Stock market volatility and international business cycle dynamics: Evidence from OECD economies[☆]

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ABSTRACT

How does a surprise movement in stock market volatility affect our forecasts of future output across countries? This paper studies the time series and cross-sectional responses of output to variation in stock market volatility across 27 countries over 40 years, controlling for a number of country-specific characteristics. High levels of stock market volatility are detrimental to future output growth not only after financial crises as previously emphasized in the literature, but also in non-crisis periods. Output growth and interest rates react negatively to a random shock to volatility and revert to their means quickly thereafter. Moreover, these results are robust after controlling for economic policy uncertainty, the level of financial development, and the direction of the market.
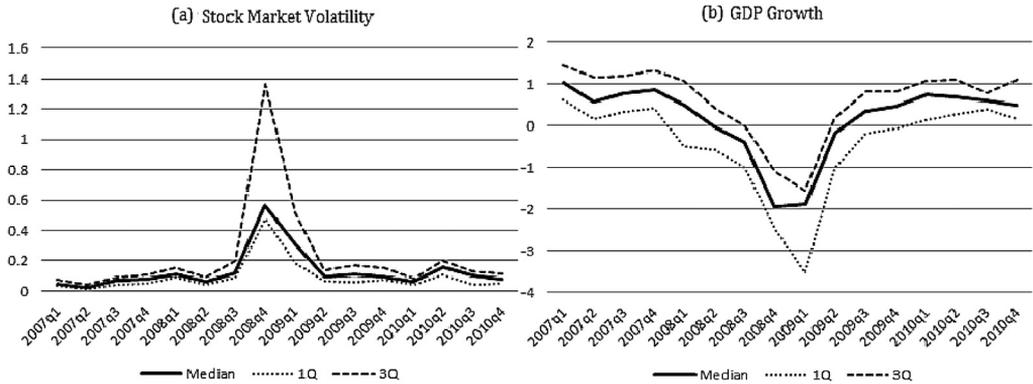
1. Introduction

Fig. 1 plots both the quarterly variance of the Morgan Stanley Capital International (MSCI) standard country equity index and real output growth. Two patterns are visible. First, output growth shrinks following spikes in stock market volatility. Second, the 2007 recession is undeniably among the most devastating since the Great Depression with prolonged output growth stagnancy and stark cross-country

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Fig. 1. Stock Market Volatility and Output Growth (2007.Q1–2010.Q4). **Note:** This figure presents the median, 1st quartile (denoted 1Q), and 3rd quartile (denoted 3Q) of stock market volatility and output growth across 27 countries from 2007.Q1 to 2010.Q4. Data is seasonally adjusted. The official NBER recession dates for the US are from 2007.Q2 to 2009.Q2, or 18 months.

spillovers. How does a surprise movement in stock market volatility affect our forecasts of future output? I address this question using quarterly and monthly data across 27 countries from 1970 to 2012.

While there are a plethora of studies linking increases in stock market volatility to declines in output growth, they often abstract from incorporating cross-country dynamics. Given that many macroeconomic fundamentals are known to be driven by a variety of common world factors (see, for example, Gregory et al. (1997) and Crucini et al. (2011)), the analysis presented here thus fits in by accounting for these dynamics. Another source of novelty is the combined use of dynamic panel, panel vector autoregressive, and Granger-style panel causality analyses. These approaches are desirable because they allow for the analysis of the interaction of random shocks to output growth and stock market volatility.

Before proceeding further, let us take a step back and review some of the most important works in the related literature. Using US data from 1834 to 1987, Schwert (1989) confirms that stock market volatility rose and interest rates fell on average during recessions in the pre-1987 period. As emphasized by Reinhart and Rogoff (2008), the aftermath of a financial crisis is typically associated with a large and persistent decline in output growth. This paper complements Reinhart and Rogoff (2008) by suggesting that future output growth reacts negatively and consistently to high stock market volatility in the previous period in both crisis *and* non-crisis periods. More recently, using a time-series VAR and multi-step Granger causality approach on Australian data, Rahman (2009) suggests that the volatility of the stock market tended to be associated with profound declines in output growth and increases in both inflation and the unemployment rate. Similarly, Kanas and Ioannidis (2010) observe a strong relationship between stock market volatility and real activity in the UK over the period 1946–2002.

The research presented here also builds upon a growing literature that concerns the forecasting power of stock market volatility for future real economic activity, by incorporating international stock markets.[1] From a theoretical perspective, our results are supported by a strand of literature concerning the role of financial frictions in amplifying the response of the macroeconomic aggregates to various types of shocks. (e.g., Bernanke et al. (1999)). Most recently, Jermann and Quadrini (2012) attempt to explain such a mechanism using a DSGE framework in which firms cut back on hiring and investment when faced with stricter financial constraints. To preview the results, (1) a high level of stock market volatility corresponds to declines in output growth during both crisis *and* non-crisis periods *regardless* of the direction of the market, (2) output growth reacts negatively to a random shock to stock market volatility and reverts to its mean quickly thereafter, (3) all US recessions from 1970 to 2010 exhibit stark spill-over effects to other countries, and (4) economic policy uncertainty has a significant negative effect on output growth in the next period, but not to the extent that it undermines the effect of stock market volatility.

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[1] See, for example, Campbell et al. (2011), Chauvet et al. (2012), and Fornari and Mele (2011).