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Intertemporal relations between the market volatility index and stock index returns

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Abstract

We examine the intertemporal relationships between Chicago Board Options Exchange (CBOE) market volatility index (VIX) and returns of the S&P 100, 500 and 600 indexes among three subperiods during 1992–2011 to account for structural shifts in VIX and to investigate if the role of VIX as an investor fear gauge and indicator of portfolio insurance price has strengthened in periods of high market anxiety and turbulence. We find a strong negative contemporaneous relation between daily changes (innovations) in VIX and S&P 100, 500 and 600 returns. Our results suggest that the strength of contemporaneous VIX-returns relation depends on the mean and volatility regime of VIX, and that this relation is much stronger when VIX is both high and more volatile. In fact, during 2004–2011, the negative contemporaneous VIX-returns relation was the most dominating and the only significant relation. Our results also indicate a strong asymmetric relation between daily stock market returns and innovations in VIX,

suggesting that VIX is more of a gauge of investor fear and portfolio insurance price than investor positive sentiment. The response of VIX to negative changes in market returns was the highest during 2004–2011 when VIX was most volatile. This result is consistent with rising portfolio insurance premiums in periods of high market anxiety and turbulence.

Keywords:

VIX | S&P 500 and 100 returns | investor fear gauge | portfolio insurance price | asymmetric relationship

JEL Classification::

G14 | G19 | G10

Notes

[1] A VIX value of more than 30 is often considered to be high and outside of the normal range (Whaley, 2000). Practitioners often think that a VIX below 30 means that stock market is relatively stable, while a VIX above 30 reflects a sense of panic or capitulation (Ghosh, 2009).

[2] Coefficients of stock index returns beyond lag and lead two were not statistically significant at the 5% level in nearly all of the cases. Similarly, coefficients of lead and lag absolute returns were predominantly statistically insignificant. Hence, these coefficients are not included in the regression analysis presented in Table 6.

[3] We also conducted the regression analysis for the subperiod 24 February 2006 to 30 June 2011 when VIX options were traded in addition to VIX futures which started trading on 26 March 2004. The regression analyses for this subperiod (not reported here) are virtually identical to those shown in Table 4 for 26 March 2004 to 30 June 2011 (i.e. 2004–2011).