

# Low volatility makes a financial crisis more likely

[blogs.lse.ac.uk/businessreview/2016/08/22/low-volatility-makes-a-financial-crisis-more-likely/](https://blogs.lse.ac.uk/businessreview/2016/08/22/low-volatility-makes-a-financial-crisis-more-likely/)

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Received wisdom maintains that financial market volatility has a direct impact on the likelihood of a financial crisis. Perhaps the best expression of this is [Hyman Minsky's \(1992\) hypothesis](#) that economic agents observing low financial risk are induced to increase risk-taking, which in turn may lead to a crisis. This is the foundation of his famous statement that 'stability is destabilising'.

More recently, this sentiment has been echoed by policy-makers. For example, in June 2014, Federal Reserve Chair Janet Yellen [said](#) 'Volatility in markets is at low levels, both actual and expected... to the extent that low levels of volatility may induce risk-taking behavior is a concern to me and to the Committee'.

Such views find support in recent theoretical research describing how economic agents react to volatility deviating from the level they come to expect it to be at. Low volatility induces economic agents to take more risk, endogenously increasing the likelihood of future shocks. If the economic conditions deteriorate and the resulting bad investment decisions start to sour, volatility then increases, signalling a pending crisis.

But these researchers could not find any empirical literature documenting such a relationship between financial market volatility, risk-taking, the real economy and crises. Perhaps, they say, we have made little empirical progress since Paul Samuelson's famous quip\* in 1966 that 'Wall Street indexes predicted nine out of the last five recessions'.

## The decomposition of volatility

The lack of empirical clarity motivates us to take a new approach to verifying the volatility-crisis relationship, focusing on unusually high and low volatility. Crises are rare events – recent history notwithstanding, an OECD member country suffers a banking crisis only once every 35 years, on average. Consequently, in order to obtain a meaningful statistical relationship between volatility and crises, it is helpful to take a long-term historical view.

Since no comprehensive data on historical volatilities are available, we constructed such a database, spanning 1800 to 2010 and covering 60 countries, from primary sources. We make use of [Reinhart and Rogoff's \(2009\)](#) banking

and stock market dataset as our crisis indicator and use GDP per capita, inflation, change in the government debt-to-GDP ratio, institution quality and fixed effects as controls.

We then run a binomial regression model on the incidence of financial crises with lagged averages of volatility and controls as explanatory variables, finding little significance. We surmise that this is due in part to the theoretical literature emphasising volatility deviations, not the contemporaneous level of volatility. Furthermore, the volatility trend evolves slowly over time, and differs considerably across countries at any given time. Hence, a particular measurement of volatility could be seen as high, low, or typical depending on the country or year, weakening any empirical analysis focused solely on volatility levels.

We address this by decomposing volatility into low and high volatility and using this as an explanatory variable in the regression model. In particular, borrowing terminology from the literature on output gap, we interpret the slow-running volatility trend, calculated by a one-sided Hodrick-Prescott filter, as long-term volatility. High and low volatility is then the deviation of volatility above and below its trend, respectively.

### **Validating Minsky**

We find a strong and significant relationship between high and low volatility and the likelihood of a financial crisis. Low volatility increases the probability of both a banking and a stock market crisis. This is especially strong if low volatility persists for half a decade or longer. We further investigate this by using the credit-to-GDP gap as a proxy for risk-taking, finding that prolonged periods of low volatility significantly increases risk-taking. This result complements that of [Schularick and Taylor \(2012\)](#), who find that credit booms are destabilising, leading to a banking crisis.

High volatility also increases the likelihood of a stock market crisis – but not a banking crisis – though with much shorter lags of up to two or three years. This is very much in line with what theory predicts and provides strong evidence for Minsky's instability hypothesis. Low volatility induces risk-taking, which leads to riskier investments. When those turn sour, the resulting high volatility signals a pending crisis.

These results are robust to a number of alternative specifications, for example, on the definition of volatility and crises, lag lengths, sample selections and model specifications. We find that the relationship between volatility and the likelihood of a future crisis becomes stronger over time. This is not surprising, since the importance of stock markets and the prevalence of limited liability corporations have steadily been increasing. The main exception to this is the Bretton Woods era, when financial markets were tightly regulated and capital flows controlled, causing the volatility-crisis relationship to weaken significantly.

### **Conclusion**

While the common view is that volatility directly affects the probability of a crisis, this has proven difficult to verify empirically. In what we believe is the first study to do so, we find direct empirical evidence that the *level* of volatility is not a good indicator of crisis, but that *unusually* high or low volatility is.

This is directly in line with what is predicted by theory and provides a validation of Minsky's hypothesis that 'stability is destabilising'. Market volatility is of clear interest to policy-makers, with the quote of chairwoman Yellen being just one example. By documenting how volatility can affect the risk-taking behaviour of economic agents, and hence the incidence of financial crises, policy-makers and market participants alike would gain a valuable tool for understanding crises, tail events and systemic risk.

\* **Samuelson, P (1966) 'Science and Stocks', Newsweek.**



## Notes:

- This post is based on the authors' paper [Learning from History: Volatility and Financial Crises](#) and this research is being presented at the annual congress of the European Economic Association in Geneva, 22-26 August 2016.
- *Disclaimer: The views in this summary are solely those of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or of any other person associated with the Federal Reserve System.*
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