On the determinants of stock market dynamics in emerging countries: the role of economic policy uncertainty in China and India

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Abstract

We contribute to the ongoing literature on the effects of policy uncertainty on economic variables by investigating the relationship between economic policy uncertainty and stock markets in China, India and the USA. Our findings suggest that contrary to China, an increase in policy uncertainty in the USA and India reduces significantly stock returns and augments market volatility.

1. Introduction

This paper contributes to the growing literature on the impact of policy uncertainty on economic variables. While most of previous works have focused on interactions between policy uncertainty and macroeconomic variables such economic growth, inflation and employment [Fernandez-Villaverde et al. (2014), Oros and Zimmer (2015) and references therein], only a few studies have been carried out to investigate the effects of policy uncertainty on stock markets [Antonakakis et al. (2013), Kang and Ratti (2013a, 2014), Brogaard and Detzel (2014) and Liu and Zhang (2015)]. Moreover, most of these studies have focused on developed countries. We build on this ongoing literature and propose to investigate the effects of policy uncertainty in two major emerging countries, China and India. China and India are playing an increasing role in the world economy: China is the world's second largest economy and India is the world's second fastest growing economy. We think that it is interesting to investigate the sensitivities of their stock markets to policy uncertainty and to compare our findings to those from developed economies. Our findings may provide important implications for other emerging and transition economies.

We define economic policy uncertainty (EPU) as the probability of changes in the existing economic policies that determine the rules of the game for economic agents [Baker et al. (2014)]. The effect of economic policy uncertainty on stock markets can run along numerous channels. First, policy uncertainty may delay important decisions taken by economic agents such as investment, consumption, saving and employment decisions [Gulen and Ion (2014) and Kang et al. (2014)]. Second, EPU may increase production and financing costs by affecting both demand and supply sides, intensifying disinvestment and economic contraction specially in developing countries [Julio (2002) and Fernandez-Villaverde et al. (2014)]. Third, policy uncertainty may increase risks in financial markets in particular by reducing the value of protections provided by the government for markets [Pastor and Veronesi (2012)]. Finally, EPU may also affect inflation, interest rate and expected risk premiums [Pastor and Veronesi (2013). Thus, we expect changes in economic policy uncertainty to affect stock prices by affecting both expected firms' cash-flows and discount rates.

This expected negative effect of EPU has been very recently confirmed by some empirical studies. Sum (2013) develops a VAR analysis using the EPU index of the United States and shows that an increase in EPU Granger-causes the market returns to drop. Antonakakis et al. (2013) use a DDC GARCH model to show that comovements between US stock market

returns, volatility and economic policy uncertainty vary over time and that an increase in policy uncertainty decreases stock market returns. Based on a VAR model, Kang and Ratti (2013b) reach a similar conclusion. Chang et al. (2014) investigate for a sample of seven OECD countries whether economic policy uncertainty is linked to stock markets and show that volatility in the US and UK economic policies lead stock prices to decrease and that the US EPU also affects oil prices. Finally, Sum (2014) shows that the changes in EPU negatively affect all stock market returns in the Euro zone, Croatia, Norway, Russia, Switzerland, Turkey and Ukraine.

We estimate different specifications using data from China and India over the last turbulent decade. We also include the USA for comparison purpose. We show that the effect of policy uncertainty is not alike across the studied countries: for the USA, an increase in EPU reduces stock returns in a persistent way, EPU does not affect stock returns in China while its effect on Indian stock returns in contemporaneous. Similar findings were obtained when studying the effects of EPU on stock market volatility.

The remainder of the article proceeds as follows. Section 2 presents some preliminary analyses. Section 3 reports and discusses our empirical findings. Section 4 concludes the paper and provides some policy implications.
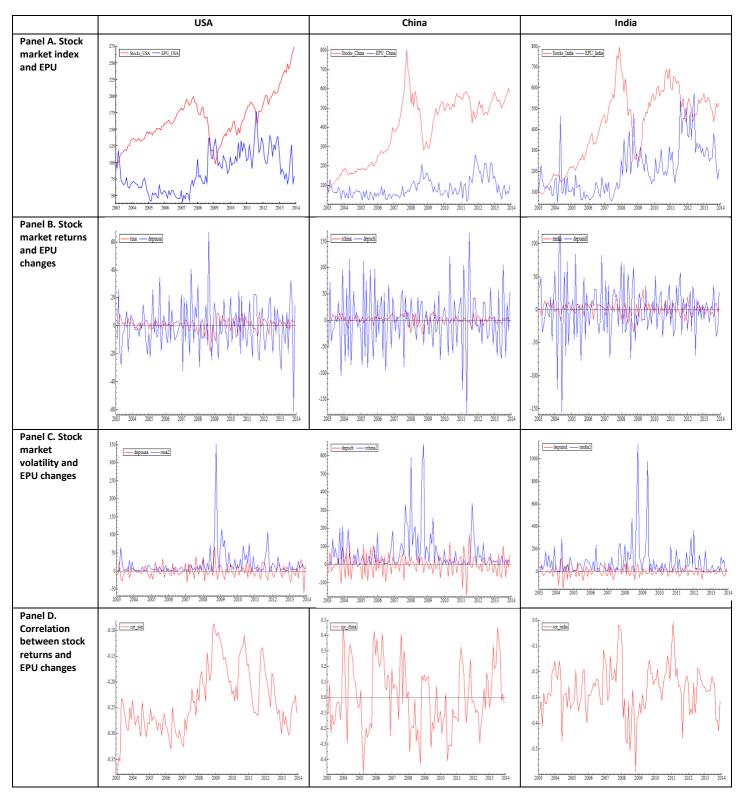
2. **Preliminary analysis**

This section serves two purposes. First, we introduce the data we use in our empirical investigation. Second, we propose a first analysis of the relationship between EPU and stock markets in China and India.

The dataset includes three distinct groups of data: stock market indices, EPU indices and economic variables that we use later to condition our estimations. All our data are monthly and cover the period January 2003- January 2014. We consider three countries: China and India, the main focus of our paper, and the USA for comparison purpose. Financial and economic data are extracted from DataStream International while EPU indices are extracted from the Federal Reserve Economic Data base. The EPU indices, constructed by Baker et al. (2014), are weighted averages for each country or region of three uncertainty components: (1) newspaper coverage of policy-related economic uncertainty; (2) the number of federal tax code provisions set to expire in future years, and (3) a measure of disagreement among

economic forecasters as a proxy for uncertainty. We normalize EPU indices to 100 in January 2003 to make easier their comparison across countries.

Figure 1. EPU indices, stock market returns, volatility and correlation

Panel A of Figure 1 plots the EPU index together with the stock market index. We remark that the timing of major national and international historical events is marked in the two indices. For example, if we take the case of India, we identify events like the Congress Party's surprise election victory in April 2004, the 2008-2009 financial crisis, the 2010-2011 Euro and debt crises, and the inflationary fears in December 2010. The structural break tests we run in the following section confirm the presence of changes associated with those events. These events are often followed by increases in EPU and decreases in the market index. In addition, we remark that there is an increasing pattern in policy uncertainty indices, at least for the USA and India.

Panel B suggests a negative relationship between stock returns and EPU changes for the USA and India. However, the sign of the relationship appears to be not clear for China. Panel D, which reports conditional correlations between EPU changes and stock returns, confirms this observation: the correlation between EPU changes and stock returns is negative in the case of the USA and India and alternate between negative and positive values in the case of China.

Finally Panel C in Figure1 plots EPU changes together stock market volatility. It suggests a positive association between the two variables. Generally, major global or national economic and political events increase both policy uncertainty and market volatility. We further investigate these links based on regressions and causal relationships in the following section.

Table 1: Descriptive statistics

Panel A. Policy uncertainty

	Mean	Std. dev.	JB	MIN	Max
EPU USA	86.013	29.866	14.676***	41.167	176.41
EPU China	86.152	49.930	57.276***	18.442	256.43
EPU India	209.85	117.32	34.915***	50.607	575.65

Panel B. Stock market returns

	Mean	Std. dev.	JB
USA	0.770	4.215	20.851***
China	1.345	7.977	11.611***
India	1.267	9.151	10.057***

Panel C. Correlations between returns and changes in EPU

	USA	China	India
Correlation	-0.219***	0.008	-0.292***

Notes. EPU was normalized to 100 in January 2003. JB is the Jarque-Bera test for normality based on excess skewness and Kurtosis. *, ** and *** denote statistical significance at the 10%, 5% and 1%.

Basic statistical proprieties of the series we use are summarized in Table 1. Panel A shows that, on average, policy uncertainty is largely higher in India than in China or the USA, 210 versus 86. Moreover, EPU in India is highly volatile.

Panel B reveals a number of interesting facts. Compared to the USA, India and China show higher returns, but also higher risks. The USA has the highest return-to-risk ratio (0.18), followed by China (0.17) and India (0.14).

Panel D reports average correlations between EPU changes and stock returns. There are significant negative correlations in the cases of the USA and India. However, the correlation between EPU changes and stock returns is not significant in the case of China.

3. Discussion of empirical findings

To further examine the effects of EPU on stock markets in India and China, we regress stock returns (R_{it}) on EPU changes (*REPU*) and other control variables. However, we should first notice that Figure 1 suggests that the stock markets we study might be subjected to structural changes. Indeed, during our sample period the studied markets have experienced various periods of financial turbulences such as the global 2007-2008 financial crisis and the 2010-2011 debt crises. We make use of the Bai and Perron (2003)'s testing procedure to investigate whether the studied stock market returns series contain structural breaks. Results, not reported to save space but available upon request from authors, show that the hypothesis of stability is rejected for all the studied markets since the Bai-Perron's test detects breakpoints. For the USA, three significant breakpoints are obtained, and for India and China countries four breakpoints are detected. We add dummy variables to take into consideration those breakpoints in our regressions.

Regression results are summarized in Table 2. Column 1 shows that the coefficient relating the contemporaneous returns to the one-lag returns is significant only in the case of India, suggesting some predictability in the Indian stock markets based on previous returns. On the other side, the coefficient on $REPU_t$ is significantly negative in the case of the USA and India and not significant in the case of China. Thus, an increase in economic policy uncertainty is associated with a decrease in returns in India and the USA, but seems to do not affect stock market in China.

More interestingly, Column 1 shows that the coefficient on the one-lagged EPU is significantly negative for the USA, suggesting that the effect of economic policy uncertainty on this stock market is rather persistent. Some predictability of the US stock returns can be obtained using previous levels of economic policy uncertainty. In contrast, this coefficient is not significant for China and India.

In column 2, we include macroeconomics factors that may be associated with both stock markets and EPU. Indeed, a correlation between stock markets and economic policy uncertainty may become from a "proxy effect": the association between stock markets and EPU may simply reflect an association between economic policy uncertainty and economic factors that have been shown to be associated with stock markets. Thus, we may need to control for these economic factors when studying the association between economic policy uncertainty and stock markets. We consider the following variables: Changes in industrial production (*IP*), changes in Brent oil price (*Oil*), changes in the 3-month interest rate (*TB*) and changes in the exchange rate via-à-vis dollar for India and China and changes in the composite exchange rate for the USA (*Currency*). We considered also other variables such as inflation and unemployment. However, their effects were not statistically significant. Moreover, to take into account the effect of potential omitted variables, we add in the regressions the residuals of the MSCI world market portfolio returns (Rmsciw) regressed on the variables already included in the model.

Our empirical findings show that oil price changes significantly affect stock markets in the three countries, the coefficient on exchange rate changes is significant for the USA and India. The coefficient on changes in industrial production is significant for the USA. The coefficients on changes in the 3-month interest rate as well as on residual work market returns (Rmsciw) are significant for the three markets. More importantly, our results on the effect of economic policy uncertainty on stock market returns remain almost unchanged: the effect of EPU is negative and persistent for the USA, negative for India with some persistence and non-significant for China.

Table 2. Economic policy uncertainty and stock market returns

	USA		China		India	
	(1)	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**
Constant	0.651*	0.642***	1.235*	6.868	1.153	4.642**
	(0.354)	(0.108)	(0.718)	(6.045)	(0.775)	(2.225)
$R_{i,t-1}$	0.048	0.002	0.097	-0.085	0.161*	0098*
	(0.085)	(0.021)	(0.088)	(0.069)	(0.087)	(0.057)
$REPU_t$	-0.063***	-0.051**	-0.002	0.008	-0.076***	-0.041***
	(0.021)	(0.023)	(0.014)	(0.010)	(0.020)	(0.014)
$REPU_{t-1}$	-0.058***	-0.056***	-0.010	0.001	-0.027	-0.031**
	(0.020)	(0.019)	(0.014)	(0.010)	(0.021)	(0.014)
IP_t		0.666***		0.098		0.046
		(0.118)		(0.154)		(0.093)
Oil_t		0.133**		0.350***		-0.324***
		(0.011)		(0.067)		(0.064)
TB_t		-1.316**		-14.430*		-7.000*
		(0.567)		(8.073)		(3.709)
$Currency_t$		-0.592***		-0.115		1.079***
		(0.051)		(1.740)		(-3.78)
$Rmsciw_t$		0.933***		1.153***		1.215***
		(0.022)		(0.142)		(0.143)
Adj-R²	0.141	0.954	0.014	0.429	0.099	0.589

*Notes: Robust standard errors are reported into parentheses. . *, ** and *** denote statistical significance at the 10%, 5% and 1%.*

To sum up, our results confirm the correlation analysis (Table 1). Our finding is expected for India. Indeed, the Indian economy has run into deep structural problems because of increased policy uncertainty and the lack of adequate economic reforms since 2004. Bhagat et al. (2014) find that GDP and corporate investments are negatively related to EPU in India. As for the USA, Antonakakis et al. (2013) find based on DCC GARCH models that correlations between US stock market returns, volatility and economic policy uncertainty vary over time and that a rise in the volatility of policy uncertainty reduces stock market returns.

Next, we test for the effects of EPU on stock market volatility. As suggested by Figure 1, we hypothesize that higher world economic policy uncertainty is associated with higher volatility. To this end, we regress the variance of within-month daily returns (σ_{it}^2) on changes in EPU (*REPU*) and other control variables. Results are summarized in Table 3.

	USA		China		India	
	(1)	(2)	(1)	(2)	(1)	(2)
Constant	12.591***	7.786*	46.593***	97.062***	70.675***	72.104***
	(3.328)	(3.856)	(10.72)	(14.750)	(14.91)	(28.880)
$\sigma^2_{i,t-1}$	0.332***	0.311***	0.292***	0.233***	0.173**	0.163**
	(0.080)	(0.063)	(0.085)	(0.091)	(0.087)	(0.081)
$REPU_t$	0.307*	0.089	0.069	0.047	0.906***	0.619**
	(0.182)	(0.102)	(0.184)	(0.157)	(0.341)	(0.306)
$REPU_{t-1}$	0.516***	0.479***	0.0727	0.106	0.290	0.316
	(0.109)	(0.171)	(0.185)	(0.159)	(0.344)	(0.299)
$\sigma^2_{IP,t-1}$		2.699**		0.058		0.214*
		(0.945)		(0.081)		(0.128)
$\sigma^2_{oil,t-1}$		0.083***		0.315***		0.549***
		(0.014)		(0.061)		(0.088)
$\sigma^2_{TB,t-1}$		45.67		53.123***		11.145
		(28.520)		(15.780)		(71.080)
$\sigma^2_{Currency,t-1}$		0.572*		12.745		3.349***
		(0.311)		(21.020)		(1.067)
$\sigma^2_{Rmsciw,t-1}$		1.045***		3.777*		3.985
		(0.070)		(2.077)		(3.003)
Adj-R²	0.304	0.775	0.188	0.332	0.1758	0.309

*Notes: Robust standard errors are reported into parentheses. . *, ** and *** Denote statistical significance at the 10%, 5% and 1%.*

Column (1) shows that the effect of contemporaneous economic policy uncertainty on stock market volatility is highly significant in the case of India, weak in the case of the USA and non-significant in the case of China. When we introduce control variables, the effect remain unchanged for India but disappears for the USA (Column (2)). On the other side, our results show that the one-lagged EPU increases volatility only in the case of the USA. It seems that an increase in the US EPU is associated with an increase in macroeconomic and financial risks which leads the stock market volatility of the following month to be higher.

To sum up, an increase in EPU does not increase contemporaneous volatility in the USA but has a delayed effect. In the case of India, the effect is contemporaneous. The effect is not significant in the case of China.

4. Conclusion and policy recommendations

We contribute to the ongoing literature on the effects of policy uncertainty on economic variables. We considered the cases of two major emerging markets (China and India) together with the USA for comparison purpose. Our findings suggest that contrary to China, an

increase in policy uncertainty in the USA and India reduces significantly stock returns and augments market volatility. The effect of EPU on stock market return and volatility seems to be strongly persistent in the case of the USA and at some extent in India. This suggests that EPU may help improve the forecasting of returns and volatility for these two countries.

Our results highlight the importance for authorities in India and the USA to maintain transparency and stability in the implementation of economic policies to prevent their impacts on stock markets and help create a more favorable investment environment. In terms of portfolio management implications, our findings suggest that the risk from investing simultaneously in the US and Indian stocks could be high in periods of high policy uncertainty.

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