Uncertainty and International Capital Flows

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Abstract

In a large panel of 26 emerging countries over the last 40 years, stock market return volatilities forecast capital flows. When a country's stock market volatility increases, capital inflows decrease and capital outflows increase, with net flows slightly decreasing. We study one potential explanation for these results: expropriation risk. Empirically, we find that volatility forecasts political risk, and that political risk significantly affects capital flows. In a simple portfolio choice model, assuming that foreigners are more exposed to expropriation risk than local investors, an increase in the probability of expropriation leads foreigners to sell the domestic assets to the local investors, leading to a counter-cyclical home bias. This coincides with higher price volatility under plausible assumptions.

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1 Introduction

International capital flows among emerging economies increased dramatically in the last 25 years. But in 2008, at a time of great global uncertainty, international capital inflows and outflows collapsed. In this paper, we study, both empirically and theoretically, the response of international capital flows to uncertainty shocks. In a large panel of emerging countries over the last 40 years, we find that the amount of uncertainty predicts future capital flows. We then study one potential explanation, namely expropriation risk, both theoretically and empirically.

We measure uncertainty in each country using the realized aggregate stock market volatility in that country during each quarter. This measure is simple and available in real time, and free of revisions and sample selection. The impact on capital flows is unambiguous: volatility increases lead to "retrenchment." Future capital inflows decrease and capital outflows increase when total volatility increases. In other words, when volatility rises, foreigners pull their capital out and the domestic residents of those same countries sell foreign assets. The effects are statistically and economically significant, and robust to many controls (including country and time fixed effects), and variations in the sample. In contrast, net inflows fall by a smaller amount.

This result is driven by both global and local shocks. To demonstrate this, we decompose stock market volatility in two parts. We first regress the realized variance of a country's stock market return on the world stock market variance, over rolling windows. The slope coefficients in these regressions are our uncertainty betas. Total volatility can therefore be decomposed into an aggregate (or systematic) component and a country-specific component. Differences in exposure to systematic volatility are driven by differences in uncertainty betas. Similar to our results for total volatility, we find that capital inflows decrease and capital outflows increase when country-specific volatility increases. But global shocks to volatility matter too, and they matter more for high uncertainty beta countries. Capital inflows and net inflows decrease significantly more in high uncertainty beta countries than in low uncertainty beta countries in response to a global uncertainty shock. In our dataset, past uncertainty betas therefore predict the impact of future uncertainty shocks. Because volatilities and their subcomponents are estimated over rolling windows that do not encompass each global uncertainty shock under study, there is no mechanical look-ahead bias in our results.

The same volatility shocks affect economic activity: consistent with the literature on the impact of aggregate uncertainty, when volatility increases, consumption, investment, GDP, industrial production tend to fall, and the unemployment rate rises. Asset markets, which are inherently forward-looking, contain information about future capital flows and real economic activity, as well as about future differences across countries.

What is the economic mechanism driving these empirical results? Clearly, since foreigners and residents respond differently to volatility shocks, they must have some different economic exposure to these shocks. The apparent paradox is that residents seem to increase their exposure to their home country in "bad times", despite the fact that they are likely very exposed to it in other ways (e.g. through labor or business income). This leads us to consider a natural explanation, expropriation risk, by which we mean the risk of government policies that would implicitely or explicitely differentiate between foreigners and residents. Our basic intuition is that high aggregate stock market volatility sometimes reflect uncertainty about policy, as illustrated for instance during financial crises.

Expropriation risk is indeed a major concern for foreign investors in emerging markets. A large market of political risk insurance, many legal disputes, and many political risk indices confirm the prevalence of this concern. The Berne Union, an association of public, private, and multilateral insurance providers, reports statistics on the political risk insurance market. Political risk insurance represented up to 25% of foreign direct investment for developing economies in 1982. It is down to 14 percent of foreign direct investment, but still accounts for $100 billion of investment insurance issued in 2012. The Multilateral Investment Guarantee Agency (World Bank Group) offers standardized insurance contracts against the expropriation risk inherent in both foreign direct investments and portfolio investments. Legal fights about expropriation cases are common, and a mechanism exists to settle these fights: the International Centre for Settlement of Investment Disputes is the leading international arbitration institution devoted to resolving disputes between

States and foreign investors. Several firms produce and sell country risk indices to potential investors, coding a large range of risks from direct expropriation to redenomination of assets in a different currency. The first component of the IHS Group country risk index, for example, corresponds to the likelihood of a 10-percentage-point increase in the rate of capital gains tax for foreign-owned businesses. In this paper, we rely on the International Country Risk Guide (ICRG), a benchmark in the industry. ICRG provides a large database of political risk indices available at the quarterly frequency over a long time window and for a large cross-section of countries.

We therefore study the empirical relation between political risk and capital flows. Political risk may cause international capital flows, but the correlation may also reflect reverse causality and omitted variables.[1] We do not therefore claim to prove any causality link between political risk and international capital flows. Our results are, at this stage, simply suggestive of a link between political risk and capital flows.

We first demonstrate that political risk affects capital flows using quarterly panel regressions. We also show that political risk can be forecasted by volatility, even after controlling for country fixed effects and again market returns, GDP, and exchange rates. We then use a two-step approach to illustrate the link between capital flows and political risk link, and show that the projection of political risk on volatility is a significant predictor of future capital flows and future economic activity. The two-step approach, again, does not prove that political risk causes international capital flows or economic conditions. This would be the case only if no other variable was simultaneously affecting political risk and equity volatility. Our controls make such missing variable less likely but not impossible. Our take-away from the data is thus simply that uncertainty, as measured by equity volatility, appears as a plausible, market-based, and real-time proxy for political risk, and this proxy is a significant predictor of capital flows and economic activity. We propose a simple, model-based interpretation of our empirical findings.

Our model translates the general concern for expropriation risk in a simple form. The model is

[1]Reverse causality could arise if the fear of future capital outflows leads to new investment restrictions today, raising current political risk. Omitted variables — not captured by our control variables — may drive both capital flows and political risk. Although our list of controls include market returns, GDP growth rates as well as exchange rate changes, we cannot rule out the omission of some variable that potentially affects capital flows and political risk and that is not captured by our controls.

an international portfolio problem with two countries. Each country has a representative investor and a tree producing dividends. Investors can invest in both the domestic and foreign trees. But a key friction breaks the symmetry between investors. We assume that the foreign investor is exposed to the risk of expropriation when investing in the home tree, whereas home investors are not. Expropriation risk acts like a tax on foreign holdings of the home tree. The tax is a low-probability event, and its magnitude increases with the foreign holdings, as governments are likely to face higher incentives to expropriate foreigners when foreign holdings are sizable. In the model, dividends and the probability of expropriation follow exogenous persistent processes but, for the sake of the exposure, they respond to different and uncorrelated shocks. To study the model dynamics, let us consider a temporary increase in the expropriation probability. The foreign agent, faced with a higher probability of expropriation next period, sells some of her holdings of the domestic tree to the domestic agent, who is immune to the risk of expropriation. As a result, capital first flows out of the domestic economy. The price of the domestic tree decreases because of its higher risk. As the expropriation probability reverts to its mean, the foreign agent increases its holdings of the domestic tree, but at a lower price than in equilibrium. As a result, capital flows again towards the domestic economy, but the inflows are smaller than the previous outflows.

The model provides a potential, but clearly not the unique, explanation to the dynamics of gross capital flows. In the logic of the model, the initial shock is the increase in political risk; it implies more volatile asset prices and gross capital flows out of the country. In the real world, the increase in political risk is certainly correlated with the state of the economy. Thus news about future real activity or future expropriation may trigger capital flights.[2]

Related Literature

Our paper is related to different strands of the literature, on closed as well as on open economies. Focusing on closed economies, a recent and fast-growing literature investigates the impact of uncertainty shocks, following the seminal work of Bloom (2009). Bloom (2013) presents an exhaustive

[2]The model could be easily extended to speak to the differences across countries by introducing a global component in the endowment processes and in the expropriation probabilities. Even without such systematic component, comparative statics already show that the sensitivity of the tax rate to the foreign holdings govern the size of the price and capital flows responses: the larger the expropriation risk, the larger the stock price changes, and the larger the capital flows leaving the riskier country.

review of this literature. We review the most recent work in a literature section in the Online Appendix.

Focusing on open economies, a recent literature shows that gross outflows and inflows are more informative than net flows.[3] Our work builds on two key findings in this literature: the link between capital flows and country crises, and the link between capital flows and measures of U.S. volatility. Broner et al. (2013) analyze the behavior of gross capital flows over the business cycle and during financial crises. Instead of taking the dates of financial crises from the literature, we explore the predictive content of market return volatility. Rey (2013) shows that gross capital flows respond contemporaneously to changes in the VIX, the U.S. option-implied volatility index, over the post-1990 sample. Forbes and Warnock (2012) obtain a similar result by focusing on large capital inflows and outflows and using the VXO index, the ancestor of the VIX, over the post-1986 period, as well as other risk factors. Bruno and Shin (2014) and Cerutti et al. (2014) report similar results on bank flows. Badarinza and Ramadorai (2015) study the impact of political uncertainty on capital flows to the housing market in London. We extend the analysis to emerging market volatilities over the 1970–2011 sample, decompose these volatilities into their country-specific and systematic components, and study their predictive content. We add a key, ex ante source of heterogeneity across countries, i.e., their exposure to global uncertainty shocks.

Our empirical work extends Gourio, Siemer and Verdelhan (2013) and Carrière-Swallow and Céspedes (2013) by considering the impact of global volatility shocks on capital flows and relates naturally to the sudden stop literature.[4] Our sample encompasses the sudden stop episodes identified in this literature over the last 40 years. Our results on capital flows are intuitive, notably because they echo the findings of the sudden stop literature. Our methodology, however, is clearly different: we do not start from a set of pre-determined sudden stop dates because these

[3] See Gourinchas and Rey (2007a, 2007b) Lane and Milesi-Ferretti (2007), Backus, Henriksen, Lambert and Telmer (2009), Fratzscher (2012), Obstfeld (2012a, 2012b), Forbes and Warnock (2012), Gourinchas, Rey and Truempler (2012), Rey (2013), and Broner et al. (2013). Rey (2013) shows that gross outflow and inflows are highly correlated across countries, while net flows are not. Miranda-Agrippino and Rey (2014) study the link between capital flows and U.S. monetary policy.

[4] Key contributions in this literature include Calvo (1998), Edwards (2002, 2004), Kim and Wei (2002), Choe, Kho and Stulz (2005), Calvo, Izquierdo and Talvi (2006a, 2006b), Fogli and Perri (2006), Albuquerque, Bauer and Schneider (2007), Durdu, Mendoza and Terrones (2009), Milesi-Ferretti and Tille (2011), Rothenberg and Warnock (2011), and Ahmed and Zlate (2012).

dates have been, at least partially, determined by the realized capital flows. Instead, we rely on a market-based, real-time measure of uncertainty, avoiding a potential endogeneity issue. This simple innovation allows us to study systematically the predictability of capital flows. Our measure of uncertainty turns out to be a significant predictor of future international capital flows.

Our model is part of a recent set of general equilibrium models of international portfolio allocations.[5] We focus on a simple and novel friction, but our model could naturally be extended by adding more assets and more frictions, building on this recent literature.

The rest of the paper is organized as follows. Section 2 introduces our dataset and volatility measures. Section 3 reports the response of capital flows and other macroeconomic variables to stock return volatility shocks. Section 4 links those variables to different measures of expropriation risk. Section 5 presents a model of expropriation risk and the simulated response of capital flows to increases in the probability of expropriation. Section 6 concludes.

2 Systematic and Country-specific Uncertainty

This section describes the dataset and the construction of volatility measures.

2.1 Data

Our dataset includes the following 26 developing countries: Argentina, Brazil, Bulgaria, Chile, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Israel, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Portugal, Romania, Singapore, Slovenia, South Africa, South Korea, Taiwan, Thailand, and Turkey. The sample extends from January 1970 to March 2011 but some series start later than others. We briefly describe the data sources, starting with the macroeconomic variables before turning to asset prices.

[5]Key contributions in this literature include Caballero, Farhi and Gourinchas (2008), Mendoza, Quadrini and Rıos-Rull (2009), Coeurdacier, Rey, and Winant (2011, 2013), Gourinchas, Rey, and Govillot (2010), Coeurdacier and Gourinchas (2011), Colacito and Croce (2010, 2011), Tille and van Wincoop (2012), Devereux and Sutherland (2012), Maggiori (2012), Bahmra, Coeurdacier, and Guibaud (2013), Chang, Kim and Lee (2013), Colacito et al. (2013), Gabaix and Maggiori (2013), Heathcote and Perri (2013), Kalemli-Ozcan, Papaioannou and Perri (2013), Broner, Erce, Martin and Ventura (2014), Caballero and Farhi (2014), Fornaro (2014), and Kollmann (2015).

Macroeconomic Data Import, export, international reserves, industrial production, consumer prices, and unemployment rate series are from the International Monetary Fund's (IMF) International Financial Statistics (IFS). The series are monthly. Consumption, investment, and GDP are also from the IFS database; those series are quarterly.

Capital flows are measured at the quarterly frequency, over the 1970–2011 sample. All series are scaled by GDP and de-seasonalized using the X-12-Arima seasonal adjustment procedure. Net international capital flows can be approximated by the amount of net exports, but the financial accounts of the balance of payments offer a more precise description of gross international capital flows. The balances of payments distinguish between foreign direct investment, portfolio flows, and the remainder, denoted "other flows" (which include notably bank flows). Gross international capital flows are compiled by Bluedorn, Duttagupta, Guajardo and Topalova (2013) from the IMF balances of payments (version 5), supplemented with other IMF and country sources. Gross outflows and gross inflows are actually net items following standard balance of payments accounting. Gross outflows are defined as net purchases of foreign financial instruments by domestic residents. Gross inflows are defined as net sales of domestic financial instruments to foreign residents. Net capital flows are defined as the difference between gross outflows and gross inflows.[6]

Financial Data Nominal exchange rates, expressed in foreign currency per U.S. dollar, and nominal short term interest rates are also from the IFS database. We use Treasury bill rates whenever available, and money market rates otherwise. Real interest rates are obtained as the nominal interest rates minus expected inflation rates, measured as the last 12-month differences in log consumer price indices.

Weekly stock market indices, denoted R^m, are from the Morgan Stanley Country Indices (MSCI), Datastream, and Global Financial Data (GFD) stock market databases. Long time

[6]By convention, positive outflows mean that residents are selling more foreign assets than they are buying, contributing positively to net inflows. Intuitively, a positive outflow means than money is leaving the foreign country and coming to the home country. In the U.S., outside crisis episodes, outflows tend to be negative: money is leaving the U.S. to be invested in foreign countries. Positive inflows means that foreigners are purchasing more domestic assets than they are selling, contributing positively to net inflows. Intuitively, a positive inflow is means that money is flowing into the home country.

series of aggregate stock returns for Argentina, Brazil, Chile, Colombia, Ecuador, Indonesia, Malaysia, Mexico, Morocco, Nigeria, Peru, Russia, South Africa, South Korea, Thailand, Turkey and Uruguay are from the GFD database. Weekly real stock market returns are obtained by subtracting weekly inflation rates to the nominal stock returns. Weekly price indices are obtained by linear interpolation of monthly price indices. Our stock market return indices are expressed in local currency, but we obtain similar results with returns in U.S. dollars. All returns are annualized. Stock market return volatilities offer a simple, robust, and timely measure of uncertainty.

Political Risk Data Political risk indices are sourced from the International Country Risk Guide (ICRG), a benchmark in the industry, used for example in Aguiar, Amador, and Gopinath (2009). The ICRG has been published for 140 countries since the early 1980s and over 30 metrics are used to assess political, economic and financial risks. In this paper we rely on the quarterly ICRG composite rating, which summarizes political, economic and financial risks, as well as the ICRG investment profile. The ICRG investment profile captures country risks regarding contract viability, expropriation, profits repatriation and payment delays.

2.2 Volatilities

We first present a simple framework to think about time-varying volatility and then describe precisely how we measure volatilities in the data and decompose them into country-specific and global components.

Stock Market Heteroscedasticity Let us assume that the aggregate stock return in country i is driven by some world (u^w_{t+1}) and country i-specific (u^i_{t+1}) shocks:

$$R^i_{t+1} = \alpha^i_R + \sqrt{\chi^i}\sqrt{z^w_t}u^w_{t+1} + \sqrt{\delta^i z^w_t + \gamma^i z^i_t}u^i_{t+1}.$$

The world shocks are, for example, summarized by the world stock market returns, and denoted here by $\sqrt{z^w_t}u^w_{t+1}$. In the logic of the Capital Asset Pricing Model (CAPM), the world stock market returns measure aggregate, systematic risk. The parameter $\sqrt{\chi^i}$ denotes the CAPM loading on aggregate returns. Since all the shocks are i.i.d. and gaussian, the country-specific (z_t^i) and world (z_t^w) state variables govern the time-varying volatilities of stock market returns. The volatility of the world shocks is z_t^w, while the volatility of the idiosyncratic part of the returns is $\delta^i z_t^w + \gamma^i z_t^i$. The state variables follow autoregressive square root processes so that they remain positive:

$$\begin{aligned} z_{t+1}^i &= (1-\phi)\theta + \phi z_t^i - \sigma\sqrt{z_t^i}\varepsilon_{t+1}^i, \\ z_{t+1}^w &= (1-\phi^w)\theta^w + \phi^w z_t^w - \sigma^w\sqrt{z_t^w}\varepsilon_{t+1}^w. \end{aligned}$$

where the country i-specific and global shocks ε_{t+1}^i and ε_{t+1}^w are also i.i.d. and gaussian. The variance of the stock return in country i is:

$$\sigma_t^2\left(R_{t+1}^i\right) = \left(\chi^i + \delta^i\right) z_t^w + \gamma^i z_t^i$$

Total volatility has therefore two components, an aggregate component, equal to $\left(\chi^i + \delta^i\right) z_t^w$, and a country-specific volatility component, equal to $\gamma^i z_t^i$. We define the uncertainty beta, or volatility beta, by regressing country i's aggregate volatility on the volatility of the risk factor. The uncertainty beta is therefore $\beta^i = \chi^i + \delta^i$. Our paper is about (1) the impact of country-specific volatility shock ε_{t+1}^i on international capital flows and macroeoconomic quantities, and (2) the impact of a global volatility shock ε_{t+1}^w on international capital flows, and more precisely about the differential impact across countries with different β^is. We turn now to the description of those volatility measures in the data.

Volatility Measures Total volatility at the quarterly frequency corresponds to the average of weekly squared real stock market returns over a quarter. To decompose total volatility into its aggregate and country-specific components, we regress each country i squared returns on the world stock market squared returns:

$$\left(R_k^i\right)^2 = \alpha^i + \beta^i\left(R_k^w\right)^2 + \xi_k^i,$$

where R_k^i is the return on country i during week k, R_k^w is the return on the world stock market index during week k. The regression is run over one year of data to provide sufficient power to estimate the betas. We therefore define three volatility components in the data:

$$\begin{aligned} \text{Total volatility} &: \frac{1}{\tau_2+1}\sum_{k=t^*-\tau_2}^{t^*}\left(R_k^i\right)^2 \\ \text{Country-specific volatility} &: \frac{1}{\tau_2+1}\sum_{k=t^*-\tau_2}^{t^*}\left(\alpha^i+\xi_k^i\right) \\ \text{Global component of volatility} &: \frac{1}{\tau_2+1}\sum_{k=t^*-\tau_2}^{t^*}\beta_i\left(R_k^w\right)^2 \end{aligned}$$

where t^* denotes the last week of each quarter and τ_2 is one quarter to match the frequency of the capital flows and macro variables. By construction, total volatility is the sum of the country-specific and global volatilities. The decomposition and the uncertainty betas are time-varying since the regressions are estimated on rolling windows. We use these volatility measures as proxy for total, country-specific, and systematic uncertainty.

3 The Response of Capital Flows and Economic Activity to Volatility Shocks

This section reports the response of capital flows to volatility shocks. We run quarterly panel regressions of capital flows (or other macroeconomic variables) on past volatility:

$$CF_t^i=\alpha_i+\beta_1 Vol_{t-1}^i+\beta_2 CF_{t-1}^i+\beta_3 CF_{t-2}^i+\beta_4 R_{t-1}^i+\beta_5 R_{t-2}^i+\beta_6\Delta y_{t-1}^i+\beta_7\Delta y_{t-2}^i+\beta_8\Delta s_{t-1}^i+\beta_9\Delta s_{t-2}^i+\varepsilon_t^i,$$

where CF denotes capital outflows, inflows or net inflows. We run similar tests for other macroeconomic variables (GDP, consumption, investment, industrial production and the unemployment rate). All regressions include country fixed effects, controls (two lags of market return R_{t-1}^i, R_{t-2}^i and GDP growth, Δy_{t-1}^i, Δy_{t-2}^i and exchange rate changes, Δs_{t-1}^i, Δs_{t-2}^i), and lagged values of the dependent variable. The standard errors are clustered by time and country, following Petersen (2009) and Cameron, Gelbach and Miller (2011). Our appendix provides many robustness checks.

3.1 Capital Flows

Table 1 reports regression results obtained on capital flows. Increases in total volatility decrease capital inflows and increase capital outflows, both significantly. Total volatility shocks therefore entail some "retrenchment": foreign resources flow less into the country, and domestic investors invest less abroad. The magnitudes are large. An increase in total volatility from the median to the 95th percentile (i.e., from 0.22. to 0.48) implies a decline in capital inflows of 5.90* (0.48-0.22) = 1.53 percentage points relative to GDP (see the third column of Panel II in Table 1). Since median capital inflows are about 6 percent of GDP, an increase in total volatility from the median to the 95% percentile implies on average a decline of capital inflows to GDP by about 25% of its median value.

The impact on net flows is smaller and, in this specification, statistically insignificant.[7] We take those results as our starting point and dig deeper. Are capital flows responding to local or global uncertainty shocks?

To answer this question, we turn in Panel II to the decomposition of volatility described in the previous section. The country-specific component of return volatility lowers significantly inflows and increases significantly outflows. The global component of volatility impacts significantly the capital inflows to emerging countries: when global volatility increases, inflows to emerging countries dry up. Global shocks to volatility do not seem to affect significantly outflows from emerging countries. Note, however, that the global component of volatility summarizes two effects: the global volatility that affects all countries and the country-specific exposure — the uncertainty beta — to global volatility. In order to control for the former and focus on the latter, we add time

[7] We found very similar results using net exports to approximate net inflows. The trade balance measure does not correspond exactly to the inverse of net capital inflows for a variety of reasons. First, we only measure trade in goods and not trade in services. Second, the income of foreign factors of production and unilateral transfers are missing. Last, the current account and the financial account do not match perfectly. In our data, the correlation between the two series is -0.62.

fixed effects to the panel regression. The time fixed effects capture all global shocks; therefore only differences in uncertainty beta can impact capital flows. They do so significantly for inflows and net inflows, but not for outflows. Countries that have high uncertainty betas experience lower inflows when global volatility rises. Foreigners pull their capital out of the most risky countries in times of crises. This result is driven mostly by private capital flows (official transactions are not important) and in particular by the "other inflows." High uncertainty beta countries experience significantly lower net inflows in times of global volatility shocks.

In a nutshell, capital inflows decrease and capital outflows increase when total volatility increases. Capital outflows and inflows respond to country-specific volatility shocks. Capital inflows and net inflows decrease more in high uncertainty beta countries than in low uncertainty beta countries in response to a global uncertainty shock. All these effects are statistically significant.

3.2 Real Economic Activity

Let us turn now to the impact of volatility shocks on real economic activity. Table 2 reports regression results obtained on GDP, investment, consumption, industrial production, and the negative of the unemployment rate. All responses are statistically significant and in the same direction: an increase in total volatility decreases real economic activity. GDP, investment, consumption, industrial production all decline in response to an uncertainty shock, and the unemployment rate rises. This result is consistent with the literature on the impact of uncertainty.

We find that both country-specific and global volatility shocks affect significantly these macroeconomic variables. The negative impact of country-specific volatility shocks on GDP, investment, consumption, and industrial production is robust to the inclusion of time fixed effects in the panel regressions. Global volatility shocks affect significantly real economic activity. Controlling for the common component of volatility through fixed effects, clear cross-country differences appear: in response to a global volatility shock, high uncertainty beta experience significantly lower GDP, investment, consumption, and industrial production than low uncertainty beta countries. Crises remain unpredictable, but when a crisis hits, there is a pattern in the data: some countries will

Table 1: Capital Flows and Volatility Shocks

	Net Inflows	Cap. Outflows	Cap. Inflows
	Panel I: Total Volatility		
Total Volatility	-2.31	3.82**	-5.90***
	(1.63)	(1.74)	(2.04)
Observations	1,518	1,653	1,683
R^2	0.60	0.57	0.46
	Panel II: Country-specific and Global Components of Volatility		
Global Volatility	-2.08	4.02*	-7.49***
	(1.42)	(2.28)	(2.43)
Country-spec. Volatility	-2.30	3.83**	-5.90***
	(1.61)	(1.74)	(2.02)
Observations	1,518	1,653	1,683
R^2	0.60	0.57	0.46
	Panel III: Time Fixed Effects		
Global Volatility	-4.11**	1.89	-6.17***
	(1.91)	(2.43)	(2.08)
Country-spec. Volatility	-3.79*	2.18	-4.82**
	(2.09)	(2.10)	(2.24)
Observations	1,518	1,653	1,683
R^2	0.69	0.62	0.53

Notes: This table reports results from the following panel regressions:

$$CF_t^i = \alpha_i + \beta_1 Vol_{t-1}^i + \beta_2 CF_{t-1}^i + \beta_3 CF_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 \Delta y_{t-1}^i + \beta_6 \Delta y_{t-2}^i + \beta_7 \Delta FX_{t-1}^i + \beta_8 \Delta FX_{t-2}^i + \varepsilon_t^i.$$

CF denotes capital outflows, inflows, or net inflows. All regressions include country fixed effects, controls (two lags of market return R_{t-1}^i, and GDP growth, Δy_{t-1}^i, Δy_{t-2}^i and exchange rate changes, ΔFX_{t-1}^i, ΔFX_{t-2}^i), and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to remove common variation in volatility. The table reports, for each regression, the coefficient β_1, the number of observations and the R^2. The first column provides the results for net inflows, the second column for capital outflows, and the third column for capital inflows. All variables are quarterly. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

predictably experience worse real economic outcomes.

Market-based measures of volatility therefore impact both capital flows and real activity. They are determined in real time, without any look-ahead bias in the researcher's methodology. They are informative about future macroeconomic aggregates certainly because asset markets are forward looking. Many factors may influence these return volatilities. In the rest of this paper, we explore their link, in the data and in a model, to some form of expropriation risk.

4 Political Risk, Capital Flows, and Economic Activity

This section studies the link between political risk, international capital flows, and economic activity in the data. To do so, we proceed in two steps: we first show that aggregate equity volatility and political risk and significantly related, and then we show that political risk is also significantly related to capital flows and economic activity.

Table 3 reports the results of panel regressions of lagged stock return volatility on measures of political risk. The correlation is clear: periods of high uncertainty as measured on equity markets tend to be followed by more political risk. This link is highly statistically significant: it appears with or without country fixed effects, using the aggregate ICRG index or its expropriation risk subcomponent. Even after controlling for country fixed effects, the t-stat on equity volatility is still above 5. The aggregate equity volatilities alone account for 10% to 18% of the uncertainty variations. This result is intuitive: proposals for taxing foreigners tend to be discussed in times of trouble. Likewise, governments tend to establish capital controls when experiencing difficulties.[8]

We turn now to the link between political risk and international capital flows. Table 4 reports results from the following panel regressions:

$$CF_t^i = \alpha_i + \beta_1 PR_t^i + Controls_{t-2,t-1}^i + \varepsilon_t^i.$$

[8]The Appendix reports additional tests at the annual frequency, using the index of capital account openness comes from Chinn and Ito (2006). They code the restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions. A higher level of the index means less restrictions on capital flows. We find that higher country-specific stock return volatilities are associated with more capital controls. Because of the annual frequency of the index, we can not precisely study any lead-lag relationship.

Table 2: Economic Activity and Volatility Shocks

	GDP	Inv.	Cons.	Ind. Prod.	-Unempl.
	Panel I: Total Volatility				
Total Volatility	-4.05***	-8.87***	-2.67***	-5.63***	-11.07***
	(0.71)	(2.61)	(0.80)	(1.63)	(3.46)
Observations	1,851	1,397	1,430	1,389	595
R^2	0.68	0.76	0.75	0.68	0.65
	Panel II: Country-specific and Global Components of Volatility				
Global Volatility	-3.53***	-8.13***	-2.31***	-5.24***	-13.16*
	(0.70)	(2.54)	(0.85)	(1.46)	(7.88)
Country-spec. Volatility	-4.21***	-9.14***	-2.79***	-6.43***	-10.83***
	(0.67)	(2.63)	(0.82)	(1.69)	(3.10)
Observations	1,851	1,397	1,430	1,389	595
R^2	0.68	0.76	0.75	0.69	0.65
	Panel III: Time Fixed Effects				
Global Volatility	-3.30***	-5.98*	-1.90**	-2.18*	-2.89
	(0.79)	(3.09)	(0.75)	(1.24)	(7.53)
Country-spec. Volatility	-3.89***	-6.90*	-2.29***	-3.16***	-2.75
	(0.78)	(3.60)	(0.63)	(1.17)	(6.07)
Observations	1,851	1,397	1,430	1,389	595
R^2	0.74	0.80	0.80	0.78	0.72

Notes: This table reports results from the following panel regressions:

$$\Delta X_t^i = \alpha_i + \beta_1 Vol_{t-1}^i + \beta_2 \Delta X_{t-1}^i + \beta_3 \Delta X_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 R_{t-2}^i + \beta_6 \Delta y_{t-1}^i + \beta_7 \Delta y_{t-2}^i + \beta_8 \Delta FX_{t-1}^i + \beta_9 \Delta FX_{t-2}^i + \varepsilon_t^i.$$

X denotes GDP, investment, consumption, industrial production, and the negative of the unemployment rate. All regressions include country fixed effects, controls (two lags of market return R_{t-1}^i, R_{t-2}^i, and GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, and exchange rate changes, ΔFX_{t-1}^i, ΔFX_{t-2}^i), and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports, for each regression, the coefficient β_1, the number of observations and the R^2. All variables are quarterly. GDP, investment, consumption, industrial production are expressed as log year-on-year differences. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 3: Political Risk and Equity Volatility

	Inv. Profile	Inv. Profile	Political Risk	Political Risk
Total Volatility	4.19***	2.46***	23.88***	15.32***
	(0.47)	(0.42)	(3.02)	(2.88)
Observations	2,219	2,219	2,219	2,219
R^2	0.10	0.38	0.18	0.60
Country FE	n	y	n	y

Notes: This table reports results from the following panel regressions:

$$X_t^i = \alpha_i + \gamma_1 Vol_{t-1}^i + \varepsilon_t^i,$$

where Vol^i denotes total stock return volatility and X^i denotes either the composite ICRG Political Risk index or its subcomponent (Investment Profile) in country i. Regressions include or not country fixed effects. The table reports the coefficients γ_1, the number of observations and the R^2. All variables are quarterly. Standard errors are clustered by country. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

All regressions include country fixed effects, and the same set of controls as in the previous section (two lags of market returns R_{t-1}^i, R_{t-2}^i, two lags of GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of exchange rate changes, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and two lags of the dependent variable, CF_{t-1}^i, $,CF_{t-2}^i$). We study the same dependent variables as in the previous section, i.e. CF_t^i denotes different categories of capital flows (Panels I and II), and later we replace it with GDP, investment, consumption, industrial production, and the negative of the unemployment rate (Panels III and IV).

To estimate the impact of political risk (PR_t^i), the panel is either estimated directly through OLS, or using a two-stage approach (first projecting political risk on past volatilities, and then using the projection as explanatory variable for capital flows and other macroeconomic variables). OLS suggest that a higher political risk is associated with lower capital inflows and larger capital outflows. These two effects are significant, although only at the 10% confidence level for the outflows. The impact on net flows is not significant. If we instrument political risk with lagged volatilities, we obtain a significant impact on capital inflows (at the 5% confidence level), as well as capital outflows and net flows (at the 10% confidence level). Again, capital inflows tend to

Table 4: Capital Flows, Economic Activity, and Political Risk

	Net Inflows	Cap. Outflows	Cap. Inflows
	Panel I: OLS Estimation		
β_1	-0.04	0.11*	-0.12**
	(0.03)	(0.06)	(0.06)
Observations	1,542	1,677	1,707
R^2	0.59	0.57	0.46
	Panel II: Two-Stage Estimation		
β_1	-0.25*	0.43*	-0.63**
	(0.15)	(0.23)	(0.25)
Observations	1,514	1,653	1,679
R^2	0.57	0.56	0.42

	GDP	Inv.	Cons.	Ind. Prod.	Empl.
	Panel III: OLS Estimation				
β_1	-0.04***	-0.13***	-0.04***	-0.03	-0.54***
	(0.01)	(0.03)	(0.01)	(0.04)	(0.16)
Observations	1,867	1,397	1,412	1,406	608
R^2	0.66	0.75	0.75	0.68	0.65
	Panel IV: Two-Stage Estimation				
β_1	-0.40***	-1.23**	-0.35***	-0.59***	-3.18***
	(0.06)	(0.50)	(0.06)	(0.15)	(1.02)
Observations	1,837	1,381	1,399	1,389	595
R^2	0.44	0.59	0.64	0.55	0.49

Notes: This table reports results from the following panel regressions:

$$\Delta X_t^i = \alpha_i + \beta_1 PR_t^i + Controls_{t-2,t-1}^i + \varepsilon_t^i.$$

All regressions include country fixed effects, controls (two lags of market returns R_{t-1}^i, R_{t-2}^i, two lags of GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of exchange rate changes, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and two lags of the dependent variable, ΔX_{t-1}^i, ΔX_{t-2}^i). X denotes different categories of capital flows (Panels I and II), or GDP, investment, consumption, industrial production, and the negative of the unemployment rate (Panels III and IV). PR_t^i denotes the ICRG composite political risk index of country i. In the two-stage regressions we replace the index by its predicted values, $\widehat{PR}_t^i$, obtained by projecting the political risk indices on lagged equity volatilities and the same controls:

$$PR_t^i = \delta_i + \gamma_1 Vol_{t-1}^i + Controls_{t-2,t-1}^i + \epsilon_t^i,$$

where Vol^i denotes aggregate volatility in country i. The table reports the coefficients β_1, the number of observations and the R^2. All variables are quarterly. GDP, investment, consumption, industrial production are expressed as log year-on-year differences. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

decrease while capital outflows tend to increase when political risk rises. The slope coefficients are much larger with the instrument than with the direct approach, suggesting that volatility may have some effects on capital flows that are not captured by political risk, or that volatility may measure political risk better than the simple political risk index itself, thereby reducing the measurement error issue which biases OLS estimates towards zero. We cannot rule these two effects and thus do not claim any causality from political risk to capital flows, simply noting the significant link between these variables.

The link between political risk and economic activity is also strong. Using OLS, GDP, investment, consumption all decline significantly when political risk increases, and the unemployment rate rises. Industrial production also declines but not significantly. Using equity volatility as an instrument for political risk, all macroeconomic variables respond significantly. They all suggest that economic conditions worsen in times of high political risk. Most responses are significant at the 1% confidence level. Again, this does not prove a causal link between political risk and economic activity, as reverse causality is likely: political decisions may be taken in response of economic difficulties.

To summarize our empirical work, we simply note a strong statistical link between international capital flows, economic conditions, uncertainty and political risk. We turn to a model to propose a simple interpretation of our empirical results.

5 A Simple Model of Gross Capital Flows with Expropriation Risk

This section introduces a simple equilibrium model of optimal portfolio choice to interpret the evidence uncovered in the previous sections. This evidence requires generating sharp movements in opposite direction of gross inflows (i.e., net sales of domestic assets by foreigners) and gross outflows (i.e., net sales of domestic assets by residents). This is challenging because in general a shock, such as a change in the riskiness of the assets of the two countries, would lead both foreigners and residents to change their portfolio allocation in the same direction. The model reflects our first attempt at breaking this symmetry: we assume that foreigners differ from residents in that they face expropriation risk. This expropriation risk varies stochastically over time. The model then studies the effect of exogenous changes in the riskiness of different countries on gross international capital flows. We first present the model setup, then discuss briefly the solution method, and finally report some simulation results. The model is purely qualitative and we make no quantitative claim.

5.1 Model Setup

The model is an endowment economy with two countries, one representative agent in each country, and a single good (the same good in both countries). A star * denotes a foreign variable. In each country, a tree produces dividends, denoted $\{D_t\}$ for the home tree and $\{D_t^\star\}$ for the foreign tree. Both $\{D_t\}$ and $\{D_t^\star\}$ follow exogenous stochastic processes. There are no trade costs and no labor income. We denote by P and $P^\star$ the price of one share of the domestic and foreign tree respectively, and by $S^{i,j}$ the number of units of of tree j held by agent i, i.e. the share of tree j owned by i. Hence $S^{f,h}$ is the share of home tree held by the foreign agent.

In each country, the representative agent has standard expected utility preferences. The home representative agent, for example, maximizes:

$$\max_{\{C_t, S_{t+1}^{h,h}, S_{t+1}^{h,f}\}} E_0 \sum_{t=0}^{\infty} \beta^t \frac{C_t^{1-\gamma}}{1-\gamma}.$$

by choosing (1) how much to consume (C_t) and (2) how many shares of the domestic ($S^{h,h}$) and foreign ($S^{h,f}$) trees to buy, subject to a budget constraint described below. The foreign representative agent solves a similar maximization problem. Thus far, the model describes a classic two-tree portfolio optimization problem.

We depart from the frictionless two-tree portfolio problem by introducing expropriation risk, which takes the form of a stochastic tax on the foreigners' holdings of domestic capital. To keep the model simple, we assume that assets invested in the foreign country are not exposed to any expropriation, and that domestic residents are not subject to expropriation risk either. The proceeds from this tax are used either for government spending, or are rebated as lump-sum transfers to the domestic agents and the foreigners.[9]

The tax rate, denoted τ_t, depends on the state of the economy as follows:

$$\tau_t = \left\{ \begin{array}{ll} 0 & \text{with probability } 1 - p_t \\ 1 - \exp^{\left(-\lambda S_t^{f,h}\right)} & \text{with probability } p_t \end{array} \right\}.$$

Intuitively, a larger share of foreign assets held by foreigners increases the incentives to expropriate them. More technically, this formulation implies that the tax rate disappears as the foreigner share goes to zero, and hence helps ensure that the equilibrium does not hit corner solutions. Last, expropriation is a low probability event: the tax rate is zero with probability $1 - p_t$ and strictly positive with probability p_t. The probability of expropriation p_t, drawn at time $t - 1$, follows an autoregressive process. The proceeds from the expropriation are denoted by R_t. They correspond to the product of the tax rate times the tax base, which is itself governed by the shares held times their (cum-dividend) price: $R_t = \tau_t S_t^{f,h}(P_t + D_t)$.

Given these assumptions, the budget constraints of the home and foreign investors are respectively:

$$C_t + P_t S_{t+1}^{h,h} + P_t^{\star} S_{t+1}^{h,f} = (P_t + D_t) S_t^{h,h} + (P_t^{*} + D_t^{\star}) S_t^{h,f} + \alpha_2 R_t,$$

and

$$C_t^{\star} + P_t S_{t+1}^{f,h} + P_t^{\star} S_{t+1}^{f,f} = (1 - \tau_t)(P_t + D_t) S_t^{f,h} + (P_t^{\star} + D_t^{\star}) S_t^{f,f} + \alpha_3 R_t,$$

where α_2 and α_3 denote the share of expropriation proceeds that are rebated lump-sum to domestic and foreign investors respectively. Finally, the market clearing conditions for goods and assets

[9] In a variant of the model, the transfers to the domestic agents could be set in proportion to their holdings of securities.

impose that:

$$
\begin{aligned}
S_t^{h,h} + S_t^{f,h} &= 1, \\
S_t^{h,f} + S_t^{f,f} &= 1, \\
C_t + C_t^\star &= D_t + D_t^\star - \alpha_1 R_t,
\end{aligned}
$$

where α_1 denotes the share of expropriation proceeds that is spent by the government.

5.2 Solution, Calibration, and Simulation Method

We first describe the system of equations that characterize the equilibrium. We then explain our numerical solution method and our choice for stochastic processes. Finally, we discuss briefly our parameters.

Equilibrium conditions Assuming the existence of an interior solution, the maximization problems of the home and foreign agents imply the following four first-order conditions:

$$
\begin{aligned}
P_t u'(C_t) &= \beta E_t \left[(P_{t+1} + D_{t+1}) u'(C_{t+1}) \right] \\
P_t^\star u'(C_t) &= \beta E_t \left[(P_{t+1}^\star + D_{t+1}^\star) u'(C_{t+1}) \right] \\
P_t u'(C_t^\star) &= \beta E_t \left[(P_{t+1}^\star + D_{t+1}^\star) u'(C_{t+1}^\star) \right] \\
P_t^\star u'(C_t^\star) &= \beta E_t \left[(1 - \tau_{t+1})(P_{t+1} + D_{t+1}) u'(C_{t+1}^\star) \right].
\end{aligned}
$$

The first two equations correspond to the optimal portfolio choice of the home investor, while the last two equations correspond to the optimal portfolio choice of the foreign investor. Those four equations coupled with the feasibility constraints, the clearing market conditions, and a budget constraint summarize the model.

Numerical Solution Method The model is solved using projection methods similar to Judd (1992) and Aruoba, Fernandez-Villaverde and Rubio-Ramirez (2006), following the steps outlined in Rabitsch, Stepanchuk and Tsyrennikov (2014). In simple portfolio models, the only endogenous state variable is the relative wealth of the agents. In our case, because the tax proceeds R_t depend on the foreign-held share of the domestic asset, an additional state variable is necessary to describe the model solution. For simplicity, we pick this share as our second state variable. The method solves for six policy functions, which depend on the two endogenous state variables as well as the exogenous shocks. These shocks are discretized and approximated through Markov chains. We approximate the six policy functions by (tensor of) Chebyshev polynomials. The precise implementation of the projection method is described in the Appendix.

The process for exogenous variables The dividend dynamics are described by two exogenous state variables (D_t and $D_t^\star$):

$$\begin{pmatrix} D_{t+1} \\ D_{t+1}^\star \end{pmatrix} = \begin{pmatrix} \overline{D} \\ \overline{D} \end{pmatrix} + A \begin{pmatrix} D_t \\ D_t^\star \end{pmatrix} + \varepsilon_{t+1},$$

where the shocks ε_{t+1} are $i.i.d$ and normally distributed according to a $N(0, \Sigma)$ distribution.

Calibration Table 5 describes the model parameters. The risk-aversion coefficient is set to 1, while the discount factor is set to 0.9. The autoregressive coefficient of the dividend level is equal to 0.1. The expropriation proceeds are either wasted (33%), or rebated to home and foreign investors (33% each). The tax rate sensitivity is set to 10^{-5}. We view this calibration as preliminary.

5.3 Simulation Results

Let us first describe the model equilibrium before turning to the impulse response functions to expropriation probability shocks. As foreign investors become relatively wealthier, their holdings of both trees and their consumption increase, whereas the opposite happens to domestic investors.[10]

[10]Figure **??** in the Online Appendix reports the foreign and domestic consumption, the prices of the foreign and domestic trees, as well as the foreign and domestic shares of the two trees, all as a function of the share of the domestic tree held by foreign investors. This share mimics the relative wealth of foreign investors.

Table 5: Calibration

Model parameter	Notation	Value
Risk-aversion	γ	1.0
Discount factor	β	0.9
Average dividend	$\bar{D}$	1.0
Persistence of dividend	a	0.1
Volatility and cross-country correlation	Σ	$\begin{bmatrix} 0.5 & -0.05 \\ -0.05 & 0.5 \end{bmatrix}$
Tax rate sensitivity	λ	10^{-5}
Lump-sum rebates	$[\alpha_1,\ \alpha_2,\ \alpha_3]$	$[0.33,\ 0.33,\ 0.33]$
Mean, persistence, and vol. of expr. prob.	$\bar{p},\ \rho,\ \sigma$	$[0.05,\ 0.01,\ 0.6]$

Notes: The law of motion of dividend is:

$$\begin{pmatrix} D_{t+1} \\ D^{\star}_{t+1} \end{pmatrix} = \begin{pmatrix} \overline{D} \\ \overline{D} \end{pmatrix} + A \begin{pmatrix} D_t \\ D^{\star}_t \end{pmatrix} + \varepsilon_{t+1}$$

where A is a diagonal matrix with a as diagonal values and the shocks ε_{t+1} are $i.i.d$ and normally distributed according to a $N(0, \Sigma)$ distribution. The expropriation probability p_t follows a recursive process: $p_{t+1} = (1-\rho)\bar{p} + \rho p_t + u_{t+1}$, where the shocks u_{t+1} are $i.i.d$ and normally distributed according to a $N(0, \sigma^2)$ distribution.

As foreign investors become relatively wealthier, the foreign tree becomes more expensive, whereas the home tree becomes less expensive.

Figure 1 reports the same variables as a function of the expropriation probability. Consumption does not move, but prices and holdings change with the level of expropriation risk. When the expropriation probability increases, foreign investors want to hold a lower share of the domestic tree and a larger share of the foreign tree. The price of the domestic tree declines, while the price of the foreign tree increases.

These equilibrium functions explain the dynamics of the impulse response functions described in Figure 2. There, the probability of an expropriation in the future increases initially and then mean-reverts slowly. The foreign agent sells some of her holdings of the domestic tree to the domestic agent, who is immune to the expropriation risk. The foreigner's share of the home tree decreases while her share of the foreign tree increases. Because of the market clearing condition, the share of the foreign tree held by the domestic agent must therefore decline. Capital flows in

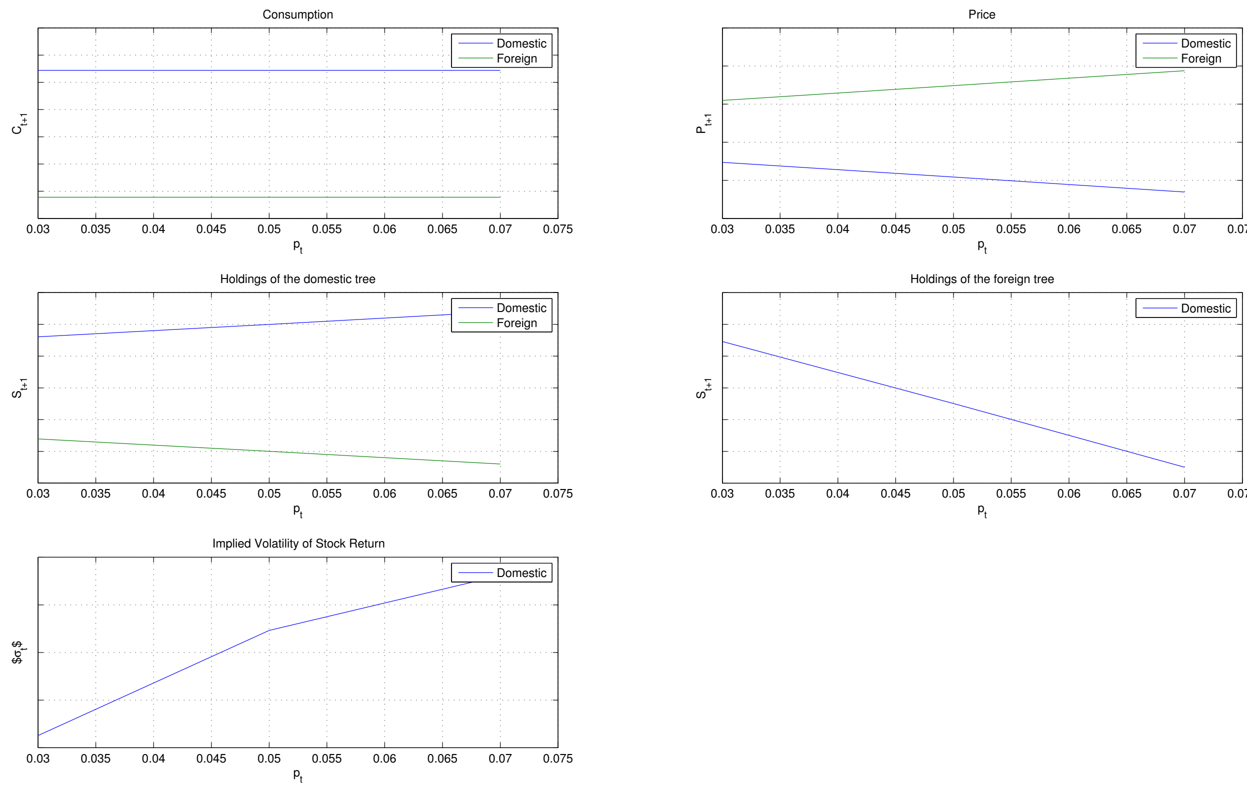


Figure 1: Model Equilibrium: Consumption, Prices and Shares of the Trees, and Volatility as a Function of Expropriation Probability — The model is simulated with the parameters described in Table 5.

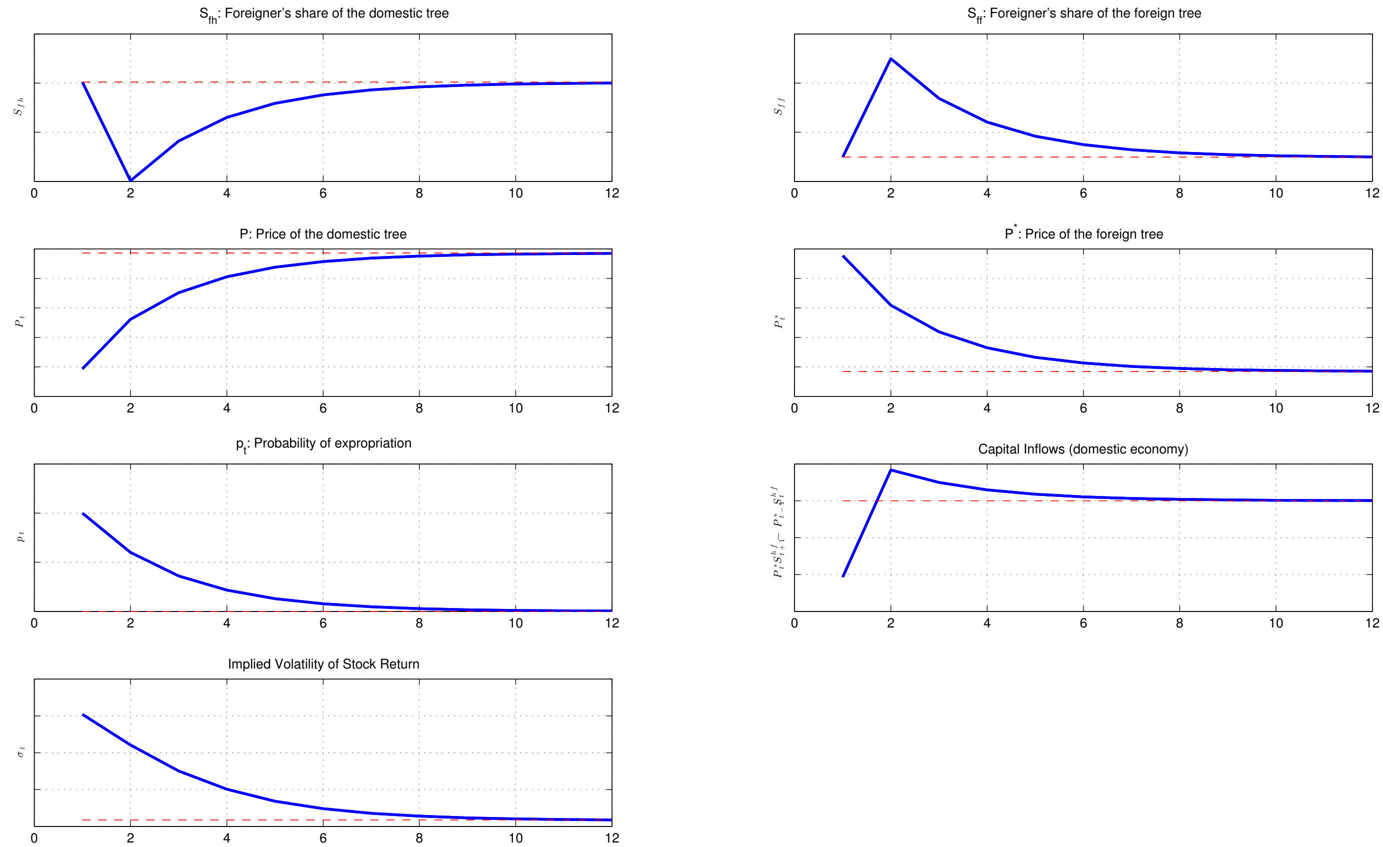
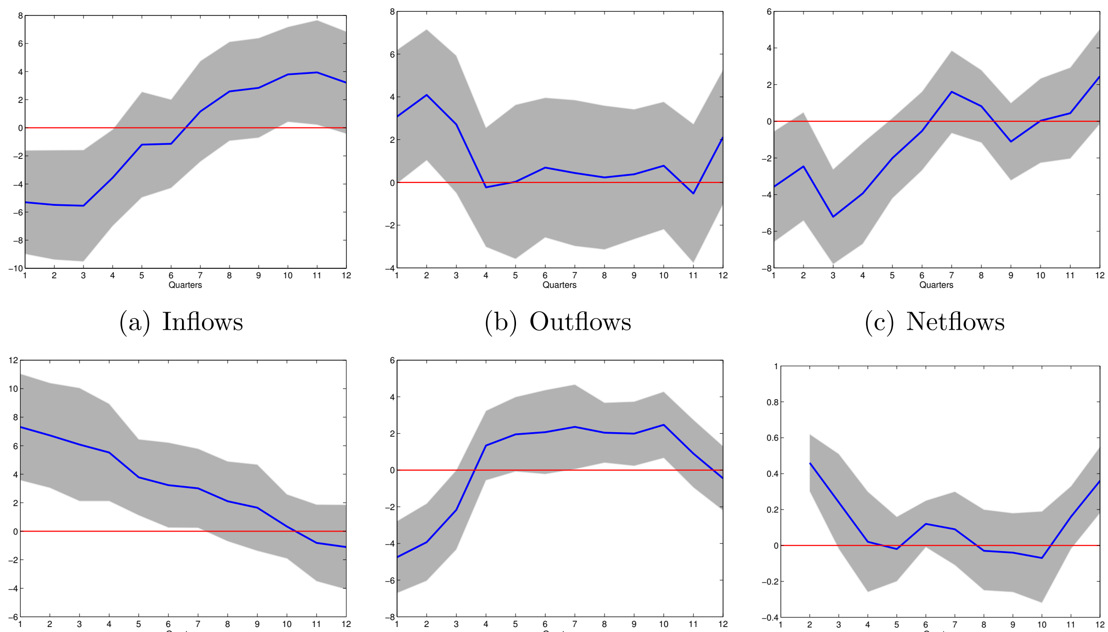


Figure 2: Impulse Response Functions: Expropriation Probability Shock — The model is simulated with the parameters described in Table 5.

the model can be measured as $P_t^\star S_{t+1}^{hf} - P_{t-1}^\star S_t^{hf}$: they correspond to the value of the foreign tree held by the domestic agent at date $t+1$ minus the value of the foreign tree held by the domestic agent at date t. Since the domestic agent is buying her own tree and selling the foreign tree, the home country (which is exposed to expropriation risk) first experiences large capital outflows.

A price effect then kicks in. The price of the domestic tree decreases to reflect its riskiness. The price of the foreign tree increases to clear the demand. When the expropriation probability reverts back to its initial level, the home country then experiences capital inflows, but those flows are in magnitude smaller than the previous capital outflows. The lower size of capital inflows than outflows is due to a price effect: the home tree is cheaper than it used to be. Therefore going back to the previous equilibrium portfolio allocation requires less capital flows.

How does the model compare to the data? Let us first consider the dynamics of capital flows and then the cross-country differences. The model-based impulse response function appears similar to the impulse response function obtained on actual data when considering a shock to total stock return volatility. Figure 3 presents the data counterpart. The impulse response functions are estimated by local projections following Jorda (2005). On average, emerging countries first experience negative net inflows after a spike in stock return volatility. The net inflows are the most negative after two quarters. After four quarters, net inflows change sign, emerging countries tend to experience positive net inflows but their absolute value is lower than the initial outflows.



(a) Inflows (b) Outflows (c) Netflows

(d) NX/GDP (e) GDP (f) Idio Vol.

Figure 3: Impulse Response Functions to A Idiosyncratic Volatility Shock in the Data — The impulse response functions are estimated by local projections following Jorda (2005). They correspond to the average responses to a shock on idiosyncratic volatility in each country. The standard errors and 90% confidence bands at each horizon take into account the uncertainty stemming from all horizons.

The model features only one country subject to expropriation risk, but comparative statics help interpret actual data on cross-country differences. In the model, the larger the expropriation risk (λ), the larger the stock price changes, and the larger the capital flows response. In the logic of the model, the initial shock is the increase of the expropriation probability. This shock affects equity prices, increasing their volatility, and money flows out of the country because foreign investors fear being taxed.

The model so far does not distinguish between country-specific and global volatility. Doing so would require the definition of global shocks. One could easily imagine that the expropriation probability has two components: a global component, common to all countries, and a country-specific component. For the sake of clarity, shocks on the expropriation probability are orthogonal to the endowment shocks in the model. They are certainly correlated in the data: governments consider expropriation measures in bad times, not in good times. Therefore, along with the two components of expropriation probability, global and country-specific shocks could be introduced on endowments. The model then would interpret differences in uncertainty betas in terms of differences in the size of expropriation risk. A high volatility beta thus corresponds to a higher level λ of expropriation risk linked to global shocks.

The model therefore suggests a potential interpretation of the capital flows dynamics. The model calibration, however, has several weaknesses. The model does not reproduce fully the equity home bias in the data: while the U.S. stock market represents close to a third of the world stock market, actual U.S. investors tend to allocate more than two-thirds of their assets to U.S. stocks. The model does not reproduce the level of the price-dividend ratio or the average equity return in the data. The model does not reproduce the volatility of equity prices or capital flows. To sum up, the current calibration offers a qualitative but not quantitative interpretation of the data.

5.4 Potential Extensions

Four different extensions can be considered. First, the representative investor could be characterized by Epstein-Zin (1989) preferences instead of constant relative risk-aversion. By disentangling the coefficient of risk aversion and the inter-temporal elasticity of substitution (IES) the model could then feature large expected equity returns (due to high risk aversion) and equity drop prices when volatility increases (due to high IES). Second, the model could feature different goods across countries and home bias in consumption (as in Heathcote and Perri, 2013). The introduction of exchange rate risk and home bias in consumption would help the model reproduce the well-known equity home bias. Third, the set of assets traded could include domestic and foreign bonds along the two equity claims. As Coeurdacier and Gourinchas (2011) show, in the presence of exchange rate risk, the introduction of such bonds has a large impact on the optimal portfolio allocation. Fourth, our focus is on country-specific volatility as it accounts empirically for most of the aggregate volatility at the country-level, but our model can be easily extended to global shocks since political risk is not independent from global crises and large global commodity price changes for example.

6 Conclusion

This paper documents that economic uncertainty has a significant impact on international capital flows for a large set of emerging countries. We measure economic uncertainty through the volatility of stock market returns, and distinguish between total, country-specific and systematic volatilities. An increase in economic uncertainty increases gross capital outflows and decreases gross capital inflows. The effect on international capital inflows is stronger for countries that have a higher exposure to global stock market volatility. Economic uncertainty appears strongly related to political risk in emerging countries. As a result, when political risk increases, capital inflows tend to decrease and economic conditions worsen. We propose a potential interpretation of these empirical facts by developing a simple model in which home and foreign investors behave differently because foreign investors face some expropriation risk. The model is able to generate qualitatively the effect of political risk and uncertainty on capital flows.

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- Supplementary Online Appendix -

NOT FOR PUBLICATION

This appendix presents the literature on uncertainty in closed economies in Appendix A, our data in Appendix B, many robustness checks in Appendix C, and the simulation method in Appendix D.

Appendix A Literature

The literature review in the main text focuses on open economy studies. We rapidly review here the most recent work on closed economies.

Bansal and Yaron (2004) and Bansal, Khatchatrian, and Yaron (2005) are early examples of the role of heteroscedasticity in macro-finance/ In Bloom (2009) and Bloom, Floetotto, Jaimovich, Saporta-Eksten and Terry (2012), the combination of economic uncertainty with real adjustment costs induce firms to behave cautiously, implying a drop in economic activity. Gilchrist, Sim and Zakrajsek (2009) provide evidence that increases in uncertainty lead to prolonged declines in investment activity due to increases in financing costs. Arellano, Bai and Kehoe (2012) argue that an increase in risk leads firms to reduce their inputs as financial frictions limit firms' ability to insure against such shocks. Schaal (2012) study uncertainty shocks in a search and matching model of unemployment, applied notably to the financial crisis of 2007-2009. Bachmann, Elstner and Sims (2013) show that the impact of uncertainty shock is more persistent in the United States than in Germany. Fernández-Villaverde, Guerrón-Quintana, Rubio-Ramirez and Uribe (2011) report that increases in the volatility of real interest rates of small open economics lead to a decline in economic activity. Baker and Bloom (2013) argue that uncertainty shocks can account for about half the variation in economic growth. Bekaert, Hoerova and Lo Duca (2013) decompose the stock market option-based implied volatility index (VIX) into a proxy for risk aversion and economic uncertainty. They argue that lax monetary policy decreases both uncertainty as well as a risk aversion. Segal, Shaliastovich, and Yaron (2014) decompose uncertainty into "good" and "bad" uncertainty. They argue that "good" uncertainty increases economic activity while "bad" uncertainty predicts lower economic growth. Kelly, Lustig, and van Nieuwerburgh (2013) develop a network model of firm volatility that can generate the observed firm level volatility distribution dynamics in the data. Christiano, Rostagno and Motto (2010) add a financial market and a banking sector to a standard monetary DSGE model. Shocks to uncertainty generate significant reductions in output. Gabaix (2012) and Gourio (2012) offer potential alternative interpretations of uncertainty shocks in terms of shocks to disaster probabilities.

Appendix B Data

Table 6 reports for each country in our sample the starting year of each series: next exports (NX), unemployment rates (UE), industrial production (IP), net capital inflows, capital inflows, capital outflows, GDP, consumption, investment, and aggregate equity returns. Table 7 reports for each country summary statistics on equity volatility and its global and country-specific components. Table 8 reports for each country summary statistics on capital flows.

Figure 4 presents the time-series of volatility betas of each country. Figure 5 reports the time-series of the global component of total equity volatility for each country. Figure 6 shows for each country in the sample the annualized volatility of weekly stock returns along with the crisis years as documented in Broner et al. (2013).

Table 6: Sample: Starting Years by Country and Series

	Code	NX	UE	IP	Net Inflows	Inflows	Outflows	GDP	Cons.	Inv.	*Ret.*
Argentina	213	1992		1985	1993	1993	1993	1990	1993	1993	1983
Bulgaria	918	1993	1991	2000	1994	1994	1994	1999			2000
Brazil	223	1989	2001	1985	1990	1990	1990	1995	1995	1995	1980
Chile	228	1995	2008		1991	1991	1991	1980	2003	2003	1981
Colombia	233	1993	2001	1980	1996	1996	1996	1994	2000	2000	1992
Czech Republic	935	1992	2005	2000	1993	1993	1993	1994	1996	1996	1993
Egypt	469			2004	2001	2001	2001	2002			1996
Hungary	944	1994	1999	2000	1995	1995	1995	1995	1995	1995	1991
India	534	2003		2005	1996	1996	1996	1996	2004	2004	1990
Indonesia	536	1989		2000	1983	1983	1995	1997	2000	2000	1990
Israel	436	1979		1990	1974	1974	1974	1980	1995	1995	1993
Malaysia	548	1990		1990	1999	1999	1999	1988	2005	2005	1977
Mexico	273	1980	2000	1993	1980	1980	1980	1980	2003	2003	1980
Morocco	686	1989			2002	2002	2002	1990			1989
Peru	293	1979	2001	1986	1985	1985	1991	1980	1980	1980	1982
Philippines	566	1979		1985	1979	1979	1983	1981	1998	2008	1987
Poland	964	1994	2002	2010	1999	1999	1999	1995	1996	1996	1994
Portugal	182	1980		2000	1977	1977	1977	1980	1995	1988	1990
Romania	968	1993	1993	2000	1995	1995	1995	1995	2003	2003	1997
South Africa	199	1979		1990	1985	1985	1985	1980	1974	1974	1978
South Korea	542	1979	1999	1980	1976	1976	1976	1980	1974	1974	1984
Singapore	576	2002		1983	1986	1986	1986	1985	1975	1975	1974
Slovenia	961	1994	1992	1998	1995	1995	1995	1992	1996	1996	1998
Taiwan	528		1978	1996	1981	1981	1981		1981	1974	1988
Thailand	578	1992	2001	1999	1993	1993	1993	1993	1993	1993	1980
Turkey	186	1986	2005	2005	1987	1987	1987	1987	1998	1998	1989

Notes: The table reports for each country, its IMF code, and the starting year of the next exports (NX), unemployment rates (UE), industrial production (IP), net capital inflows, capital inflows, capital outflows, GDP, consumption, investment, and aggregate equity returns.

Table 7: Summary Statistics on Volatility

	AR(1)			Median	95 perc.	Median	95 perc.	Median	95 perc.	σ_W^2/σ_T^2
	I-Vol	T-Vol	W-Vol	I-Vol		T-Vol		W-Vol		
Argentina	0.15	0.50	0.21	0.27	0.82	0.34	0.90	-0.01	2.05	0.03
Brazil	0.67	0.74	0.65	0.31	1.28	0.33	0.78	-0.02	0.53	0.04
Bulgaria	0.34	0.43	0.48	0.27	0.51	0.25	0.52	-0.01	0.14	.
Chile	0.60	0.46	0.65	0.14	0.34	0.16	0.31	0.00	0.13	0.04
Colombia	0.39	0.29	0.66	0.17	0.37	0.16	0.32	0.00	0.07	.
Czech Republic	0.28	0.29	0.29	0.17	0.34	0.18	0.32	0.00	0.07	0.00
Egypt	0.27	0.25	0.47	0.32	0.53	0.25	0.53	0.00	0.12	0.10
Hungary	0.51	0.26	0.70	0.21	0.60	0.21	0.50	0.00	0.44	0.04
India	0.63	0.49	0.73	0.21	0.49	0.24	0.52	0.01	0.25	0.02
Indonesia	0.18	0.47	0.26	0.25	0.53	0.24	0.59	-0.03	0.10	0.01
Israel	0.72	0.41	0.72	0.18	0.36	0.19	0.33	0.00	0.12	0.00
Malaysia	0.61	0.63	0.54	0.16	0.44	0.17	0.38	0.00	0.12	0.04
Mexico	0.15	0.60	0.06	0.21	0.52	0.24	0.51	0.01	0.23	0.01
Morocco	0.54	0.31	0.70	0.11	0.24	0.11	0.24	0.00	0.08	0.02
Peru	0.70	0.48	0.66	0.25	1.16	0.26	0.76	-0.01	0.73	0.18
Philippines	0.51	0.41	0.80	0.19	0.42	0.20	0.44	0.00	0.23	0.18
Poland	0.50	0.44	0.80	0.22	0.42	0.23	0.46	0.00	0.24	0.17
Portugal	0.36	0.47	0.55	0.13	0.25	0.13	0.27	0.00	0.10	0.22
Romania	0.53	0.27	0.40	0.26	0.73	0.29	0.61	0.00	0.38	0.04
Singapore	0.47	0.42	0.53	0.16	0.35	0.16	0.36	0.00	0.11	0.02
Slovenia	0.36	0.37	0.38	0.12	0.23	0.13	0.25	0.01	0.05	0.42
South Africa	0.34	0.36	0.59	0.16	0.31	0.17	0.35	0.00	0.10	0.05
South Korea	0.71	0.55	0.56	0.22	0.70	0.21	0.51	-0.01	0.12	0.08
Taiwan	0.46	0.62	0.50	0.22	0.62	0.24	0.55	0.01	0.22	0.00
Thailand	0.51	0.54	0.63	0.17	0.43	0.20	0.47	0.00	0.40	0.20
Turkey	0.52	0.48	0.52	0.36	1.01	0.37	0.81	-0.03	0.32	0.11
Average	0.46	0.44	0.54	0.21	0.54	0.22	0.48	-0.00	0.29	0.08

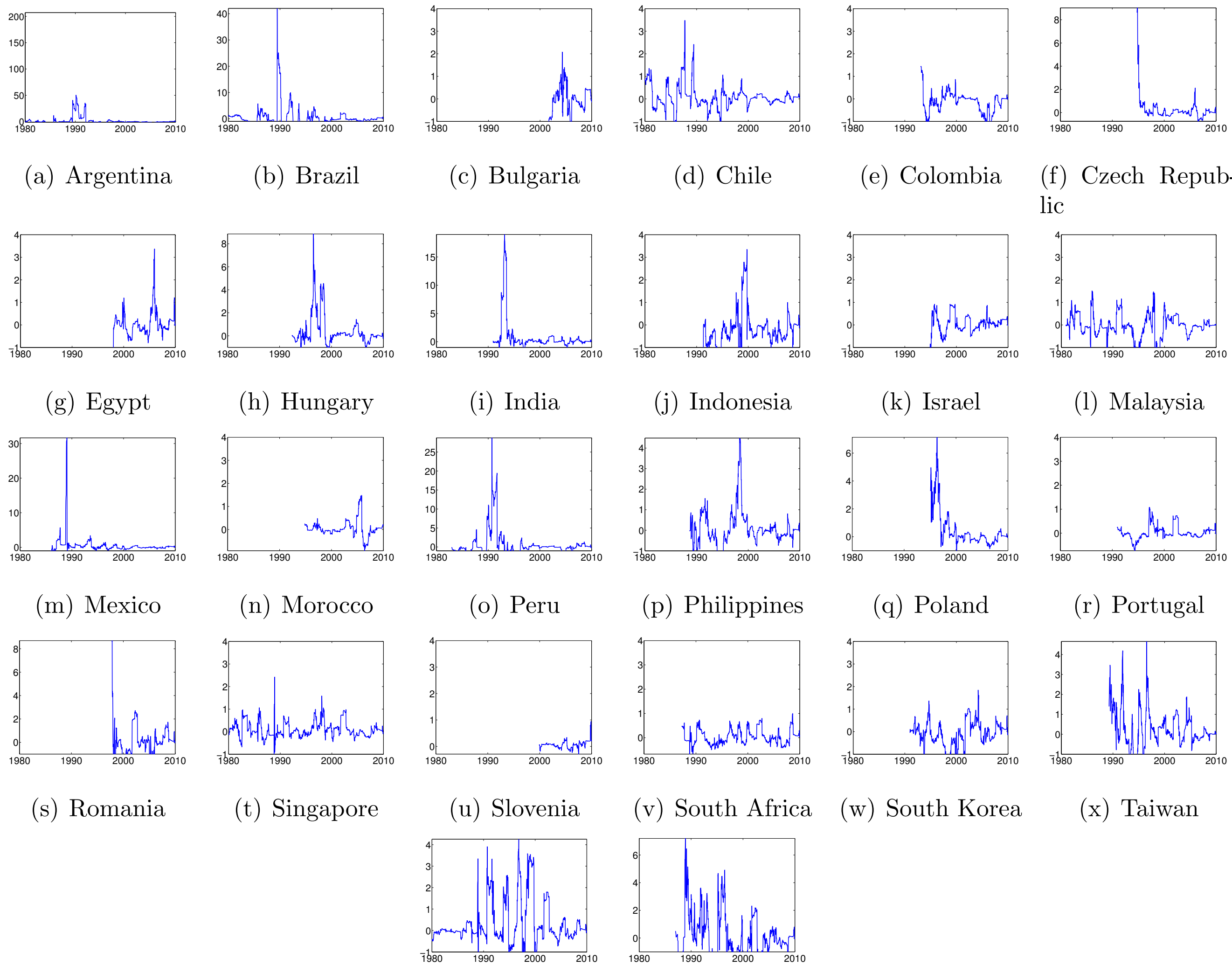
Notes: The first three columns display the autocorrelation coefficient for different components of aggregate volatilities. The three measures of volatility are defined the main text: idiosyncratic (denoted $I-Vol$), total volatility (denoted $(T-Vol)$, and the world component of total volatility (denoted $W-Vol$). For each component, the next six columns report the median and the 95th percentile values. The last column shows the fraction of total volatility that is explained by world volatility.

Table 8: Summary Statistics on Capital Flows

	AR(1)			Median	95 perc.	Median	95 perc.	Median	95 perc.
	Outflows	Inflows	Net Inflows	Net Inflows		Inflows		Outflows	
Argentina	0.30	0.76	0.51	0.32	6.53	4.48	10.85	-3.02	2.24
Brazil	-0.14	0.32	0.62	1.38	4.39	3.96	8.59	-1.09	0.56
Bulgaria	-0.04	0.84	0.63	8.29	34.67	12.42	49.17	-2.28	6.81
Chile	0.53	0.21	0.40	0.45	7.65	8.61	14.86	-4.40	3.32
Colombia	-0.19	0.33	0.66	1.70	6.26	5.13	10.41	-2.19	1.91
Czech Republic	0.06	0.36	0.19	3.74	9.25	9.01	18.02	-3.18	5.75
Egypt	-12.52	0.12	.	.	.	0.55	5.44	0.01	0.02
Hungary	0.30	0.34	0.31	6.66	13.63	10.77	54.68	-2.42	15.35
India	0.22	0.63	0.52	1.46	7.04	3.35	8.51	-0.73	0.95
Indonesia	0.59	0.60	0.78	-0.42	3.68	2.46	6.19	-0.30	0.25
Israel	0.41	0.23	0.47	-1.31	5.13	6.52	16.83	-5.44	4.50
Malaysia	0.31	0.39	0.46	-10.66	-1.01	2.80	17.77	-7.33	-0.97
Mexico	0.02	0.36	0.48	1.99	7.21	3.67	9.03	-0.81	3.01
Morocco	0.36	-0.03	0.50	-1.60	14.30	4.65	9.50	-1.02	0.64
Peru	0.25	0.37	0.45	2.52	7.53	4.67	14.62	-0.81	2.26
Philippines	0.01	0.43	0.59	0.92	10.57	4.30	14.43	-1.18	4.86
Poland	0.40	0.51	0.42	3.54	8.62	6.72	15.08	-2.01	4.22
Portugal	0.54	0.56	0.60	6.53	11.99	13.28	34.09	-7.60	17.40
Romania	0.01	0.65	.	.	.	8.57	20.05	-0.17	2.74
Singapore	0.42	0.34	0.17	-22.81	3.23	21.27	63.69	-29.48	5.65
Slovenia	0.47	0.40	0.09	1.69	9.32	8.62	27.65	-5.75	8.56
South Africa	0.34	0.61	0.48	0.85	5.90	3.05	13.50	-1.68	2.73
South Korea	0.71	0.56	0.65	-1.35	4.47	3.09	8.85	-1.49	3.31
Taiwan	0.41	0.35	.	.	.	3.95	14.28	-6.21	3.29
Thailand	-0.03	0.72	0.78	-3.92	10.41	4.38	16.80	-2.06	5.71
Turkey	0.04	0.69	0.54	2.11	7.93	3.97	12.07	-1.05	3.00
Average	-0.24	0.45	0.49	0.09	8.64	6.32	19.04	-3.60	4.16

Notes: The first three columns display the autocorrelation coefficient for international capital outflows, inflows, and net inflows. For each flow measure, the next six columns report the median and the 95th percentile values.

Figure 4: Uncertainty Betas — The figure reports the time-series of uncertainty betas obtained for each country. Total volatility at the quarterly frequency corresponds to the average of weekly squared real stock market returns over a quarter. To decompose total volatility into its world and country-specific components, we regress each country i squared returns on the world stock market squared returns. The uncertainty beta corresponds to the slope coefficient of that regression.



(a) Argentina (b) Brazil (c) Bulgaria (d) Chile (e) Colombia (f) Czech Republic

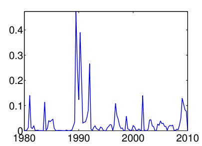
(g) Egypt (h) Hungary (i) India (j) Indonesia (k) Israel (l) Malaysia

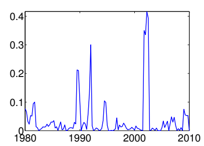
(m) Mexico (n) Morocco (o) Peru (p) Philippines (q) Poland (r) Portugal

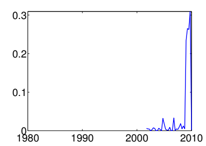
(s) Romania (t) Singapore (u) Slovenia (v) South Africa (w) South Korea (x) Taiwan

(y) Thailand (z) Turkey

Figure 5: World Component of Country Volatilities — The figure reports the time-series of the global component of total equity volatility for each country. Total volatility at the quarterly frequency corresponds to the average of weekly squared real stock market returns over a quarter. To decompose total volatility into its world and country-specific components, we regress each country i squared returns on the world stock market squared returns. The figure presents for each country the share of total volatility explained by world volatility.


(a) Argentina


(b) Brazil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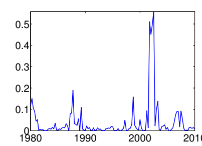
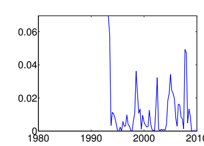
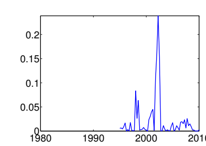
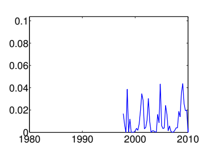

(d) Chile


(e) Colombia


(f) Czech Republic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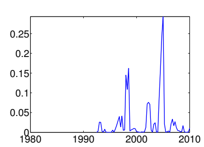
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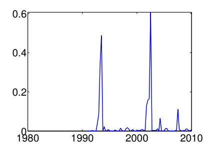
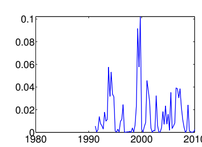

(i) India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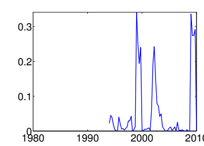
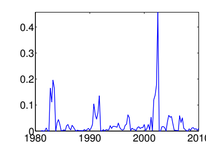
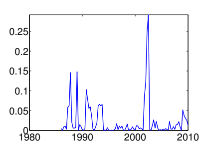

(k) Israel


(l) Malaysia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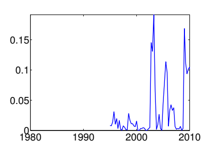
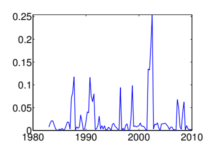
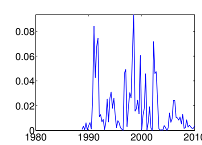
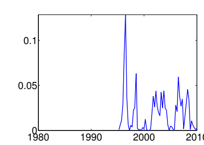
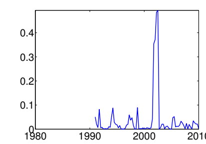

(n) Morocco


(o) Peru


(p) Philippines


(q) Poland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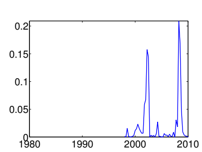
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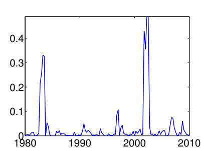
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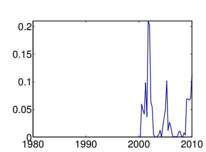
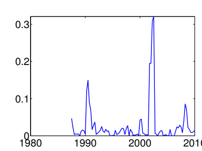
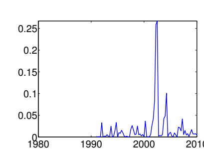
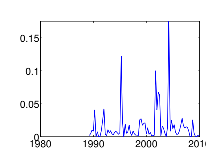
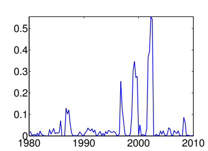

(u) Slovenia


(v) South Africa


(w) South Korea


(x) Taiwan


(y) Thailand

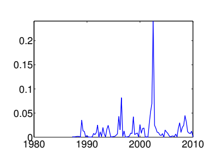
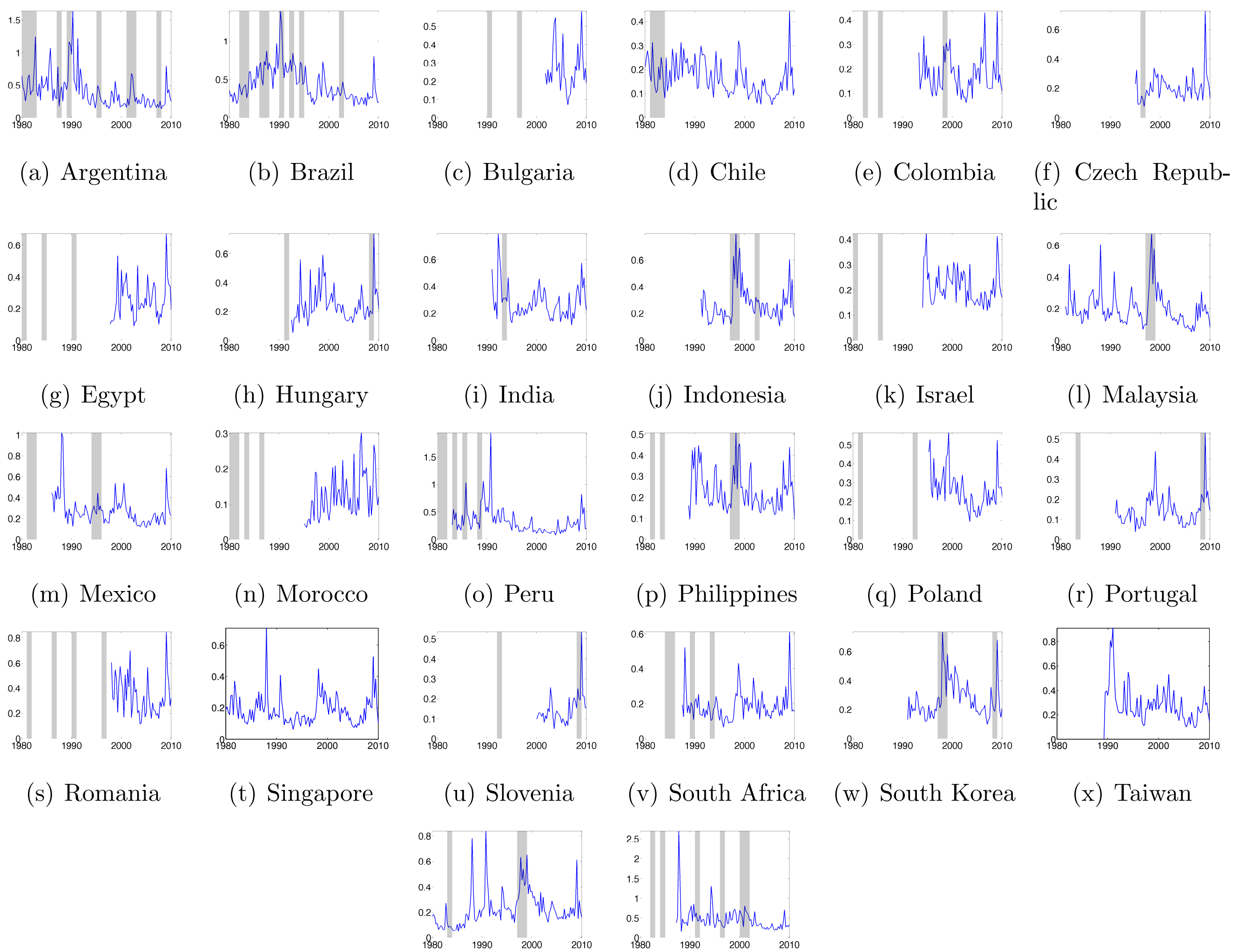

(z) Turkey

Figure 6: Equity Volatility and Crisis Dates— The figure shows for each country in the sample the annualized volatility of weekly stock returns. Grey shaded areas indicate the crisis years as documented in Broner et al. (2013). The data of Broner et al. (2013) range from 1970 to 2009.



(a) Argentina (b) Brazil (c) Bulgaria (d) Chile (e) Colombia (f) Czech Republic

(g) Egypt (h) Hungary (i) India (j) Indonesia (k) Israel (l) Malaysia

(m) Mexico (n) Morocco (o) Peru (p) Philippines (q) Poland (r) Portugal

(s) Romania (t) Singapore (u) Slovenia (v) South Africa (w) South Korea (x) Taiwan

(y) Thailand (z) Turkey

Appendix C Robustness Checks

We check the robustness of our results along several dimensions: (i) by restricting our sample to some core emerging markets, (ii) by weighting countries by their GDP, (iii) by using equity returns in U.S. dollars instead of local currencies, (iv) by using changes in volatilities instead of volatilities in levels, (v) by studying sub-components of the capital flow categories, and (vi) by studying the correlation at annual frequency between volatility measures and capital account openness.

Table 9 checks our benchmark regression results of capital flows on volatility measures for a set of core emerging markets, which includes Argentina, Brazil, Chile, Colombia, Egypt, India, Indonesia, Malaysia, Mexico, Morocco, Peru, Philippines, South Africa, South Korea, Taiwan, Thailand and Turkey. Likewise, Table 10 checks our benchmark regression results of economic activity on volatility measures for the same set of core emerging markets.

Table 11 checks our benchmark regression results of capital flows on volatility measures in panel regressions where countries are weighted by their relative size, as measured by their GDP. Table 12 does the same for the regressions of economic activity on volatility measures.

Tables 13 and 14 report similar regressions starting from equity returns in U.S. dollars.

Tables 15 and 16 report similar regression results using the changes in volatility, instead of the volatility in level, as explanatory variable.

Table 17 reports the responses of the subcomponents of capital inflows to uncertainty shocks. The different subcategories are private, foreign direct investment, equity portfolio, debt portfolio, and other capital outflows. Table 18 reports the responses of the same subcomponents of capital outflows to uncertainty shocks.

Table 19 reports regression results obtained with subcategories of the "other inflows". Those subcategories are official sector, other nonofficial sector, other bank, and other private non-bank inflows. Table 20 reports similar results obtained with similar subcategories of the "other outflows".

Finally, Table 21 reports regression results of annual volatility on capital account openness and expropriation risk measures.

Table 9: Capital Flows and Volatility Shocks: Core Emerging Markets

	NX/GDP	Net Inflows	Cap. Outflows	Cap. Inflows
	Panel I: Total Volatility			
Total Volatility	3.74*	-3.81**	0.57	-3.14**
	(2.24)	(1.53)	(0.81)	(1.57)
Observations	1,182	1,067	1,086	1,116
R^2	0.67	0.56	0.32	0.36
	Panel II: Country-specific and Global Components of Volatility			
Global Volatility	2.33	-3.74***	0.30	-4.33***
	(1.94)	(1.21)	(0.91)	(1.52)
Country-spec. Volatility	4.02*	-3.81**	0.55	-3.20**
	(2.05)	(1.51)	(0.80)	(1.62)
Observations	1,182	1,067	1,086	1,116
R^2	0.67	0.56	0.32	0.36
	Panel III: Time Fixed Effects			
Global Volatility	3.69	-5.10**	0.47	-5.62**
	(2.51)	(2.17)	(1.28)	(2.42)
Country-spec. Volatility	5.17**	-4.87**	0.95	-4.88**
	(2.57)	(2.38)	(1.04)	(2.23)
Observations	1,182	1,067	1,086	1,116
R^2	0.73	0.66	0.44	0.49

Notes: This table reports results from the following panel regressions:

$$CF_t^i = \alpha_i + \beta_1 Vol_{t-1}^i + \beta_2 * CF_{t-1}^i + \beta_3 * CF_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 R_{t-2}^i + \beta_6 * \Delta y_{t-1}^i + \beta_7 \Delta y_{t-2}^i + \beta_8 \Delta FX_{t-1}^i + \beta_9 \Delta FX_{t-2}^i + \varepsilon_t^i$$

CF denotes capital outflows, inflows, or net inflows. All regressions include country fixed effects, controls (two lags of market return R_{t-1}^i, and GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of changes in the Exchange rate, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. The first column provides the results for net exports, the second column for net inflows, the third column for capital outflows, and the fourth column for capital inflows. All variables are quarterly. Core emerging markets include: Argentina, Brazil, Chile, Colombia, Egypt, India, Indonesia, Malaysia, Mexico, Morocco, Peru, Philippines, South Africa, South Korea, Taiwan, Thailand and Turkey. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 10: Economic Activity and Volatility Shocks: Core Emerging Markets

	GDP	Inv.	Cons.	Ind. Prod.	Empl.
	Panel I: Total Volatility				
Total Volatility	-4.08***	-8.03**	-3.12***	-4.84***	-8.92**
	(0.72)	(3.69)	(0.71)	(1.16)	(3.55)
Observations	1,270	857	897	977	355
R^2	0.66	0.79	0.73	0.67	0.55
	Panel II: Country-specific and Global Components of Volatility				
Global Volatility	-3.51***	-6.98**	-2.68***	-4.57***	4.63
	(0.69)	(3.44)	(0.79)	(1.00)	(4.53)
Country-spec. Volatility	-4.29***	-8.44**	-3.28***	-5.84***	-10.21**
	(0.65)	(3.66)	(0.73)	(1.31)	(4.15)
Observations	1,270	857	897	977	355
R^2	0.66	0.79	0.73	0.67	0.55
	Panel III: Time Fixed Effects				
Global Volatility	-3.49***	-5.55	-1.51*	-2.26*	19.03
	(0.89)	(4.58)	(0.86)	(1.19)	(15.96)
Country-spec. Volatility	-4.14***	-6.80	-2.00***	-3.26***	-0.11
	(0.87)	(4.97)	(0.74)	(0.84)	(13.41)
Observations	1,270	857	897	977	355
R^2	0.72	0.85	0.81	0.77	0.69

Notes: This table reports results from the following panel regressions:

$$\Delta X_t^i = \alpha_i + \beta_1 Vol_{t-1}^i + \beta_2 * \Delta X_{t-1}^i + \beta_3 * \Delta X_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 * \Delta y_{t-1}^i + \beta_6 \Delta y_{t-2}^i + \beta_7 * \Delta FX_{t-1}^i + \beta_8 \Delta FX_{t-2}^i + \varepsilon_t^i$$

X denotes GDP, investment, consumption, industrial production, and the negative of the unemployment rate. All regressions include country fixed effects, controls (two lages of market return R_{t-1}^i, and GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of changes in the Exchange rate, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. All variables are quarterly. GDP, investment, consumption, industrial production are expressed as log year-on-year differences. Core Emerging Markets include: Argentina, Brazil, Chile, Colombia, Egypt, India, Indonesia, Malaysia, Mexico, Morocco, Peru, Philippines, South Africa, South Korea, Taiwan, Thailand and Turkey. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 11: Capital Flows and Volatility Shocks: Weighted Regressions

	NX/GDP	Net Inflows	Cap. Outflows	Cap. Inflows
	Panel I: Total Volatility			
Total Volatility	2.21	-2.19	3.60**	-5.61***
	(1.96)	(1.51)	(1.42)	(1.95)
Observations	1,659	1,518	1,652	1,682
R^2	0.70	0.61	0.60	0.50
	Panel II: Country-specific and Global Components of Volatility			
Global Volatility	0.51	-1.90	4.29**	-7.75***
	(1.99)	(1.58)	(2.08)	(2.62)
Country-spec. Volatility	2.50	-2.19	3.58**	-5.52***
	(1.86)	(1.52)	(1.40)	(1.92)
Observations	1,659	1,518	1,652	1,682
R^2	0.70	0.61	0.60	0.50
	Panel III: Time Fixed Effects			
Global Volatility	2.63	-3.79**	2.48	-7.16***
	(2.21)	(1.76)	(2.21)	(2.55)
Country-spec. Volatility	4.39**	-3.36*	2.71	-5.57**
	(2.20)	(1.72)	(1.95)	(2.23)
Observations	1,659	1,518	1,652	1,682
R^2	0.76	0.69	0.64	0.56

Notes: This table reports results from the following panel regressions:

$$CF_t^i = \alpha_i + \beta_1 Vol_{t-1}^i + \beta_2 * CF_{t-1}^i + \beta_3 * CF_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 R_{t-2}^i + \beta_6 * \Delta y_{t-1}^i + \beta_7 \Delta y_{t-2}^i + \beta_8 \Delta FX_{t-1}^i + \beta_9 \Delta FX_{t-2}^i + \varepsilon_t^i$$

CF denotes capital outflows, inflows, or net inflows. All regressions include country fixed effects, controls (two lags of market return R_{t-1}^i, and GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of changes in the Exchange rate, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. The first column provides the results for net exports, the second column for net inflows, the third column for capital outflows, and the fourth column for capital inflows. All variables are quarterly. Countries are weighted by their relative size, as measured by their GDP. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 12: Economic Activity and Volatility Shocks: Weighted Regressions

	GDP	Inv.	Cons.	Ind. Prod.	Empl.
	Panel I: Total Volatility				
Total Volatility	-4.15***	-10.08***	-2.63***	-7.56***	-15.83***
	(0.77)	(2.29)	(0.71)	(2.06)	(4.08)
Observations	1,851	1,288	1,306	1,278	504
R^2	0.69	0.76	0.77	0.69	0.63
	Panel II: Country-specific and Global Components of Volatility				
Global Volatility	-3.66***	-9.43***	-2.27***	-6.63***	-22.85***
	(0.76)	(2.28)	(0.65)	(1.80)	(5.92)
Country-spec. Volatility	-4.28***	-10.27***	-2.73***	-8.68***	-14.77***
	(0.76)	(2.38)	(0.75)	(1.94)	(4.22)
Observations	1,851	1,288	1,306	1,278	504
R^2	0.69	0.76	0.77	0.70	0.63
	Panel III: Time Fixed Effects				
Global Volatility	-2.81***	-6.48**	-1.37	-1.36	-5.33
	(0.96)	(3.08)	(0.88)	(1.60)	(9.41)
Country-spec. Volatility	-3.37***	-8.02**	-1.82**	-3.08*	-5.64
	(0.95)	(3.29)	(0.92)	(1.56)	(8.25)
Observations	1,851	1,288	1,306	1,278	504
R^2	0.74	0.81	0.81	0.79	0.68

Notes: This table reports results from the following panel regressions:

$$\Delta X_t^i = \alpha_i + \beta_1 Vol_{t-1}^i + \beta_2 * \Delta X_{t-1}^i + \beta_3 * \Delta X_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 R_{t-2}^i + \beta_6 * \Delta y_{t-1}^i + \beta_7 \Delta y_{t-2}^i + \beta_8 \Delta FX_{t-1}^i + \beta_9 \Delta FX_{t-2}^i + \varepsilon_t^i$$

X denotes GDP, investment, consumption, industrial production, and the negative of the unemployment rate. All regressions include country fixed effects, controls (two lages of market return R_{t-1}^i, GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of changes in the Exchange rate, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. All variables are quarterly. Countries are weighted by their relative size, as measured by their GDP. GDP, investment, consumption, industrial production are expressed as log year-on-year differences. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 13: Capital Flows and Volatility Shocks: USD Regressions

	NX/GDP	Net Inflows	Cap. Outflows	Cap. Inflows
	Panel I: Total Volatility			
Total Volatility	2.38	-1.73	3.73**	-5.20***
	(2.15)	(1.41)	(1.63)	(1.74)
Observations	1,660	1,519	1,651	1,681
R^2	0.68	0.60	0.57	0.46
	Panel II: Country-specific and Global Components of Volatility			
Global Volatility	2.62	-1.56	3.81**	-5.26***
	(2.16)	(1.29)	(1.86)	(1.94)
Country-spec. Volatility	2.18	-1.87	3.66**	-5.14***
	(2.22)	(1.55)	(1.45)	(1.57)
Observations	1,660	1,519	1,651	1,681
R-squared	0.68	0.60	0.57	0.46
	Panel III: Time Fixed Effects			
Global Volatility	3.67	-2.19	2.68*	-4.37**
	(2.46)	(1.69)	(1.49)	(1.88)
Country-spec. Volatility	4.11*	-2.73	1.39	-3.08**
	(2.40)	(1.85)	(1.13)	(1.50)
Observations	1,660	1,519	1,651	1,681
R^2	0.74	0.68	0.62	0.53

Notes: This table reports results from the following panel regressions:

$$CF_t^i = \alpha_i + \beta_1 Vol_{t-1}^i + \beta_2 * CF_{t-1}^i + \beta_3 * CF_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 R_{t-2}^i + \beta_6 * \Delta y_{t-1}^i + \beta_7 \Delta y_{t-2}^i + \beta_8 \Delta FX_{t-1}^i + \beta_9 \Delta FX_{t-2}^i + \varepsilon_t^i$$

CF denotes capital outflows, inflows, or net inflows. All regressions include country fixed effects, controls (two lags of market return R_{t-1}^i, and GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of changes in the Exchange rate, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. The first column provides the results for net exports, the second column for net inflows, the third column for capital outflows, and the fourth column for capital inflows. All variables are quarterly and in U.S. dollars. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 14: Economic Activity and Volatility Shocks: USD Regressions

	GDP	Inv.	Cons.	Ind. Prod.	Empl.
	Panel I: Total Volatility				
Total Volatility	-2.97***	-7.24***	-1.89***	-4.41***	-11.17***
	(0.75)	(2.46)	(0.53)	(1.47)	(4.00)
Observations	1,850	1,397	1,430	1,389	592
R-squared	0.68	0.76	0.74	0.68	0.65
	Panel II: Country-specific and Global Components of Volatility				
Global Volatility	-3.09***	-6.96**	-1.81***	-4.95***	-10.96***
	(0.80)	(2.80)	(0.61)	(1.42)	(4.13)
Country-spec. Volatility	-2.86***	-7.58***	-1.97***	-3.85***	-12.15***
	(0.69)	(2.19)	(0.49)	(1.38)	(3.87)
Observations	1,850	1,397	1,430	1,389	592
R-squared	0.68	0.76	0.74	0.68	0.65
	Panel III: Time Fixed Effects				
Global Volatility	-2.32**	-4.49	-1.08	-0.76	-4.46
	(0.91)	(3.32)	(0.83)	(1.25)	(6.24)
Country-spec. Volatility	-2.27***	-5.07**	-1.09	-0.35	-3.89
	(0.79)	(2.57)	(0.73)	(0.99)	(7.29)
Observations	1,850	1,397	1,430	1,389	592
R^2	0.73	0.80	0.80	0.77	0.72

Notes: This table reports results from the following panel regressions:

$$\Delta X_t^i = \alpha_i + \beta_1 Vol_{t-1}^i + \beta_2 * \Delta X_{t-1}^i + \beta_3 * \Delta X_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 R_{t-2}^i + \beta_6 * \Delta y_{t-1}^i + \beta_7 \Delta y_{t-2}^i + \beta_8 \Delta FX_{t-1}^i + \beta_9 \Delta FX_{t-2}^i + \varepsilon_t^i$$

X denotes GDP, investment, consumption, industrial production, and the negative of the unemployment rate. All regressions include country fixed effects, controls (two lages of market return R_{t-1}^i, GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of changes in the Exchange rate, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. All variables are quarterly and in USD. GDP, investment, consumption, industrial production are expressed as log year-on-year differences. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 15: Capital Flows and Volatility Shocks: Changes in Volatility

	NX/GDP	Net Inflows	Cap. Outflows	Cap. Inflows
	Panel I: Total Volatility			
Total Volatility	0.28	-1.04	2.08***	-3.56**
	(1.64)	(1.48)	(0.48)	(1.42)
Observations	1,648	1,507	1,644	1,672
R-squared	0.68	0.60	0.57	0.46
	Panel II: Country-specific and Global Components of Volatility			
Global Volatility	-0.65	-0.94	1.18	-3.29***
	(1.72)	(1.70)	(.)	(1.25)
IVolatility	0.69	-1.05	2.16***	-3.58**
	(1.59)	(1.47)	(0.56)	(1.45)
Observations	1,648	1,507	1,644	1,672
R-squared	0.68	0.60	0.57	0.46
	Panel III: Time Fixed Effects			
Global Volatility	0.37	-2.38**	-0.55	-3.00*
	(1.46)	(1.16)	(1.50)	(1.65)
Country-spec. Volatility	1.43	-2.27**	-0.17	-2.46
	(1.37)	(1.14)	(1.37)	(1.95)
Observations	1,648	1,507	1,644	1,672
R-squared	0.74	0.69	0.62	0.53

Notes: This table reports results from the following panel regressions:

$$CF^i_t = \alpha_i + \beta_1 \Delta Vol^i_{t-1} + \beta_2 * CF^i_{t-1} + \beta_3 * CF^i_{t-2} + \beta_4 R^i_{t-1} + \beta_5 R^i_{t-2} + \beta_6 * \Delta y^i_{t-1} + \beta_7 \Delta y^i_{t-2} + \beta_8 \Delta FX^i_{t-1} + \beta_9 \Delta FX^i_{t-2} + \varepsilon^i_t$$

CF denotes capital outflows, inflows, or net inflows. All regressions include country fixed effects, controls (two lags of market return R^i_{t-1}, and GDP growth, Δy^i_{t-1}, Δy^i_{t-2}, two lags of changes in the Exchange rate, ΔFX^i_{t-1}, ΔFX^i_{t-2}, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. The first column provides the results for net exports, the second column for net inflows, the third column for capital outflows, and the fourth column for capital inflows. All variables are quarterly and in USD. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 16: Economic Activity and Volatility Shocks: Changes in Volatility

	GDP	Inv.	Cons.	Ind. Prod.	Empl.
	Panel I: Total Volatility				
Total Volatility	-1.87***	-5.98***	-1.83***	-4.10**	-0.25
	(0.72)	(2.17)	(0.63)	(1.93)	(6.95)
Observations	1,841	1,391	1,424	1,383	591
R-squared	0.68	0.75	0.74	0.68	0.65
	Panel II: Country-specific and Global Components of Volatility				
Global Volatility	-1.76**	-5.93**	-1.66**	-3.60**	7.68
	(0.74)	(2.34)	(0.66)	(1.83)	(8.77)
Country-spec. Volatility	-1.94***	-6.00***	-1.94***	-5.00**	-1.16
	(0.73)	(2.12)	(0.68)	(2.00)	(6.73)
Observations	1,841	1,391	1,424	1,383	591
R-squared	0.68	0.75	0.74	0.68	0.65
	Panel III: Time Fixed Effects				
Global Volatility	-1.93***	-5.32**	-1.56***	-1.34	20.92***
	(0.48)	(2.44)	(0.55)	(0.82)	(7.97)
Country-spec. Volatility	-2.04***	-5.98**	-1.39**	-2.68**	5.76
	(0.41)	(2.57)	(0.60)	(1.12)	(7.01)
Observations	1,841	1,391	1,424	1,383	591
R-squared	0.74	0.80	0.80	0.78	0.72

Notes: This table reports results from the following panel regressions:

$$\Delta X_t^i = \alpha_i + \beta_1 \Delta Vol_{t-1}^i + \beta_2 * \Delta X_{t-1}^i + \beta_3 * \Delta X_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 R_{t-2}^i + \beta_6 * \Delta y_{t-1}^i + \beta_7 \Delta y_{t-2}^i + \beta_8 \Delta FX_{t-1}^i + \beta_9 \Delta FX_{t-2}^i + \varepsilon_t^i$$

X denotes GDP, investment, consumption, industrial production, and the negative of the unemployment rate. All regressions include country fixed effects, controls (two lages of market return R_{t-1}^i, GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of changes in the Exchange rate, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. All variables are quarterly and in USD. GDP, investment, consumption, industrial production are expressed as log year-on-year differences. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 17: Capital Flow Categories and Volatility Shocks: Inflows

	Cap. Inflows	Priv. Cap. Inflows	FDI Inflows	Equity Port. Inflows	Debt Port. Inflows	Other Inflows
	Panel I: Total Volatility					
Total Volatility	-5.90***	-5.78***	-1.11	-0.66	-0.21	-4.25***
	(2.04)	(1.65)	(1.16)	(0.56)	(0.69)	(1.53)
Observations	1,683	1,639	1,647	1,410	1,492	1,663
R^2	0.46	0.41	0.36	0.15	0.20	0.31
	Panel II: Country-specific and Global Components of Volatility					
Global Volatility	-7.49***	-7.24***	-1.75	-0.69	-0.55	-5.09***
	(2.43)	(2.14)	(1.52)	(0.62)	(0.79)	(1.73)
Country-spec. Vol.	-5.90***	-5.78***	-1.09	-0.66	-0.21	-4.25***
	(2.02)	(1.63)	(1.14)	(0.56)	(0.69)	(1.55)
Observations	1,683	1,639	1,647	1,410	1,492	1,663
R^2	0.46	0.41	0.36	0.15	0.20	0.31
	Panel III: Time Fixed Effects					
Global Volatility	-6.17***	-7.64***	-1.21	-0.77	-0.48	-4.40***
	(2.08)	(2.48)	(1.59)	(0.60)	(0.87)	(1.18)
Country-spec. Vol.	-4.82**	-6.82***	-1.15	-0.77	-0.21	-3.21*
	(2.24)	(2.36)	(1.47)	(0.60)	(0.77)	(1.73)
Observations	1,683	1,639	1,647	1,410	1,492	1,663
R^2	0.53	0.48	0.40	0.25	0.28	0.38

Notes: This table reports results from the following panel regressions:

$$\Delta X_t^i = \alpha_i + \beta_1 \Delta Vol_{t-1}^i + \beta_2 * \Delta X_{t-1}^i + \beta_3 * \Delta X_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 R_{t-2}^i + \beta_6 * \Delta y_{t-1}^i + \beta_7 \Delta y_{t-2}^i + \beta_8 \Delta FX_{t-1}^i + \beta_9 \Delta FX_{t-2}^i + \varepsilon_t^i$$

X denotes total, private, FDI, equity portfolio, debt portfolio, and other capital inflows. All regressions include country fixed effects, controls (two lages of market return R_{t-1}^i, GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of changes in the Exchange rate, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. All variables are quarterly and in USD. GDP, investment, consumption, industrial production are expressed as log year-on-year differences. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 18: Capital Flow Categories and Volatility Shocks: Outflows

	Cap. Outflows	Priv. Cap. Outflows	FDI Outflows	Equity Port. Outflows	Debt Port. Outflows	Other Outflows
	Panel I: Total Volatility					
Total Volatility	3.82**	2.72**	1.82	-0.29	0.02	2.54***
	(1.74)	(1.37)	(1.19)	(0.45)	(0.19)	(0.89)
Observations	1,653	1,603	1,473	1,276	1,144	1,622
R^2	0.57	0.53	0.24	0.25	0.39	0.35
	Panel II: Country-specific and Global Components of Volatility					
Global Volatility	4.02*	3.11	3.48*	-0.29	-0.08	2.45*
	(2.28)	(1.97)	(2.10)	(0.48)	(0.31)	(1.35)
Country-spec. Vol.	3.83**	2.72**	1.79	-0.29	0.02	2.54***
	(1.74)	(1.36)	(1.10)	(0.45)	(0.19)	(0.89)
Observations	1,653	1,603	1,473	1,276	1,144	1,622
R^2	0.57	0.53	0.24	0.25	0.39	0.35
	Panel III: Time Fixed Effects					
Global Volatility	1.89	2.25	2.78	0.10	0.29	-0.76
	(2.43)	(2.41)	(2.24)	(1.07)	(0.34)	(2.35)
Country-spec. Vol.	2.18	2.62	1.88	0.44	0.43	-0.52
	(2.10)	(2.18)	(1.72)	(0.83)	(0.37)	(2.20)
Observations	1,653	1,603	1,473	1,276	1,144	1,622
R^2	0.62	0.57	0.28	0.32	0.44	0.42

Notes: This table reports results from the following panel regressions:

$$\Delta X_t^i = \alpha_i + \beta_1 \Delta Vol_{t-1}^i + \beta_2 * \Delta X_{t-1}^i + \beta_3 * \Delta X_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 R_{t-2}^i + \beta_6 * \Delta y_{t-1}^i + \beta_7 \Delta y_{t-2}^i + \beta_8 \Delta FX_{t-1}^i + \beta_9 \Delta FX_{t-2}^i + \varepsilon_t^i$$

X denotes total, private, FDI, equity portfolio, debt portfolio, and other capital outflows. All regressions include country fixed effects, controls (two lages of market return R_{t-1}^i, GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of changes in the Exchange rate, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. All variables are quarterly and in USD. GDP, investment, consumption, industrial production are expressed as log year-on-year differences. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 19: Capital Flow Categories and Volatility Shocks: Other Capital Inflows

	Official sector Inflows	Nonofficial Sector Inflows	Bank Inflows	Private non-bank Inflows
	Panel I: Total Volatility			
Total Volatility	0.94	-4.30***	-2.15***	-1.47***
	(0.57)	(1.42)	(0.67)	(0.53)
Observations	1,558	1,623	1,561	1,561
R^2	0.12	0.36	0.34	0.38
	Panel II: Country-specific and Global Components of Volatility			
Global Volatility	0.55	-5.02***	-2.41***	-1.75**
	(1.00)	(1.85)	(0.83)	(0.79)
Country-spec. Vol.	0.94	-4.30***	-2.15***	-1.47***
	(0.60)	(1.43)	(0.68)	(0.53)
Observations	1,558	1,623	1,561	1,561
R^2	0.12	0.36	0.34	0.38
	Panel III: Time Fixed Effects			
Global Volatility	1.39	-5.73***	-3.46***	-2.30**
	(1.80)	(1.98)	(1.21)	(0.91)
Country-spec. Vol	1.29	-4.97***	-3.13***	-2.01***
	(1.69)	(1.59)	(1.19)	(0.62)
Observations	1,558	1,623	1,561	1,561
R^2	0.19	0.43	0.40	0.47

Notes: This table reports results from the following panel regressions:

$$\Delta X_t^i = \alpha_i + \beta_1 \Delta Vol_{t-1}^i + \beta_2 * \Delta X_{t-1}^i + \beta_3 * \Delta X_{t-2}^i + \beta_4 R_{t-1}^i + \beta_5 R_{t-2}^i + \beta_6 * \Delta y_{t-1}^i + \beta_7 \Delta y_{t-2}^i + \beta_8 \Delta FX_{t-1}^i + \beta_9 \Delta FX_{t-2}^i + \varepsilon_t^i$$

X denotes other official sector, other nonofficial sector, other bank, and other private non-bank inflows. All regressions include country fixed effects, controls (two lages of market return R_{t-1}^i, GDP growth, Δy_{t-1}^i, Δy_{t-2}^i, two lags of changes in the Exchange rate, ΔFX_{t-1}^i, ΔFX_{t-2}^i, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. All variables are quarterly and in USD. GDP, investment, consumption, industrial production are expressed as log year-on-year differences. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 20: Capital Flow Categories and Volatility Shocks: Other Capital Outflows

	Official sector Outflows	Nonofficial Sector Outflows	Bank Outflows	Private non-bank Outflows
	Panel I: Total Volatility			
Total Volatility	0.86*	1.83***	0.95*	0.51
	(0.49)	(0.69)	(0.54)	(0.33)
Observations	1,054	1,579	1,482	1,448
R^2	0.05	0.38	0.06	0.20
	Panel II: Country-specific and Global Components of Volatility			
Global Volatility	0.90	1.96	0.79	0.17
	(0.68)	(1.37)	(0.74)	(0.33)
Country-spec. Vol	0.86*	1.83***	0.95*	0.52
	(0.49)	(0.69)	(0.55)	(0.35)
Observations	1,054	1,579	1,482	1,448
R^2	0.05	0.38	0.06	0.20
	Panel III: Time Fixed Effects			
Global Volatility	0.10	0.37	0.81	0.04
	(0.56)	(1.65)	(1.17)	(0.52)
Country-spec. Vol	0.47	0.60	1.29	0.18
	(0.38)	(1.38)	(0.91)	(0.61)
Observations	1,054	1,579	1,482	1,448
R^2	0.12	0.44	0.15	0.30

Notes: This table reports results from the following panel regressions:

$$\Delta X^i_t = \alpha_i + \beta_1 \Delta Vol^i_{t-1} + \beta_2 * \Delta X^i_{t-1} + \beta_3 * \Delta X^i_{t-2} + \beta_4 R^i_{t-1} + \beta_5 R^i_{t-2} + \beta_6 * \Delta y^i_{t-1} + \beta_7 \Delta y^i_{t-2} + \beta_8 \Delta FX^i_{t-1} + \beta_9 \Delta FX^i_{t-2} + \varepsilon^i_t$$

X denotes other official sector, other nonofficial sector, other bank, and other private non-bank outflows. All regressions include country fixed effects, controls (two lages of market return R^i_{t-1}, GDP growth, Δy^i_{t-1}, Δy^i_{t-2}, two lags of changes in the Exchange rate, ΔFX^i_{t-1}, ΔFX^i_{t-2}, and lagged values of the dependent variable. Panel I focuses on the impact of total volatility. Panel II reports the different impacts of the country-specific and global components of stock return volatilities. Panel III uses the same variables as in Panel II but adds time fixed-effects to focus on the role of uncertainty betas. The table reports the coefficients β_1, the number of observations and the R^2. All variables are quarterly and in USD. GDP, investment, consumption, industrial production are expressed as log year-on-year differences. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Table 21: Stock Return Volatility, Capital Account Openness, and Expropriation Risk

	Vol.	Vol.	Vol.	Vol.
Capital Account Openness	-0.25**	-0.28***		
	(0.10)	(0.11)		
Investment Profile			-0.35***	-0.24***
			(0.10)	(0.09)
Observations	539	539	411	411
R^2	0.086	0.432	0.147	0.451
Country FE	n	y	n	y

Notes: This table reports results from the following panel regressions:

$$Vol_t^i = \alpha_i + \gamma_1 X_{t-1}^i + \varepsilon_t^i$$

where Vol^i denotes the four quarter moving average of total stock return volatility and X^i denotes the Chinn-Ito (2008) or the ICRG Political Risk index for country i. All variables are normalized to have mean zero and variance one. Regressions include or not country fixed effects. The table reports the coefficients γ_1, the number of observations and the R^2. All variables are annual. The number of observations varies in each regression because of data availability; for each variable, all countries with available data are included. Standard errors are clustered by country and time. Three stars (***) denote significance at the 1% confidence level, while two stars (**) and one (*) star denote significance at the 5% and 10% confidence levels.

Appendix D Model Simulations

Let ω denote the relative wealth and x the expropriation event. Recall that $S^{f,h}$ denote the holdings of foreign household of the domestic asset, σ the stochastic volatility of the dividend process, and p the disaster probability. For each of these variables we first define a discrete grid. All policy functions are approximated at each σ, x, p by

$$f(\omega, S^{f,h}, \sigma, x, p) = \sum_{i=0}^{n_w} \sum_{j=0}^{n_{S^{f,h}}} \phi_{ijp} \Psi_{ij}(w, S^{f,h}) \qquad \text{(Appendix D.1)}$$

where $\Psi_{ij}(k, b) = T_{i-1}(2((\omega - \underline{\omega})/(\overline{\omega} - \underline{\omega}) - 1)T_{j-1}(2((S^{f,h} - \underline{S^{f,h}})/(\overline{S^{f,h}} - \underline{S^{f,h}}) - 1)$, $T_l(x) = cos(l\ arccos\ x)$, $l = 0, 1, ..., n_x$ and $x = \omega, S^{f,h}$ generate the Chebyshev polynomials of degree n_x. The higher the degree of the polynomial the more precise is the solution. Let $\underline{\omega}$ denote the lower bound for the share of wealth and $\overline{\omega}$ the upper bound. The bounds for $S^{f,h}$ follow the same notation.[11] While other basis functions can be used Chebyshev polynomials have the useful feature of being orthogonal on $[-1, 1]$ with respect to the inner product defined by the weighting function $(1 - k^2)^{-1/2}$. This makes it feasible to keep the number of unknown coefficients low. The central idea of the collocation method is to pick (collocation) points for $\omega, S^{f,h}, \sigma, x, p$ for which a to be defined residual function $R((\omega, S^{f,h}, \sigma, x, p, \phi) = 0$. Regarding the choice of the collocation points the *Chebyshev Interpolation Theorem* says, see Judd (1992), that the choice of the Chebyshev zeroes is optimal for rapid convergence with an increasing number of collocation points. The zeroes of a Chebyshev polynomial of order N can be found through

$$x_k = cos\left(\frac{(2k+1)\pi}{2N}\right) \quad \text{for} \quad k = 0, 1, ..., N-1 \qquad \text{(Appendix D.2)}$$

The policy functions that to be approximated are $P(\omega, S^{f,h}, \sigma, x, p), P^*(\omega, S^{f,h}, \sigma, x, p)$,

$C(\omega, S^{f,h}, \sigma, x, p), C^*(\omega, S^{f,h}, \sigma, x, p), S^{h,h}(\omega, S^{f,h}, \sigma, x, p), S^{h,f}(\omega, S^{f,h}, \sigma, x, p), S^{f,h}(\omega, S^{f,h}, \sigma, x, p)$ and $S^{f,f}(\omega, S^{f,h}, \sigma, x, p)$. Each iteration consists of two key steps: First, given the guess for the policy functions and all possible combinations of states tomorrow we solve for the implied relative wealth tomorrow, ω'. Using the guess for the policy functions and ω' we can then compute expectations and solve the for the coefficient ϕ that imply $R((\omega, S^{f,h}, \sigma, x, p, \phi) = 0$. There is a trade of between precision of the solution

[11] Chebyshev polynomials can also be generated recursively, $T_0(k) = 1$, $T_1(k) = k$, by $T_{n+1}(k) = 2kT_n(k) - T_{n-1}(k)$ for $n = 2, 3, ...$

and computational feasibility. While higher order polynomials allow for highly non-linear policy functions, they lead to a large number of unknown coefficients at the same time which makes the computation of the solution very difficult. In order to ease this problem we therefore start with a low order polynomial for the state variables $S^{f,h}(\omega, S^{f,h}, \sigma, x, p)$. A crucial element to reach convergence is the initial guess for the ϕ coefficients. It is helpful to use the solution of a the model without expropriation risk as initial guess for the model with expropriation risk. Updating of the guess via a Levenberg-Marquardt algorithm and iterating until convergence gives the solution to the model. The Jacobian for the Levenberg-Marquardt method is computed analytically which results in a significant computational speedup compared in comparison to computing it via finite differences. The result of the low order polynomial can be used to increase the order of the polynomials where the additional coefficients are assigned a zero initial guess.