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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.

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 instalment 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

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[1] Keynes' argument is that while individual shareholders can liquidate their investments, the society as whole cannot, so that firm managers are constrained by the short-term fluctuations of share prices due to speculative activity.

[2] Blanchard et al. (1993), p. 132.

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Table 1
3SLS estimates of Eqs. (1) and (2).

$\Delta S_t = \alpha_0 + \alpha_1 \Delta B_t + \alpha_2 R_{S,t} + \alpha_3 \sigma_{S,t} + \alpha_4 \Delta y_t + \sum_{i=1}^{4} \alpha_{i+4} \Delta S_{t-i} + \varepsilon_{S,t}$										
α_0	α_1	α_2	α_3	α_4	α_5	α_6	α_7	α_8		R^2
−0.153	0.298	2.319	1.252	−2.521	−0.426	−0.304	−0.134	−0.147		0.336
(−2.071)	(0.373)	(3.598)	(0.816)	(−0.942)	(−3.496)	(−2.095)	(−2.636)	(−2.664)		
Q(8)[a] = 8.543 (0.382)			Q(16)[a] = 13.38 (0.645)			BG[b] = 1.368 (0.209)		W[c] = 17.95 (0.458)		
$\Delta B_t = \beta_0 + \beta_1 \Delta S_t + \beta_2 R_{B,t} + \beta_3 \sigma_{B,t} + \beta_4 \Delta y_t + \sum_{i=1}^{5} \beta_{i+4} \Delta B_{t-i} + \varepsilon_{B,t}$										
β_0	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	β_9	R^2
0.040	0.266	3.579	−1.806	−6.333	−0.743	−0.547	−0.396	−0.246	−0.205	0.534
(1.159)	(1.537)	(4.820)	(−1.173)	(−3.124)	(−13.03)	(−9.919)	(−7.440)	(−4.659)	(−4.823)	
Q(8)[a] = 5.718 (0.679)			Q(16)[a] = 20.21 (0.211)			BG[b] = 0.739 (0.657)		W[c] = 14.36 (0.705)		

Notes: Empirical estimates worked out for the period 1973:03–2006:06. *T*-statistics in parenthesis.
[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.

than one year, and include both financial and nonfinancial corporations, and both private and public placements in the case of bonds, while public placements only in the case of shares.[3] All figures are deflated by using the US Consumption Price Index. The dataset includes also the series of the Industrial Production Index, while the stock and bond market indices considered are the Standard&Poor500 (S&P500) and the Lehman Brothers Corporate Bond Index (LBCB).[4]

The basic relations we want to test involve linear relationships among the volumes raised by means of primary placements of shares (S_t) and corporate bonds (B_t), plus a set of predetermined variables which includes stock ($R_{S,t}$) and bond ($R_{B,t}$) market returns, their volatility ($\sigma_{R_{S,t}}$ and $\sigma_{R_{B,t}}$), and the growth rate of the Industrial Production Index (y_t). Stock and bond market returns are computed by employing monthly S&P500 and LBCB. Stock and bond market volatilities are modelled by fitting ARMA–GARCH processes to the same series.[5] The structural form of our model is as follows:

$$\Delta S_t = \alpha_0 + \alpha_1 \Delta B_t + \alpha_2 R_{S,t} + \alpha_3 \sigma_{S,t} + \alpha_4 \Delta y_t + \sum_{i=1}^{k_S} \alpha_{i+4} \Delta S_{t-i} + \varepsilon_{S,t} \quad (1)$$

$$\Delta B_t = \beta_0 + \beta_1 \Delta S_t + \beta_2 R_{B,t} + \beta_3 \sigma_{B,t} + \beta_4 \Delta y_t + \sum_{i=1}^{k_B} \beta_{i+4} \Delta B_{t-i} + \varepsilon_{B,t} \quad (2)$$

where the inclusion of lagged endogenous variables has a twofold valence. First, to be consistent (under the null that the parameters α_i and β_i are equal to zero for $i = 1,..,4$) with their stationary nature, the sources of external finance are allowed to evolve as mean reverting AR stochastic processes. Second, lagged dependent variables can capture the effects of omitted factors. In fact, it is plausible to think that the variables included in the model are not the only determinants of the sources of external finance. Moreover, this specification of the model should ensure residuals not serially correlated. The hypothesis we want to test is that no relationship exists between issuance of stocks and corporate bonds and financial market volatilities. There are two potential problems related to this analysis. The first is that the different sources of external finance are non stationary. The second is their endogeneity. To overcome the first problem we first-difference the two series.[6] 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.[7] As a result, empirical estimations of Eqs. (1) and (2) are carried out by means of Three-Stage Least Squares (3SLS).[8]

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 that might become significant, the two regressions are supplemented with lags of order one, two, and so forth. Following this procedure it can be shown that Eq. (1) includes lagged dependent variables up to the fourth lag, while Eq. (2) includes lagged dependent variables up to the fifth lag.[9]

The variable that exerts the strongest influence on primary placements of shares is the returns on S&P500 which is significant at the 1% level. This result is in line with the literature.[10] The coefficient associated with volatility is positive, but not statistically significant. Consequently, the volatility of stock 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 capital 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 finances are strained. Therefore our results might suggest that following strong negative 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 values 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 $k_S = 4$ and $k_B = 5$.

[10] See, for instance, Lowry (2003) and Welch (2004).