The Channels for the Real Collateral Damage of the 2008-2009 Global Crisis: Evidence from Firms in 42 Countries

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Abstract

We use accounting data for 7722 non-financial firms from 42 countries to examine how the 2007-2009 crisis affected firm performance and how various linkages propagated shocks across borders. We separate the effects of changes in external financing conditions, domestic demand, and international trade on firms' profits, sales and investment using both sectoral benchmarks and firm-specific sensitivities estimated prior to the crisis. We find that the crisis had a bigger negative impact on firms with greater demand and trade sensitivity, and particularly so in countries more open to trade. Financial openness though appears to have had limited impact.

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1. Introduction

The 2007-2009 crisis that originated in the United States shocked the core of the global financial system. It led to a sharp drop in international trade in goods and services to a degree not seen since the end of the WWII and triggered a severe global recession, dubbed the "Great Recession," unparalleled since the Great Depression. A small literature is emerging that studies the transmission of the latest crisis across national borders and the role of cross-country differences in how countries were affected. The evidence from these studies is mixed. For example, Claessens et. al. (2010) and Milesi-Ferretti and Tille (2010) document some evidence that countries more integrated with global financial markets suffered more during this crisis. In contrast, Cetorelli and Goldberg (2009) and Rose and Spiegel (2010a, 2010b) fail to find strong evidence that country factors, including bilateral trade and financial linkages with the U.S., are associated with how the crisis impacted individual countries (see also Rose and Spiegel (2011) for an update).[2]

A common feature of these studies, however, is the reliance on aggregate data. The mixed evidence on the role of country factors and the individual contagion channels is thus perhaps no surprise since the macro data reflect the aggregation of multiple underlying factors. The crisis likely spread through a combination of real (trade) and financial channels, as well as by affecting expectations of consumers and firms, in turn changing consumption and investment behaviors. The existing literature has attempted to distinguish these channels by including proxies for trade or financial integration (see Rose and Spiegel, 2010; and Milesi-Ferretti and

[2] Rose and Spiegel (2011) reports to find few clear reliable indicators in the pre-crisis data that can help explain the incidence of the Great Recession across countries, except that countries with current account surpluses seemed better insulated from slowdowns. Another paper that looks at the real and financial impact of the crisis and how it spread to emerging markets is Blanchard, Das, and Faruqee (2010).

Lane, 2010). But these proxies tend to be highly correlated with each other and hence per se do not provide for a means to cleanly separate the different channels. For example, both a reversal of capital flows and a reduction in demand for exports can induce a worsening of corporate sector performance or a contraction of investment. When using aggregate data as outcome variables, and because aggregate indicators for trade and financial openness are highly correlated, such studies cannot be used to separate the specific channel causing the adjustment of firms.

To separate the importance of these various channels, one needs to go to the firm-level, micro data. The first firm-level analysis to study how crises (in emerging markets) spread to other markets was done by Forbes (2004). Few other firm-level analyses of contagion exist (see Claessens and Forbes (2001) for an early review and Pritsker (2010) for a recent review of the contagion literature).[3] For the current crisis, micro firm-level evidence has been limited as well, to date at least, partly because firm-level investment and performance data for many countries are only released with a long lag and only now becoming available. The lack of suitable data in turn has prevented the examination of the responses across firms to the crisis and possible differences across countries.[4]

One substitute that has been used to date is stock market data, as Tong and Wei (2010) do. They report evidence of liquidity crunches across emerging market economies by showing that the decline in stock prices was more severe for firms that intrinsically are more dependent on external finance for working capital. In terms of transmission mechanisms, Tong and Wei (2010)

[3] Claessens, Djankov, and Xu (2000) investigate how individual East Asian corporations were affected by the 97-98 crisis, but their focus was not on spillover channels.

[4] There has been more analysis of the drivers of the trade retrenchment, also using micro data. For example, Levchenko, Lewis and Tesar (2010), Alessandria, Kaboski and Midrigan (2010), and Bems, Johnson and Yi (2010). And Duchin, Ozbas and Sensoy (2010) have examined quarterly US investment from Q3, 2007 to Q3, 2008. International firm-level evidence is still scarce.

focus on the composition of a country's pre-crisis capital inflows, and found that the crisis reduced stock prices more significantly for firms in countries with a greater share of short-term capital flows, but did not explore other channels. Due of lack of appropriate data at the time, they were not able to show the impact of the financial crisis on the actual investment and performance of firms. By using actual firm level balance sheets and income variables, broadening the set of potential transmission channels, and investigating these effects for a large number of countries affected by the crisis, this paper will fill an important void in research.

2. The Framework

Building on the existing literature, we aim to more clearly distinguish by using firm-level data the transmission channels through which the crisis spilled over from the US and other advanced countries to the rest of the world. We examine three channels through which the crisis may have spilled over: a financial channel, a domestic demand channel and a trade channel. We employ a consistent framework to distinguish the impacts of each these three channels. To isolate transmission through the finance channel, we make use of the following idea: if a reduction in available credit (a "credit crunch") would play an important role for firms, it should be reflected in the relative performance of those firms that rely more on external finance for investment and working capital relative those firms that rely less on external financing. Similarly, if the trade shock were to be an important factor, it should be reflected in a relatively worse performance of those firms that rely more heavily on exports relative to those firms that exports less. Finally, if the crisis would have triggered a negative domestic demand shock in the respective country, it

should be reflected in a relative worse performance of those firms that are more demand-sensitive relative those firms that are less sensitive to demand.

The challenge with identifying the importance of each of these transmission channels is that ex-post firm-level data do not necessarily reveal which channel was at work to what degree. For example, a firm may well reduce its international trade, and it may thus appear that the trade channel is important, but the reason for the reduction in trade could have been a lack of working capital, rather than a trade shock. Conversely, a reduction in working capital or investment may be the logical response to a reduction in international trade or domestic demand, and not reflective of a shock to the supply of external financing.

The basic empirical strategy therefore is to check whether *ex ante* classifications of firms in terms of their intrinsic characteristics – degree of their financial dependence, demand sensitivity and exposure to trade - help to explain changes in their *ex post* "performance" (i.e., profits, sales and investments) following the crisis. We use the approach of relying on the sector characteristics of U.S. firms, which are arguably exogenous to our sample of firms (see Rajan and Zingales, 1998), to proxy these intrinsic characteristics.

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

$$(1)\ \Delta\text{Performance}_{i,j,k,t} = \beta * \text{FinancialDependence}_j + \gamma * \text{DemandSensivity}_j + \lambda * \text{TradeSensivity}_j + \text{Control}_{i,j,k,t} + \varepsilon_{ijkt}$$

where *i* stands for company, *j* for sector, *k* for country and *t* for time. $\Delta\text{Performance}_{i,j,k,t}$ are our measures of the changes in firm-level performance and financing due to the crisis. For example, we use the change in firms' profit ratio (profits relative to assets) as measured by the average profit ratio for 2008 and 2009 minus the profit ratio in 2007. Using differences (in performance and financing) has the advantage of controlling for many firm and country characteristics, such

as the differences in profitability of various firms before the crisis. As a start, we assume the same β, γ, and λ for all countries in order to estimate an average effect.

The propagation can depend on not just firm characteristics, but also vary by country features. For example, firms in more open (to trade or financial markets) countries could be expected to see their firms suffer more from financial or trade shocks. To investigate this, we also explore cross-country heterogeneity in the key dimensions. We do so by interacting firm features with country features, such as country-level exposure to global capital flows, its overall level of financial development and trade openness, and then include these interactions terms in the regressions. For example, to see how firms in a country are affected by changes in (international) financing conditions, we consider the interaction between a country's degree of international financial integration and its manufacturing firms' dependence on external finance. We do these interactions, besides for a country's financial openness, for the relative importance of domestic demand, the degree of trade openness, and the level of domestic financial development of the country.

As a robustness check, we also consider the financial, demand, and trade channels measured at the firm level by examining the following regression equation:

$$(2)\ \Delta Performance_{i,j,k,t} = \beta * \text{FinancialDependence}_i + \gamma * \text{DemandSensivity}_i + \lambda * \text{TradeSensivity}_i + \text{Control}_{\text{i},j,k,\text{t}} + \varepsilon_{ijkt}$$

Here we use firm-level sensitivities. As noted, firm-level variables, such as actual usage of external financing, are less exogenous compared to the sector variables based on US firm data. But since these firm variables, measured over the period from 2000 to 2006, are pre-determined with respect to the 2008-2009 crisis, there is no simultaneity in them, even though there is some endogeneity. To further control for this possibility and other factors, in some of our robustness tests, we also include individual firm characteristics, such as firm size.

3. Data Sources, Variables, and Basics Statistics

We collect annual data from *Worldscope* on the balance sheet, cash flow and income statements for all listed, non-financial manufacturing companies. The data cover 42 advanced countries and emerging markets (note that the US is excluded as it was the source of the financial crisis and the country for which we use earlier firm data to derive the sector characteristics). The number of listed manufacturing firms in each country of our sample for the year 2009 is presented in Table 1. The period for which we study the key left-hand-side variables is from 2007 to 2009. Key dependent variables are the changes between 2007 and 2008/2009 in the ratios of firm-level profits/assets, sales/assets and investments/assets. These dependent variables are all winsorized at the 1% level to reduce the impact of outliers. All right-hand-side variables are measured before 2007, including to the extent we use firm-specific sensitivities or control variables.

Figure 1 plots the density distributions of firm-level profits/assets, sales/assets and investments/assets from 2007 to 2009. The patterns in Figure 1 are intuitive. For the profit/asset ratio, the curves shift to the left gradually over the three years, and indeed both the mean and the median of the profit/asset ratio decline (see also Table 2a). The left tail also increases over time, reflecting the increase in the share of those firms with poor performance. For the sales/asset ratio, the curves shift to the left only in 2009, while the curves for 2007 and 2008 track each other quite closely (with the 2008 curve actually being slightly to the right of that for 2007). For the capital expenditure/asset ratio, we find the curves for 2007 and 2008 to be quite similar. The 2009 curve clearly shifts to the left, however, with a lower mean and median and, interestingly, an increased dispersion as well. The charts combined suggest that sales and investments fell somewhat later in time than profitability did, which is consistent with the fact that the peak of the global crisis occurred mostly between Q3, 2008 and Q2, 2009, and with fact that investment

typically takes more time to respond to developments. Figure 1 also suggests that for many firms the differences in performance and external financing between 2009 and 2007 were larger than those between 2007 and 2008, suggesting that we may find sharper impacts of our explanatory variables for the regressions using 2009 data versus 2007 data. We will explore this in our robustness checks. Our three key regressors identifying the three possible channels of spillovers (finance, trade and demand) are defined in the next three sections.

i. Sector- and firm level financial dependence indexes

We use two measures of firms' intrinsic dependence on external finance: *Intrinsic dependence on external finance for investment* (DEF_INV_j) and *Intrinsic dependence on external finance for working capital* (DEF_WK_j). We construct a sector-level approximation of a firm's intrinsic demand on external finance for capital investment following the methodology developed by Rajan and Zingales (1998). Specifically, we define:

$$\text{(3) Dependence on external finance for investment} = \frac{\text{capital expenditures - cash flow}}{\text{capital expenditures}}.$$

Besides capital needed for investment, working capital is required for a firm to operate and to satisfy both short-term debt payment and ongoing operational expenses, and to allow for trade finance. We construct such a measure of intrinsic need for external finance using the notion of "cash conversion cycle", which is commonly used in financial analysis to measure the liquidity position of a firm. The cycle measures the time elapsed from the moment a firm pays for its inputs to the moment it receives payment for the goods it sells. Specifically, we define:

$$\text{(4) Cash conversion cycle} = 365*\left(\frac{\text{inventories - account payables}}{\text{cost of goods sold}} + \frac{\text{account receivables}}{\text{total sales}}\right).$$

Following Tong and Wei (2010), both sector level indexes are constructed as follows. First, for each U.S. firm during 1990-2006, we calculate its dependence on external finance and its cash conversion cycle based on the annual data from *Compustat USA Industrial Annual*. Second, we define the sector-level value of the two indexes by calculating the median across all firms in the sector (at each SIC 3 digit sector). While the original Rajan and Zingales (1998) paper covered only 40 (mainly SIC 2-digit) sectors, we expand the coverage to 111 3-digit SIC sectors. The index numbers are based on U.S. firms, which are judged to be least likely to suffer from financing constraints (during normal times) relative to firms in other countries, meaning we can reasonably assume that the same intrinsic external financing dependence applies to firms in all other countries. This assumption is quite common in the literature (earlier papers that have used such indexes include Claessens and Laeven, 2003; Raddatz, 2006; and Kroszner, Laeven, and Klingebiel, 2007). The literature has also confirmed that there is a large degree of commonality in the rank-order of external financing dependence for at least the major industrial countries (Rajan and Zingales (1998), for example, confirm that the rank-order of external financing dependence for firms in Canada is similar to that for firms in the U.S.).

We define firms' actual use of external financing for working capital and investment (*Actual firm use of external financing for investment*, ACT_INVi, and *Actual firm use of external financing for working capital*, ACT_WKi) in the same way as the sector level external financing dependence variables are defined, but now using firm-level information on the actual usage of external finance. This means:

$$(5)\ \mathrm{ACT\_INV}_i = \text{Actual use external finance for investment} = \frac{\text{capital expenditures - cash flow}}{\text{capital expenditures}}.$$

$$(6)\ ACT\_WK_i = \text{Actual use external finance for working capital} = 365*\left(\frac{\text{inventories - account payables}}{\text{cost of goods sold}} + \frac{\text{account receivables}}{\text{total sales}}\right)$$

We calculate the median of these ratios, ACT_INV_i or ACT_WK_i, over the period 2000 to 2006. Using these firm-level indicators, we ask whether firms that were more dependent on external financing prior to the crisis were more affected by the global crisis. Even though the firm-level actual use of external finance in 2000-2006 may have been endogenous to a country's level of financial development and other, country- and firm-specific variables, using this period make the ratios largely exogenous to the crisis period itself. Note also that the crisis itself was largely external in origin (again, note that the U.S. is excluded).

There can be some omitted variables here nevertheless. For example, those firms that were able to obtain more external financing for some reasons before the crisis could be more adversely affected, because, say, they were engaged in activities involving (unsustainable) booms that received excessive financing. There is some evidence for the notion of too much external financing going to some sectors when financial sector development exceeds a certain level (see for example, Arcand, Berkes and Panizza, 2011). Similarly on the trade and demand channels, there could be some remaining omitted variables and endogeneity. Nonetheless, it is meaningful to ask the question: did the 2007-2009 supply-of-finance (trade and domestic demand) shocks hit those firms that used more external financing (were more sensitive to trade and domestic demand) during the period 2000-2006 especially hard, and are therefore financial markets (trade or demand) perhaps important channels for global spillovers?

ii. Sector-level and firm-level demand sensitivity indexes

We next provide our definition of the index of a firm's relative sensitivity to a contraction in aggregate consumer demand. As noted, the effect of a crisis on demand is likely to vary by type of product and sector. For example, consumer durables are typically more affected than consumer necessities during a recession. Tong and Wei (2008) develop such a sector-level based index using the stock price reactions of firms in various sectors to the September 11, 2001 terrorist attack. To construct the index, they compute the change in log stock price for each U.S. firm between September 10 and September 28, 2001. They then calculate the mean log stock price change for all firms in each three-digit SIC sector, and use it as a measure of the sector-level demand sensitivity. Excluding financial sector firms, they do this in total for 361 three-digit level sectors. Similar to the external financing dependence ratio, this approach assumes that the sensitivity to demand shocks is an intrinsic property of a sector, and therefore the index derived from the pre-crisis data is applicable to firms in the same sector across all countries during the crisis. Tong and Wei (2006) conduct a number of checks to make sure that this index reflects the relative sensitivity of a firm's stock price to an unexpected shock in consumer demand, and is not contaminated by a firm's sensitivity to liquidity or other shocks.[5]

Similar to the external financing variables, we also consider the pre-crisis firm-specific actual level of demand sensitivity. This we construct as the elasticity of firm-specific sales to the country's GDP in the six years before the crisis, i.e., 2000-2006. More specifically, we regress

[5] First they verify that there was indeed a big downward shift in expected aggregate demand, as reflected by a downward adjustment in the consensus forecast of subsequent U.S. GDP growth in the aftermath of the shock at the same time. Second, they argue that because the Federal Reserve took timely and decisive actions, the relative stock price moves do not reflect effect of the 9/11 shock on firms' financial constraints since that was small or at most short lived. Indeed they show that for that episode, both the level of the real interest rate and the TED spread (risk premium), after initial spikes, quickly returned to a level only moderately higher than the pre-9/11 level, suggesting that the market regarded the Federal Reserve's actions as sufficient to restore the market's desired level of liquidity. They therefore conclude that the cumulative stock price change from September 10 to 28, 2001, is unlikely to also reflect firms' reactions to a deterioration of credit availability.

for each firm the change in its (log) real sales (in local currency) on the change in the (log) country's real GDP (in local currency) over the period 2000 to 2006, and then use the coefficient as the firm-level measure of demand elasticity.

iii. Sector-level and firm-level trade sensitivity indexes

We next construct a sector-level measure of exposure to trade in an analogous way. Specifically, we regress the change in the (log) global exports at the 3-digit sector level over the period 2000-2006 on the change in (log) global GDP (in US dollar) during the same period. We then use the coefficient on global GDP as the sector-level degree of trade sensitivity. Note that this trade sensitivity index is neither country- nor firm-specific, similar to the earlier sector indexes for investment, working capital and demand.

We also construct firm-level sensitivity to trade measures and check how significant a role it played during the crisis. We construct a firm-level measure of sensitivity to trade by regressing for each firm its annual change of real sales on the annual percentage change in the country's exports over the period 2000 to 2006. The coefficient on the exports variable is then used to proxy the pre-crisis trade sensitivity of the particular firm. Note that this measure is firm-specific, and hence varies across firms, sectors, and countries.

iv. Basic Statistics

Table 2a provides summary statistics of firm performance before and during the 2008-09 crisis, while Table 2b reports summary statistics for key dependent and explanatory variables. The statistics confirm the impression gleaned from Figure 1. Profitability generally declined between 2008/09 and 2007, by some 3 percentage points on average. But, as Figure 1 already

showed, there is much variation among firms (and countries), and there are many firms that actually increased their profitability. Similarly, while the sales and capital expenditure to assets ratios generally decline, there is also much variation across firms in the changes in these ratios.

Table 2c reports the correlations of variables, with correlations significant at the 5% level marked. We find that the change in profit is significantly negatively associated with more than half of the explanatory variables. This number of significant correlations is similar for the change in sales, but less often found for the change in capital expenditures. Hence we have some prior reason to expect that we could identify some important specific channels that affected firm performance during the crisis. Of course, these are only pair-wise correlations, without controlling for other factors. We next address this issue formally by employing multivariable regression analyses to detect the meaningful patterns across countries and firm characteristics.

4. Empirical Results

i. Baseline Results

We start with out basic regression, which examines how various sector features affect changes in firm performance during the crisis, and which results are reported in Table 3. As our explanatory variables are at the sector level, we cluster standard errors by sector.

In Column 1, we look at the impact of the crisis on changes in firms' profit/asset ratios. We find that the impact of the crisis on profits to be more pronounced for those sectors that are intrinsically more sensitive to demand shocks. This result suggests that there was indeed a significant global demand shock during the crisis period as consumers and firms adjusted. The impact of crisis on profits is also more pronounced for trade-sensitive sectors, consistent with the decline in global trade during the crisis period. The coefficients on DEP_WK and DEP_INV are

also negative, albeit each of them insignificant. This suggests that there may have been some negative shock to external financing.

In Column 2, we look at the impact of the crisis on sales over assets. Similar to profit, sales declined significantly for those sectors more sensitive to demand and trade shocks, consistent with the presence of important demand and trade shocks. Sales over assets also decreased significantly for those sectors with greater intrinsic needs for working capital. This result suggests that disruptions to the supply of working capital, as a consequence of the global financial crisis, reduced firm-level sales. This finding is consistent with Tong and Wei (2010), who found that the crisis reduced stock prices significantly more for those sectors with large working capital needs.

In Column 3, we examine the impact on capital investment. Here we find no significant relationships. This may not be surprising, however, since investment is notoriously difficult to explain, being dependent on one hand on (volatile) expectations of future profitability and on the other hand being subject to long leads and lags, as well as lumpy behavior. So the limited statistically significance may not be a surprise.

The demand and the trade channels could be related in that a country open to trade may also find that overall domestic demand is more sensitive to shocks because of changes in external trade. In Columns 4 to 6, we drop the demand channel therefore and focus on the trade channel solely. We find that trade channels have almost the same coefficients for profits, sales and investment, indicating that our demand sensitivity index and trade sensitivity index capture different aspects (while the coefficients for trade are slightly larger, suggesting part of the trade effect may be reflected in the demand channel, these differences are not statistically significant).

To study the economic impact of our estimates, we focus on statistically significant variables in Columns 1-3. For the profit ratio, a one standard deviation in the demand sensitivity explains about 5.5% of the standard deviation of the change of profit, while a one standard deviation in trade sensitivity explains about 7.5% of the change of profit. For the sales ratio, one standard deviation of DEP_WK explains about 3.5% of the standard deviation of the change of sales, while a one standard deviation in demand sensitivity explains 6%, and trade sensitivity explains about 5% of the change of sales.

We next investigate the role of country factors (and the robustness of our main results). In Table 4, we include various country features to examine differential effects of the crisis across countries. We include the following country characteristics: financial openness (defined as total international assets plus liabilities over GDP), financial development (defined as credit to private sector over GDP), trade linkage (defined as exports minus imports over GDP), and the share of domestic expenditure in total demand (defined as the sum of consumer expenditures, investment and government expenditure over GDP). Note that by definition, the last two variables, the shares of trade and domestic expenditures in GDP, sum up to one. Country-level financial openness and financial development are interacted with both DEP_WK and DEP_INV; country-level trade linkage is interacted with firm-level trade sensitivity; and country-level domestic expenditure share is interacted with sector-level demand sensitivity respectively. These country features are all measured as of the year 2006, i.e., prior to the crisis, and hence do not vary over time. In Columns 1-3 of Table 4, we do not include any country or sector fixed effects, while in Columns 4-6, we include both sector and country fixed effects (and thus drop the country level variables when not interacted).

Column 1 reports the results for profits. Here we find a significantly negative coefficient from the interaction term between trade sensitivity and trade openness, but no significant coefficient for the interaction terms between other sector characteristics and country features. Trade sensitivity and financial openness themselves are statistically significant negative. Column 2 reports the results for sales. Here we again find the interaction of trade sensitivity and trade linkage to have a statistically significant and negative coefficient, but no other variable is statistically significant. Column 3 reports the results for capital expenditures. The only significant coefficient is again the interaction between trade sensitivity and trade openness, with trade-sensitive sector reducing capital expenditures more in trade-open countries. The coefficient for general trade openness is positive, but its interpretation has to consider the interaction effects as well.

In Columns 4-6, we include both country and sector fixed effects. The sector-level trade sensitivity interacted with country-level trade linkage always retains its significantly negative coefficient. For profit, demand sensitivity interacted with domestic expenditure now has a negative coefficient significant at the 10% level. For capital expenditures, DEP_INV interacted with financial openness is also negative statistically significant at the 10% level.

Collectively, these results differ from Rose and Spiegel (2010), who find little systematic evidence regarding the role of cross-country linkages during the crisis affecting outcomes at the macro level. Here we find the openness of the country to trade and finance to have affected the impact of the crisis on firms in a material way. Based on Column 1 of Table 4, for a trade-dependent sector whose trade sensitivity is at the 75^{th} percentile (1.57), an increase in trade linkage at the country level of one standard deviation (0.07) will reduce a firm's profit ratio by one percent, or about 12% of the standard deviation of the profit ratio. Based on Column 2, for

the same trade dependent sector, an increase in trade linkage at the country level of one standard deviation will reduce the sales ratio by another two percentage points, or about 10% of the standard deviation of the sales ratio. Finally, according to Column 3, for the same trade dependent sector, an increase in trade linkage at the country level by one standard deviation will reduce the investment ratio by 0.45%, or around 10% of the standard deviation of investment. Overall, Table 4 suggests that exposure to international trade was a statistically and economically important channel in the global transmission of the crisis.

ii. Robustness Checks

In Table 5, we include among the set of explanatory variables a number of firm-specific control variables, such as cash holding/asset, total assets in US Dollar, Tobin's Q, short-term debt over assets, and long-term debt/assets. All these firm controls are measured by their values in the year 2006, so they are pre-determined with respect to the crisis. In Columns 1-3 of Table 5, we replicate the first three columns of Table 3. Adding these firm variables does not weaken our results for sectoral measures, and strengthens them in some cases. For example, in Column 1, studying the change in the profit ratio, the coefficient for demand sensitivity now has a larger magnitude (-0.63) compared with that in Table 3 (-0.46). In Columns 4-6 of Table 5, we repeat the exercise of Columns 4-6 of Table 4 for the interaction of country and sector features, but adding firm-specific controls. Again, the interaction terms of sector and country features become slightly more significant. For example, in the profit equation, trade linkage interacted with trade sensitivity now has a coefficient of (-9.0) compared with (-8.0) earlier. Among these firm controls, a higher Tobin's Q is significantly associated with lower profit and lower sales, possibly reflecting the fact that firms that were valued higher because of their greater growth

opportunities suffered more in the crisis. But we need to exercise caution in interpreting these results, as they may suffer from endogeneity issues.

We next check whether our results are affected by the specific period over which we conduct the comparison. In Table 6, we replicate Table 3 but separate the crisis into its effects over the 2008 and 2009 subperiods. In Columns 1-3, we study the change between 2007 and 2008, while in Columns 4-6, we look at the change between 2007 and 2009. We largely confirm the role of the various channels and country factors, but since the change in firm performance appeared stronger in 2009 (as also suggested by Figure 1), we find more evidence for the importance of the trade integration channel during the second sub-period.

In case of the change in profit in 2008 compared to 2007 (Column 1), we find no significant result for the sectoral variables in terms of the financial, trade and demand channels. In contrast, for profit in 2009 compared to 2007 (Column 4), the coefficients are all negative for all three channels and significant for the trade and demand channels. For sales in 2008 (Column 2), we find demand sensitivity to be significantly negative, but trade sensitivity to be significantly positive. One possibility for the positive result of trade sensitivity could be because we are using annual data on firm performance and may thus miss the decline of trade in the fourth quarter of 2008. (Note that on an annual basis, exports still increased rather than decreased in 2008, as shown at the global level in Figure 2.) In Column 2, we find a significant and negative coefficient for working capital needs, which suggests the presence of financial constraints already in 2008. For sales in 2009 (Column 5), we now find that trade sensitivity has a negative coefficient, significant at the 1% level. Moreover, demand sensitivity has a more pronounced impact, which is also more statistically significant. Hence, this suggest that, while

financing constraints may have played a role already in 2008, overall, the trade and demand channels played a more significant role on firm performance in 2009 than in 2008.

In Table 7, we replace our sector-level measures of financial and real channels with firm-level measures. That is, we use the firm-level dependence on external finance for investment, firm-level working capital needs, firm-level demand sensitivity and trade sensitivity. These variables are measured by using the pre-crisis data from 2000 to 2006. Relative to sector features derived from the US data, the firm-level measures could be subject to some endogeneity issues and hence could bias our estimation. In Column 1, we report the results on profits. We find that the profit rate is significantly lower for firms that are more demand-sensitive. This result is consistent with Table 3 where we examined sector-level demand sensitivity. However, we find that the coefficient on ACT_INV to be significantly positive, which is somewhat puzzling. This could be because of the endogeneity of ACT_INV.[6] In Column 2, we report the results for sales over assets. Again we find the coefficients on trade sensitivity and demand sensitivity to be negative and statistically significant, similar to the findings based on sectoral measures of sensitivity.

In Column 3 of Table 7, we report the results for capital expenditures. Firms with large ACT_INV or trade sensitivity prior to the crisis seem to adjust their capital expenditures after the crisis in significantly negative ways. These findings are intuitive, but differ from the sectoral analysis in Table 3 (that did not find a significant impact on investment). As a robustness check, in Columns 4 to 6, we focus on the trade channel and shut down the demand channel, to avoid their possible joint codetermination (as firm-level trade sensitivity and demand sensitivity have a

[6] ACT_INV is larger for firms with smaller cash flow (or lower profits), for a given level of capital expenditure, which could explain why less profitable firms had to rely more on external financing for their investment needs.

correlation of 0.28) affecting our regression results. Now the trade channel shows a larger magnitude and is significantly negative for all three dependent variables.

In Table 8, we include the interaction terms between firm and country features. Column 1 reports the result for profit. The interaction between ACT_INV and financial development is significant at the 10%. But no other interaction term is significant. Columns 2 and 3 report the results for sales and capital expenditures, respectively. For both cases, we do not find any significant interaction effect. In Columns 4 to 6, we further include country dummies and find the patterns to be similar. The lack of results using firm specific indicators could be due to the more noisy measurement of the intrinsic characteristics of these firms.

5. Conclusions

In this paper, we apply a well-established methodological framework to study the real impacts of the 2008-09 crisis on firm-level performance and the role of global linkages in the crisis. We analyze three channels through which the crisis may have affected firms: a financial channel, a demand channel, and a trade channel. To investigate the financial channel, we asked the question: if we classify manufacturing firms into different baskets based on their ex ante sensitivity to shocks to external financing (in terms of investment and working capital needs), does this classification help us to explain the ex-post performance of these firms? Similarly, if we classify these firms based on their intrinsic sensitivity to demand or trade shocks, do firms in different groups perform differently during the crisis? And to investigate the role of global linkages, we include country-level financial and trade linkages, and their interactions with the proxies for the financial/demand/trade channels, into our regression framework.

We examine changes over the crisis period in three measures of firm performance—sales, profits and capital expenditure—for 7722 manufacturing firms from 42 countries. We find that, in economic terms, the trade and demand channels were the most important, particularly in 2009. When we examine the role of country-level linkages, including financial and trade linkages, we find that trade linkages played a significant role in the spillover of crisis, while the evidence for the role of financial linkages is considerably weaker.

It is important to point out that the current paper is not meant to be a comprehensive assessment of the welfare effects of global linkages. To do that, several additional aspects need to be examined, including how different forms of global linkages affected firm external financing constraints and growth rates during tranquil times, e.g., before the crisis. This would be a fruitful topic for future research.

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Table 1. Number of Listed manufacturing firms by country

	Country	Obs #		Country	Obs #
1.	ARGENTINA	28	2.	ITALY	100
3.	AUSTRALIA	212	4.	JAPAN	1,584
5.	AUSTRIA	30	6.	KOREA (SOUTH)	643
7.	BELGIUM	48	8.	MALAYSIA	376
9.	BRAZIL	111	10.	MEXICO	40
11.	CANADA	196	12.	NETHERLANDS	49
13.	CHILE	41	14.	NEW ZEALAND	32
15.	CHINA	866	16.	NORWAY	53
17.	COLOMBIA	5	18.	PAKISTAN	66
19.	CZECH REPUBLIC	2	20.	PERU	22
21.	DENMARK	46	22.	PHILIPPINES	31
23.	EGYPT	41	24.	POLAND	114
25.	FINLAND	60	26.	PORTUGAL	11
27.	FRANCE	225	28.	RUSSIAN FEDERATION	105
29.	GERMANY	275	30.	SOUTH AFRICA	72
31.	GREECE	91	32.	SPAIN	43
33.	HUNGARY	11	34.	SWEDEN	148
35.	INDIA	995	36.	SWITZERLAND	93
37.	INDONESIA	96	38.	THAILAND	208
39.	IRELAND	12	40.	TURKEY	125
41.	ISRAEL	67	42.	UNITED KINGDOM	349
Total		7722			

Note: The table lists the number of manufacturing firms in our sample for the year 2007.
Source: *Worldscope*.

Table 2a. Summary statistics of firm performance before and during the 2008-09 crisis

Variable	Year	Obs	Mean	Std	p25	Median	p75	Min	Max
Profit/asset	2007	7540	0.097	0.131	0.062	0.108	0.155	-0.555	0.395
Profit/asset	2008	7506	0.074	0.146	0.045	0.092	0.143	-0.555	0.395
Profit/asset	2009	7147	0.063	0.141	0.030	0.080	0.131	-0.555	0.395
Sales/asset	2007	7722	1.019	0.554	0.658	0.933	1.284	0.028	2.964
Sales/asset	2008	7721	1.035	0.564	0.665	0.946	1.307	0.028	2.964
Sales/asset	2009	7402	0.988	0.551	0.614	0.902	1.255	0.028	2.964
Capital expenditure/asset	2007	7606	0.059	0.059	0.019	0.041	0.078	0.000	0.301
Capital expenditure/asset	2008	7575	0.059	0.058	0.019	0.041	0.079	0.000	0.301
Capital expenditure/asset	2009	7261	0.049	0.052	0.015	0.033	0.063	0.000	0.301

Note: The data is for 7722 listed manufacturing firms in 42 countries.
Source: Worldscope.

Table 2b. Summary statistics of key dependent and explanatory variables

Variable	Obs	Mean	Std	p25	Median	p75	Min	Max
Firm level								
Change in Profit/Asset (%)	7540	-3.09	9.26	-6.27	-2.01	0.86	-38.26	26.68
Change in Sales/Asset(%)	7722	-0.73	22.56	-10.57	0.10	9.85	-82.07	70.73
Change in CapEX/asset (%)	7606	-0.57	4.90	-1.99	-0.08	1.31	-19.91	14.74
Actual firm use of working capital (ACT_WK, in days)	7257	105.60	58.01	64.50	96.84	134.40	4.40	307.86
Actual firm use of external financing for investment (ACT_INV)	6152	-0.31	2.26	-1.17	-0.22	0.51	-8.95	11.81
Firm-level demand sensitivity	5756	1.93	10.23	-1.79	1.56	5.63	-40.10	47.43
Firm-level trade sensitivity	5710	0.48	2.88	-0.47	0.26	1.44	-10.57	12.62
Sector Level								
Dependence on external finance for working capital (DEF_WK , days)	111	91.91	32.71	66.98	88.45	116.06	22.34	158.62
Dependence on external finance for investment (DEF_INV)	100	0.03	0.44	-0.26	0.04	0.33	-0.86	1.13
Demand sensitivity	123	1.56	0.96	1.02	1.43	2.07	-1.06	4.58
Trade sensitivity	132	1.32	0.60	0.99	1.29	1.57	-0.64	3.58
Country level								
Financial Openness (year 2006)	42	3.47	4.14	1.18	2.07	4.19	0.61	23.81
Trade linkage (year 2006)	42	0.02	0.07	-0.02	0.02	0.06	-0.10	0.22
Credit over GDP (year 2006)	42	0.87	0.51	0.35	0.87	1.12	0.13	1.86
Domestic expenditure (year 2006)	42	0.97	0.07	0.94	0.97	1.02	0.78	1.09

Note: The data is for 7722 listed manufacturing firms in 42 countries. Key dependent variables are the changes between 2007 and 2008/2009 in the ratios of firm-level profits/assets, sales/assets and investments/assets.
Source: Worldscope.

Table 2c.Correlation table of key dependent and explanatory variables

	ΔProfit	ΔSales	ΔCE	DEF_WK	DEF_INV	Demand sensitivity	Trade sensitivity	ACT_WK	ACT_INV	Firm demand sensitivity
ΔSales	0.18*									
ΔCapital Expenditure	0.001	-0.03*								
DEF_WK	-0.02	-0.04*	0.02							
DEF_INV	-0.05*	-0.04*	0.01	0.26*						
Demand Sensitivity	-0.04*	-0.04*	-0.01	0.03*	0.23*					
Trade sensitivity	-0.07*	-0.05*	0.02*	0.01	0.24*	0.06*				
ACT_WK	0.002	0.005	-0.003	0.20*	0.03*	0.04*	0.01			
ACT_INV	0.03*	0.03*	-0.03*	0.03*	0.06*	0.02	-0.02	0.09*		
Firm demand sensitivity	-0.03*	-0.04*	-0.03	0.01	0.01	0.04*	0.004	0.04*	-0.01	
Firm trade sensitivity	-0.03	-0.03*	-0.03*	0.01	0.01	0.01	0.02	0.01	0.04*	0.28*

Note: * is at the 5% significance level. The data is for 7722 listed manufacturing firms in 42 countries. Change in profit/asset refers to the difference between the profit/asset ratio averaged over 2008-09 and the profit/asset ratio in 2007. Similar for the changes of sales and capital expenditure (CapEX). Source: Worldscope.

Table 3. ***The Impact of Crisis on Firm Performance -sector feature***

VARIABLES	(1) ΔProfit	(2) ΔSales	(3) ΔCapEx	(4) ΔProfit	(5) ΔSales	(6) ΔCapEx
Demand sensitivity	-0.456**	-1.196***	-0.0835			
	[0.222]	[0.451]	[0.106]			
Trade sensitivity	-1.068***	-1.778**	0.125	-1.091***	-1.815**	0.121
	[0.266]	[0.693]	[0.0817]	[0.304]	[0.781]	[0.0839]
Dependence for working capital	-0.00406	-0.0213*	0.00183	-0.00379	-0.0206	0.00188
(DEP_WK)	[0.00509]	[0.0129]	[0.00193]	[0.00556]	[0.0140]	[0.00189]
Dependence on external finance for investment	-0.489	-0.398	0.0997	-0.666	-0.884	0.0673
(DEF_INV)	[0.392]	[0.767]	[0.165]	[0.409]	[0.866]	[0.165]
Constant	-0.391	5.750***	-0.809***	-1.057	3.959*	-0.931***
	[0.745]	[2.092]	[0.300]	[0.715]	[2.181]	[0.235]
Observations	7,540	7,722	7,606	7,547	7,729	7,613
R-squared	0.008	0.005	0.001	0.007	0.004	0.000

Note: Key dependent variables are the changes between 2007 and 2008/2009 in the ratios of firm-level profits/assets, sales/assets and investments/assets. Robust standard errors in brackets, clustered at the 3-digit sector level. *** p<0.01, ** p<0.05, * p<0.1.

Table 4. ***The Impact of Crisis on Firm Performance***
-Sector and Country Interaction

VARIABLES	(1) ΔProfit	(2) ΔSales	(3) ΔCapEx	(4) ΔProfit	(5) ΔSales	(6) ΔCapEx
Domestic expenditure*Demand sensitivity	-3.431	6.651	0.0651	-4.140*	4.208	0.439
	[2.351]	[6.562]	[1.301]	[2.160]	[6.383]	[1.198]
Trade linkage*Trade sensitivity	-9.139**	-18.05**	-4.172***	-8.049***	-13.23*	-3.874***
	[3.548]	[8.999]	[1.497]	[2.496]	[7.309]	[1.349]
FinancialOpenness*DEP_WK	0.00175	-0.00651	0.000668	0.000914	-0.00653	0.000954
	[0.00223]	[0.00446]	[0.000746]	[0.00234]	[0.00450]	[0.000752]
FinancialOpenness*DEP_INV	0.0424	0.593	-0.0963	0.0306	0.438	-0.136**
	[0.162]	[0.362]	[0.0614]	[0.166]	[0.342]	[0.0652]
Credit/GDP*DEP_WK	-0.00152	0.0357	0.000226	-0.00134	0.0201	-0.00480
	[0.0139]	[0.0347]	[0.00674]	[0.0137]	[0.0334]	[0.00639]
Credit/GDP*DEP_INV	0.353	-1.385	0.651	0.443	-1.397	0.632
	[1.139]	[2.709]	[0.611]	[1.034]	[2.525]	[0.533]
Demand sensitivity	2.883	-7.720	-0.141			
	[2.273]	[6.410]	[1.234]			
Trade sensitivity	-0.920***	-1.132	0.259**			
	[0.296]	[0.713]	[0.130]			
Dependence for working capital	-0.00670	-0.0417	-0.000740			
(DEP_WK)	[0.0110]	[0.0285]	[0.00596]			
Dependence on external finance for	-0.920	-0.795	-0.307			
investment (DEF_INV)	[0.913]	[2.223]	[0.590]			
Financial openness	-0.400**	0.155	-0.105			
	[0.192]	[0.447]	[0.0747]			
Credit /GDP	0.407	2.526	0.863			
	[1.281]	[3.431]	[0.656]			
Domestic expenditure/GDP	-3.620	-35.58	-5.656			
	[13.50]	[29.69]	[5.458]			
Trade linkage	6.764	-2.277	0.663			
	[13.69]	[30.91]	[5.601]			
Constant	3.639	37.82	4.144			
	[13.37]	[29.61]	[5.396]			
Sector fixed effects	n	n	n	y	y	Y
Country fixed effects	n	n	n	y	y	Y
Observations	7,540	7,722	7,606	7,540	7,722	7,606
R-squared	0.013	0.012	0.005	0.052	0.060	0.031

Note: Key dependent variables are the changes between 2007 and 2008/2009 in the ratios of firm-level profits/assets, sales/assets and investments/assets. Robust standard errors in brackets, clustered at the country-sector level. *** p<0.01, ** p<0.05, * p<0.1.

Table 5. ***The Impact of Crisis on Firm Performance***
-Adding firm controls

	(1)	(2)	(3)	(4)	(5)	(6)
	ΔProfit	ΔSales	ΔCapEx	ΔProfit	ΔSales	ΔCapEx
Demand sensitivity	-0.626***	-1.374***	-0.110			
	[0.216]	[0.462]	[0.122]			
Trade sensitivity	-1.261***	-1.533**	0.0804			
	[0.249]	[0.620]	[0.0980]			
Dependence for working capital	-0.00231	-0.0258**	0.00261			
(DEP_WK)	[0.00480]	[0.0124]	[0.00208]			
Dependence on external finance	-0.274	-0.400	0.0553			
for investment (DEF_INV)	[0.379]	[0.791]	[0.178]			
Domestic expenditure*Demand sensitivity				-4.067*	9.334	0.804
				[2.256]	[6.589]	[1.192]
Trade openness*Trade sensitivity				-9.001***	-14.87**	-3.591***
				[2.759]	[7.278]	[1.212]
FinancialOpenness*DEP_WK				0.000451	-0.00776*	0.000987
				[0.00247]	[0.00469]	[0.000666]
FinancialOpenness*DEP_INV				0.00597	0.358	-0.172***
				[0.171]	[0.358]	[0.0606]
Credit/GDP*DEP_WK				0.00123	0.0181	-0.00171
				[0.0146]	[0.0351]	[0.00619]
Credit/GDP*DEP_RZ				1.048	-0.198	0.857
				[1.092]	[2.629]	[0.536]
Tobin-Q (06)	-0.773***	-1.612***	-0.0772	-0.686***	-1.269***	-0.0785
	[0.160]	[0.365]	[0.0618]	[0.158]	[0.348]	[0.0778]
Firm size (06)	-0.184**	-0.0751	0.0984***	-0.0883	-0.398**	0.0173
	[0.0742]	[0.165]	[0.0303]	[0.0778]	[0.173]	[0.0379]
Cash holding/Assets (06)	-2.376**	14.73***	0.226	-2.778**	11.76***	-0.400
	[1.157]	[2.789]	[0.601]	[1.240]	[2.479]	[0.531]
Short-term debt/Assets (06)	-0.0461	1.442	0.404	-1.203	3.798	0.672
	[1.157]	[2.563]	[0.532]	[1.337]	[2.796]	[0.544]
Long-term debt/Assets (06)	0.0954	5.017**	-1.844***	0.285	7.498***	-1.157**
	[1.102]	[2.262]	[0.625]	[1.134]	[2.787]	[0.558]
Constant	3.578***	6.455**	-1.744***			
	[1.204]	[3.137]	[0.548]			
Sector and country fixed effects	n	n	n	y	y	y
Observations	6,954	7,094	7,008	6,954	7,094	7,008
R-squared	0.020	0.014	0.005	0.064	0.070	0.039

Note: Key dependent variables are the changes between 2007 and 2008/2009 in the ratios of firm-level profits/assets, sales/assets and investments/assets. Robustness standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 6. The Impact of Crisis on Firm Performance --Separating Year 2008 and 2009

VARIABLES	(1) ΔProfit 08	(2) ΔSales 08	(3) ΔCapEx08	(4) ΔProfit 09	(5) ΔSales 09	(6) ΔCapEx09
Demand sensitivity	-0.379	-0.784*	-0.0623	-1.153***	-1.847**	-0.172
	[0.257]	[0.470]	[0.126]	[0.286]	[0.739]	[0.141]
Trade sensitivity	-0.363	1.232**	0.0561	-2.301***	-4.473***	0.141
	[0.305]	[0.546]	[0.0973]	[0.352]	[0.995]	[0.126]
Dependence for working capital	0.00678	-0.0423***	0.00178	-0.00759	-0.0118	0.00204
(DEP_WK)	[0.00519]	[0.0115]	[0.00207]	[0.00763]	[0.0195]	[0.00264]
Dependence on external finance	0.208	0.163	0.0401	-0.509	-1.363	0.0741
for investment (DEF_INV)	[0.463]	[0.730]	[0.157]	[0.561]	[1.246]	[0.226]
Tobin-Q (06)	-0.677***	-1.479***	-0.0341	-0.924***	-1.592***	-0.0916
	[0.181]	[0.391]	[0.0703]	[0.267]	[0.603]	[0.0932]
Firm size (06)	-0.179*	0.395*	0.106***	-0.311***	-0.477**	0.0832*
	[0.102]	[0.210]	[0.0325]	[0.103]	[0.218]	[0.0428]
Cash holding/Assets (06)	-4.598***	14.45***	-0.0650	-1.217	16.79***	0.178
	[1.700]	[2.821]	[0.603]	[1.413]	[4.562]	[0.771]
Short-term debt/Assets (06)	-4.273**	7.284**	0.398	3.700*	-2.360	0.279
	[1.811]	[3.406]	[0.592]	[1.871]	[3.552]	[0.639]
Long-term debt/Assets (06)	-0.617	-2.079	-1.680**	1.734	10.64***	-2.287***
	[1.460]	[2.388]	[0.664]	[1.758]	[3.996]	[0.833]
Constant	2.496*	-0.519	-1.382**	6.780***	12.53**	-1.898**
	[1.386]	[3.228]	[0.528]	[1.910]	[4.846]	[0.770]
Observations	6,923	7,093	6,979	6,619	6,827	6,715
R-squared	0.010	0.013	0.003	0.027	0.016	0.004

Note: Key dependent variables are the changes between 2007 and 2008 (or 2009) in the ratios of firm-level profits/assets, sales/assets and investments/assets. Robust standard errors in brackets, clustered at the 3-digit sector level. *** p<0.01, ** p<0.05, * p<0.1.

Table 7. The Impact of Crisis on Firm Performance
-firm features

VARIABLES	(1) ΔProfit	(2) ΔSales	(3) ΔCapEx	(4) ΔProfit	(5) ΔSales	(6) ΔCapEx
Firm-level demand sensitivity	-0.0246***	-0.0511**	-0.00481			
	[0.00869]	[0.0205]	[0.00410]			
Firm-level trade sensitivity	-0.0345	-0.125*	-0.0273*	-0.0574*	-0.174**	-0.0348**
	[0.0308]	[0.0727]	[0.0145]	[0.0295]	[0.0696]	[0.0139]
Actual firm use of working capital	0.000835	-0.00513	0.000626	0.000548	-0.00569	0.000548
(ACT_WK)	[0.00183]	[0.00432]	[0.000863]	[0.00183]	[0.00432]	[0.000863]
Actual firm use of external financing	0.105***	0.210**	-0.0432**	0.108***	0.217**	-0.0430**
for investment (ACT_INV)	[0.0401]	[0.0941]	[0.0190]	[0.0401]	[0.0940]	[0.0190]
Constant	-2.891***	0.166	-0.476***	-2.892***	0.162	-0.472***
	[0.228]	[0.540]	[0.108]	[0.228]	[0.539]	[0.108]
Observations	5,808	5,915	5,868	5,812	5,919	5,872
R-squared	0.003	0.003	0.002	0.002	0.002	0.002

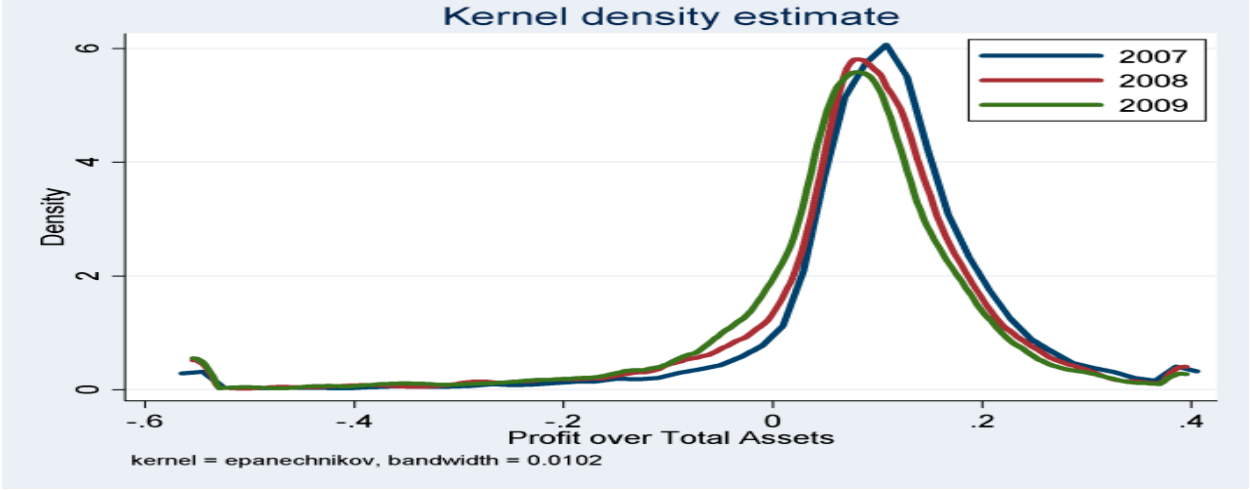
Note: Key dependent variables are the changes between 2007 and 2008/2009 in the ratios of firm-level profits/assets, sales/assets and investments/assets. Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

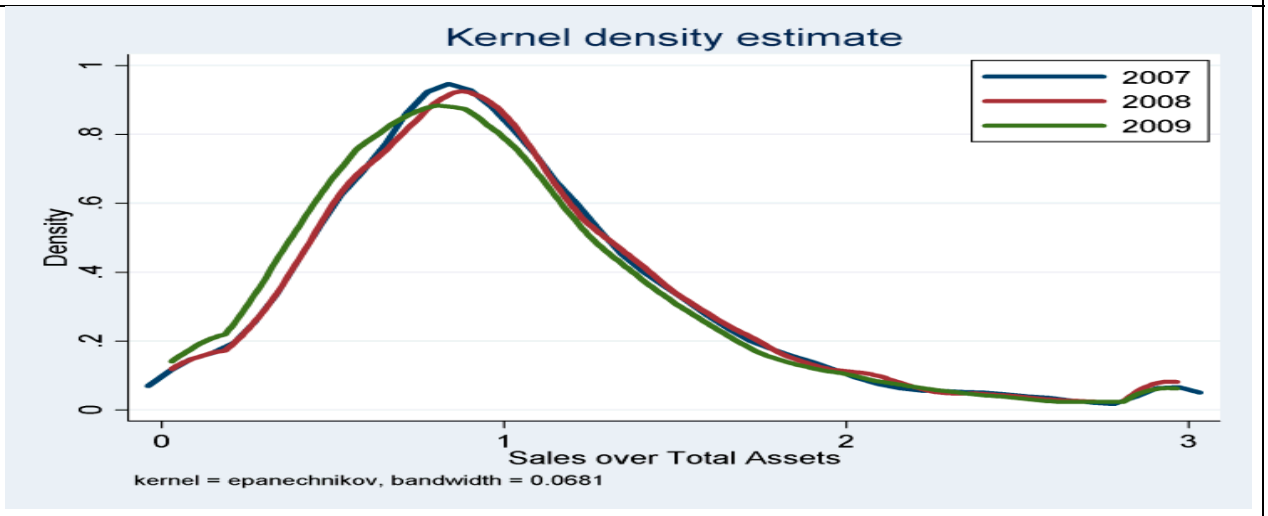
Table 8. The Impact of Financial Crisis on Firm Performance
---firm and country features

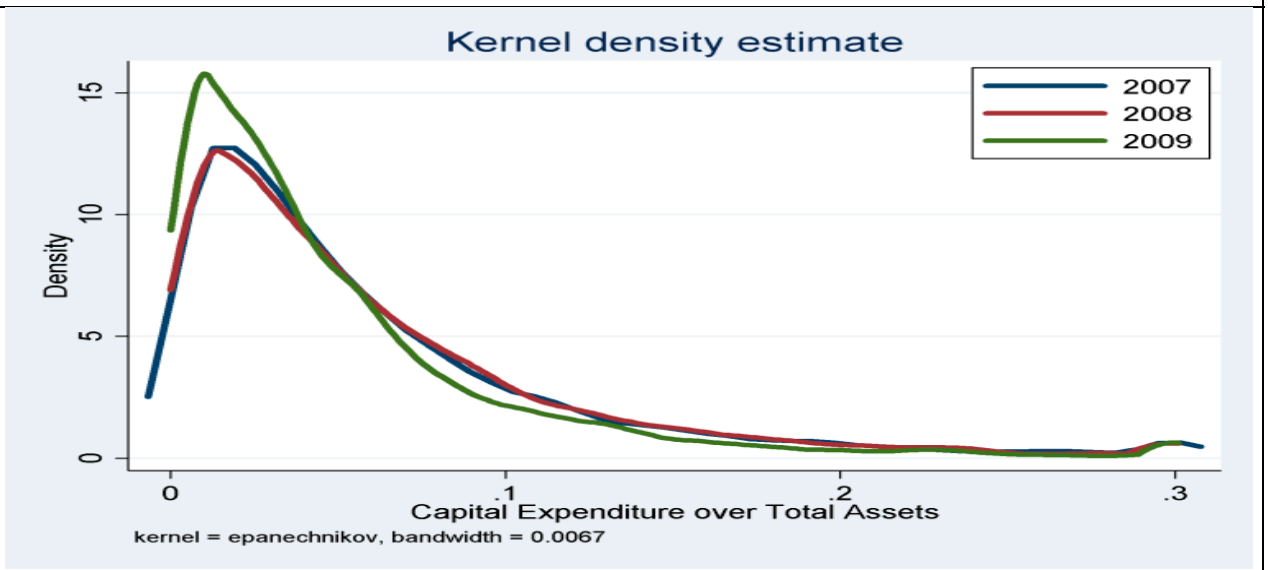
VARIABLES	(1) ΔProfit	(2) ΔSales	(3) ΔCapEx	(4) ΔProfit	(5) ΔSales	(6) ΔCapEx
Firm-level demand sensitivity	0.151	0.421	-0.0955	0.145	0.407	-0.0874
	[0.131]	[0.313]	[0.0623]	[0.131]	[0.310]	[0.0624]
Domestic expenditure	-0.179	-0.490	0.0956	-0.175	-0.500	0.0852
*Firm demand sensitivity	[0.138]	[0.329]	[0.0654]	[0.138]	[0.326]	[0.0655]
Firm-level trade sensitivity	-0.0416	-0.148*	-0.0297*	-0.0161	-0.0498	-0.0200
	[0.0370]	[0.0879]	[0.0176]	[0.0371]	[0.0873]	[0.0177]
Trade linkage*Firm trade sensitivity	0.766	2.180	0.105	0.419	0.521	-0.0127
	[0.583]	[1.384]	[0.277]	[0.585]	[1.375]	[0.279]
Actual firm use of working capital	0.00430	-0.000617	0.000509	0.00375	0.00963	0.00139
(ACT_WK)	[0.00602]	[0.0142]	[0.00284]	[0.00620]	[0.0144]	[0.00292]
Financial openness*ACT_WK	0.00167	-0.00181	0.000506	0.00160	-0.00422	0.000500
	[0.00118]	[0.00281]	[0.000568]	[0.00130]	[0.00308]	[0.000629]
Actual firm use of external financing	-0.473***	-0.382	-0.137**	-0.426***	-0.174	-0.125**
for investment (ACT_INV)	[0.124]	[0.289]	[0.0586]	[0.126]	[0.291]	[0.0598]
Financial Openness*ACT_INV	0.0289	0.123	0.00246	0.0216	0.0941	0.00245
	[0.0317]	[0.0752]	[0.0151]	[0.0320]	[0.0753]	[0.0153]
Credit/GDP*ACT_WK	-0.00873	-0.00126	-0.00101	-0.00717	0.00252	-0.00145
	[0.00693]	[0.0163]	[0.00327]	[0.00721]	[0.0168]	[0.00340]
Credit/GDP*ACT_INV	0.544***	0.345	0.0934	0.543***	0.281	0.0904
	[0.161]	[0.377]	[0.0760]	[0.163]	[0.379]	[0.0772]
Financial openness	-0.377***	-0.209	-0.104*			
	[0.128]	[0.305]	[0.0612]			
Credit/GDP	1.691**	3.777*	0.931**			
	[0.821]	[1.945]	[0.390]			
Domestic expenditure/GDP	-11.57	19.74	-5.041			
	[11.06]	[26.28]	[5.233]			
Trade linkage	-7.160	14.12	-4.709			
	[10.82]	[25.69]	[5.115]			
Constant	7.954	-22.34	3.888			
	[11.03]	[26.21]	[5.219]			
Country fixed effects	n	n	n	y	y	y
Observations	5,808	5,915	5,868	5,808	5,915	5,868
R-squared	0.014	0.008	0.006	0.034	0.045	0.023

Note: Key dependent variables are the changes between 2007 and 2008/2009 in the ratios of firm-level profits/assets, sales/assets and investments/assets. Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Figure 1. Density distribution of firm performance around the 2008-09 crisis







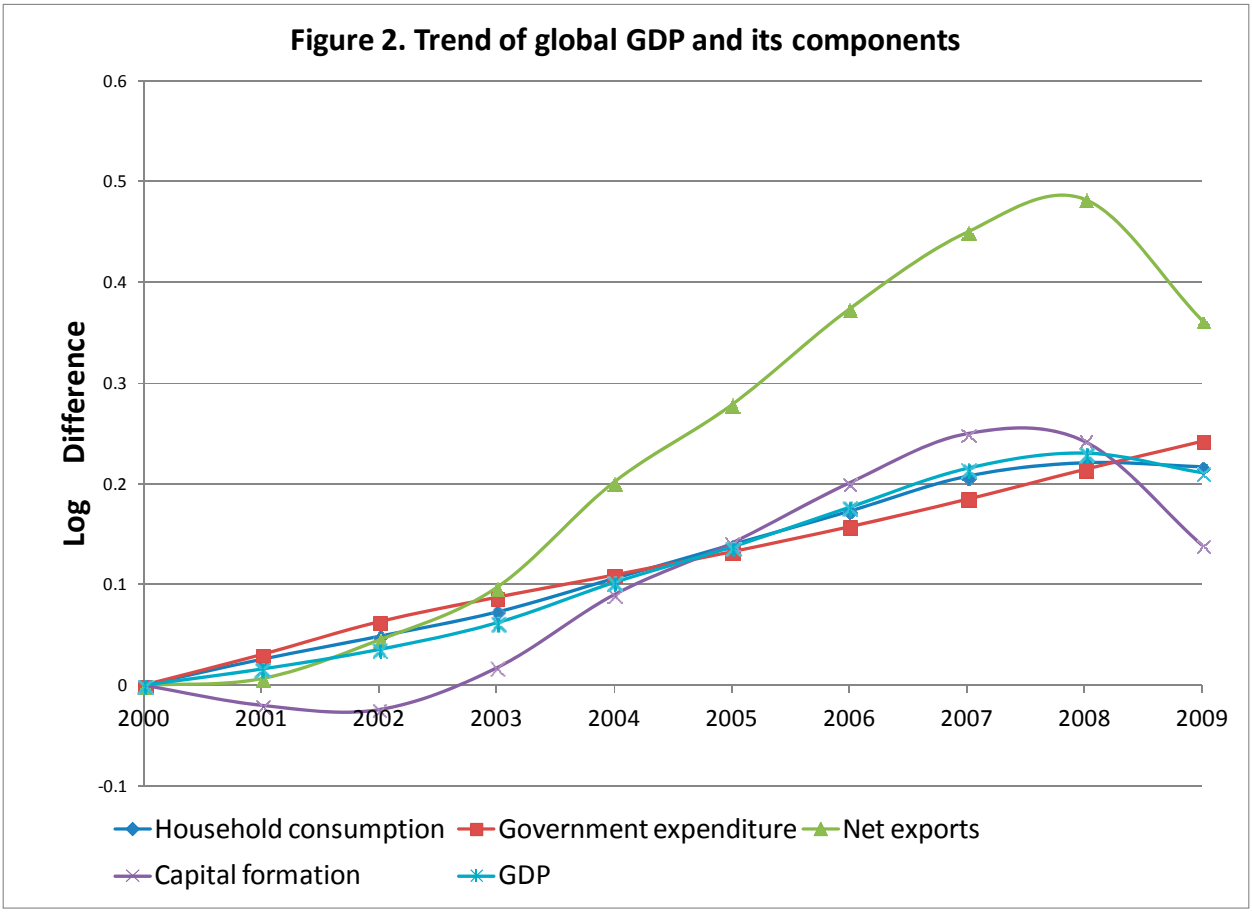


Figure 2. Trend of global GDP and its components
Log Difference
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Household consumption
Government expenditure
Net exports
Capital formation
GDP