Do People Overreact? Evidence from the Housing Market After the Wenchuan Earthquake

Perceived risk plays a significant role in individuals’ investment decisions. Unfortunately, most people are not particularly adept at properly evaluating risk – many of us are prone to overreacting to it. These overzealous responses affect a host of financial decisions including job selection, investment portfolio decisions and real estate purchases.

Overreaction is a particularly common response to low-frequency, high-cost events that grasp the attention of individuals. Events like hurricanes, tsunamis and earthquakes can cause extreme and unwarranted responses.

In PERC Working Paper 1310 PERC Research Fellow Li Gan, Guoying Deng and Manuel Hernandez explore how individuals in the real estate market responded to the 2008 Wenchuan earthquake in China’s Sichuan Province. Specifically they use a dataset of new apartment sales to ask whether the earthquake changed residential apartment prices and residents’ preferences for living on the lowest floors of apartment buildings.

The earthquake served as a dramatic reminder that Chengdu is close to the Longmen Shan Fault. Theoretically, this reminder could cause housing prices to drop across the city as prices updated to reflect the new earthquake risk perceptions. This is consistent with the existing literature, which finds that property values generally drop after traumatic events and that these effects dissipate over time as the initial shock of the event wears off.

The return of prices to previous levels over time supports the idea that the response is an overreaction, but Gan et al. are also able to provide more evidence that this change is driven by safety concerns. In an earthquake as massive as the Wenchuan earthquake, individuals who are able to get outside are more likely to survive because many casualties are caused by collapsing buildings. In the aftermath of such an earthquake, individuals are more likely to desire lower floor dwellings. Because many apartment buildings in Chengdu are high-rise buildings in excess of 10 floors, this effect could be quite pronounced. The authors find that there is a temporary relative increase in the price of apartments on lower floors compared to those on higher floors, despite finding that prices fell overall after the earthquake.

Because the earthquake was such a sudden event, the authors are
able to treat whether a unit was sold after the earthquake as if it were random. This allows for a causal interpretation of their estimates.

The authors first estimate a simple hedonic model in which they control for the floor on which an apartment is located and whether it was sold after the earthquake. In addition they control for a number of apartment and market characteristics (unit size, whether it was built by a highly-regarded developer, whether the local government was offering housing subsidies and a national housing price index), and they control for local effects and changes over time. They find that, in general, apartments on higher floors cost more (0.3% per floor), presumably because they have better amenities and more prestige, and that the average apartment price fell after the earthquake.

They next add a term to determine whether apartments on higher floors still cost more after the earthquake. They find that the earthquake diminishes the relationship between floor and price – residents are still willing to pay more to live on a higher floor, but it’s only 0.1% more per floor.

The effect is not simply that lower levels are more preferred, though. The authors expand their model to see if there are different effects for specific floors. The starkest results are unsurprisingly for the first and second floor. Before the earthquake, units on the first or second floor cost on average 4.4% less than apartments on the 7th floor or higher. After the earthquake, they cost 0.1% more than those on the 7th floor or higher holding all else equal. Although their prices stayed below those of the apartments on the 7th floor or higher, apartments on the 3-4 and 5-6 floors were sold for relatively higher prices after the earthquake.

Trading Volume and Stock Returns

The relationship between trading volume and stock returns has been an active area of research for many decades. The popularization of high-speed (high-frequency) trading, a conspicuous aspect of financial markets in the last ten years, has attracted increasing attention to the relationship from both academicians and practitioners. Not surprisingly, it also figures prominently in the debate about the revived proposals to impose Tobin-type securities transaction taxes to reduce trading volume following the recent financial crisis. Better understanding of the volume-return relationship could also shed light on the ongoing de-
bating about whether modern finance is too big.

The questions at issue are whether there is any relationship between trading volume and stock returns and whether such a relation is economically significant. The latter is probably more important in the current debate. Existing empirical work focuses on whether including past volume information can help predict stock returns after controlling for past returns and other relevant information - the so-called Granger causality test. The test is typically implemented using the in-sample regressions method.

As is well known, many commonly used financial and economic variables have been found to have negligible out-of-sample forecasting ability for stock returns despite their enormous in-sample predictive power. Out-of-sample return predictability is economically important, in itself, from the perspectives of risk management and asset allocation. In PERC Working Paper 1311, PERC Research Scientist Zijun Wang re-examines the volume-return relationship by conducting the Granger causality test in both in- and out-of-sample contexts to provide a more comprehensive picture about the volume-return relationship that in-sample evidence alone cannot.

The paper also investigates the volume-return relationship using both direct aggregate time series estimates (turnover) and the high volume return premium, which summarizes cross-sectional return predictability based on volume. Empirical studies typically either concentrate on time series of market/index volume and return, or examine the cross-sectional variation using data on individual stocks. By combining evidence from both time series and cross-sectional analysis, Wang presents a full picture that relates the variation in expected returns through time to models for the cross section of expected returns.

Like many other empirical studies on the volume-return relationship, the paper concentrates on the U.S. market. However, to mitigate the concerns of data mining and the low power of time series tests, the author also investigates major international equity markets, including six other developed countries in the Group of Seven (G-7) and an additional 12 countries with both developed and emerging economies that house large stock exchanges by market capitalization.

The main findings can be summarized as follows. First, in U.S. data from 1963 to 2010, trading volume shows statistically significant in-sample predictive power for stock returns. Out-of-sample regressions show mixed evidence. There is no gain in forecast accuracy for value-weighted portfolios. In contrast, trading volume generates better forecasts for stock returns to equal-weighted portfolios. Nevertheless, for a typical risk-averse investor, the improvement in forecasts transforms to a utility gain of 0.73% per annum in terms of rates of return. This estimate is close to Kenneth French’s famous estimate of 0.67% of the aggregate value of the market each year investors spend searching for superior returns over 1980 to 2006. Further sub-sample analysis shows that trading volume’s out-of-sample forecasting ability declines significantly over the last ten years.

Second, Canada is the only other G-7 country, other than the U.S., in which the high volume premium helps predict returns out of sample for equal-weighted portfolios by all three statistical and economic criteria. Value-weighted, aggregate turnover shows out-of-sample predictive power in five out of the other 12 major markets. The high volume premium contains some additional predictive power for value-weighted portfolios only in India, and for equal-weighted portfolios only in China.

The author also finds that trading volume in the U.S. market generally does not contain additional information for forecasting returns in other markets after controlling for past returns, volume, and volatility information from domestic markets as well as past U.S. market returns. Because many international samples comprise predominantly recent data, the absence of a spillover effect of U.S. trading activity is consistent with its vanishing predictive power for U.S. market returns in the second sub-sample analysis.

“Trading volume shows statistically significant in-sample predictive power for stock returns”
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