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Stock returns' sensitivities to crisis shocks: Evidence from developed and emerging markets

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ABSTRACT

We consider three "crisis shocks" related to key features of the 2007–2008 crisis, for emerging and developed economies: (1) the collapse of global trade, (2) the contraction of credit supply, and (3) selling pressure on firms' equity. Using an international cross-section of firms, we find that returns' sensitivities to these shocks imply 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 several placebo periods shows that these effects are generally less severe or absent in non-crisis periods. Relative to developed economies, emerging markets are more responsive to global trade conditions (in crisis and in placebo periods), but less responsive to selling pressures. An analysis of portfolios of firms during various placebo periods indicates that investors are not compensated for the risks associated with the crisis shocks. Finally, a month-by-month analysis of returns during the crisis period shows that the time variation of the importance of each of the sensitivities to shocks tracks related changes in the global economic environment.

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1. 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 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 (leverage ratio), its dividend behavior (dividend to sales ratio), and the ability of the firm to cover its debt obligations (interest coverage).

We collect data on over 16,000 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.[1] 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.[2] 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 as well as with two longer placebo periods spanning 5 and 10 years each, going back as far as 1997.

To complement the regression analysis, we also build portfolios of "crisis-shock exposed" and "crisis-shock robust" firms (which are defined later in the paper) and test whether returns before and during the 2007–2008 crisis, as well as the different placebo periods, have differed across these two types of firms.

To preview our results, we find that firms sensitive to credit supply shocks, global demand shocks, and selling pressures in the equity market had lower returns during the crisis. On the other hand, sensitivity to these shocks had generally less severe effects during the placebo periods. Our results are robust to different measures of beta, momentum, and weighting.

Because the crisis originated in the developed countries (largely in the US and UK), and later spread to emerging markets, we also investigate whether there are major differences in the impact of these sensitivities in the developed countries and emerging markets samples. We find meaningful differences. Global demand sensitivity is higher in the emerging markets sample, likely because trade is more important for firms in emerging economies. On the other hand, the sensitivity to selling pressures is higher in the sample of developed countries, reflecting the fact that stock markets in developed countries tend to be more liquid than in emerging markets. Both developed and emerging markets display similar sensitivity of returns to credit supply shocks, but the magnitudes differ.

Confirming the conclusions of our placebo period analysis, our portfolio analysis during the pre-crisis period (1997–2006) reveals that the influences we identify do not appear to be "priced." Mean

[1] 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.

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