

Navigating External Shocks: Capital Flow Responses and Policy Effectiveness in Turbulent Times

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I. Introduction

Building a deep financial system through capital market liberalization can promote economic growth, but it also increases the risk of economic crises. Figure 1 shows the correlation between the degree of freedom in international capital movements (capital mobility) and the frequency of global banking crises (share of countries in banking crisis) from 1800 to 2010, suggesting that the freer the cross-border movement of financial capital, the higher the frequency of global banking crises. Kaminsky and Reinhart (1999) reported that in 18 out of the 26 banking crisis episodes that occurred between 1970 and 2000, the countries' financial markets had been opened up within 5 years prior to the crisis.

Rapid cross-border capital movements increase instability in financial and foreign exchange markets, and can trigger economic cri-

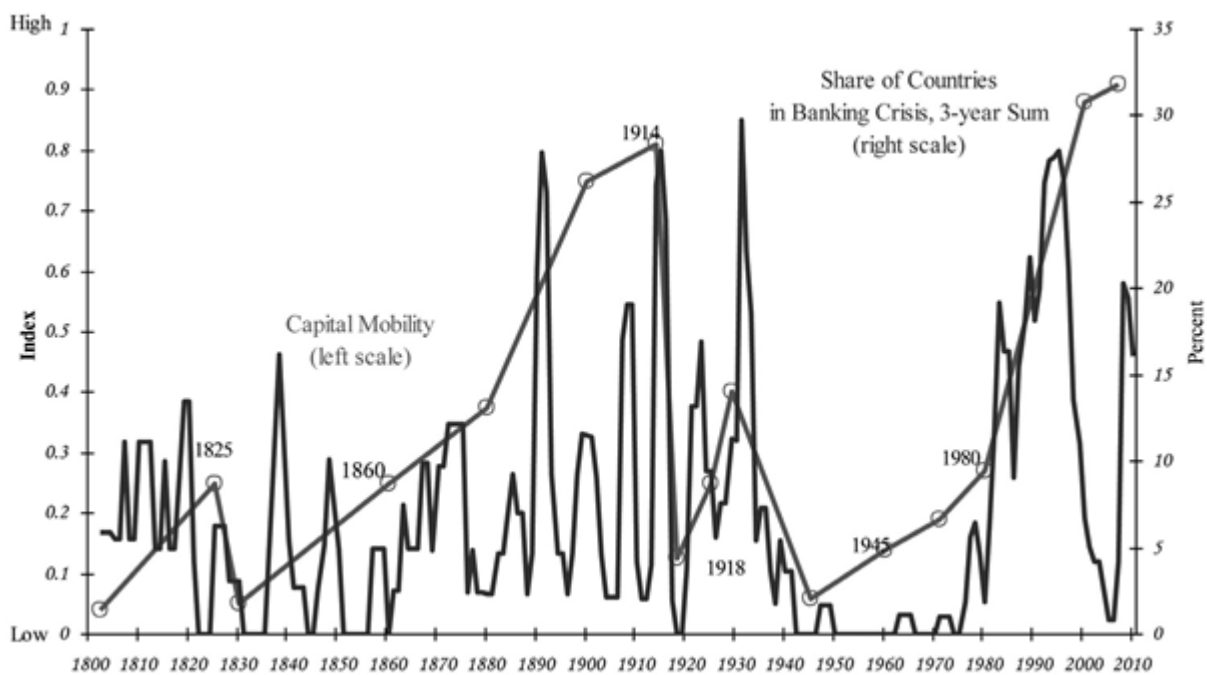
ses. When the degree of freedom in international capital movements is high, large amounts of financial capital flow into emerging markets with rapid economic growth in pursuit of higher investment returns. This leads to inflated asset prices, increased leverage, and credit expansion. Substantial capital inflows cause an overvaluation of the recipient country's currency and widen its current account deficit, increasing the likelihood of a "Sudden Stop" economic crisis. Capital inflows and outflows serve as major channels for cross-border risk transmission, and abrupt capital movements can trigger domestic systemic risks, heightening macroeconomic volatility.

During the COVID-19 pandemic crisis, financial imbalances intensified due to increased fiscal spending and quantitative easing by ma-

major countries. The unprecedented implementation of asset purchase programs (quantitative easing) led to a massive influx of liquidity into the asset markets of each country, causing asset prices to rise while the real economy stagnated, resulting in an imbalance. In the immediate aftermath of the pandemic crisis, a much larger amount of funds flowed into emerging markets compared to the periods following the

2008 global financial crisis and the 2013 Taper Tantrum, worsening their resilience to external shocks.¹ Along with financial imbalances, interest rate hikes by major countries triggered by global inflation in 2022 have exacerbated the policy environment for countries around the world, which must simultaneously achieve financial market stability and economic recovery.

Figure 1. Capital Mobility and the Incidence of Banking Crisis



Note: The degree of freedom in international capital movements (Capital Mobility) is represented by the circular gray solid line with an index on the left axis, where values closer to 1 indicate a higher degree of freedom. The frequency of global banking crises is represented by the black solid line on the right-hand side's percentage scale, showing the 3-year moving average of the total proportion of countries experiencing banking crises.

Source: Reinhart (2012), Figure 5

¹ Kim, KwonSik (2021)

Today, with the intensifying US-China strategic competition, the Russia-Ukraine situation, the Israel-Hamas war, and the strengthening of protectionism and nationalist policies, the trend of de-globalization is leading to the international regime of trade norms and financial infrastructure being weaponized as tools for sanctions. This adds greater uncertainty to the spillover effects of cross-border capital flows between countries. Accordingly, this article examines major external shocks, policy responses, and the status of cross-border capital inflows and outflows in the aftermath of the pandemic crisis, and reassesses the effects of great uncertainty on capital flows. Additionally, it aims to draw policy implications by utilizing the key models of the Integrated Policy Framework currently being developed at the IMF.

II. The Impact of External Shocks on Capital Flows

The COVID-19 shock and global inflation have increased uncertainty across the entire economy, including financial market instability, economic slowdown, and corresponding fiscal and monetary policy responses. When economic uncertainty heightens, international investors become more risk-averse, potentially triggering rapid capital outflows. For small open economies with high external dependence, like South Korea, the negative impact of increased uncertainty can be significant. Accordingly, this study analyzes the effects of global uncertainty shocks (Figure 2)

on capital inflows and outflows, as well as on financial and macroeconomic variables, through panel regression analysis.

We analyzed the impact of economic uncertainty indices on capital inflows using the following panel regression model.

$$y_{i,t} = \alpha + \beta EPU_{i,t} + \Gamma X_{i,t} + \gamma_i + \delta_t + \epsilon_{i,t}.$$

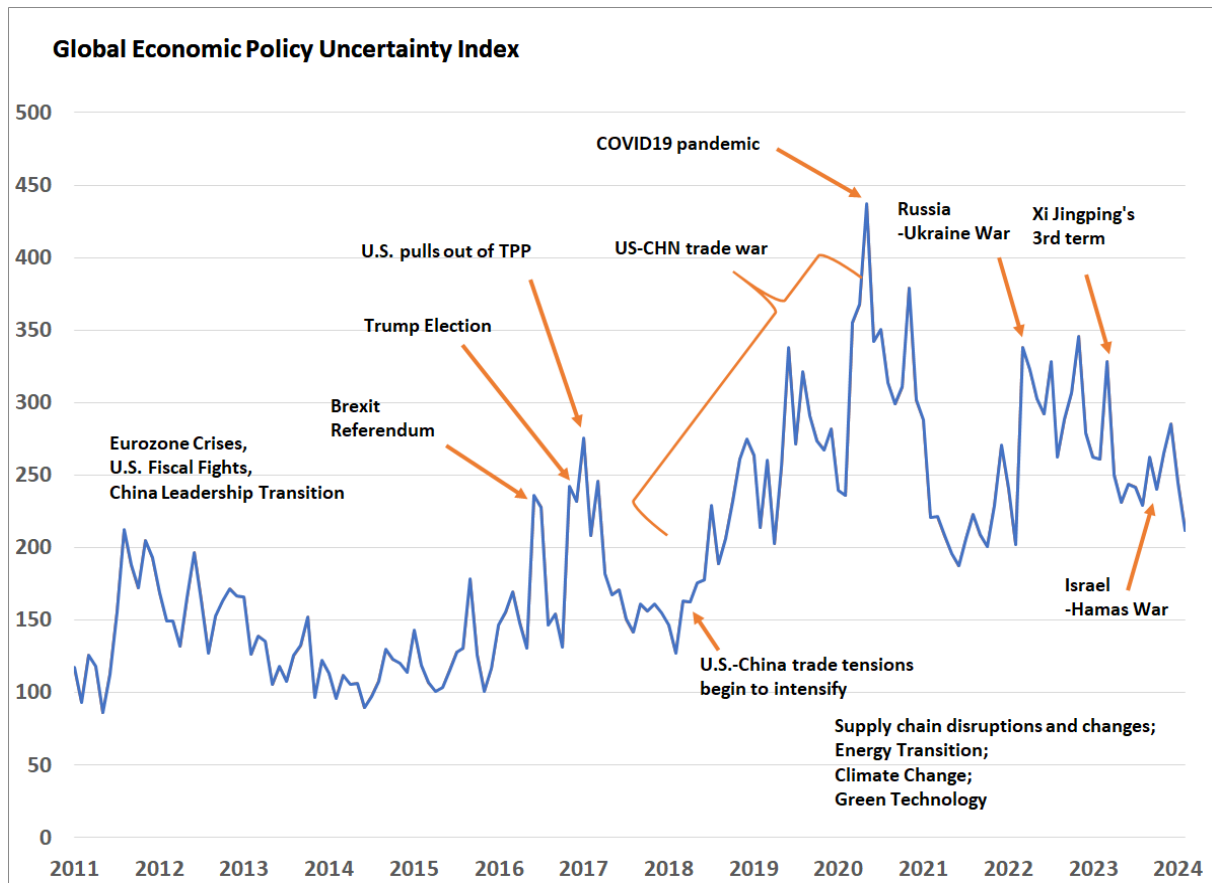
In the above equation, i represents the country, and t represents the monthly time period. The dependent variable y is total gross capital inflows as a percentage of GDP, where total gross capital inflows is the sum of direct investment, portfolio investment, and other investment by non-residents in the country. EPU represents the Economic Policy Uncertainty index, and X denotes the control variables. γ represents country fixed effects, and δ represents monthly time fixed effects. We consider models using both the Global EPU (GEPU) and the country-specific EPU (CEPU).

The dependent variable is total gross capital inflows as a percentage of GDP, and the main independent variables are the log-transformed volatility indices (GEPU, CEPU). The control variables are the change in exchange rates against the U.S. dollar, GDP growth rate, and the sum of each country's net acquisition of financial assets and net incurrence of liabilities. The model is estimated using the least square dummy variable method, and the analysis results are presented in Table 1. Considering that the time series observations are relatively

large compared to the number of countries included in the analysis, we calculated standard errors that account for autocorrelation in the error terms, as proposed by Driscoll-Kraay. Models (1), (2), and (3) report the results using

the global uncertainty index (GEPU) as the explanatory variable, while models (4) and (5) use the country-specific uncertainty index (CEPU).

Figure 2. Trends in the Global Economic Policy Uncertainty Index and Overview of Major Events



Source: Global Economic Policy Uncertainty Index (www.policyuncertainty.com)

According to the estimation results of Model (1), an increase in the global uncertainty index (GEPU) decreases total capital inflows. A similar result was obtained in Model (2), which additionally considers control variables such as GDP and exchange rate growth rates. On the other hand, in Models (4) and (5), the

country-specific uncertainty index (CEPU) does not exhibit a statistically significant relationship with capital flows. This result may be attributable to the differences in the countries analyzed. Therefore, in Model (3), we used the global uncertainty index (GEPU) as the explanatory variable based on the same set of

countries as in Models (4) and (5). The coefficient of GEPU decreased compared to Models (1) and (2) but still showed a statistically significant negative relationship with capital inflows. This suggests that fluctuations in capital inflows are more closely associated with external factors than with uncertainty arising from domestic factors. While the exchange rate change and total capital flows showed a positive correlation with capital inflows in Model (2), the results were statistically insignificant. Regardless of the model specification,

economic growth rate exhibited a positive correlation with capital inflows.

III. Analysis of the Spillover Effects of External Shocks and Economic Stabilization Policies

Now we analyze the spillover effects of an increase in foreign interest rates by using the IMF's Integrated Policy Framework model.

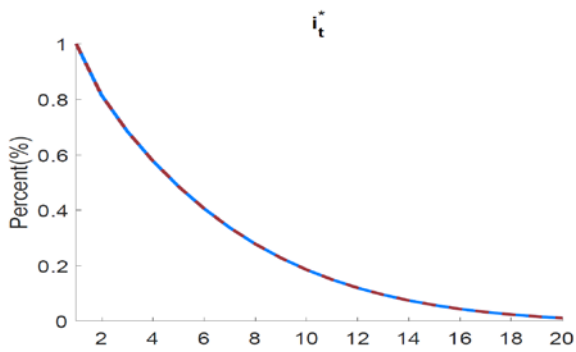
Table 1. Results from Panel Regression Analysis

	Dependent Variable: Total Capital Inflows as a Percentage of GDP				
	Global Economic Policy Uncertainty			Country-specific Economic Policy Uncertainty	
	(1)	(2)	(3)	(4)	(5)
GEPU	-0.029** (0.004)	-0.036** (0.004)	-0.008** (0.004)		
CEPU				0.001 (0.007)	0.002 (0.007)
Exchange Rate Growth		0.053* (0.028)	0.051 (0.037)		0.053 (0.037)
GDP Growth		0.077*** (0.021)	0.072** (0.031)		0.073** (0.031)
Total Financial Capital	0.025* (0.013)	0.025* (0.013)	0.017 (0.028)	0.014 (0.028)	0.017 (0.028)
Observations	5,576	5,576	2,927	2,927	2,927
Countries	33	33	14	14	14

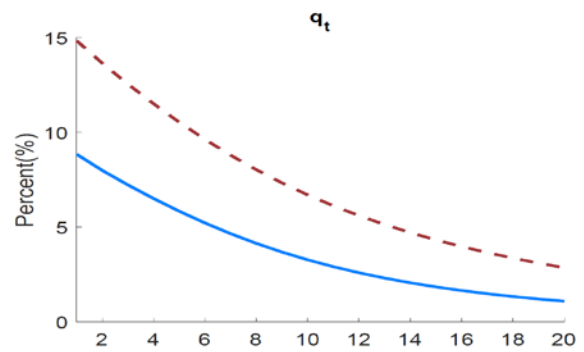
Note: Total Financial Capital is the sum of net acquisition of financial asset and net incurrence of liabilities. We obtain capital flow and GDP data from the OECD and IFS. GEPU and CEPU data are taken from the Economic Policy Uncertainty Index website. Exchange rate and total financial capital data are obtained from the IFS. The time period for data covers Jan 1995 to May 2023.

Source: Author's calculation.

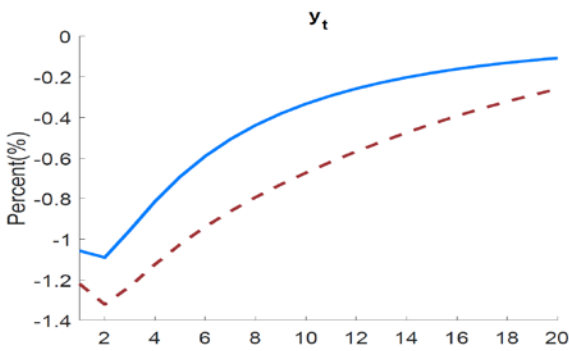
Figure 3. Macroeconomic Variable Responses to a 1% Increase in Foreign Nominal Interest Rates



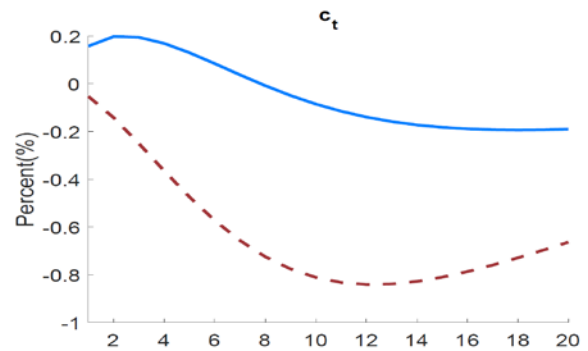
A. World Interest Rate



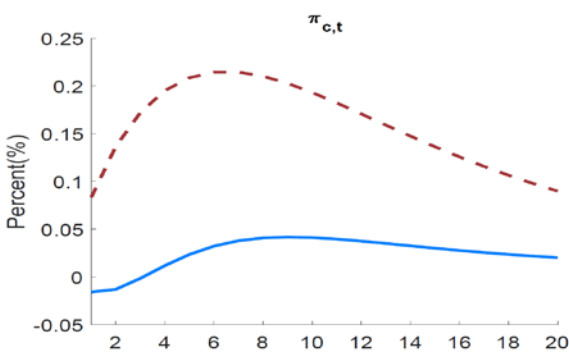
B. Real Exchange Rate



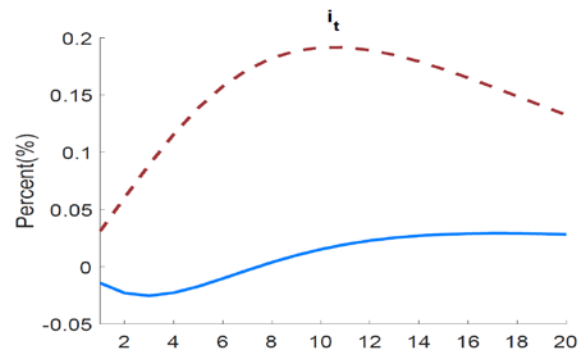
C. Output



D. Consumption



E. CPI Inflation



F. Nominal Interest Rate

Note: The values on the x-axis denote the number of quarters after the impact of shocks. The values on the y-axis show the percentage deviation from the steady state. The blue solid line stands for responses of advanced economies while the red dotted line denotes responses of emerging markets.
Source: Author's calculation.

We particularly focus on the global monetary tightening trend that began in March 2022. By adopting the model and Bayesian estimation results described by Chen, Kolasa, Lindé, Wang, Zabczyk, and Zhou (2023), the ripple effects of the global interest rate hike on advanced small open economies and emerging small open economies, as well as the effects of economic stabilization policies, are analyzed.

Figure 3 illustrates the spillover effects of a 1% increase in foreign nominal interest rates on advanced small open economies and emerging small open economies. According to the simulation results of the impact of the increase in foreign nominal interest rates, as foreign interest rates rise, the spread between domestic and foreign interest rates widens, leading to capital outflows from the country and an increase in the exchange rate. Due to the rise in the exchange rate, imported goods prices increase, resulting in inflation. The increase in foreign interest rates dampens economic growth in foreign economies, leading to a decrease in demand for exports from the home country and negatively impacting production.

The spillover effect of rising overseas nominal interest rates on advanced and emerging economies is appearing asymmetrically. If overseas interest rates rise 1 percentage point above the steady-state equilibrium, exchange rates in emerging economies rise 14.8% above the steady-state equilibrium, while in advanced economies they rise 8.8%. This is because the depreciation pressure from rising

overseas interest rates is greater in emerging economies with shallower foreign exchange markets. As the economies abroad slow down due to rising overseas interest rates, foreign demands decrease, reducing exports, and import prices rise due to currency appreciation, also reducing imports. As both imports and exports decline, with exports declining relatively more, the trade balance records a deficit. In both emerging and advanced economies, the trade balance to GDP ratio decreases by 1.18% immediately after the rate hike, but the trade balance turns to a surplus faster in emerging economies due to the export promotion effect from higher exchange rates lasting longer. Rising exchange rates increase prices of imported intermediate goods, leading to higher domestic production costs and thus reduced domestic production. Simulations show production declining by -1.22% in emerging economies and -1.06% in advanced economies, with the recovery to equilibrium slower in emerging economies where exchange rate appreciation is greater.

In emerging economies, consumer prices rise nearly 0.2 percentage points after the fourth quarter, but in advanced economies, the fluctuation in consumer prices is less than 0.05 percentage points, showing little significant change. Inflation expectations are well-anchored and advanced economies with deep foreign exchange markets face less inflationary pressure. Their strong economic fundamentals also lead to lower capital outflow

pressure, resulting in smaller increases in exchange rates and prices compared to emerging economies. In emerging economies, policy rates rise nearly 0.2 percentage points with a lag, but in advanced economies, policy rates actually decline due to decreased domestic production from weak export demand.

In terms of the effects of economic stabilization policies, combining monetary policy and foreign exchange intervention is more effective in stabilizing the economy against the shock of rising overseas interest rates than using monetary policy alone. Under the setup of our simulation, the real exchange rate rose 8.8% with monetary policy alone while the exchange rate rise was set to be limited to half at 4.4% by combining foreign exchange market intervention and capital flow management policies. Three policy stances were compared: (i) monetary policy alone, (ii) combined monetary policy and foreign exchange intervention, and (iii) combined monetary policy and capital flow management. The combination of monetary policy and foreign exchange intervention showed the greatest economic stabilization effect. When monetary policy was combined with foreign exchange intervention, inflation stabilized faster, consumption increased more, and the output decline was smaller. In advanced economies where inflation expectations are anchored, monetary policy responded more sensitively to output declines than inflation.

IV. Implications

This study analyzed the effects of uncertainty and interest rate hike shocks on capital flows, as well as the effectiveness of economic stabilization policies. When comparing the impacts of global economic policy uncertainty shocks and individual country economic policy uncertainty shocks, empirical analysis showed that global economic policy uncertainty shocks had a significant effect on capital flows. This suggests that global factors are more closely associated with capital flows than country-specific factors, relating to discussions on the global financial cycle. Although classified as an advanced economy, Korea has a shallow foreign exchange market and its financial markets are sensitive to external shocks, so the spillover effects of uncertainty shocks need to be analyzed through various channels like trade, capital transactions, industrial structure, and monetary policy. As financial globalization progresses with Fintech and digital finance, the spillover effects of external shocks through capital transactions are expected to increase, especially requiring close monitoring of shocks from countries with similar industrial structures to Korea.

An integrated policy framework analysis found that for emerging economies without anchored inflation expectations and shallow foreign exchange markets, a combination of monetary policy and foreign exchange intervention was effective for economic stabilization. Recently, major international organizations like the IMF, BIS, and OECD have

shifted towards allowing some foreign exchange intervention and capital flow management measures to reduce exchange rate and capital flow volatility and achieve financial stability. Since there is a general consensus that Korea does not have a deep foreign exchange market, an appropriate combination of monetary policy, foreign exchange intervention, and capital flow management measures

can help reduce exchange rate volatility. As Korea's foreign exchange market advances and if Korea succeeds to join major global bond indices, its sensitivity to external factors may increase, so measures to assess the depth and maturity of Korea's foreign exchange and financial markets are needed to determine the optimal policy mix. **KIEP**