerova and Holthausen (2009) on the Euribor market, Gorton and Metrick (2010) on the repo market, Corvitz, Liang, and Suarez (2009) on the asset-backed commercial paper market, Duca (2010) on the commercial paper market, and Mitchell and Pulvino (2010) on the bond market.

[5] Cella, Ellul, and Giannetti (2010) finds that investors with short trading horizons are inclined or forced to sell their holdings to a larger extent than investors with longer trading horizons, amplifying the effects of market-wide shocks on stock prices.

We measure the sensitivity of a firm's equity to selling pressures in the stock market using pre-crisis stock turnover (the volume of trading relative to outstanding market value of equity).[6] This measure is intended to capture the relative liquidity of a stock prior to the crisis.[7]

In theory, the effect of stock liquidity on returns is ambiguous. On the one hand, greater liquidity may be associated with steeper declines in equity prices, as investors select their most liquid risky assets to sell during a liquidity squeeze. On the other hand, liquidity becomes more valuable during a crisis, implying that relatively illiquid stocks may experience relative price declines. The interpretation of any observed liquidity effects on returns is also controversial. For example, if liquid stocks decline more during the crisis, one could argue that relatively illiquid stocks also experienced similar or even larger "shadow" declines in value during the crisis that were masked by the lack of sales of these illiquid stocks. In other words, had someone tried to sell a large amount of an illiquid stock, its price would have been much lower. Selectivity bias related to endogenous decisions to sell, therefore, complicates the interpretation of the meaning of the effects of liquidity on stock returns during the crisis.

Credit-Supply Shock

Several studies show dramatic declines in credit supply during the crisis. Ivashina and Scharfstein (2009) find that banks curtailed new lines of credit, and thus, that credit supply contracted much faster than would be apparent by only examining outstanding aggregates

[6] In a prior draft of this paper, we included the amount of free float as a second measure of sensitivity to selling pressure. In examining further the data for free float, we encountered some anomalies that led us to exclude it. Namely, for some firms, free float was measured as one hundred percent. Given our doubts about those data, we excluded the variable from our analysis. However, none of our results change significantly whether we include or exclude this variable.

[7] Bekaert, Harvey, and Lundblad (2007) finds that, in emerging markets, expected returns vary with the liquidity of stocks, which they measure as the proportion of trading days for which stock returns are zero.

amounts of commercial and industrial lending. Campello, Graham, and Harvey (2010) surveys chief financial officers (CFOs) of 1,050 firms in 40 countries after the September 2008 market collapse and find that a substantial proportion of those surveyed report that they were forgoing positive net present value investments due to financing constraints.[8] Almeida, Campello, Laranjeira, and Weisbenner (2010) finds that firms that are more exposed to debt rollover risk experienced much greater investment decline during the financial crisis.[9]

Although the contraction of credit supply affects all firms, either directly (through reduced credit) or indirectly (through reduced demand by customers who face reduced credit), some companies could be harder hit by a contraction in credit supply than others. Companies with intrinsically high costs of external finance – for example, small, growing firms, specializing in new products, or with short histories of public trading – could find their prospects of attracting financing reduced relative to other firms during times of general economic contraction, or credit-supply stringency.[10]

For a given degree of exogenous difference in the costs of external finance, a company with higher leverage and lower cash flows relative to debt service requirements (i.e., interest coverage) prior to the crisis may experience greater vulnerability to credit supply shocks associated with a financial crisis. All firms experience reductions in their "debt capacities" during a crisis (the maximum degree of leveraging that their cash flow prospects will permit);

[8] "[T]he inability to borrow externally caused many firms to bypass attractive investment opportunities, with 86% of constrained U.S. CFOs saying their investment in attractive projects was restricted during the credit crisis of 2008. More than half of the respondents said they canceled or postponed their planned investments."

[9] Almeida, Campello, Laranjeira and Weisbenner (2010) uses long-term debt maturing in the near term as a particularly exogenous indicator of firms' exposures to rollover risk. They argue that while a reliance on short-term contractual debt may proxy for other firm attributes, long-term debt maturing in the near term is a purer measure of exposure to rollover risk.

[10] There is a long literature examining indicators of firms' costs of external finance. Fazzari, Hubbard and Petersen (1988) used dividend payout as their key indicator. Dividend payout may reflect other differences, and has been criticized in some studies (Kaplan and Zingales 1997, but see the response by Fazzari, Hubbard and Petersen 2000, and the further evidence in Campello and Chen 2010 and Almeida, Campello and Weisbach 2004).

therefore, companies with high leverage and lower interest coverage prior to the onset of a credit crunch could be more adversely affected than other firms, as credit supply constraints will be more likely to bind on them.[11]

Thus, vulnerability to credit-supply shocks should reflect both the exogenous external finance costs of the firm and its endogenous financial choices. To capture both sorts of sensitivities to financial fragility, we considered a variety of measures that had been identified in the literature, and settled on a subset of indicators that capture endogenous leverage choices as well as exogenous characteristics related to external financing costs.[12]

Previous research on the effects of financial constraints on stock returns confirms that the effects are relatively pronounced during macroeconomic downturns. Lamont, Polk, and Saa-Requejo (2001) surprisingly found "no evidence that the relative performance of constrained

[11] A large body of empirical and theoretical research supports the view that "corporate finance vulnerability" should matter for the cross-section of stock returns (Anginer and Yildizhan, 2010 is an exception), and that it should matter more for the cross-section of returns in adverse states of the world (i.e., recessions, credit crunches, or financial panics). The theoretical foundations of "corporate finance vulnerability" for stock returns dates back to the seminal work of Brock and LeBaron (1990), who showed that financing constraints (i.e., differences in the marginal cost of external finance across firms and across time) could explain variation in stock returns above and beyond those predicted by standard risk models. Brock and LeBaron (1990) showed that an adverse macroeconomic shock should cause a larger decline in the stock returns of financially constrained firms (those with relatively high costs of external finance) than other firms. With respect to the effects of leverage in magnifying financial constraints, Sharpe (1994) and Calomiris, Orphanides, and Sharpe (1994) found that although high leverage tends not to be useful for explaining cross-sectional differences in investment and employment decisions during expansions, during recessions US firms that had chosen to increase their debt to high levels during the preceding booms suffered larger contractions of employment, fixed investment and inventory accumulation in reaction to declines in their sales growth during the recession. In other words, highly levered firms experience relatively large declines in expected cash flows in adverse economic states, but not in other economic states.

[12] Unlike Tong and Wei (2011), we do not confine our investigation to exogenous influences on external finance dependence related to working capital. We consider financial structure characteristics more broadly for two reasons. We note that working capital use, like other financial structure characteristics is endogenous to firm-specific costs of external finance. Calomiris, Himmelberg and Wachtel (1995) shows that, ceteris paribus, firms that face greater external financing constraints tend to choose combinations of productive factors that make greater use of working capital. While that finding supports Tong and Wei's emphasis on working capital to measure financing constraints, it also indicates that their measure is endogenous to choices that reflect financing constraints, which are related more broadly to age, opacity, and other firm characteristics. We do not regard endogeneity as a problem; on the contrary, we believe that it makes sense to consider the ways in which endogenous choices of firms' financing structure make them differentially vulnerable to crisis-related credit-supply shocks. We consider a wide range of such measures. In particular, we show that endogenous decisions by firms – for example, the decision to increase leverage – mattered for firms' sensitivity to the crisis.

firms reflects monetary policy, credit conditions, or business cycles." Subsequent research by Campello and Chen (2010), however, shows that macroeconomic conditions do affect the magnitude of the financial constraint factor, once one properly identifies cross-sectional variation in the extent of financing constraints, which they show Lamont et al. did not do.

In light of these theoretical and empirical findings, we chose four indicators to capture the sensitivity of firms to the credit-supply shock aspect of the crisis: (1) dividends to sales, (2) total debt to assets, (3) a dummy variable that is a threshold measure of potential financial distress, which distinguishes whether firms' debt service payments are very high relative to their cash flows – firms that have debt service coverage greater than one are defined as "good coverage" firms, and (4) an interaction effect of leverage with good coverage.

Dividend payout is a useful indicator of the exogenous cost of external finance; firms with high dividend payout tend to have high cash flows relative to investment, and are relatively mature. Our three leverage measures allow us to distinguish between the effects of financial distress, per se, and the effect of the financial crisis in reducing the effective debt capacity of non-distressed firms with significant pre-crisis leverage ratios. In particular, the interaction of leverage and good coverage highlights this potential effect of the crisis.

Limits to Identifying Firms' Sensitivities to Crisis Shocks

We believe that our six observable measures (the ratio of foreign sales, the share of firms traded, the dividend to sales ratio, the leverage ratio, the good coverage dummy, and the interaction of leverage with good coverage) can be used to capture firms' sensitivities to the three categories of shocks reasonably well. Our identification assumptions linking each of these

six observable variables primarily to one of the three crisis shocks (global product demand shocks, market sell-off pressure shocks, and credit-supply shocks) are plausible, but we recognize that all three shocks probably affect each of the six observable variables to some extent. For example, firms with high pre-crisis costs of external finance will be more sensitive to reductions in cash flow (related to contractions in product demand) than other firms, even if credit supply were not declining. Nevertheless, we believe that the three sets of variables are naturally divisible into three groups based on our priors about the shock to which one would expect them to be most closely related.

III. Methodology and Data

To explore the role of firms' sensitivities to crisis-related shocks in driving the performance of firms' stocks, we estimate a cross-section model of returns represented by equation (1)

$$y_{f,i,c} = \alpha_1 \textit{Standard Risk Factors}_{f,i,c} + \alpha_2 \textit{Firm Sensitivities to Crisis Shocks}_{f,i,c} + \mu_i + \gamma_c + \varepsilon_{f,i,,c} \quad (1)$$

where f represents the firm, i the industry, and c the country where each firm operates. The dependent variable in our study, $y_{f,i,c}$, is the return of each firm f, in each industry i, and each country c. *Standard Risk Factors* refer to a set of variables which the asset pricing literature have shown to drive expected results (Sharpe, 1964; Fama and French, 1992; Lakonishok, Shleifer, and Vishny, 1994; Ang et al., 2006, 2009). The *Firm Sensitivities to Crisis Shocks* are our proxies for firms' credit supply sensitivity, global demand sensitivity, and stock market selling pressure sensitivity. Following Tong and Wei (2011) and Whited and Wu (2006), we incorporate the standard risk factors and the sensitivities to crisis shocks by entering the relevant firm characteristics directly into the regression, rather than entering them indirectly first going

through a factor model.[13] μ_i and γ_c are industry and country fixed effects, respectively, and $\varepsilon_{f,i,c}$ is the firm level error term. We estimate our model with clustered standard errors to allow for within-country across-firms correlation of error terms.

We estimate equation (1) over two periods: the crisis period and a placebo (non-crisis) period. Crisis period returns are measured over the period August 2007 through December 2008. Most firm characteristics are measured at December 2006.[14] The placebo period encompasses returns from August 2005 through December 2006, with most firm characteristics measured at December 2004. Table 1 lists the countries along with the number of firms included in each sample. We only consider countries with at least 20 firms. The crisis period includes at most 17,350 firms operating in 44 countries, while during the placebo period our sample consists of at most 15,740 firms operating in 44 countries.[15]

Table 2 presents descriptive statistics for returns, standard risk factors, and firms' sensitivities to crisis shocks during the crisis and placebo periods. Data on returns come from Datastream. Table 2 shows that firm returns average -48 percent over the crisis period. The standard deviation of returns over the crisis period is 32 percent. During the placebo period, returns average 28 percent and the standard deviation is 55 percent.

The independent variables used in our analysis come from Worldscope, a commercial database produced by Thomsom Reuters, which provides financial statement data for most listed

[13] Daniel and Titman (1997) were early advocates of this approach to capturing Fama-French risk factors, arguing that firm characteristics rather than the covariance structure of returns appear to explain the cross-sectional variation in stock returns.

[14] The firms' beta vis-a-vis the global market portfolio is calculated over the period December 2001 through December 2006 for the crisis period regressions. For the placebo regressions, beta is calculated over the period December 2000 through December 2005. Momentum (i.e., a measure of returns six month prior) is calculated over the period January 2005 through June 2005 for the placebo period and for January 2007 through June 2007 for the crisis period.

[15] In the regressions shown on Table 3-6 the number of observations is typically smaller because we lose observations once we combine variables in the regressions.

firms around the world. *Standard Risk Factors* follow Tong and Wei (2011) and include: the *beta* of each firm vis-a-vis the global market, the *standard deviation of the beta residual* (i.e., the standard deviation of the error from the estimation of the beta vis-a-vis the global market), the *log of firm assets*, a measure of *momentum*, and the *market to book value ratio*. The beta of each firm vis-a-vis the global market is the coefficient from regressing each firm's stock return on the return from a global portfolio as captured by the FTSE World Index. The capital asset pricing model of Sharpe (1964) predicts that individual stock returns will be driven by the correlation of each firm with the market's return. Because stock markets around the world have become increasingly integrated (see, for example, Bekaert et all, 2010), we consider the correlation or beta vis-a-vis a world portfolio as opposed to the local market. For the crisis period beta is measured over the period December 2001 and December 2006 and averages 0.77. For the placebo period beta is calculated over the period December 2000 through December 2005 and averages 0.85. The standard deviation of beta is 0.63 during the crisis and 0.65 during the placebo period.

Following Ang et al. (2006, 2009), we also include the standard deviation of the error term from the regressions used to calculate beta. The average of this variable during the crisis period is 12.56, while it averages 12.87 during the placebo period.

Fama and French (1992) have shown that aside from beta, firms' expected returns are driven by firms' size and market to book value ratios. We measure firm size by the log of asset measured in dollars. The average for this variable during the crisis period is 11.6 (109,097 dollars) and the standard deviation is 2.1 (8.6 dollars). For the placebo, the log of assets averages 11.5 (98,715 dollars) and the standard deviation is the same as during the crisis period. The market to book value ratio is equivalent to the number of firms outstanding multiplied by the

price of the shares, divided by the book value of equity. For the crisis period, the mean market to book value ratio is 2.54 and the standard deviation is 3.41. This variable averages 2.13 during the placebo period, with a standard deviation of 3.06

Following Lakonishok, Shleifer, and Vishny (1994), we also include among the standard risk factors a measure of momentum, defined as each firm's return over the six month period prior. For the crisis period, this refers to January 2007 through June 2007. For the placebo period, momentum is measured over the period January 2005 through June 2005. The mean of momentum is 29 percent during the crisis, while it is 0 percent during the placebo period.

We include a number of variables to measure firms' sensitivity to credit supply shocks, namely: the ratio of *dividends to sales,* the *leverage ratio*, *good coverage* – a dummy equal to 1 for firms with interest coverage ratios above 1- and the interaction between leverage and good coverage, which we label *good coverage×leverage*. The interest coverage ratio is defined as the ratio of earnings to interest expenses. It measures the ability of firms to meet their debt obligations. Hence, the dummy variable we use captures the share of firms for which their earnings exceed their debt obligations. Table 1 shows that 75 percent of firms have interest coverage ratios above 1 during the crisis and placebo periods. The average leverage ratio is 0.22 during both the crisis and the placebo period, and the standard deviation in both periods is close to 0.25.

Our estimations also capture firms' sensitivity to stock selling pressures through the inclusion of the *ratio of shares traded,* defined as the number of shares traded per month over the

number of shares outstanding.[16] This variable is an indicator of the ease with which firms' stocks can be traded. The average for the volume traded is 0.10 during the crisis and the placebo period.

We capture firms' sensitivity to global demand shocks by including the *share of foreign (overseas) sales* to total sales. For both the crisis and placebo periods, the share of foreign sales averages 0.31.

In some estimations, to facilitate the interpretation of the economic impact of the sensitivities to crisis shocks, we report standardized measures of these variables by subtracting the mean and dividing by the standard deviation. In particular, the *Standardized Selling Pressure Sensitivity* is a standardized measure of the ratio of shares traded over total shares, while the *Standardized Global Demand Sensitivity* is the comparably standardized measure of the share of foreign sales to total sales. In the case of the sensitivity to the credit supply shock , instead of including each of the individual variables that enter as indicators of firms' sensitivity to credit supply shocks, we compute the first principal component of the variables and include the standardized principal component in our regression for ease of comparisons with the other standardized measures of sensitivity. In particular, *Standardized Credit Supply Sensitivity* is the first principal component of the leverage ratio, good coverage, and the dividend to sales ratio.

We also conduct estimations replacing the individual credit supply variables with a set of dummies that divide firms into different categories, depending on the values of the various credit supply sensitivity measures. Group A contains the firms that a priori are likely to be the most sensitive to the credit supply shock, Group B contains the firms that have middle degree of

[16] Amihud (2002) uses a different measure of liquidity which is based on daily trading data. We prefer our measure as it allows us to include firms with missing daily trading data.

sensitivity and Group C contains firms with least sensitivity to the credit supply shock (Group C is the omitted category in the regressions).[17]

Specifically, *Group A* contains firms that have low interest coverage (i.e. "good coverage" equals to zero). These are "distressed" firms that cannot meet their debt obligation with their cash flows. In addition, firms with good coverage but high debt levels (above 80th percentile) and zero dividends also belong to this group. These firms have the lowest debt capacity and are likely to be the most affected by the credit supply shock. *Group B* contains firms with good coverage and which either have high debt but pay dividends, or those that have moderate debt but do not pay dividends.[18] This group has some vulnerability to credit supply shocks. *Group C* contains the rest of the firms. In our sample 29% of all firms are classified as Group A, 19% as Group B, and about 52% as Group C.

IV. Empirical Results

In Table 3, we begin by reporting results for six regressions, estimated over the crisis period August 2007-December 2008, in which each of the six variables (including the interaction of leverage with good coverage) that we use to capture firms' sensitivities to crisis shocks enter separately in the regressions, and a seventh regression for the "placebo" period of August 2005-December 2006.

The first three columns in Table 3 consider regressions in which all three types of sensitivities to crisis shocks are present (where we alternately omit one of the leverage measures

[17] Our results do not change significantly if we modify the specific criteria we use to separate firms into these groups.

[18] Specifically, Group B contains firms that have moderate debt levels (i.e. fall between 60th and 80% percentile of debt distribution) and have no dividends, or firms that are high in debt (above 80th percentile) but have non-zero dividends.

to demonstrate the effects of doing so). The fourth through sixth columns of Table 3 include the three sets of sensitivities to crisis shocks one at a time. All regressions include controls for standard risk factors relating to expected returns, as discussed in Section III, which are not discussed here.[19] We focus our discussion on the sensitivities to crisis shocks.

For the crisis period, the measured coefficients on variables associated with the sensitivity to each of the three sets of shocks do not change much as a result of including or excluding variables associated with the other two sets of crisis shocks. We find statistically significant and economically important effects for all three categories of sensitivities to shocks. With respect to selling pressure effects, the share of stocks traded consistently enters negatively and statistically significantly in the regressions. The measure of sensitivity to the global demand shock, the coefficient on the proportion of foreign sales, is also consistently negative and statistically significant.

The four corporate finance indicators used to measure the sensitivity to credit supply shocks (dividends to sales, leverage, good coverage, and the interaction between leverage and good coverage) generally enter with the predicted signs and are statistically significant. Dividends to sales enters positively, indicating that firms with higher pre-crisis payout tended to experience higher residual returns during the crisis. Leverage enters negatively and good coverage enters positively. The interaction between the two also enters negatively and significantly. Including the interaction eliminates the significance of the simple leverage effect, indicating that variation in leverage among the set of firms that do not have good coverage ratios adds relatively little to the explanatory power of leverage as a measure of credit supply sensitivity during the crisis. In other words, if firms are "distressed" (if *good coverage*=0), that is

[19] All regressions also include country level and industry level fixed effects. Furthermore, standard errors are clustered by country.

(roughly speaking) all one needs to know about their debt capacity, but if they are not distressed (if *good coverage*=1), then variation in leverage is informative about debt capacity.

During the placebo period, the coefficient on leverage alone is negative and insignificant, and the coefficient on the good coverage-leverage interaction term is positive and significant at only the 10% level. In other words, during non-crisis periods, firms that face a significant prospect of financial distress (those with *good coverage*=0, whose debt service commitments are extremely high relative to their income) experience negative returns relative to similarly leveraged firms with *good coverage*=1. A similar finding has been noted in prior work by Campbell, Hilscher and Szilagyi (2006), who document that the probability of financial distress is associated with negative stock returns for U.S. firms for the past thirty years.[20]

Clearly, the effect of the sensitivity to the credit supply shock is very different between the crisis and placebo periods. During non-crisis times only distressed firms have negative returns (i.e., those with interest coverage below one), while during the crisis time period we find that not only firms in distress have negative returns, but even firms with high leverage that are not distressed also have negative returns. Also, firms with high dividend payout experience higher returns during the crisis, but not during the placebo period.

Similarly, with respect to the sensitivities to the other two crisis shocks, we find that the variables capturing the sensitivity to the global demand shock or the market liquidity shock are

[20] In another study of U.S. stocks, Vassalou and Xing (2004) construct a measure of default risk and show that "the observed relation in the literature between size and equity returns is completely due to default risk. Size proxies for default risk and this is why small caps have higher default risk than big caps. Book-to-market also proxies for default risk. Default risk is not however all the information included in book-to-market" (p. 859). They also find that this default risk factor is priced in the market; that is, firms with higher default risk earn a higher expected return. Because we include size and the market-to-book ratio as controls, if the Vassalou-Xing findings apply to global stocks, the inclusion of these controls should reduce measured effects associated with leverage. Thus, the fact that leverage effects are present during the crisis, even in the presence of the other controls, suggests a crisis-specific change related to leverage.

insignificant during the placebo period, confirming that these variables capture shocks that are crisis-specific.

In Table 4, we report standardized measures of the sensitivities to shocks and we summarize the vulnerability to credit shocks by using the first principal component or the group dummies for different categories of exposure to credit supply shocks. The first two columns of Table 4 report coefficients for the crisis period, and the second two columns report effects for the placebo period.

The regressions including standardized measures of vulnerability to shocks in Table 4 confirm the results reported in Table 3, since we find that all three standardized measures of sensitivity to crisis shocks are negative and statistically significant. Furthermore, these results suggest that the effect of the sensitivity to crisis shocks is also economically significant. A one standard deviation increase in the principal component for the sensitivity to a credit supply shock is associated with a decline in returns of 2.9 percent. A one standard deviation increase in the sensitivity to a global demand shock translates into a fall of 1.6 percent. A one standard deviation increase in the sensitivity to a selling pressure shock is associated with a 1.7 percent decline in returns.

Using the group approach to measure the combination of variables that capture credit supply sensitivity, we find that the Group A effect is larger and more statistically significant than the Group B and Group C effects during the crisis. In particular, firms that fall in the Group A category for the credit supply sensitivity exhibit returns that are 5 percent lower than firms in Group C. The Group B effect is also negative and statistically significant relative to the omitted Group C, and returns for Group B firms are 3.2 percent lower.

In contrast, during the placebo period, under the principal-components approach, none of the measures of sensitivity to shocks is highly significant. Under the group approach, neither the Group A nor Group B variables is significant during the placebo period. The results in Table 4 confirm those using individual indicators of sensitivity to crisis shocks.

V. Robustness Checks

We conduct a number of additional estimations to verify the robustness of our results. We use as the baseline results those reported in models (2) and (7) of Table 3. First, instead of calculating the beta vis-à-vis the global market index, we compute the beta for each firm vis- à -vis its local stock market index. Second, because the number of firms varies by country, to reduce the potentially excessive influence of countries with a large number of firms, we conduct weighted least squares with weights proportional to the inverse of the square root of the number of firms in each country. We also report separate estimations for developed and developing countries to ascertain whether our main findings are verified for both samples of countries. Finally, for purposes of comparison, we report results for U.S. firms (which are not otherwise included in our sample).

Table 5 presents results for the crisis period and Table 6 shows the estimations for the placebo period. Using the local beta rather than the global beta does not change our main results in any significant way (see model (1) in Table 5 and 6). The same variables proxying for sensitivity to credit supply, selling pressure, and global demand shocks are significant during the crisis period when we use the local beta instead of the global beta. As before, these variables are not significant in the placebo period. Running our estimations with weights proportional to the inverse of the square root of the number of firms does not lead to changes in results either.

Our main findings are not driven by a particular sample of countries, since we are able to verify our findings among separate samples of developed and of developing countries. There are, however, some differences across samples with respect to which specific proxies are relatively important. The leverage ratio is significant during the crisis for developed countries, but not for developing countries. On the other hand, for developed countries the interaction between leverage and coverage is smaller than it is for developing countries. The coefficient on the share of foreign sales is larger in magnitude and more significant for developing countries, while the coefficient on the ratio of shares traded is larger in magnitude and more significant for developed countries. Overall, we continue to find that the variables capturing firms' sensitivities to credit supply, selling pressure, and global demand shocks are significant during the crisis period but not during the placebo period.

Model (5) in Tables 5 and 6 presents our results for the sample of US firms. While the results for U.S. firms are broadly similar, they differ in two respects: First, the coefficient on the ratio of shares traded is insignificant during the crisis period.[21] Second, for U.S. firms, during the placebo period, the coefficient on the ratio of foreign sales is positive and significant. That could be an indication that the placebo period was one of unusually profitable news associated with global trade exposure, or it could reflect a globalization risk factor in expected returns that is unique to U.S. firms.

[21] In results not reported here, we investigated whether similar results held for U.K. firms (the country in our sample most similar to the U.S.) and we found that results for the U.K., in particular with respect to the coefficients on the two selling pressure variables, were broadly similar to those of other developed countries and different from those of the U.S.

VI. A Month-by-Month Analysis of the Cross-Section of Returns During the Crisis

Having shown that residual returns for the crisis period as a whole varied importantly as the result of firms' sensitivities to each of the three crisis shocks, we now turn to a more detailed analysis of the crisis period on a month-by-month basis. To do so, we ran separate monthly regressions for each month from August 2007 through December 2008, using the same specifications as those in the first two columns of Table 4. Figures 1 (Panel A), 2, and 3 plot the coefficients and two times their standard errors for each standardized sensitivity measure (which is a principal component in the case of the credit supply variables) in each month using regressions analogous to those in column (1) of Table 4. Figure 1 (Panel B) plots Group A coefficient values and their standard errors for the credit supply sensitivity.

We find that the effects of the firms' sensitivities to crisis shocks vary in intensity during the crisis in a manner that conforms to what one would expect. Time variation in the coefficients associated with the credit-supply sensitivity (Figure 1) is related to those found in credit risk spreads that reflect the timing of credit-supply shocks. Coefficients on the credit supply sensitivity tend to be more positive during the early part of the period when the Baa spread is low, and more negative in the latter part of the period when the Baa spread is high.

The coefficients associated with the sensitivity to a global demand shock tend to vary with the timing of the declines in exports (see Figure 2). Both show a drop in August 2007, a subsequent recovery, then another drop in late 2007, followed by a rising trend through the Spring of 2008, after which the trend is negative, culminating in a steep drop around November 2008.

The variation over time in the coefficients that measure the sensitivity to selling pressure tracks the variation in the returns to the stock market. Peaks and troughs of returns are related to

peaks and troughs in the coefficients of the selling pressure indicators (see Figure 3). The time variation in these three sets of coefficients confirms our interpretation of the coefficients relating to the sensitivities to the three shocks as reflecting three crisis-specific influences on residual returns.

VII. Conclusion

Equity returns provide a uniquely comparable window through which to examine the performance of firms throughout the world, and their responses to financial crises. The global financial crisis of 2007-2008 was characterized by three types of shocks: (1) a collapse of global trade, which caused a major shock to demand for firms that had positioned themselves to benefit from participating in expanding global trade and production; (2) a credit-supply contraction which curtailed the access of firms to funding and reduced their effective debt capacity , and (3) selling pressures in equity markets as investors scrambled to meet margin calls and made redemptions to make up for losses in the US market. This paper showed that firms' sensitivities to all three of these crisis "shocks" – exposure to the collapse in global trade demand, vulnerability to credit-supply shocks, sensitivity to stock market selling pressures – are reflected in the large and statistically significant observed patterns in residual equity returns (after controlling for normal risk factors that are associated with expected returns).

We constructed a vector of six variables that measure the effects of the three crisis-related shock factors from August 2007-December 2008 – four variables that measure vulnerability to credit-supply shocks, one that measures exposure to global trade demand shocks, and one that measures sensitivity to stock market selling pressure. These six variables entered with the expected sign and were significant statistically. The three sets of influences were unique to the

crisis. Similar analysis for the placebo period of August 2005-December 2006 showed that the influences identified during the 2007-2008 sample period were not present in this non-crisis period.

Using the four variables we identified as measures of firms' exposures to credit supply shocks, we constructed composite measures of the credit shock factor in two ways: first, by using the first principal component of the various credit supply exposure measures, and second, by constructing group indicator variables that divide firms according to their combined values of the various credit supply sensitivity indicators. These two composite effect regressions confirmed the unique importance of the sensitivity to the credit supply shock during the crisis.

A month-by-month analysis of the magnitude of the sensitivity to each of three shocks showed that the time variation of the sensitivities tracked related changes in the global economic environment. The time variation in the coefficients associated with sensitivity to the global trade demand shock factor varied with the timing of the declines in exports. Time variation in the coefficients associated with the sensitivity to the credit-supply shock were related to credit risk spreads that reflected the timing of credit-supply shocks. The variation over time in the coefficients that measure sensitivity to the market illiquidity shock closely tracked the variation in the returns to the stock market.

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Table 1: Sample of countries and firms

Country	Number of firms	
	Crisis	Placebo
Argentina	66	63
Australia	1415	1225
Austria	72	65
Belgium	108	98
Brazil	271	257
Canada	1428	1393
Chile	149	152
China	1656	1390
Czech Republic	25	38
Denmark	105	104
Egypt	42	32
Finland	118	120
France	626	618
Germany	667	611
Greece	255	278
Hong Kong, China	767	765
Hungary	28	32
India	859	507
Indonesia	239	238
Ireland	67	62
Israel	154	150
Italy	231	202
Japan	1223	1167
Korea, Rep.	969	884
Luxembourg	28	31
Malaysia	876	838
Mexico	105	109
Netherlands	147	149
New	112	106
Norway	180	148
Pakistan	89	73
Peru	63	53
Philippines	134	120
Poland	213	149
Portugal	46	53
Russian Federation	149	89
Singapore	553	528
South Africa	254	249
Spain	99	104
Sweden	345	278
Switzerland	183	182
Thailand	409	370
Turkey	173	187
United Kingdom	1652	1473
Total non-US	***17350***	***15740***
United States	4548	4121
Total	***21898***	***19861***

Table 2: Descriptive statistics for Non-US firms

	Crisis			Placebo		
Variable	N	Mean	Sd.	N	Mean	Sd.
Return	17350	-0.48	0.32	15014	0.28	0.55
Beta	16068	0.77	0.63	14764	0.85	0.65
Momentum	16514	0.29	0.51	14336	0.00	0.29
Market to book value	16409	2.54	3.41	14212	2.13	3.06
Logarithm of total assets in USD	17350	11.58	2.09	15014	11.51	2.10
Standard error of residuals from beta	16276	12.56	4.78	14949	12.87	5.00
Good coverage	15260	0.75	0.43	13383	0.75	0.43
Leverage ratio (debt to assets)	17267	0.22	0.24	14925	0.22	0.25
Dividends over sales	14262	0.02	0.04	12827	0.02	0.04
Ratio of shares traded to total shares	16181	0.10	0.17	14045	0.10	0.20
Foreign sales to total sales	17350	0.31	0.26	15014	0.31	0.26
Construction industry dummy	17350	0.09	0.29	15014	0.09	0.29
Mining industry dummy	17350	0.15	0.35	15014	0.13	0.33
Retail trade industry dummy	17350	0.05	0.21	15014	0.05	0.23
Services industry dummy	17350	0.24	0.43	15014	0.25	0.43
Transport, communication, electricity, gas, and sanitary industry dummy	17350	0.12	0.32	15014	0.12	0.32

Table 3: Estimations using individual indicators of sensitivity to "crisis shocks"

Table shows estimations for returns over the crisis (August 2007-December 2008) and placebo (August 2005-December 2006) periods. Robust standard errors, clustered by country, are in parentheses. *, **, *** denote statistical significance at 10, 5 and 1 percent respectively. Sample is comprised of non-US firms from 44 countries.

	Crisis						Placebo
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Beta	-0.021***	-0.021***	-0.020***	-0.022***	-0.020***	-0.021***	0.017
	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.010)
Momentum	-0.026***	-0.025***	-0.025***	-0.026***	-0.026***	-0.026***	0.126***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)	(0.032)
Market to book value ratio	-0.002**	-0.002**	-0.002*	-0.002**	-0.001	-0.001	-0.004
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)
Logarithm of total assets	-0.001	-0.000	-0.000	-0.002	-0.001	-0.001	0.033***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.007)
Standard dev. beta residuals	-0.012***	-0.012***	-0.012***	-0.012***	-0.014***	-0.014***	-0.010***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Dividends to sales	0.376***	0.359***	0.359***	0.370***			-0.222
	(0.081)	(0.079)	(0.079)	(0.076)			(0.170)
Good coverage dummy	0.029***	0.053***	0.056***	0.055***			0.039
	(0.008)	(0.008)	(0.009)	(0.007)			(0.026)
Leverage ratio	-0.059***	-0.011		-0.008			-0.068
	(0.016)	(0.018)		(0.019)			(0.049)
Good coverage *leverage		-0.096***	-0.107***	-0.097***			0.094*
		(0.024)	(0.021)	(0.023)			(0.048)
Ratio of shares traded	-0.099***	-0.097***	-0.097***		-0.101***		0.026
	(0.034)	(0.035)	(0.035)		(0.033)		(0.048)
Ratio of foreign to total sales	-0.070***	-0.070***	-0.070***			-0.072***	-0.013
	(0.026)	(0.025)	(0.026)			(0.026)	(0.033)
Constant	-0.267***	-0.290***	-0.293***	-0.290***	-0.252***	-0.231***	-0.050
	(0.074)	(0.074)	(0.074)	(0.071)	(0.073)	(0.076)	(0.086)
Country Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,677	11,677	11,677	11,677	11,677	11,677	10,815
R-squared	0.184	0.185	0.185	0.181	0.176	0.177	0.137
Number of countries	44	44	44	44	44	44	44

Table 4: Estimations using composite indicators of sensitivity to "crisis shocks"

Table shows estimations for returns over the crisis (August 2007-December 2008) and placebo (August 2005-December 2006) periods. Robust standard errors, clustered by country, are in parentheses. *, **, *** denote statistical significance at 10, 5 and 1 percent respectively. Sample is comprised of non-US firms from 44 countries.

	Crisis		Placebo	
Beta	-0.021***	-0.021***	0.017	0.017
	(0.006)	(0.006)	(0.011)	(0.011)
Momentum	-0.027***	-0.027***	0.128***	0.128***
	(0.008)	(0.008)	(0.032)	(0.032)
Market to book value ratio	-0.002**	-0.001	-0.004	-0.004
	(0.001)	(0.001)	(0.004)	(0.003)
Logarithm of total assets	-0.002	-0.001	0.034***	0.033***
	(0.004)	(0.004)	(0.007)	(0.007)
Standard dev. beta residuals	-0.012***	-0.012***	-0.010***	-0.010***
	(0.002)	(0.002)	(0.002)	(0.002)
Standardized principal component of sensitivity to credit supply shock	-0.029***		-0.018*	
	(0.004)		(0.009)	
Standardized ratio of foreign to total sales	-0.016***		-0.003	
	(0.006)		(0.008)	
Standardized ratio of shares traded	-0.017***		0.006	
	(0.006)		(0.010)	
Group A sensitivity to credit supply shock		-0.050***		-0.030
		(0.008)		(0.020)
Group B sensitivity to credit supply shock		-0.032***		0.018
		(0.008)		(0.013)
Ratio of foreign to total sales		-0.072***		-0.012
		(0.026)		(0.033)
Ratio of shares traded		-0.097***		0.030
		(0.034)		(0.048)
Constant	-0.277***	-0.226***	-0.045	-0.026
	(0.067)	(0.073)	(0.079)	(0.076)
Country Fixed effects	Yes	Yes	Yes	Yes
Industry Fixed effects	Yes	Yes	Yes	Yes
Observations	11,677	11,677	10,815	10,815
R-squared	0.184	0.183	0.135	0.136
Number of countries	44	44	44	44

Table 5: Robustness checks for the crisis period

Table shows estimations for returns over the crisis period (August 2007-December 2008). Robust standard errors, clustered by country, are in parentheses. *, **, *** denote statistical significance at 10, 5 and 1 percent respectively. In equations (1)-(4), sample is comprised of non-US firms from 44 countries.

	Local Beta (1)	Weighted (2)	Developed (3)	Developing (4)	US (5)
Beta	-0.031***	-0.029***	-0.011	-0.033***	-0.028***
	(0.011)	(0.007)	(0.009)	(0.007)	(0.008)
Momentum	-0.025***	-0.029***	-0.009	-0.033***	0.030*
	(0.008)	(0.009)	(0.012)	(0.010)	(0.018)
Market to book value ratio	-0.002**	-0.002**	-0.001	-0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Logarithm of total assets	0.001	-0.004	0.002	-0.002	0.004
	(0.004)	(0.004)	(0.006)	(0.005)	(0.004)
Standard dev. beta residuals	-0.010***	-0.012***	-0.009***	-0.015***	-0.012***
	(0.002)	(0.001)	(0.003)	(0.001)	(0.002)
Dividends to sales	0.375***	0.402***	0.462***	0.291***	0.503**
	(0.076)	(0.081)	(0.129)	(0.090)	(0.197)
Good coverage dummy	0.055***	0.052***	0.064***	0.043***	0.150***
	(0.008)	(0.012)	(0.009)	(0.014)	(0.019)
Leverage ratio	-0.008	-0.009	-0.048**	0.038	-0.015
	(0.017)	(0.024)	(0.023)	(0.028)	(0.022)
Good coverage *leverage	-0.098***	-0.102***	-0.068**	-0.129***	-0.130***
	(0.023)	(0.029)	(0.029)	(0.032)	(0.044)
Ratio of shares traded	-0.102***	-0.107***	-0.184***	-0.066*	0.040
	(0.035)	(0.032)	(0.039)	(0.035)	(0.037)
Ratio of foreign to total sales	-0.070***	-0.071***	-0.054	-0.093***	-0.075***
	(0.026)	(0.020)	(0.033)	(0.020)	(0.024)
Constant	-0.318***	0.003	-0.394***	-0.193**	-0.435***
	(0.075)	(0.065)	(0.112)	(0.072)	(0.060)
Country Fixed effects	Yes	Yes	Yes	Yes	No
Industry Fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	11,770	11,677	6,274	5,403	2,867
R-squared	0.182	0.181	0.176	0.209	0.155
Number of countries	44	44	21	23	1

Table 6: Robustness checks for the placebo period

Table shows estimations for returns over the placebo period (August 2005-December 2006). Robust standard errors, clustered by country, are in parentheses. *, **, *** denote statistical significance at 10, 5 and 1 percent respectively. In equations (1)-(4), sample is comprised of non-US firms from 44 countries.

	Local Beta	Weighted	Developed	Developing	US
	(1)	(2)	(3)	(4)	(5)
Beta	0.018	0.009	0.009	0.022*	0.050***
	(0.019)	(0.012)	(0.018)	(0.013)	(0.017)
Momentum	0.130***	0.131***	0.117**	0.124***	0.058
	(0.032)	(0.033)	(0.048)	(0.042)	(0.036)
Market to book value ratio	-0.004	-0.006*	-0.001	-0.011*	-0.000
	(0.004)	(0.003)	(0.004)	(0.006)	(0.003)
Logarithm of total assets	0.032***	0.031***	0.029***	0.034***	0.023***
	(0.007)	(0.006)	(0.010)	(0.010)	(0.006)
Standard dev. beta residuals	-0.009***	-0.008***	-0.011***	-0.010**	-0.008***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)
Dividends to sales	-0.193	-0.058	-0.438***	-0.036	-0.677**
	(0.171)	(0.178)	(0.119)	(0.311)	(0.308)
Good coverage dummy	0.040	0.062**	0.058	0.006	0.125***
	(0.026)	(0.028)	(0.034)	(0.030)	(0.031)
Leverage ratio	-0.065	-0.081	-0.032	-0.119	0.031
	(0.048)	(0.059)	(0.044)	(0.082)	(0.038)
Good coverage *leverage	0.090*	0.090	0.104	0.126*	-0.066
	(0.047)	(0.065)	(0.061)	(0.062)	(0.071)
Ratio of shares traded	0.015	0.036	0.087	0.008	0.046
	(0.046)	(0.053)	(0.134)	(0.048)	(0.044)
Ratio of foreign to total sales	-0.013	-0.038	0.039	-0.100*	0.111**
	(0.032)	(0.035)	(0.045)	(0.056)	(0.046)
Constant	-0.054	-0.214**	-0.091	0.041	-0.213**
	(0.086)	(0.095)	(0.106)	(0.128)	(0.102)
Country Fixed effects	Yes	Yes	Yes	Yes	No
Industry Fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	10,856	10,815	5,884	4,931	2,603
R-squared	0.136	0.139	0.143	0.128	0.084
Number of countries	44	44	21	23	1

Figure 1. Panel A.

Principal Component of Sensitivity to Credit Supply Shock and Baa-Treasury spread

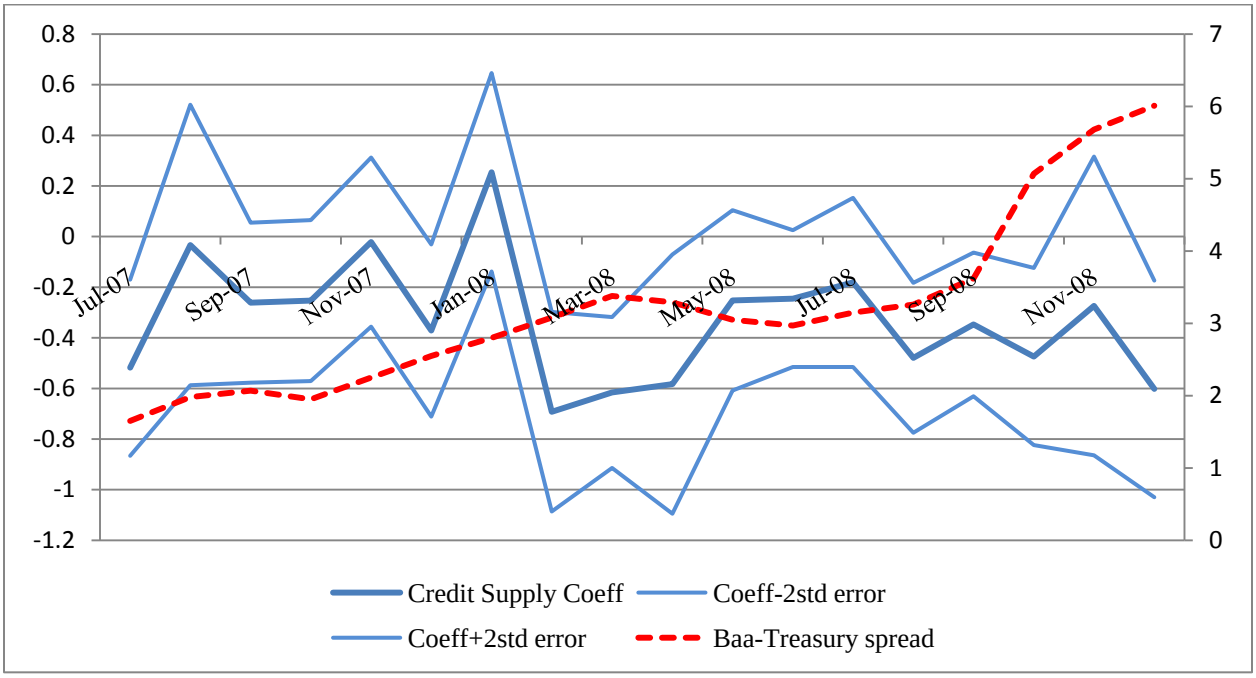

Figure 1. Panel B.

Group A Sensitivity to Credit Supply Shock and Baa-Treasury spread

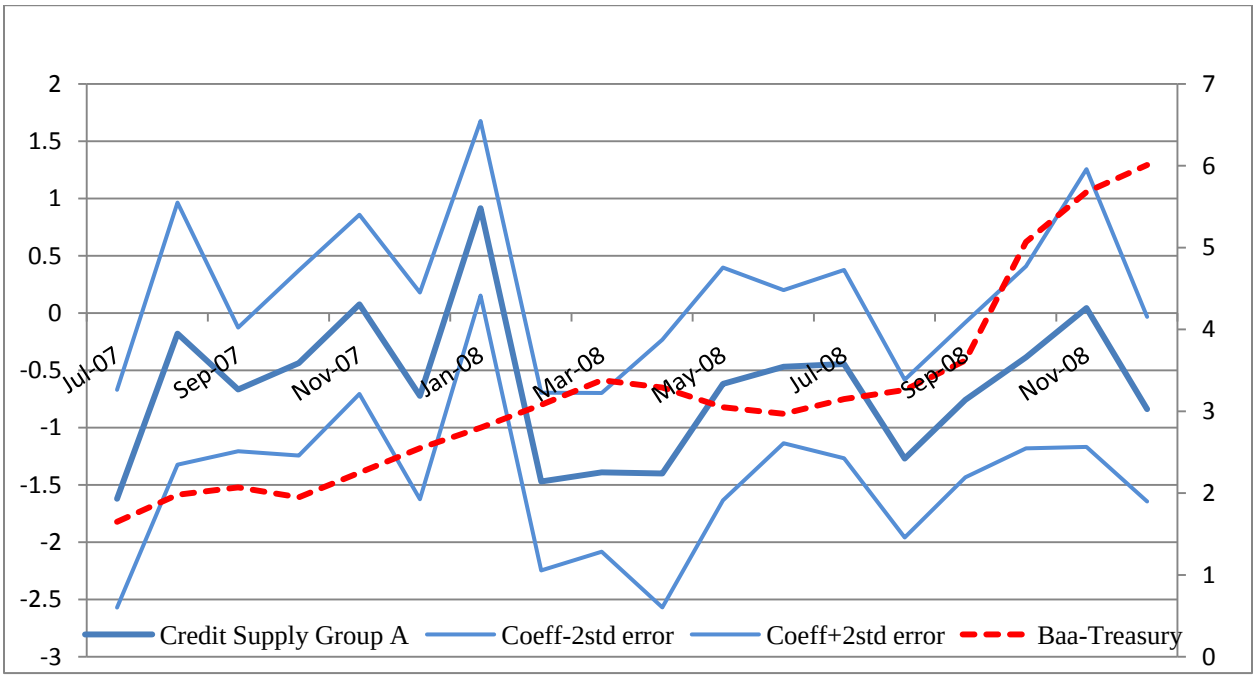

Figure 2. Coefficients for Standarized Ratio of Foreign to Total Sales and Exports

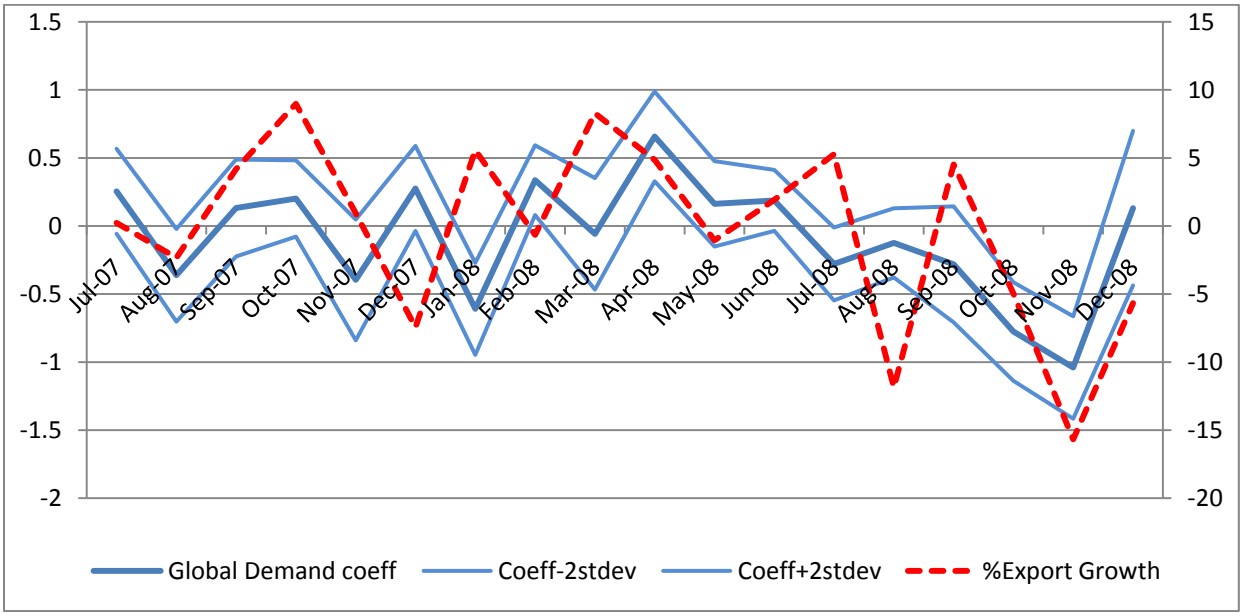

Figure 3. Coefficients for Standarized Ratio of Shares Traded and S&P Returns