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OCCASIONAL PAPER

# Linkages in World Financial Markets

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## Summary

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Assessing the full consequences of the global financial crisis that began in the summer of 2007 will require years. It is possible now, however, to examine how short-term (i.e., day-to-day) linkages in different financial markets have changed since the onset of the crisis. In particular, it might be interesting to ask whether there has been any diminution in the traditional role of U.S. financial markets in leading movements in other financial markets.

We cannot observe directly what events triggered short-term movements in U.S. or other financial markets. We can, however, observe *when* market movements appear to have originated—that is, which markets tend to lead subsequent movements in other markets.

In this short paper, we examine daily movements in three major equity indexes—the U.S. S&P 500, the Japanese Nikkei 225, and the British FTSE 100. We examine how daily changes in one market are correlated with the immediately subsequent changes in the other two. We also examine the size of movements in each market—the “betas”—subsequent to a given change in the other markets before and after the onset of the crisis.

We use two alternative dates for the onset of the crisis: August 1, 2007, when the first signs of trouble with subprime mortgages began to emerge, and September 1, 2008, before the failure, forced sale, or government takeovers of high-profile financial institutions in the United States and elsewhere.

Because UK markets are still open when U.S. markets open, we restrict our data to morning trading in the UK, “unpolluted” by news emerging in the couple of hours immediately before the markets open in New York.

Generally, we find that the three national equity indices examined became more highly correlated after the onset of the crisis. This result is robust with respect to the choice of starting date for the crisis and is consistent with the findings of other studies of other financial crises. The returns on individual financial instruments and broader market indices tend to become more correlated during times of crisis.

More novel is our finding that the size of one market’s movements subsequent to movements in other markets—the beta of one market with respect to another—also increased.

The links between movements in the U.S. market and subsequent movements in other markets do not strengthen as much as do links originating in the Japanese and the UK markets, but the links from U.S. markets to other markets start at a much higher precrisis level (an indication of the leading role that U.S. markets seem to play in global financial affairs). In our analysis, U.S. influence on the other markets is the strongest influence both before and after the onset of the crisis and does not appear to have diminished in absolute terms in the period immediately following the onset of the crisis.

In an excursion from our basic analysis, we eliminate all Mondays from our sample of daily market movements. The rationale for this excursion is that some important developments might occur over the weekend, allowing Asian or European markets to react before U.S. markets open, even if the news originated in the United States. Generally, “excluding-Mondays” analysis shows the same patterns as the analysis using the full data set. The one interesting exception is that the increased influence of UK market movements on subsequent U.S. market movements observed in the full sample becomes insignificant in the excluding-Mondays analysis. We interpret this to mean that the apparent increase in the influence of UK markets was due mostly to common reactions in the United States and the UK to events that took place over the weekend.

In another excursion, we examined linkages among movements in financial equity subindices in the United States, Japan, and the UK. Our rationale was that, since the recent crisis was particularly threatening to financial stocks, we might expect to see more-dramatic changes in the linkages among financial subindices. Somewhat surprisingly, we found no consistent pattern of changes in linkages among financial subindices. One interpretation of this finding is that developments that were detrimental to, say, U.S. financial institutions might have conferred some advantage on, say, Japanese institutions.

In a final excursion, we allow the date for the onset of the crisis to vary across our entire range of data, searching for the dates that yield the best fit in our two-period (precrisis and after onset of the crisis) models. No single date maximizes the fit for models that seek to explain linkages among all three markets. Generally, though, we find that dates for the onset of the crisis in September and October 2008 yield the best fit. Curiously, a date of January 1, 2007—well before a plausible beginning date for the crisis—yields good fits for models of the influence of UK markets on other markets.