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Fund Flows, Stock Markets, and Economic Policy Uncertainty: From the Perspective a CIVET Nation

Joseph J. French[a], Philipp D. Schaberl[a], and Rodrigo Taborda [ID][b]

[a]Monfort College of Business, University of Northern Colorado, Greeley, Colorado, USA; [b]Facultad de Administración, Universidad de los Andes, Bogotá, Colombia

ABSTRACT

We investigate the relationships among economic policy uncertainty (EPU), equity fund flows (EFF), and the Colombian stock market. Results show adverse impacts of domestic, global, and regional EPUs on Colombia's stock returns and EFF. Global and regional EPUs transmit to Colombian EPU which makes the market vulnerable to uncertainty shocks. A global EPU shock reduces returns by 2.2% the following month, raises Colombian EPU by 12%, and reduces EFF by 0.24%. Furthermore, heightened EPU increases liquidity and reduces stock returns. Our results suggest a feedback loop where uncertainty shocks increase trading, fuel domestic uncertainty, and reduce equity prices.

1. Introduction

In this study, we examine the effect of economic policy uncertainty (EPU) on equity fund flows (EFF) in the Colombian stock market. Economic policy uncertainty is the risk associated with undefined future government policies. This phenomenon may increase the risk that liquid fund flows are reversed due to market uncertainty. Baker, Bloom, and Davis (2016) suggest that policy uncertainty delays recovery from a recession as businesses, households, and investors may postpone their decisions about investment. Fund flows are an important issue in emerging markets like Colombia as sudden reversals can potentially have severe destabilizing effects. These concerns and the substantial growth in EFF in Latin America over the past three decades motivate this study. We use Gil and Silva's Economic Policy Uncertainty (EPU) Index for Colombia that follows the methods of Baker, Bloom, and Davis (2016) to calculate the aggregate index of EPU based on the frequency of news coverage to consider the intertemporal relationships among EPU, net EFF, and liquidity and equity returns. We use the EPU index because it is based on a diverse set of indicators of economic policy uncertainty. This index corresponds well with events widely associated with times of extreme policy uncertainty, with spikes occurring around elections and other major political and economic events.

Our results from several Bayesian vector autoregressions (BVARs) show a negative association among EFF and the Colombian EPU and global and major Latin American nations' EPUs. Increases in Colombia, Brazil, Chile, and global EPUs negatively affect foreign equity flows to Colombia.[1] These results are both statistically and economically significant. For example, a one-standard-deviation shock to global EPU leads to a reduction in the EFF to Colombia by 0.24% of its allocated total foreign equity. Furthermore, we find a strong spillover effect from global and regional EPUs on the EPU in Colombia. These findings have direct and practical implications for policymakers and investors. The ability to better predict the direction of EFF will allow policymakers to impose circuit breakers to mitigate the adverse effects of sudden investment reversals. This is particularly relevant to

the current situation where additional financial uncertainty due to COVID-19 coupled with political instability may increase the likelihood of such reversals.

Additional results of this study show that a one-standard-deviation positive shock to the EFF leads to increases in the returns on the Colombia stock market. Given the low liquidity of that market, the EFF has the potential to affect prices that indicate their potential to trigger price bubbles and price collapses. In addition, we uncover a strong link between market value turnover (MVTN), which is a commonly used measure of market liquidity, and EPU. We show that when EPU is elevated MVTN increases that leads to higher levels of EPU. The bi-directional causality between the Colombian EPU and MVTN indicates that when the EPU is elevated market participants increase their trading of securities possibly to exit the market or to reallocate their portfolios. This increased trading leads to higher uncertainty as measured through newspaper text mining. Taken together, our results demonstrate the important connections between EPU and the functioning of the Colombian stock market. For example, a shock to global EPU tends to increase Colombian EPU that reduces EFF and may reduce the value of equities and increase MVTN that then may lead to higher EPU, further reductions in the values of equities, and higher MVTN. The results presented in this study show that policymakers should be aware of the potential dangers of an exogenous uncertainty shock on the functioning of equity markets and should design policies to mitigate these negative effects.

The extant literature has documented the undesirable effects of EPU on several micro- and macro-economic variables. Using a sample of 21 countries, Drobetz et al. (2018) document that an increase in EPU mitigates the negative relationship between firm-level investment and cost of capital. This result is consistent with the notion elevated EPU reduces the sensitivity of firm-level investment to the cost of capital, thereby distorting the fundamental relationship between investment and the cost of capital.

Duong et al. (2020) find that US corporations increase their cash holdings in response to higher EPU and that this positive relationship between EPU and cash holdings is more pronounced for firms that are financially constrained or that are more exposed to policy uncertainty. Interestingly, the observed increase in cash holdings cannot be attributed to a reduction in firm investments. Using a measure of government economic policy uncertainty (GEPU), which is derived from EPU, Xu (2020) finds that GEPU increases a firm's cost of capital, thereby leading to a reduction in firm-level innovation. Balcilar et al. (2020) document a long-run positive relationship between EPU and insurance premiums. Their results suggest that the positive relationship between EPU and insurance premiums is more pronounced for non-life insurance premiums, suggesting that the economic risks covered by non-life insurance are more sensitive to EPU.

The empirical academic studies have largely ignored the relationship between aggregate EFF and EPU. One exception is French and Li (2022) who examine the effects of global and US EPUs on EFF and Treasury flows in the US. They show that for the US EPU shocks positively affect EFF and Treasury flows in the medium to long term due to the deep and liquid financial markets in the US. Furthermore, the authors argue that the global financial community considers the US to be a "safe haven" and is therefore more attractive when uncertainty is higher. However, we predict the results will be different for an emerging, small, and open economy like Colombia. We expect that a representative emerging market like Columbia has different patterns in local, regional, and global shocks.

The recent literature on the effects of EPU on a myriad of other macroeconomic and financial variables is vast.[2] For example, with regard to macroeconomic outcomes, EPU influences foreign direct investment, real exchange rates, unemployment, and business cycles (Baker, Bloom, and Davis 2016; Caggiano, Castelnuovo, and Figueres 2017; Canh et al. 2020; Nilavongse, Rubaszek, and Uddin 2020). Examples of recent studies have shown that EPU predicts the volatility in cryptocurrency, the risk of a crash in stock prices, stock returns, and Bitcoin returns (Chiang 2019; Demir et al. 2018; Luo and Zhang 2020; Yen and Cheng 2021). However, to the best of our knowledge, no other study has considered the effect of EPU on aggregate fund flows in a small emerging market setting.

Many studies do exist on the determinants of EFFs. These studies have found "return chasing" or feedback trading behavior. Clearly stated, return chasing means that high (low) equity returns in

a local market are associated with subsequent foreign equity inflows (outflows) (e.g., Froot and Ramadorai 2001; Griffin, Nardari, and Stulz 2004; Tsai 2009; Vo 2017). Other studies examine the information contribution of foreign equity flows and the permanent and temporary effect on equity returns (e.g., French and Li 2012; Harris and Gurel 1986; Junior and Junior 2017). These studies confirm a positive relationship between past or current foreign equity flows and current equity returns in a local market. For an emerging economy, we expect both local and foreign EPUs to affect EFF. This effect can be explained by the search for a safe haven for international investors from medium- to long-term uncertainty or exogenous shocks to economic activity. Recent history shows the timeliness of this research. Emerging market economies have often seen currency devaluations when foreign investors withdraw liquid portfolio investments. Our research has direct implications for policymakers and investors. The ability to better predict the direction of this "hot money" will allow policymakers to impose circuit breakers to mitigate the adverse effects of sudden investment reversals. This is particularly relevant to the current situation in countries like Colombia, where additional financial uncertainty coupled with political instability may increase the likelihood of such reversals. The impact of economic policy uncertainty on equity flows to Colombia is of particular interest in the current scenario of high volatile political activity of the last two decades. The long-term economic development conditions in the region have not evolved into stable economic growth, igniting a trend toward change in development approach harbored by leftist political parties. The region has begun to experiment with alternatives to market-based economic policies with the hope to reengage economic development based on Government management of the economy.

These medium-term political changes have evolved in a quite disruptive manner. Political swings have become the norm with repeated changes between left and right governments, presidential overthrows, and scandals. Each new government arrives with the view to bring back the economy to its roots away from the markets. Followed by a right government with amendments and efforts to restore a functional economy. These swings are well captured by the uncertainty measurement used in the paper, which in turn become the reflection of the situation of emerging markets and their relationship with neighboring countries as well as international investors. It is in this context that our paper explores policy uncertainty and equity flows in an emerging market country. We add to the existing literature in examining this relationship for a country within a region of economic and policy swings. The results inform policy makers and practitioners in the international financial markets of the upcoming reaction between emerging markets uncertainty and fund flows.

The remainder of this paper proceeds as follows: Section 2 provides some background information about Colombia. We describe our empirical methods in Section 3. Section 4 presents our results, and Section 5 concludes.

2. Institutional Background

Colombia is South America's oldest democracy and has a developing market with a middle-income economy. This country has approximately 50.3 million people and the fourth largest economy in Latin America, behind Brazil, Mexico, and Argentina. Colombia is also part of the so-called CIVET emerging market countries that also includes Indonesia, Vietnam, Egypt, Turkey, and South Africa. Historically, Colombia has had an agrarian economy. But after urbanization during the twentieth century, agriculture has generated only 6% of Colombia's GDP. Because Colombia is rich in natural resources, most of its exports are still commodity-based with petrol being the largest one. Colombia's manufacturing sector as well as its information technology industry have experienced high growth rates. The growth of credit and the good performance of its economy have supported Colombia's financial sector. The financial services sector is now Colombia's largest sector as measured as a percentage of GDP. In the early 1990s the Colombian government still owned more than 50% of the assets of the banking system. As part of a structural reform program, the government re-privatized national institutions and relaxed the requirements for the entry of foreign firms. It also removed the distinctions between domestic and foreign investors and the limits on profit remittances (Barajas,
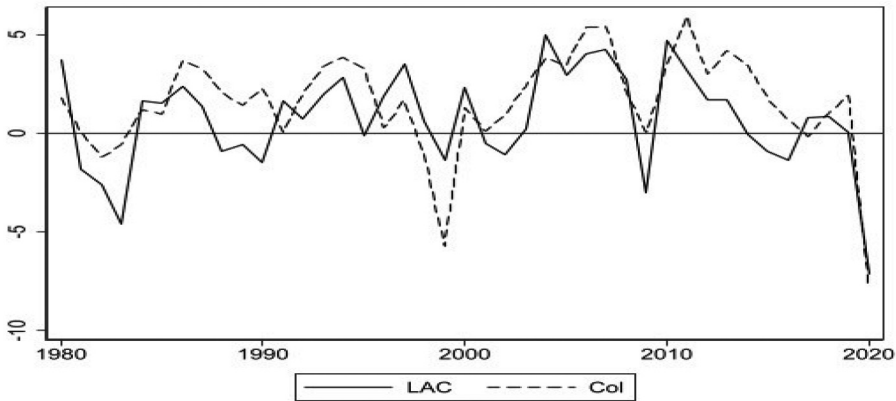
Figure 1. GDP annual growth for Colombia, Latin America, and the Caribbean. *Source: World Bank (2021).*

Steiner, and Salazar 2000). Additionally, in the 1990s Colombia initiated more liberal economic policies such as privatizations, tariff reductions, financial deregulation as well as more liberal policies on foreign exchange rates. Figure 1 shows the annual GDP growth rates for Colombia versus Latin America and the Caribbean (LAC). Since 1990 the region has suffered several periods of negative growth and Colombia's growth has been correlated with its regional neighbors as illustrated in the figure. Many of the reforms implemented in the early 1990s appear to be slow in delivering on growth expectations. Figure 2 shows the GDP per-capita in the region. Thirty years after Columbia implemented structural reforms to reduce poverty, it still ranks remains well below the averages of many of its neighbors such as Chile, Brazil, and Mexico. In contrast, the reforms implemented in Chile since the early 1980s have led to an impressive growth in GDP per-capita relative to its neighboring nations.

The Colombia Securities Exchange, or Bolsa de Valores de Colombia (BVC), is the result of a merger in 2001 of three independent stock exchanges, Bolsa de Bogotá, the Bolsa de Medellín, and the Bolsa de Occidente. As of early 2021, 66 issuers were registered on the BVC, with a total market cap of 351,577 billion Colombian Peso (COP), which is equivalent to approximately 94.76 billion USD. Together Colombia, Chile, and Peru founded the Latin American Integrated Market (Mercado Integrado Latinamericano, MILA) in 2011 to unite their equity trading platforms to attract a larger number of listings and investors. In 2014, the Mexican stock exchange joined the MILA. However, the BVC remains underdeveloped. Figure 3 displays the value of shares traded compared to GDP for
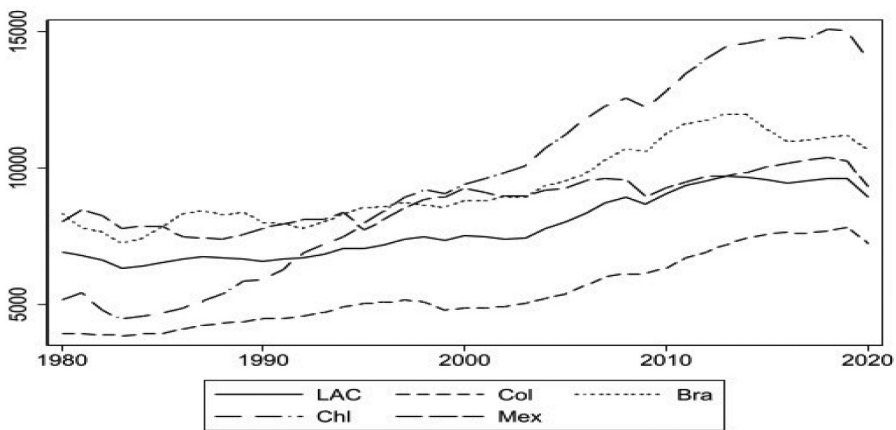

Figure 2. GDP per-capita for Colombia versus Latin America and the Caribbean (LAC). *Source: World Bank (2021).*
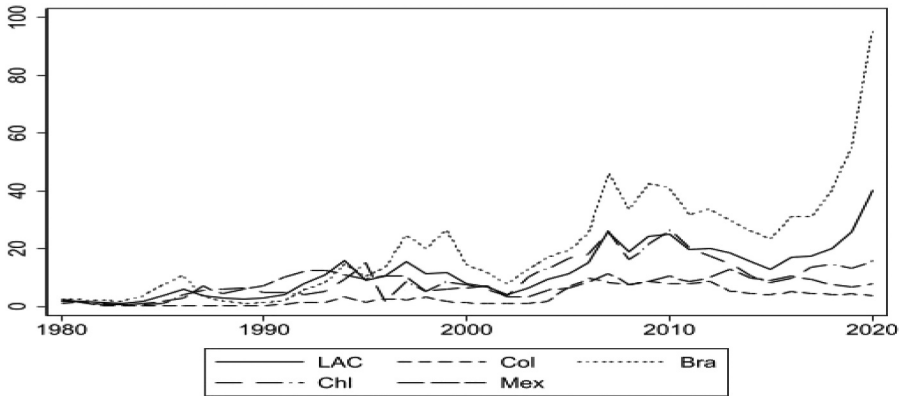
Figure 3. Stocks traded value with respect to GDP for Colombia versus Latin America and the Caribbean (LAC), *source: World Bank (2021)*.

Colombia, Mexico, Brazil, Chile, and the LAC. The value of stocks traded in Colombia is less than 10% of the country's GDP. The period around 2010 was characterized by increased trading volume and can be explained by the strong economic growth after the 2008 financial crisis and the inflow of investment into the region from international investors.

Figure 4 displays the market capitalization as a percent of GDP for Colombia and selected countries. Chile has the highest market capitalization with respect to GDP with values ranging from 75% to more than 100%. On the other hand, Colombia's market capitalization has been around 40% of GDP for the past decade. Taken together, Figures 3 and 4 demonstrate that most securities in Colombia do not often trade and Colombia remains a relatively illiquid market.

Figure 5 shows the number of listed stocks in each country as a percentage of the LAC. The number of listed firms has been constant through the last 30 years. Combining these data with the market capitalization and stock value, one can conclude that the former two measures are a function of the price of equities and not the number of firms listed on the Colombian stock market. Overall, growth in the economy and the stock market in Colombia remains slow amid the deep economic reforms in the early 1990s. The financial market stiffness in terms of the number of stocks traded has been a limiting factor in the development of its financial market. Markets remain relatively illiquid. Therefore, EFF are an important element in understanding the performance of the financial and real sector. Figure 6 displays the aggregate EFF data used in this study. Between 2006 and 2016 Latin-America experienced
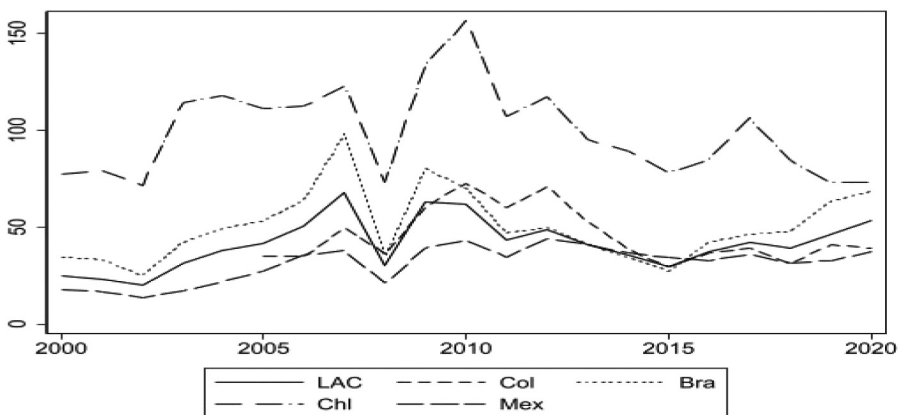

Figure 4. Market capitalization w.R.t GDP for Colombia versus Latin America and the Caribbean (LAC), *source: World Bank (2021)*.
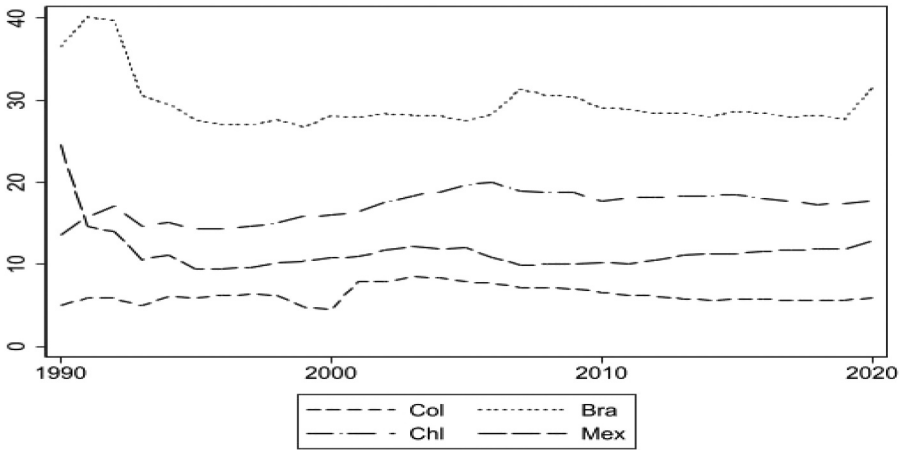
Figure 5. Number of stocks (% of Latin America and the Caribbean (LAC)). *Source: World Bank (2021).*

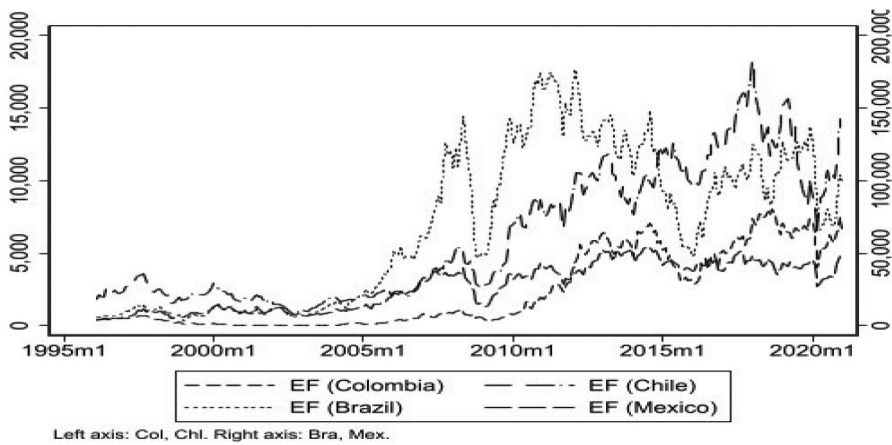Left axis: Col, Chl. Right axis: Bra, Mex.

Figure 6. Equity flow to Latin America and the Caribbean (LAC). *Source: World Bank (2021).*

a notable increase of equity fund flows from the rest of the world. In the next section of this paper, we will analyze how these flows are linked to Colombia's stock market and domestic, regional, and global economic policy uncertainty.

3. Empirical Methods and Data

We analyze the reaction of EFF, market returns, and liquidity to Colombian EPU by estimating several vector autoregressions (VARs). The following is the specification for our VARs:

$$Y_t = c + A_1 Y_{t-1} + A_2 Y_{t-2} + B_0 X_t + u_t \qquad (1)$$

where Y_t is a vector of endogenous variables; X_t is a vector of exogenous variables; and $c, A_1, A_2,$ and B_0 are the vectors of parameters. Specifically, Y_t contains the following variables: aggregate EFF to Colombia scaled by the initial allocation and expressed as a percentage (i.e. multiplied by 100), the logarithm of the Colombian EPU, the logarithmic return on the Colombian Stock Exchange (rCOL), and the Colombian market value turnover (MVTN) that is calculated as the natural logarithm of the ratio of the value of equity traded during a month to the market capitalization at

the beginning of the month. To not have a proliferation of parameter estimates, we also include as an exogenous variable (X_t) the spread of the AAA rated bond over the BBB as a measure of risk tolerance as well as the natural logarithm of the VXO implied volatility index (VIX) from the Chicago Board Options Exchange as a measure of general economic uncertainty (Bonaime, Gulen, and Ion 2018). Colombia temporarily introduced capital controls in the 1990s (1993–2000), from December 2004 until June 2006, and then more recently from May 2007 to July 2008 as part of a new strategy to slow the appreciation of the peso (Clements and Kamil 2009). We therefore control for months where Colombia imposed capital controls by including an exogenous dummy variable for months where capital controls were in place (i.e., 12/2004–06/2006 and 05/2007–07/2008).[3] We next conduct both ADF (Dickey and Fuller 1979) unit-root and KPPS (Kwiatkowski et al. 1992) stationarity tests to investigate whether variables are stationary. All variables are appropriately transformed to attain stationarity. We fit the model in Equation (1) to monthly data from January 2002 to January 2021 in which the choice of the first observations is determined by the availability of fund flow data. To fit the model in equation (1)to the data, we proceed as follows: First, we set the maximum lag to 2 based on the Schwarz Information Criterion (SIC) criteria. To address overparameterization, we estimate the parameters in equation (1) by using Bayesian inference methods. We assume the standard Normal-Wishart prior, as proposed by Kadiyala and Karlsson (1997), with the standard random walk prior. Next, we estimate the generalized response functions for which the ordering of variables is not important (Pesaran and Shin 1998).

The data for EPU are retrieved from the "Economic Policy Uncertainty" webpage (http://www.policyuncertainty.com). To construct the EPU index, Gil and Silva follow Baker, Bloom, and Davis (2016) who perform month-by-month searches on the digital archives for *El Tiempo*, which is a leading national newspaper in Colombia. *El Tiempo* is a daily publication that covers national and international news. It is the only such Colombian newspaper with a digital archive that covers from 2000 to the present. Gil and Silva use four categories for words in the articles. Category E comprises any word that begins with "econ." Category P contains the words politics, politician, government, tax, reform, fiscal deficit, public debt, public spending, Congress, crisis, Bank of the Republic, Ministry of Finance, corruption, peace, conflict, subsidy. Category U comprises the words uncertainty or uncertain. Following Cerda, Silva, and Valente (2016), Gil and Silva add category C which has the word Colombia. Adding category C should better capture the EPU that is specific to Colombia, rather than all policy-related uncertainty terms reported in *El Tiempo*.

The monthly EPU index is constructed as follows: First, we count the articles that contain at least one word of the E, P, U, or C categories for each month. Second, this count is scaled by the total number of articles for that month. Third, the standard deviation of this scaled count is determined over the entire sample period. Fourth, each scaled count is then divided by the standard deviation to obtain a normalized measure of EPU. For ease of exposition, this series is adjusted to have a mean of 100.

Figure 7 displays the evolution of the Colombian EPU over the available sample period.

The two peaks during the 2001 to 2002 window represent the elevated EPU during the 9/11 attacks on the US World Trade Center, followed by a Colombian bond crisis in August 2002 during which the price of Colombian bonds fell to historic lows. The peak in early 2003 reflects the start of the Iraq war in March 2003. In April 2006, the Colombian para-politics scandal occurred in which the Columbian Congress found that several of its politicians and members of Congress had colluded with a paramilitary group which killed thousands of Colombians. In June 2006, the Colombian stock market dropped by over 10% in one day. The peak in 2008 reflects the bankruptcy of Lehman Brothers. The peak in 2011 coincides with the uncertainty surrounding the US debt ceiling and the debt crisis in the European Union. The elevated EPU during 2014 to 2016 coincides with a drop in the price of oil (a crucial source of government revenue for Colombia), the closing of the Colombian border with Venezuela, and the US FED increasing interest rates. The marked increase in EPU during 2020 coincides with the COVID-19 virus and its associated economic and fiscal effects.
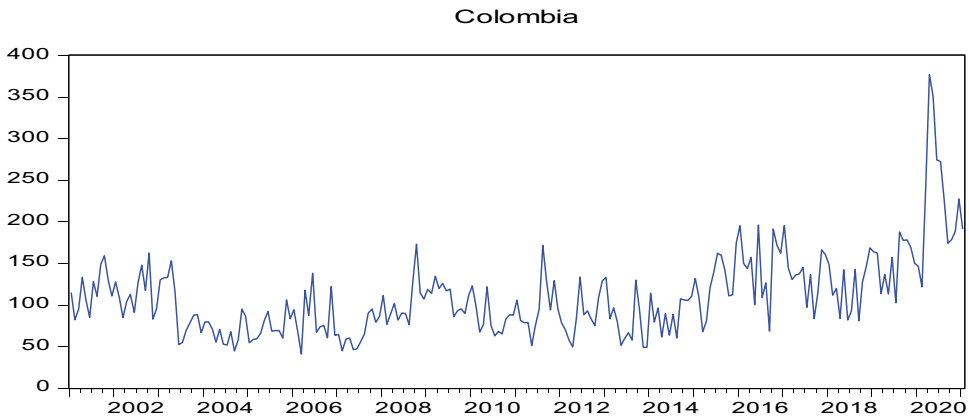
Colombia

Figure 7. Colombian economic policy uncertainty.

We pair EPU with EFF and country allocation data obtained from Informa Financial Intelligence's EPFR fund flow and allocation data. The EPFR is the most widely used data provider of fund flow data.[4] Fund flows are net contributions and redemptions in various types of funds. The EPFR adjusts the fund flow and allocation data for the effects from market performance and currency changes. These funds are domiciled globally and include both actively and passively managed funds. Country allocation data contain information on the proportion of funds that portfolio managers allocate to countries or regions. We combine fund flow data and country allocation data to estimate how much money is moving to Colombia from all funds in each period. Following the literature, we scale these fund flows by the initial allocation to Colombia; thereby, the flow represents the percentage of initial allocation each month. All other data used in this paper are obtained from Bloomberg data services.

Table 1 shows the descriptive statistics for the variables used in our study (measured monthly). EPU shows a substantial difference between its mean and median. This is because of the EPU outlier of 376 during the early 2020 COVID-related lockdowns and the pandemics' implications on economic and fiscal uncertainty. The average EFF is 0.53% with a standard deviation almost three times larger than the mean. This deviation indicates that EFF displays substantial variation across our sample period. A look at the maximum and minimum values for EFF show that the largest inflow was 6.07% (approximately 12 times the mean) and the largest outflow was 4.49% (approximately 9 times the mean). Table 2 shows the univariate correlations for the key variables used in this study. As expected, EPU is negatively correlated with EFF, suggesting that in times of high EPU, equity capital flows out of Colombia. The positive correlation between EPU and MVTN indicates that during periods of high EPU, trading activity (or liquidity) is elevated. Consistent with expectations, the valuation metrics PE and PB are both negatively correlated with EPU. This result shows that during times of elevated uncertainty, earnings or book assets are discounted at a higher discount rate, thereby making both earnings and book assets less valuable.

Table 1. Summary statistics.

	rCOL	EPU	EFF	MVTN
Mean	0.009	109.303	0.531	0.082
Median	0.019	96.493	0.529	0.082
Max.	0.214	376.845	6.071	0.101
Min.	−0.537	41.074	−4.498	0.066
Std. Dev.	0.091	49.003	1.437	0.007
Obs.	229	229	229	229

Notes: Means, standard deviations, and extreme values for variables used in this research are presented in the table above. All variables are defined in section 2.

Table 2. Correlations.

	rCOL	EPU	EFF	MVTN
rCOL	1			
EPU	−0.122	1.000		
EFF	0.433	−0.094	1.000	
MVTN	−0.148	0.503	0.005	1.000

Notes: Correlations of key variables. All variables are defined in section 2.

4. Empirical Results

4.1 Granger results

We begin our analysis with pairwise Granger causality tests. We select the optimal lag of two based on the SIC.[5] Table 3 contains the results for all variables to be included in Equation (1). Interestingly, we find that returns are not Granger caused by any of the endogenous variables to be included in the BVAR. However, EPU in Colombia is Granger caused by both returns and our liquidity measure, MVTN.[6] This cause shows that past movements in returns or market liquidity affects the level of uncertainty as measured through newspaper text mining.

Turning to the Granger results for EFF. We report that the lagged values of all variables have forecasting power for the EFF at the 10% significance level or greater. We find a strong effect of past returns on EFF; this finding is common in the literature and is often cited as evidence of a trend or return chasing by fund managers (French and Naka 2013). The lagged values of EPU are also relevant to forecasting EFF along with the lagged values of MVTN. Further, we report a relationship between MVTN and EPU that indicates the EPU affects the liquidity of the Colombian stock market.

While pairwise Granger causality does not capture the underlying complex information exchange among the Colombian EPU, rCOL, MVTN, and the EFF, the above analysis is informative in that it shows the endogenous relationship among many of the variables.

Table 3. Granger results.

Null hypothesis	Chi-sq
EPU does not Granger cause rCOL	0.42
EFF does not Granger cause rCOL	0.57
MVTN does not Granger cause rCOL	4.13
rCOL does not Granger cause EPU	6.38**
EFF does not Granger cause EPU	3.05
MVTN does not Granger cause EPU	9.66***
rCOL does not Granger cause EFF	19.01***
EPU does not Granger cause EFF	7.35**
MVTN does not Granger cause EFF	5.67*
rCOL does not Granger cause MVTN	1.33
EPU does not Granger cause MVTN	6.87**
EFF does not Granger cause MVTN	3.68

Notes: Table 3 presents the results for the pairwise Granger causality for the period from January 2002 to January 2021. Chi-squared statistics are reported; The ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

4.2 Baseline BVAR Results

Figures 8–11 present the impulse response functions (IRFs) for the BVAR outlined in Section 2. Figure 8 presents the responses of rCOL to other endogenous variables. We find that a shock to Colombian EPU has immediate and negative effects on rCOL, but that effect quickly dissipates. However, the positive effect of a one-standard-deviation shock to EFF strongly affects rCOL within the next month with returns increasing 4.1% in the month after the shock occurs. This is likely due to
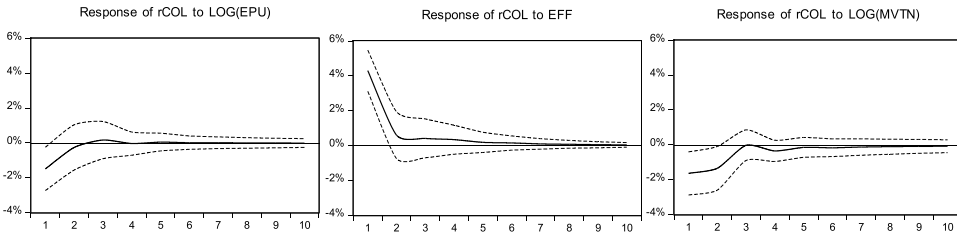
Figure 8. Impulse responses of rCOL. *Note*: This figure shows the impulse responses of rCOL to other variables in the endogenous Bayesian VAR. The endogenous variables are rCOL, EPU, EFF, and MVTN. The figure also shows the generalized impulse responses. Figure 8 shows the 10-day responses of rCOL to one standard-deviation positive shocks to other variables for the period from January 2002 to January 2021. Included are the 95% confidence intervals calculated using a Monte Carlo procedure.

the low level of liquidity in the Colombian stock market. Indeed, we show that a shock to MVTN reduces returns in Colombia in the month immediately following the shock. This reduction shows that in the case of Colombia, a higher MVTN is an indicator of negative market sentiment, which contrasts with its role in developed markets (Baker and Stein 2004). Furthermore, taken together, these results indicate that unexpectedly large fund flows have the potential to pressure returns higher in Colombia. On the other hand, an unexpected withdrawal of EFF has the potential to have a very negative effect on returns in Colombia. These results show that given its market development, Colombian market participants and policymakers need to be cognizant of large fund flows distorting prices.

Figure 9 presents the IRF of Colombian EPU to one-standard-deviation shocks to rCOL, MVTN, and EFF. We find that an unexpected positive shock to rCOL reduces the EPU in Columbia. On the other hand, a higher MVTN is associated with a higher EPU. When markets are up, newspaper-based EPU declines; but when market liquidity increases, it indicates higher uncertainty in Colombia. This result, along with our earlier results, show that greater liquidity is associated with more uncertainty and lower returns in Colombia. We note that there is not a significant effect of EFF on EPU as reported in the US (French and Li 2022). However, in the context of small open economy like Colombia, this finding is absent from the literature.

Figure 10 presents the IRF of EFF to innovations in other endogenous variables. Consistent with the literature, we find a positive effect of a shock to rCOL on EFF. Fund managers increase their allocations to Colombia following periods of unexpectedly good returns, and the effect persists for about four months. The EFF is negatively affected by EPU shocks and demonstrates that EPU as a measure of uncertainty is useful for forecasting EFF in Colombia. A positive shock to MVTN negatively affects the EFF. Given that MVTN negatively (positively) affects rCOL (EPU), we argue that greater MVTN is an indicator of negative sentiment and reduces EFF to Colombia in the 2 months following the shock.

Figure 11 shows the IRFs of MVTN to shocks for other endogenous variables. While shocks to MVTN have strong effects on other variables, shocks to rCOl and EFF do not have a significant effect
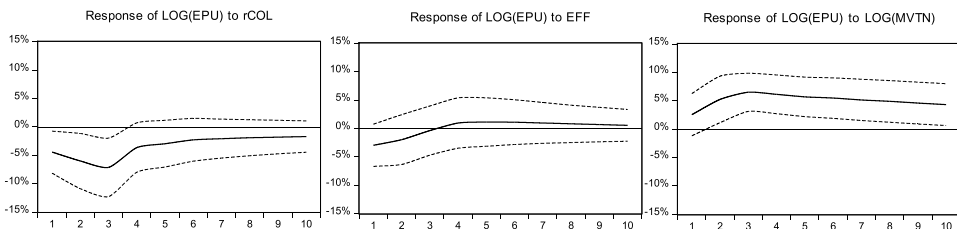

Figure 9. Impulse responses of EPU. *Note*: This figure shows the impulse responses of EPU to other variables in the endogenous Bayesian VAR. The endogenous variables are rCOL, EPU, EFF, and MVTN. The figure also shows the generalized impulse responses. This figure also shows the 10-day responses of EPU to one standard-deviation positive shocks to other variables for the period from January 2002 to January 2021. Included are the 95% confidence intervals calculated using a Monte Carlo procedure.
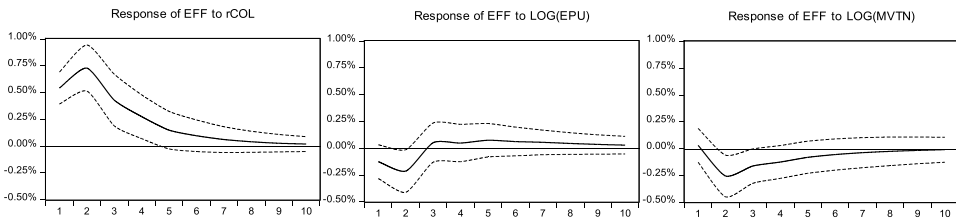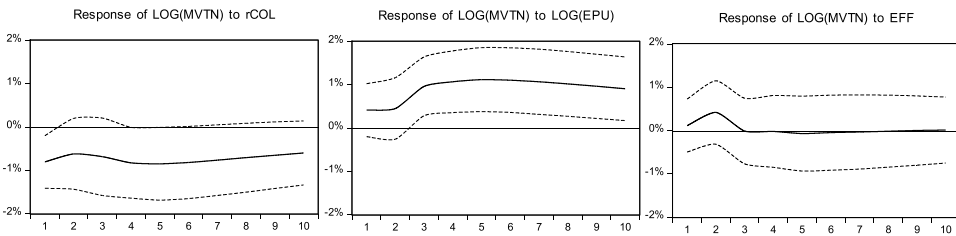
Figure 10. Impulse responses of EFF. *Note*: This figure shows the impulse responses of EFF to other variables in the endogenous Bayesian VAR. The endogenous variables are rCOL, EPU, EFF, and MVTN. The figure also shows the 10-day responses of EFF to one standard-deviation positive shocks to other variables for the period from January 2002 to January 2021. Included are the 95% confidence intervals calculated using a Monte Carlo procedure.

Figure 11. Impulse responses of MVTN. *Note*: This figure shows the impulse responses of MVTN to other variables in the endogenous Bayesian VAR. The endogenous variables are rCOL, EPU, EFF, and MVTN. The figure also shows the 10-day responses of MVTN to one standard-deviation positive shocks to other variables for the period from January 2002 to January 2021. Included are the 95% confidence intervals calculated using a Monte Carlo procedure.

on MVTN. However, we do find that a shock to EPU increases MVTN and that effect persists for several months. When EPU is elevated investors trade more, whether to reallocate their portfolios or to get out of the market during increased uncertainty.

4.3 Global EPU Spillover Effects?

In this subsection, we explore how global EPU shocks spill over into Colombian markets and EFF. We estimate a second BVAR with the Global EPU (GEPU) index as an additional endogenous variable. We use the index constructed by Baker, Bloom, and Davis (2016) who builds on the work of Baker, Bloom, and Davis (2016) to develop a GEPU index that uses the weighted average data for 16 powerful nations, which represent most of the world's output.[7] We find that GEPU affects all the endogenous variables in the BVAR. A GEPU shock negatively affects returns in Colombia by 2.2% in the month following the shock and increases Colombian EPU by 12%. These effects also cause MVTN to increase in Colombia that indicate the GEPU shocks spill over into the Colombian market and that they are measures of uncertainty. Furthermore, we show that EFF to Colombia is negatively and significantly affected by global uncertainty shocks. When EFF are reduced by 0.24% in the initial allocation, this reduction lowers the available capital for investment and development. Given the vulnerability of Colombian returns to global uncertainty shocks to liquidity and fund flows, it is imperative for Colombia to impose circuit breakers to ensure stable markets and capital for development.

4.4 Regional EPU Spillovers?

Given the strong and significant global uncertainty effects on Columbia, we investigate if regional uncertainty spillovers exist. We extract country EPUs for Brazil, Mexico, and Chile from https://www.policy uncertainty.com/ for our sample period. We then estimate three more BVARs in which we separately add Brazilian, Mexican, and Chilean EPUs as the endogenous variable. Figure 12 contains the IRFs with the
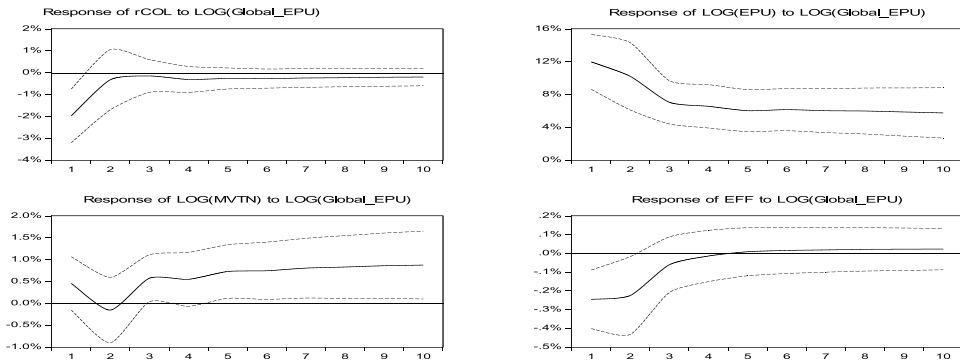
Figure 12. Impulse Responses to Global EPU shock. *Note*: IRF are obtained through estimation of a Bayesian VAR. The endogenous variables are rCOL, EPU, EFF, MVTN, and Global EPU. The figure shows the 10-day responses of rCOL, EPU, EFF, and MVTN to one standard-deviation positive shock to Global EPU for the period from January 2002 to January 2021. Included are the 95% confidence intervals calculated using a Monte Carlo procedure.

Brazilian EPU. Consistent with the results with the inclusion of the GEPU, we find significant uncertainty spillover effects from Brazil to Colombia. A shock to Brazilian EPU reduces returns and EFFs to Colombia. Many fund flows have a Latin American or South American focus. Therefore, increased uncertainty in the largest economy in the region triggers reductions in allocations to all of South America when portfolio weights are reduced. Furthermore, a shock to Brazilian EPU increases Colombian EPU but to a lesser extent than a global EPU shock. After a Brazilian EPU shock, MVTN also increases, which is consistent with earlier results.

Figure 13 contains the IRF to a Mexican EPU shock for the endogenous variables. Mexican EPU shocks do not affect the Colombian market as much as global or Brazilian EPU. However, we find some significant effects. For example, rCOL has an immediate and negative effect following a Mexican EPU shock, but quickly recovers. Furthermore, shocks to EPU in Mexico increase Colombian EPU by 7.8% in the month that immediately follows the shock, but this increase is short lived. While we do not find any effect of a Mexican EPU on EFF or MVTN, we do find results for the Brazilian EPU. These results show that Colombia is more vulnerable to uncertainty from Brazil than from Mexico.

Figure 14 shows the effects of a one-standard-deviation shock to Chilean EPU on other endogenous variables. The results are similar to those found for Brazil. A shock to Chilean EPU reduces rCOL and EFF in Colombia and increases Colombian EPU and MVTN. These results confirm that the markets in and fund allocations to Colombia are susceptible to regional uncertainty as measured through newspaper text mining.
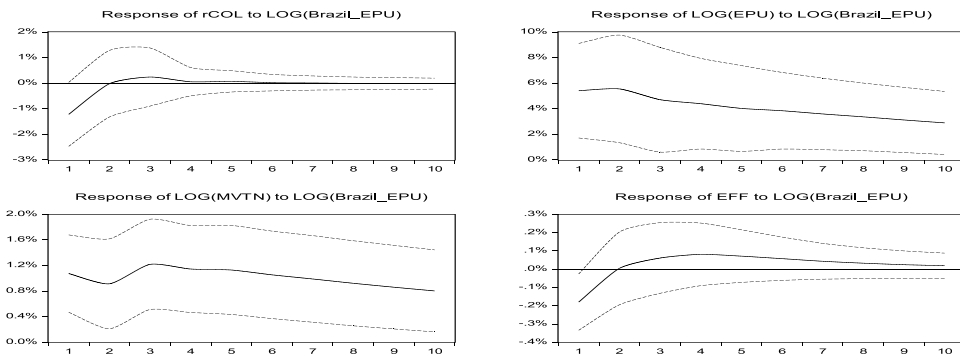

Figure 13. Impulse responses to Brazilian EPU shock. *Note*: IRF are obtained through estimation of a Bayesian VAR. The endogenous variables are rCOL, EPU, EFF, MVTN, and Brazilian EPU. The figure shows the 10-day responses of rCOL, EPU, EFF, and MVTN to one standard-deviation positive shock to Brazilian EPU for the period from January 2002 to January 2021. Included are the 95% confidence intervals calculated using a Monte Carlo procedure.
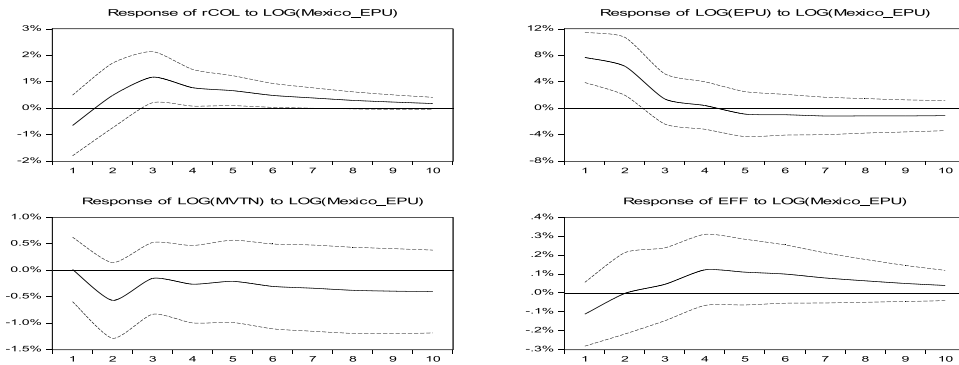
Figure 14. Impulse responses to Mexican EPU shock. *Note*: IRF are obtained through estimation of a Bayesian VAR. The endogenous variables are rCOL, EPU, EFF, MVTN, and Mexican EPU. The figure shows the 10-day responses of rCOL, EPU, EFF, and MVTN to one standard-deviation positive shock to Mexican EPU for the period from January 2002 to January 2021. Included are the 95% confidence intervals calculated using a Monte Carlo procedure.

4.5 Additional Analysis

In this section, we perform additional analysis and test the robustness of our main results. Namely, we re-estimate using volume as an alternative measure of liquidity and test the robustness of our results using standard VAR techniques rather than Bayesian inference methods. Figures 15 and 16 present these results. Results presented in Figure 15 generally conform to earlier analysis. An innovation in volume leads to lower returns in Colombia like those presented for MVTN earlier. Furthermore, we show consistent with earlier analysis that a shock to volume is positively related to newspaper-based measures of policy uncertainty. We note that while directionally similar, the impact of volume on EFF is not significant. In Figure 16, the model presented in Figure 17 is estimated using an unrestricted standard VAR model. Results and inferences are like those presented earlier and indicated a robust relationship among the endogenous variables.[8]

Overall, our findings reveal how within and between countries uncertainty affects equity flows. Given the economic uncertainty observed in the region in the last 15 years, the results for a CIVET country can become a focal point into understanding the relationship for other Latin-American countries. The region is far from political and economic stability to expect equity flows to evolve smoothly.
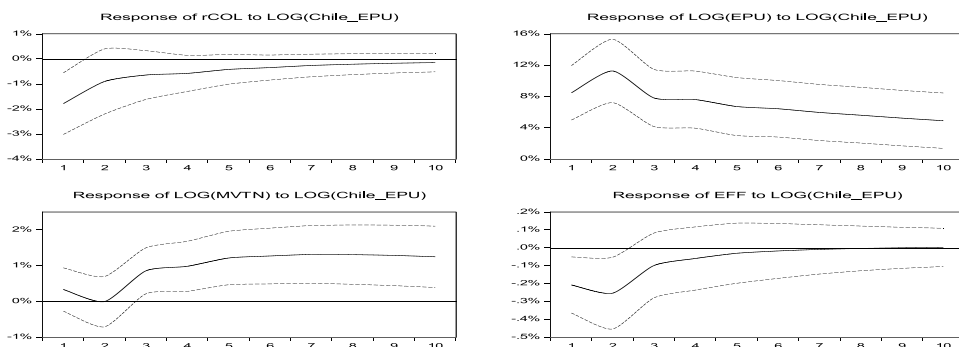

Figure 15. Impulse responses to Chilean EPU shock. *Note*: IRF are obtained through estimation of a Bayesian VAR. The endogenous variables are rCOL, EPU, EFF, MVTN, and Chilean EPU. The figure shows the 10-day responses of rCOL, EPU, EFF, and MVTN to one standard-deviation positive shock to Chilean EPU for the period from January 2002 to January 2021. Included are the 95% confidence intervals calculated using a Monte Carlo procedure.
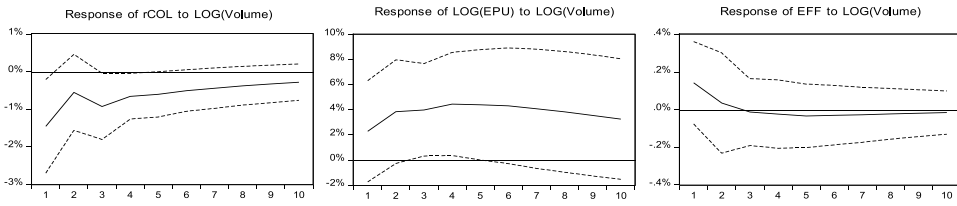
Figure 16. Impulse responses of volume. *Note*: This figure shows the impulse responses of volume to other variables in the endogenous Bayesian VAR. The endogenous variables are rCOL, EPU, Global EPU, EFF, and volume. The figure also shows the 10-day responses of volume to one standard-deviation positive shocks to other variables.
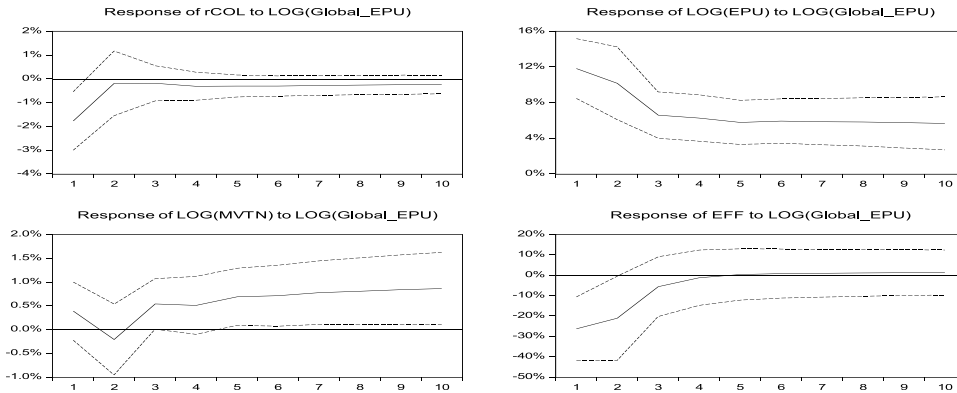

Figure 17. Impulse Responses to Global EPU shock (Robustness). *Note*: IRF are obtained through estimation of an unrestricted VAR. The endogenous variables are rCOL, EPU, EFF, MVTN, and Global EPU. The figure shows the 10-day responses of rCOL, EPU, EFF, and MVTN to one standard-deviation positive shock to Global EPU for the period from January 2002 to January 2021. Included are the 95% confidence intervals calculated using a Monte Carlo procedure.

5. Closing Thoughts

A decade ago, Colombia was included in a group of nations labeled the CIVETS by HSBC's former chief executive. HSBC predicted that CIVETS would deliver sustainable growth given their young populations and diversified economies and the foreign equity flowing into these nations. In the case of Colombia, economic growth has been slower than expected and its financial markets lag several of its neighbors. Given these realities, we consider the effects of economic policy uncertainty (EPU) on Colombia's equity market and equity fund flows (EFF). We show that Colombia remains vulnerable to global and regional shocks in uncertainty to EFF. Furthermore, uncertainty shocks affect foreign investment, and this investment has the potential to affect equity returns and the liquidity of the Colombian market. Our findings have important policy implications for Colombia and small open economies more broadly. Given that global and regional EPUs turn foreign investors into return chasers, Colombia's markets are susceptible to negative uncertainty shocks. If uncertainty increases, lower returns are likely to lead to an exodus of foreign equity capital and further declines in equity prices given the low levels of liquidity. Colombian officials should consider these potential uncertainty spillover effects when determining capital control policies. It is important that Colombian firms have stable sources of capital that are driven by domestic fundamentals. Until this time, some level of capital controls may be necessary to prevent global or regional uncertainty from driving disturbances in the economy.

We note that our study is limited by its focus on equity flows. Future research could adopt a similar approach to understand the impacts of EPU on bond flows or hedge fund flows. It would also be useful

to understand the impacts of EPU on foreign direct investment at a regional level. Additionally, future research could explore the relationships uncovered in this paper in other regions such as South Asia, ASEAN, or Africa.

Notes

1. We fail to find a significant effect of Mexican EPU on EFF in Colombia.
2. For a detailed literature review, please see Al-Thaqeb and Algharabali (2019).
3. We note that the coefficient for the capital control dummy in the EFF equation is negative as expected. Results are available on request.
4. Data are based on a large sample of reporting funds. More than 18,000 reporting equity funds cover around 96% of the assets under management of the global investment fund industry (as of September 2019, Informa Financial Intelligence 2020a).
5. The results are available on request.
6. Granger causality tests are also performed for an alternative measure of liquidity, namely volume. The results are like those for MVTN and are available on request.
7. We use a GEPU with purchase power parity weightings. The results are very similar with current weights and are available on request.
8. All models were re-estimated using standard VAR methods and results were like those using Bayesian inference methods. These results are available upon request.

ORCID

Rodrigo Taborda 🔴 http://orcid.org/0000-0002-3961-6852

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