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The impact of political risk on return, volatility and discontinuity: Evidence from the international stock and foreign exchange markets

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ABSTRACT

The paper examines the impact of political risk on stock and foreign exchange markets in a comprehensive sample of sixty-six countries and twenty political risk indicators mostly covering the financial crisis and recovery periods from May 2001 to April 2014. The impact is assessed on return, volatility and jumps series of monthly frequency. Evidence reveals that Europe is mostly at higher risks generated from economic crisis; whereas, political risks explain the high volatility and discontinuity in international stock and foreign exchange markets in other regions.

1. Introduction

The existing literature examines the political risk impact on macroeconomic fundamentals (Bekaert et al., 2013) and government bond yields (Huang et al., 2015), and few country-specific studies have investigated the influence of political risk on the stock and foreign exchange markets (Bailey and Chung, 1995; Perotti and van Oijen, 2001). However, there is no cross-country study that captures the impact of political risk on volatility and jumps of stock and foreign exchange markets during the global financial crisis and the recovery periods. Volatility and jumps, measure the market risk and discontinuities, and are considered to be the most crucial factors for risk management, trading and asset allocation. This study fills the gap in the literature by focusing on the impact of political risk indicators on returns, volatility and jumps in stock and foreign exchange markets. The political risk indicators are assessed both regionally and internationally for the period from 2001 to 2014. Interestingly, the analysis explores both economic and political risks.

Contrarily to Huang et al. (2015) which focus on the effect of political crises to government bond yields, the present paper contributes by capturing the direct impact of political risk on the returns, volatility and jumps in stock and foreign exchange markets. The entire analysis is implemented in a monthly frequency. Volatility is estimated by using the median realized variance estimator (Andersen et al., 2012) and jumps are detected and estimated following Duong and Swanson (2015). Twenty political risk indicators covering four groups of political risk (government stability, socioeconomic conditions, investment profile and internal conflict) and a composite index are assessed.

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2. Methodology

Monthly realized volatility is estimated by the median realized variance (MRV_t) which is considered as the best alternative jump-robust estimators of realized variance introduced by Andersen et al. (2012). The (MRV_t) is defined as

$$MRV_t = \frac{\pi}{6-4\sqrt{3}+\pi} \cdot \frac{N}{N-2} \cdot \sum_{l=2}^{N-1} med\left(|R_{t,l-1}|, |R_{t,l}|, |R_{t,l+1}|\right) \tag{1}$$

where $R_{t,\,l}$ is the daily return for l day within month t and $l = 1, .., N$ is the total number of daily observations within a month.

Jumps are detected in accordance to a non-jump volatility measure. Corsi et al. (2010) showed that the threshold bipower variation estimator is substantially better than others for such purposes. The threshold bipower variation ($TBPV_t$) is given by

$$TBPV_t = \sum_{i=2}^{22} |R_{t,i-1}| \cdot |R_{t,i}| \cdot I_{|R_{t,i-1}|^2 \le \vartheta_{i-1}} \cdot I_{|R_{t,i}|^2 \le \vartheta_i} \tag{2}$$

where $I_{\{\cdot\}}$ is the indicator function and the threshold function, $R_{t,\,i}$ is the daily return series and t is time in months. Barndorff-Nielsen and Shephard (2006) developed the jumps detection scheme based on bipower variation; and recently, Bekaert and Hoerova (2014) used the $TBPV_t$ dependent jumps detection scheme successfully. Another recent study on jumps from realized volatility is Duong and Swanson (2015). The jumps statistic is:

$$ZJ_t^{(TBPV)} = \sqrt{22} \cdot \frac{(RV_t - TBPV_t) RV_t^{-1}}{\left(\left(\xi_1^{-4} + 2\xi_1^{-2} - 5\right)\ max\left\{1, TQ_t TBPV_t^{-2}\right\}\right)^{1/2}} \tag{3}$$

where RV_t is the medial realized volatility (MRV_t),[1] and TQ_t is the realized tripower quarticity which is $TQ_t = 22 \cdot \xi_{4/3}^{-3} \cdot \sum_{i=1}^{22} |R_{t,i}|^{4/3} |R_{t,i+1}|^{4/3} |R_{t,i+2}|^{4/3}$ and converges in probability to integrated quarticity. The $ZJ_t^{(TBPV)}$ statistic follows standard normal distribution. A jump is considered to be significant if the test statistic exceeds the appropriate critical value of the standard normal distribution, denoted by Φ_α, at α level of significance. A 95% significance level is employed.[2] The jump component is:

$$J_t^{(TBPV)} = [RV_t - TBPV_t] \times I\left[ZJ_t^{(TBPV)} > \Phi_a\right] \tag{4}$$

where I [·] is the indicator function of the $ZJ_t^{(TBPV)}$ statistic in excess of a given critical value of the Gaussian distribution Φ_a. The summation of the squared jump component and the continuous component of the RV_t estimator equals to RV_t.

The direct effect of political risk is assessed with the use of control variables, as suggested by Huang et al. (2015) and Gennaioli et al. (2014). Following Huang et al. (2015), the ordinary least squares method employed is:

$$X_{i,t} = a_0 + a_1 Pol_{i,t} + a_2 INFL_{i,t} + a_3 MC_{i,t} + a_4 GDP_{i,t} + a_5 IT_{i,t} + a_6 INT_{i,t} + e_{i,t} \tag{5}$$

where $X_{i,\,t}$ is either return, volatility or jumps series of a country i in time t (in months); $Pol_{i,\,t}$ is any one from the twenty political indicator as split into five categories. Control variables are: inflation rate ($INFL_{i,\,t}$), stock market capitalization ($MC_{i,\,t}$), Gross Domestic Product ($GDP_{i,\,t}$), trade integration ($IT_{i,\,t}$) and interest rate ($INT_{i,\,t}$). Newey-West robust standard errors are employed across all empirical analyses.

3. Data

Dataset begins on May 1, 2001 and ends on March 31, 2014, for a total of 3410 trading days. All stock and foreign exchange daily data are in US dollars and obtained from Datastream.[3] Sixty-six countries (split in four regions/continents) are considered.[4] The countries selected in this study are with the most significant economies and stock markets in their regions/continents. The most widely used International Country Risk Guide (ICRG) monthly political risk indicators are obtained from the Political Risk Services. Their values range from 0 to 12; where 0 means the highest political risk. The control variables of inflation rate, stock market capitalization, GDP (Gross Domestic Product), trade integration and interest rate are retrieved from the Economic Outlook Database of the International Monetary Fund in October 2014 in quarterly and monthly frequency.[5] Trade integration is measured as the ratio of international trade (imports plus exports) over the country's GDP.

4. Empirical results

The descriptive statistics of the continuous returns, volatility and jumps (average, maximum and minimum) of the international stock and foreign exchange markets are presented in Tables 1A and 1B, respectively. The results suggest that stock

[1] The RV_t is employed in the jumps detection scheme in order to comply with the literature.
[2] There are no significant changes in intensity and magnitude of volatility jumps for a 99% significance level.
[3] For the purpose of the study, stock and foreign exchange daily data are converted into monthly frequency.
[4] The names of countries and their respective stock indices and exchange rates are available upon request from authors.
[5] For quarterly data, a linear interpolation based on the monthly ones, is implemented.

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