Financial market volatility and primary placements

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Abstract

This paper studies empirically the link between financial market volatility and primary placements of stocks and bonds for the US economy. We find that the impact of volatility on primary placements is not statistically significant.

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1. Introduction

The opinion that volatility of financial markets has a negative impact on the real economy lies at the heart of proposals such as the Tobin Tax. Following Keynes (1936), many economists argue that uncertainty can negatively affect investment, pushing firms to delay the installment of new capital.1 Nevertheless, the impact of volatility on asset prices and, eventually, on real quantities, is essentially an empirical issue, and not entirely settled. Poterba and Summers (1986) show that changes in risk premia, reflecting volatility, have a modest impact on stock prices, since risk premia are stationary. French et al. (1987), on the contrary, find that the expected market risk premium is positively related to the volatility of stock returns. Their results are confirmed by Chou (1988) who, by estimating the volatility by means of GARCH techniques, finds that it is highly persistent.

In two separate studies Schwert (1989, 2002) suggests that stock market volatility is a leading indicator for economic activity, with heightened volatility often associated with recessions, and that clusters of high volatility are explained, to a large extent, by technological shocks.

Overall the literature on volatility and returns suggests that clusters of high volatility are normally concentrated in periods of low returns, and anticipate recessions or other (technological) shocks affecting the real economy. On the contrary, there is no clear-cut evidence that stock market volatility affects real variables and investment in particular. Indeed, there is no neat evidence that stock prices affect investment. For instance, Chirinko and Schaller (1996) found that bubbles are present in the US stock market, but they have no influence on investment, which is instead driven by fundamentals; Blanchard et al. (1993) conclude that “market valuation appears to play a limited role, given fundamentals, in the determination of investment decisions.”2 The above mentioned literature has focused on the analysis of stock prices and investment. But should any relationship between stock and bond prices (and their volatility) and investment exist, this relationship must take place through the impact of stock and bond prices on primary placements. Since firms raise funds by issuing new shares and bonds, and the amount raised depends on the value of the outstanding shares and bonds, through this channel stock and bond prices can directly affect their investment decisions. We thus test empirically if the volatility of stock and bond prices influences the amount of resources that firms raise from financial markets. The empirical analysis is conducted by taking into consideration potential endogeneity between the two different sources of external finance. We model stock and bond market volatility as GARCH stochastic processes and we find that both volatilities do not have any significant impact on the issuance of stocks and bonds.

2. Dataset and empirical model

The dataset consists of US monthly aggregate data ranging from March 1973 to June 2006. The data on issuance of bonds and stocks are taken from the Statistical Supplement to the Federal Reserve Bulletin. Figures represent gross proceeds of issues maturing in more
Table 1
3SLS estimates of Eqs. (1) and (2).
\[
\Delta S_t = \alpha_0 + \alpha_1 \Delta B_t + \alpha_2 R_{S,t} + \alpha_3 \Delta S_{t-1} + \alpha_4 \Delta y_t + \sum_{i=1}^{k_1} \alpha_i + 4 \Delta S_{t-i-1} + \epsilon_{S,t}
\]
\[
\Delta B_t = \beta_0 + \beta_1 \Delta S_t + \beta_2 R_{B,t} + \beta_3 \Delta B_{t-1} + \beta_4 \Delta y_t + \sum_{i=1}^{k_2} \beta_i + 4 \Delta B_{t-i-1} + \epsilon_{B,t}
\]

<table>
<thead>
<tr>
<th>$\alpha_0$</th>
<th>$\alpha_1$</th>
<th>$\alpha_2$</th>
<th>$\alpha_3$</th>
<th>$\alpha_4$</th>
<th>$\alpha_5$</th>
<th>$\alpha_6$</th>
<th>$\alpha_7$</th>
<th>$\alpha_8$</th>
<th>$\alpha_9$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.153</td>
<td>0.298</td>
<td>2.319</td>
<td>1.252</td>
<td>-2.521</td>
<td>-0.426</td>
<td>-0.304</td>
<td>-0.134</td>
<td>-0.147</td>
<td>0.336</td>
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</tr>
<tr>
<td>(-2.071)</td>
<td>(0.373)</td>
<td>(3.598)</td>
<td>(0.816)</td>
<td>(-3.942)</td>
<td>(-2.496)</td>
<td>(-2.095)</td>
<td>(-2.636)</td>
<td>(-2.664)</td>
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</tbody>
</table>

$\Delta^4 B_t = \rho_0 + \rho_1 \Delta S_t + \rho_2 R_{B,t} + \rho_3 \Delta B_{t-1} + \rho_4 \Delta y_t + \sum_{i=1}^{k_1} \rho_i + 4 \Delta B_{t-i-1} + \epsilon_{B,t}$

<table>
<thead>
<tr>
<th>$\rho_0$</th>
<th>$\rho_1$</th>
<th>$\rho_2$</th>
<th>$\rho_3$</th>
<th>$\rho_4$</th>
<th>$\rho_5$</th>
<th>$\rho_6$</th>
<th>$\rho_7$</th>
<th>$\rho_8$</th>
<th>$\rho_9$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.040</td>
<td>0.266</td>
<td>3.579</td>
<td>-1.806</td>
<td>-6.333</td>
<td>-0.743</td>
<td>-0.547</td>
<td>-0.396</td>
<td>-0.246</td>
<td>-0.205</td>
<td>0.534</td>
</tr>
<tr>
<td>(1.159)</td>
<td>(1.537)</td>
<td>(4.820)</td>
<td>(-1.173)</td>
<td>(-3.124)</td>
<td>(-13.03)</td>
<td>(-9.191)</td>
<td>(-7.440)</td>
<td>(-6.659)</td>
<td>(-4.823)</td>
<td></td>
</tr>
</tbody>
</table>

$Q(8)^b = 8.543 (0.382)$
$Q(16)^b = 13.38 (0.945)$


a. Ljung–Box Q-statistics for standardized residuals at lags 8 and 16.
b. Breusch–Godfrey tests for serial correlation up to lag 8.
c. White tests for heteroscedasticity. P-values in parenthesis.

demonstrated. Moreover, ARCH LM tests suggest the absence of GARCH effects in the series. The two series, to investigate the second problem we make use of a system version of the Hausman Test developed by Revankar and Yoshino (1990). Results suggest that issues of stocks and corporate bonds are endogenously determined. As a result, empirical estimations of Eqs. (1) and (2) are carried out by means of Three-Stage Least Squares (3SLS).

3. Results

The empirical estimates of the system of Eqs. (1) and (2) are reported in Table 1. The two regressions are initially estimated without any lagged dependent variables. Then, in order to account for lagged dependent variables, their volatility (\(\sigma_{\text{stock}}\) and \(\sigma_{\text{bond}}\)) market returns, their stationarity, the stationary nature of the two series, and the growth rate of the Industrial Production Index (\(\Delta y_t\)). Financial market volatilities. There are two different sources of external factors in the structure of the two series. First, the factor that exerts the strongest influence on primary placements of shares is the volatility of bond market prices does not affect primary placements of shares. This surprising result can be explained recalling that primary placements include not only IPOs of privately owned firms, but they also include the issuance of convertible bonds and convertible increases of public firms. While the literature suggests that decreasing stock returns have a negative impact on IPOs, firms, in the aggregate, issue large amounts of new shares and convertible bonds to raise capital when their financials are strained. Therefore our results might suggest that following strong positive shocks, associated with peaks in volatility, the amount of equity raised by means of capital increases or convertible bonds increases, thus at least partially offsetting the reduced volumes of IPOs. Moreover, peaks in volatility might have a retarded impact on primary placements of shares. We investigate this hypothesis by supplementing Eq. (1) with lagged variables of volatility and testing for

3. Figures exclude secondary offerings, employee stock plans, investment companies other than closed-end, intra-corporate transactions, and Yankee bonds.
4. These series are obtained from the FRED database at the Federal Reserve Bank of St Louis and Datastream.
5. The best fitting models for monthly stock and bond market returns are respectively an ARMA(1,1)–GARCH(1,1) and an ARMA(1,0)–GARCH(1,1). These specifications deliver standardized residuals and squared residuals not serially correlated. Moreover, ARCH LM tests suggest the absence of GARCH effects in standardized residuals. To save space these results are not reported.
6. Both the Augmented Dickey–Fuller and the Phillips–Perron tests suggest that when the series are taken in levels, the null of unit root cannot be rejected at standard significance levels. The null, however, is strongly rejected when the series are considered in their first differences. These results are consistent for different specifications of the two tests.
7. To save space these results are not reported.
8. The model has been supplemented with dummy variables to account for monthly seasonality, the Stock Market Crash of October 1987 and the collapse of LTCM fund of November 1998.
9. When lagged dependent variables of order higher than four and five are included, empirical results show that these terms are not statistically significant. Thus, the identification process of the two regressions implies \(k_1 = 4\) and \(k_2 = 5\).
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