

Abstract Submitted
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Lead-lag relationships between stock and market risk within linear response theory¹ STANISLAV BORYSOV², ALEXANDER BALATSKY³, Nordita, KTH Royal Institute of Technology and Stockholm University, Roslagstullsbacken 23, SE-106 91 Stockholm, Sweden — We study historical correlations and lead-lag relationships between individual stock risks (standard deviation of daily stock returns) and market risk (standard deviation of daily returns of a market-representative portfolio) in the US stock market. We consider the cross-correlation functions averaged over stocks, using historical stock prices from the Standard & Poor's 500 index for 1994-2013. The observed historical dynamics suggests that the dependence between the risks was almost linear during the US stock market downturn of 2002 and after the US housing bubble in 2007, remaining at that level until 2013. Moreover, the averaged cross-correlation function often had an asymmetric shape with respect to zero lag in the periods of high correlation. We develop the analysis by the application of the linear response formalism to study underlying causal relations. The calculated response functions suggest the presence of characteristic regimes near financial crashes, when individual stock risks affect market risk and vice versa.

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