

Capital Outflow Waves in the Korean Economy during Financial Turmoil: Its Implications and Policy Suggestions*

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Abstract

Purpose – This paper investigates whether financial crises could be the indicators of capital outflow waves or vice versa in Korea. Korea has experienced two severe financial crises, which are the Asian Crisis and the global financial crisis. Although there were many variables associated with these two remarkable events, one notable variable was gross capital outflows, which had significantly increased around them. Motivated by existing literature which built theoretical frameworks explaining the relationship between capital flight and financial crises, we examine the empirical evidence for this relationship.

Design/methodology – We use panel data from 61 countries including Korea from 1980 to 2009 to study the associations between capital flight and diverse financial crises such as banking, currency, debt, and inflation crises. To be specific, we use the complementary log-log model to see whether capital outflow waves are reliable indicators for domestic financial crises.

Findings – The results show, first, that banking, currency, and inflation crises are associated with capital flight. Second, debt crises are also associated with capital flight, but the result is not robust to different specifications. And, third, the positive associations between capital flight and crises are mainly driven by banking flows rather than FDI and portfolio flows.

Originality/value – This paper is one of a few studies that investigates domestic (not foreign) investors' behavior during financial turmoil. Furthermore, theoretical studies which provide contradictory explanations on the movements of gross capital outflows during financial crises emphasizes the importance of empirical evidence in this paper.

Keywords: Banking Flows, Gross Capital Outflows, Financial Crisis, Flights

JEL Classifications: F21, F32, F40, G01

1. Introduction

As capital outflows by domestic agents in the global economy have been increasing significantly in recent years, new literature is focusing on its impacts on the domestic economy. Unsurprisingly, Korea is also following this trend and Fig. 1 shows it.

As we can see from this figure, gross capital outflows in Korea have been increasing since 1980 (0.81 % of GDP) and were the largest in 2007 (8.46 % of GDP). This is, to some extent, because of recently liberalized and developed financial markets in Korea. Meanwhile, one interesting feature emerges from the figure. That is, it shows that gross capital outflows have especially surged before two remarkable financial crises that depressed the Korean economy, which are the Asian Crisis and the global financial crisis. Does this imply capital outflow waves convey information about financial crises (or vice versa) in the country?

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Fig. 1. Gross capital outflows in Korea between 1980 and 2009

Source: IMF BOPS and WEO.

To answer this question, this paper investigates the associations between capital flight and diverse financial crises in 61 countries, including banking, currency, debt, and inflation crises. Specifically, we examine whether financial crises are leading or lagging indicators (signal or symptom) of capital flight. Here, capital flight means a large number of foreign asset purchases by domestic agents.¹ If capital outflow movements are associated with financial crises, the Korean government is able to implement proper policies quickly by observing them to prevent the crises or to reduce the damage induced. Moreover, if large and volatile capital outflows result from domestic crises, capital outflow controls may be warranted.

There are, to my knowledge, few empirical studies of this association but some work using DSGE models describes how productivity shocks affect optimal portfolio allocations between two countries. Regarding a financial crisis as a kind of negative productivity shock, its impact on capital outflows can be explained theoretically but some of the results are contradictory. For example, Tille and van Wincoop (2010) argue that negative productivity shocks decrease the price of domestic equity and expected excess returns on it. As a result, people reduce domestic asset purchases and gross capital outflows become counter-cyclical. On the contrary, Hnatkovska (2010) argues that gross capital outflows are pro-cyclical. By her account, negative productivity shocks in the nontradable sector raise the relative riskiness of domestic tradable equity while increasing its relative risk premium. As a result, domestic agents are motivated by the prospect of higher returns to purchase domestic rather than foreign equity. These contradictory theoretical explanations of gross capital outflows emphasize the importance of empirical evidence on the question.

To briefly explain our results, first, banking, currency, and inflation crises are positively associated with capital flight. Second, debt crises are also associated with capital flight, although they are not robust to the specification of the regression. Third, the results show that positive associations between capital flight and domestic crises are mainly driven by banking flows rather than FDI and portfolio flows. FDI and portfolio flows are actually negatively associated with financial crises. We find similar results for the Korean economy and,

¹ See Section 3.2 for the formal definitions.

therefore, it necessitates proper policy reactions to prepare for and respond to related financial crises when the country is experiencing capital flight.

The paper is organized as follows. Section 2 discusses the relationships between capital outflows and financial crises, while Section 3 explains the data used for the study, the formal definition of capital flight, and the estimation strategy. Section 4 presents the main results and examines the case of South Korea. Section 5 concludes.

2. Linkages between Capital Outflows and Financial Crises

Capital outflows and financial crises could be related to each other in diverse ways. On the one hand, financial crises might cause capital flight because people would prefer to purchase less risky foreign assets if severe financial distress is present in the domestic economy. Conversely, capital outflows may cause financial crises. For example, speculative attacks by domestic investors can cause currency crises and following inflation crises in a country. Moreover, joint causality between two events is plausible. Specifically, investors' expectations of future crises as a result of bad fundamentals may encourage them to invest abroad, making their prediction of these crises self-fulfilling. This section briefly discusses the relationships between capital outflows and financial crises.

The relationship between capital outflows and banking crises is straight-forward. According to our definition, a banking crisis generates significant signs of financial distress in the country's banking system and necessitates policy intervention. In this case, domestic agents would withdraw their deposits from domestic banks and transfer to foreign banks, consequently causing bankruptcies. More importantly, such bank runs could be triggered by panic rather than agents' rational expectations. Since the seminal paper of Diamond and Dybvig (1983), many papers have attempted to prove panic-based contagion in banking crises, and experimental economics has made an especially notable contribution. For instance, Chakravarty et al. (2014) show that a run on one bank triggers a run on other banks even though their liquidity and solvency are unrelated. See Dufwenberg (2015) for a survey of the literature. According to them, capital flight, rather than retrenchment, could be positively associated with banking crises.

Given the tendency of large capital outflows to depreciate the domestic currency, the relationship between capital flight and currency crises is also clear. A flight might indicate domestic agents' speculative attacks on the domestic currency. For instance, if domestic investors have internal information that the government does not have enough reserves to defend its peg regime, they will attempt to depreciate it (See Obstfeld, 1996). Moreover, if such depreciation is chronic, speculations could be prolonged, causing the currency to collapse further. In the worst case, an inflation crisis may follow. It is noteworthy that several developing countries tried to stabilize their currencies by managing exchange rates. However, many of them failed and indeed only encouraged attacks (See Dornbusch, 1986). Such historical evidence suggests that currency and inflation crises are related to capital flight.

After observing Latin-American debt crises in the 1970s and 1980s and consequent capital flight from the region, many researchers have attempted to explain why private-sector investors fled domestic markets during a period of increasing probability of a debt crisis. Dooley (1988) explains this phenomenon by the difference in domestic-asset risk perceived by residents and non-residents, respectively. That is, ex-ante risk perceived by residents is higher than that perceived by nonresidents because of factors such as taxation on investment or inflation rate risk. As a result, the ex-post risk premium underestimates residents' risk while overestimating that of nonresidents', so simultaneous debt inflows and private capital outflows occur. Similarly, Alesina and Tabellini (1989) and Khan and Haque (1985) argue

that capital flight is caused by expropriation risk that residents tend to face when the government over-accumulates external debts. According to their analyses, capital flight is a fleeing behavior intended to avoid domestic uncertainty, and they build theoretical frameworks to explain why capital flight is associated with debt crises. Indeed, they show capital flight to be significantly associated with debt crises even though one does not directly cause the other.

The discussion in this section thus provides the hypotheses of this paper: first, capital flights are positively associated with financial crises. Second, banking flows mainly drive this positive relationship between the two.

3. Data and Estimation Strategy

3.1. Data

We use annual data for 61 countries including South Korea from 1980 to 2009. See Table 1 for the list of countries. Gross capital outflows, the key variable for defining capital flight, are net foreign asset purchases (gross foreign asset purchases net of sales) by domestic agents that include (1) FDI, (2) portfolio investment (equities and debts), and (3) other investment (e.g., trade credits, loans, and deposits).

Table 1. The List of Countries

Countries in the data		
South Korea	Albania	Angola
Argentina	Armenia	Azerbaijan, Rep. of
Belarus	Bolivia	Bosnia and Herzegovina
Botswana	Brazil	Bulgaria
Chile	China, P.R.: Mainland	Colombia
Congo, Republic of	Costa Rica	Croatia
Dominican Republic	Ecuador	Egypt
El Salvador	Gabon	Georgia
Guatemala	Honduras	India
Indonesia	Jamaica	Jordan
Kazakhstan	Latvia	Libya
Lithuania	Macedonia	Malaysia
Mauritius	Mexico	Moldova
Mongolia	Morocco	Namibia
Nicaragua	Pakistan	Paraguay
Peru	Philippines	Poland
Romania	Russian Federation	South Africa
Sri Lanka	Swaziland	Syrian Arab Republic
Thailand	Tunisia	Turkey
Ukraine	Uruguay	Venezuela, R.B.
Vietnam		

Notes: Total 61 countries.

For the independent variable, the model uses four different kinds of crises, which are the main interests of this paper; banking, currency, debt, and inflation crises. Each is an indicator

variable, which is 1 if a country is experiencing the corresponding crisis in a given year and 0 otherwise. Banking and currency crisis data are from Laeven and Valencia (2012). According to them, a country experiences a systemic banking crisis if there are 1) significant signs of financial distress in the banking system (e.g., significant bank runs, losses in the banking system, and/or bank liquidations) and 2) significant banking policy intervention measures in response to significant losses in the banking system. A currency crisis is defined as a nominal depreciation of the currency vis-à-vis the U.S. dollar of at least 30 percent and at a rate of depreciation at least 10 percentage points higher than the rate of depreciation in the previous year. A debt crisis is defined as per Broner et al. (2013), originally from Reinhart and Rogoff (2009) but supplemented by Standard and Poor's data; a country has a debt crisis in a given year if it downgrades to default levels for sovereign local-currency debt (a domestic debt crisis) or for sovereign foreign-currency debt or the sovereign foreign-currency bank loans (an external debt crisis). The indicator variable for an inflation crisis is 1 if the inflation rate in a country is over 40%. Additionally, we define 'financial crisis' using an indicator variable that is 1 if a country has experienced any of these four types of crises in a given year. Note that we only consider the initial year of each crisis because the end of the crisis is ambiguous in several cases. Moreover, it is hard to regard capital outflow waves in the middle of long-lasting crises as a significant response to them (or vice versa).²

For control variables that are expected to reduce omitted-variable bias in the estimator, we added the global real interest rate (GLOBRATE) and global real GDP growth (GLOBGDP) as global common factors and capital market openness (KAOPEN), domestic real GDP growth (ZGDP), and exchange rate regime (EXREGIME) as domestic specific factors. Global real interest rate and global real GDP growth rate are the averages of the G7 countries³ real interest rates and real GDP growth while capital market openness is from Chinn and Ito (2006), which designates a more open economy with higher values. Finally, the exchange rate regime variable is a fine classification ranging from 1 to 16, with a larger index indicating a more flexible regime. Most of these variables are identified as significant determinants of capital flight in other research (e.g., Calderón and Kubota, 2013; Forbes and Warnock, 2012a). See Table 2 for a summary of these definitions and sources.

Table 2. Data Sources

Variable	Definition	Source
Gross Capital Outflows (% of GDP)	Net foreign-asset purchase by domestic agents. Foreign assets consist of foreign direct investment, portfolio investment, and other investment	IMF, BOPS
Crisis	Indicator variable that is	
Banking Crisis	1 if there is 1) significant signs of financial distress and 2) significant banking policy intervention in the banking system.	Laeven and Valencia (2012)

² Considering the initial year only also reduces endogeneity bias to some extent.

³ U.S., U.K., Canada, Italy, France, Germany, and Japan

Table 2. (Continued)

Variable	Definition	Source
Currency Crisis	1 if nominal depreciation of the currency vis-à-vis the U.S. dollar is at least 30 percent and also at least 10 percentage points higher than the rate of depreciation in the year before.	Laeven and Valencia (2012)
Debt Crisis	1 if a country defaults by local-currency debts or by foreign-currency debts	Reinhart and Rogoff (2009) and Broner et al. (2013)
Inflation Crisis	1 if the inflation rate is larger than 40%	Author's calculation
Financial Crisis	1 if a country experiences any of banking, currency, debt, and inflation crises.	Author's calculation
Global real interest rate (%)	The average of G7 countries' real interest rate	IMF, IFS
Global real GDP real growth (%)	The average of G7 countries' GDP growth	World Bank
Real GDP growth (%)		IMF, WEO
GDP (nominal and real)		IMF, WEO
Capital market openness	Higher values indicate greater financial openness.	Chinn and Ito (2006)
Exchange rate regime	The index ranged from 1 to 16. 16 means the most flexible regime.	Ilzetzi, Reinhart and Rogoff (2016)

3.2. Definition of Capital Flight

Capital flight indicates large-scale purchasing of foreign assets by domestic agents. That is,

- Flight

$$\begin{cases} 1 & \text{if } KO_{jt} \in \left\{ \text{top } 30\% \text{ of } (KO_{js})_{s=1}^T \right\} \cap \left\{ \text{top } 30\% \text{ of } (KO_{js})_{j=1, s=1}^{N,T} \right\} \\ 0 & \text{otherwise} \end{cases}$$

where KO is gross capital outflows.

Additionally, to study the detailed relationships between capital flight and crises, we use different definitions for flight episodes. First, the top 30 percent may be generous to indicate a large purchasing of capital assets in a country. For this reason, we define "severe flight" as follows:

- Severe Flight

$$\begin{cases} 1 & \text{if } KO_{jt} \in \{ \text{top 20\% of } (KO_{js})_{s=1}^T \} \cap \{ \text{top 20\% of } (KO_{js})_{j=1,s=1}^{N,T} \} \\ 0 & \text{otherwise} \end{cases}$$

By definition, severe flight is a subset of flight.

Second, gross capital outflows consist of three different kinds of investments; FDI, portfolio investments, and other investments. Foreign direct investments and portfolio investments are associated with direct and indirect controls on enterprise and, therefore, are usually stable and persistent.⁴ On the other hand, other investments, comprising short-term debts such as bank loans, are more volatile and more easily reversed. For this reason, other-investment flight might be more relevant to crises than FDI and portfolio flights. To test this hypothesis, we define the following three kinds of capital flight using different investments:

- FDI Flight

$$\begin{cases} 1 & \text{if } KO_{jt} \in \{ \text{top 30\% of } (FDI_{js})_{s=1}^T \} \cap \{ \text{top 30\% of } (FDI_{js})_{j=1,s=1}^{N,T} \} \\ 0 & \text{otherwise} \end{cases}$$

- PI Flight:

$$\begin{cases} 1 & \text{if } KO_{jt} \in \{ \text{top 30\% of } (PI_{js})_{s=1}^T \} \cap \{ \text{top 30\% of } (PI_{js})_{j=1,s=1}^{N,T} \} \\ 0 & \text{otherwise} \end{cases}$$

- OI Flight:

$$\begin{cases} 1 & \text{if } KO_{jt} \in \{ \text{top 30\% of } (OI_{js})_{s=1}^T \} \cap \{ \text{top 30\% of } (OI_{js})_{j=1,s=1}^{N,T} \} \\ 0 & \text{otherwise} \end{cases}$$

where PI and OI are portfolio investments and other investments, respectively. These three forms of flight are not necessarily subsets of 'flight', and there is nonzero overlap among them.

Table 3 shows the frequency of each crisis accompanying capital flight. For example, among a total of 69 banking crises, 19% at year t-1 were accompanied by capital flights at year t and 53% of them in year t-1, t, or t+1 were accompanied by flights at year t. We can see that capital flights were quite relevant to financial crises in 61 countries.

Table 3. The Frequency of Financial Crises Accompanying Capital Flights

Crisis	Obs.	No. of Crisis	Frequency			Cumulative Frequency
			t-1	t	t+1	
Banking	1,830	69	19%	14%	20%	53%
Currency	1,830	82	15%	21%	17%	53%
Debt	1,668	76	17%	12%	10%	39%
Inflation	1,462	46	9%	17%	9%	35%

Source: Author's own calculations.

⁴ According to IMF BOP6 manual, FDI is associated with more than 10% of the voting power in the enterprise and portfolio investment is associated with less than 10% of it.

3.3. Estimation Strategy

Flights are abnormal phenomena in the sense that it takes only about 19% of total observations. As these dependent variables are skewed, normal or logistic distributions, which are symmetric, might not be appropriate to model their distributions. We use the complementary log-log (clog) model for such asymmetric distributions. According to the clog model, probability $p(= \Pr(y=1|X))$ is

$$\exp(-\exp(X'\beta)) \exp(X'\beta) \beta_j$$

and marginal effect of j_{th} variable, $\partial p / \partial x_j$, is

$$\exp(-\exp(X'\beta)) \exp(X'\beta) \beta_j$$

The dependent variable is the indicator variable designating capital flight and $X'\beta$ is

$$\begin{aligned} & \beta_0 + \beta_1 \text{Crisis}_{t-1} + \beta_2 \text{Crisis}_t + \beta_3 \text{Crisis}_{t+1} + \beta_4 \text{GLOBRATE}_t \\ & + \beta_5 \text{GLOBGDP}_t + \beta_6 \text{KAOPEN}_t + \beta_7 \text{ZGDP}_t + \beta_8 \text{EXREGIME}_t \end{aligned}$$

where 'Crisis' is the indicator variable for one of five crisis types: banking, currency, debt, inflation, or financial crises. 'Crisis(t-1)' and 'Crisis(t+1)' are included to consider the possibility that domestic agents may purchase foreign assets the year before or after a crisis. If the independent variable is significantly associated with capital flight, it will contribute to increasing the likelihood of extreme capital outflow movements.

4. Results

4.1. Capital Flight and Financial Crises

Table 4 shows the estimation results.

First, domestic agents have purchased a large number of foreign assets one year before and after banking crises. Flights one year after the crisis are not surprising because domestic agents will invest in safer foreign banks when systematic financial distress is experienced in the domestic economy. Flights occurring one year before the crisis may designate self-fulfilling prophecies of banking crises. For example, if domestic agents expect a banking crisis in the near future, they will withdraw their deposits from domestic banks beforehand and save in foreign bank accounts. As a result, default risk increases and banks may fail to pay their liabilities. This suggests that capital flights might indicate bank runs and explains why they correlate with increased probability of banking crises in domestic economies. Therefore, when flights are observed, policymakers may have to intervene to prevent domestic banks from defaulting.

Second, currency crises at year t are significantly associated with flights. This suggests that a capital flight could be a speculative attack to take advantage of sustained depreciation in the countries. If so, the domestic government has to implement sound policies against flight to prevent it from triggering currency depreciation. The interesting point is that capital inflows usually surge during flight periods.⁵ This might indicate that domestic investors have access

⁵ See Rey (2013). In my data, the mean of capital inflows during flight periods is 7.92% of GDP which is only 3.9% of GDP during no-flight periods. The mean difference is significant at the 1% level.

to internal information that foreign investors do not, which they use to depreciate their currency successfully.

Table 4. The Association between Capital Flight and Crises

	Banking	Currency	Debt	Inflation	Financial
Crisis					
(t-1)	0.66 ** (0.29)	0.41 (0.30)	0.34 (0.30)	-0.60 (0.71)	0.36 * (0.19)
(t)	0.23 (0.34)	1.02 *** (0.26)	0.08 (0.34)	1.11 ** (0.44)	0.39 ** (0.19)
(t+1)	0.57 * (0.29)	0.46 (0.31)	-0.05 (0.38)	-0.18 (0.69)	0.23 (0.21)
GLOBRATE	-0.42 *** (0.04)	-0.42 *** (0.04)	-0.42 *** (0.04)	-0.38 *** (0.04)	-0.42 *** (0.04)
GLOBGDP	0.20 *** (0.06)	0.21 *** (0.06)	0.19 *** (0.06)	0.21 *** (0.06)	0.20 *** (0.06)
KAOPEN	0.09 ** (0.04)	0.10 ** (0.04)	0.12 ** (0.04)	0.12 *** (0.04)	0.10 ** (0.04)
ZGDP	0.00 *** (0.00)	0.00 *** (0.00)	0.00 *** (0.00)	0.00 *** (0.00)	0.00 *** (0.00)
EXREGIME	-0.04 ** (0.01)	-0.05 *** (0.01)	-0.03 * (0.01)	-0.03 ** (0.01)	-0.05 *** (0.01)
Constant	0.19 (0.22)	0.27 (0.21)	0.19 (0.24)	0.03 (0.24)	0.24 (0.22)
Countries	61	61	61	61	61
Obs.	1,384	1,384	1,278	1,265	1,384
Events	271	271	245	246	271

Notes: 1. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

2. Dependent Variable: Flight in Section 3.2.

3. Robust standard errors in the parentheses.

Source: Author's own calculations.

Third, debt crises and flights are not significantly associated. This result stands against Latin America's experiences in the 1970s and 1980s with capital flights during debt crises, and might indicate that a positive association between debt crises and flights was a regional feature of Latin America in the past rather than a global phenomenon in general. However, an alternative specification for robustness checks provided a different result, namely debt crises are positively associated with flights.⁶ For this reason, this paper does not conclude that debt crises and capital flights are not associated.

Fourth, inflation crises at year t are positively associated with flights. This is not surprising considering the positive association between flights and currency crises. Moreover, several emerging market economies have dollarized their currencies after the value of those

⁶ The results are not reported here. See further discussion below.

currencies collapsed through hyperinflation.

Lastly, financial crises at years $t-1$ and t are positively associated with flights at year t . On the one hand, this result shows that investors avoid domestic turmoil and prefer to invest in safer foreign markets supporting the “flight-to-safety” hypothesis. On the other hand, it implies flights cause financial crises by collapsing domestic currencies and self-fulfilling people’s expectations of them.

Global real interest rate and growth are both important indicators for flights. Investors increase foreign asset purchases in good times when the global interest rate is low and growth is strong, which implies that they consider risks more than returns. Likewise, domestic real GDP growth is associated with flights but this association is much weaker. Capital market openness is associated with flights because more liberalized capital markets allow domestic agents to increase their investment in foreign countries. The coefficient of exchange rate regime is also significant showing that investors increase their investments when exchange rates are more rigid so as to avoid exchange rate risk. In sum, this result shows that both global common factors and domestic specific factors are important indicators for estimating the likelihood of extreme capital outflow movements.

To verify these results, we performed several robustness checks. First, we used ‘severe flight,’ which is defined in Section 3.2 as a dependent variable. Second, we excluded the years of the global financial crisis (2007-2009) on the basis that these three years may have driven significant associations between capital flights and financial crises globally. Third, we included country-fixed effects to estimate the probability of episodes.⁷

The results are not reported here to save space but there is little change.⁸ Namely, banking, currency, inflation, and financial crises are still significantly associated with capital flights with different specifications. Moreover, debt crises are now significantly associated with flights if capital outflows are within the top 20 percent (‘severe flights’). These findings are consistent with arguments in the existing literature on the relationships between financial crises and capital outflows and confirm that domestic investors prefer foreign assets during domestic turmoil.

4.2. FDI, Portfolio Investment, and other Investment Movements and Financial Crises

Gross capital flows consist of three different kinds of capital flows: foreign direct investments, portfolio investments, and other investments. As the determinants of each component are different, the relationship between financial crises and flights of each type of flow might be also different (See Forbes and Warnock, 2012b). To investigate this hypothesis, I define flight using three kinds of flows, considered separately. In particular, I hypothesize that other investment flows mostly drive the positive association between capital flight and financial crises because this association mostly relates to hot money.

The results are reported in Table 5, 6, and 7. Two interesting features emerge. First, these results confirm the previous results about positive relationships between capital flight and financial crises. Second, the results also confirm the hypothesis that other investments drive a positive association between flight and financial crises: to be specific, other-investment

⁷ If we include country-fixed effects, the coefficients of them for countries that never experienced crises are unidentifiable and, thus, they are dropped. As these countries are important control groups, we did not include fixed effects in the main estimation.

⁸ They are available upon request.

flights are associated with all kinds of financial crises. Although FDI flight in year t is positively associated with a banking crisis in year $t+1$, we see this is mainly attributable to the global financial crisis (i.e., the association is not significant anymore if global financial crisis periods are excluded.). Therefore, the results suggest governments need to monitor and manage other investments, such as bank loans and deposits carefully, to prevent financial crises or to minimize the damage induced by them.

Table 5. The Association between FDI Flight and Crises

Crisis	Banking	Currency	Debt	Inflation	Financial
T-1	Omitted	-0.1322 (0.4692)	-1.1605 (0.7325)	Omitted	-0.7862 * (0.4063)
T	0.4605 (0.3888)	-0.6739 (0.6081)	-0.3922 (0.5254)	Omitted	-0.2632 (0.3418)
T+1	1.1333 *** (0.3342)	-0.5039 (0.5917)	-0.0770 (0.5092)	Omitted	0.3711 (0.2991)
Countries	61	61	61	61	61
Obs.	1,324	1,384	1,278	1,196	1,384
Events	161	161	150	146	161

Notes: 1. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

2. Dependent Variable: FDI flight in Section 3.2.

3. Independent Variable: Global real GDP growth, global real interest rate, capital market openness, domestic real GDP growth, exchange rate regime, and a constant term.

4. Robust standard errors in the parentheses.

5. 'Omitted' indicates the coefficient is unidentifiable.

Source: Author's own calculations.

Table 6. The Association between Portfolio-investment Flight and Crises

Crisis	Banking	Currency	Debt	Inflation	Financial
T-1	-0.0240 (0.5093)	0.3066 (0.4057)	-0.0554 (0.4481)	Omitted	0.1467 (0.3106)
T	-0.3682 (0.5953)	-0.9383 (0.7334)	-0.9369 (0.7014)	Omitted	-0.5878 (0.4093)
T+1	-1.3319 (1.0037)	-1.5155 (1.0110)	-1.5288 (1.0139)	Omitted	-1.3167 ** (0.6028)
Countries	61	61	61	61	61
Obs.	1,384	1,384	1,278	1,196	1,384
Events	152	152	139	135	152

Notes: 1. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

2. Dependent Variable: PI flight in Section 3.2.

3. Independent Variable: Global real GDP growth, global real interest rate, capital market openness, domestic real GDP growth, exchange rate regime, and a constant term.

4. Robust standard errors in the parentheses.

5. 'Omitted' indicates the coefficient is unidentifiable.

Source: Author's own calculations.

Table 7. The Association between Other-investment Flight and Crises

Crisis	Banking	Currency	Debt	Inflation	Financial
T-1	0.5111 * (0.3058)	0.5540 * (0.2956)	0.6211 ** (0.2882)	0.4512 (0.455)	0.3937 ** (0.1939)
T	0.0683 (0.3636)	1.1568 *** (0.2571)	0.1702 (0.3432)	1.0154 ** (0.457)	0.4427 ** (0.1945)
T+1	0.4093 (0.3261)	0.2381 (0.3484)	0.1309 (0.3669)	-0.1964 (0.705)	0.0984 (0.2284)
Countries	61	61	61	61	61
Obs.	1,384	1,384	1,278	1,265	1,384
Events	242	242	217	218	242

Notes: 1. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

2. Dependent Variable: OI flight in Section 3.2.

3. Independent Variable: Global real GDP growth, global real interest rate, capital market openness, domestic real GDP growth, exchange rate regime, and a constant term.

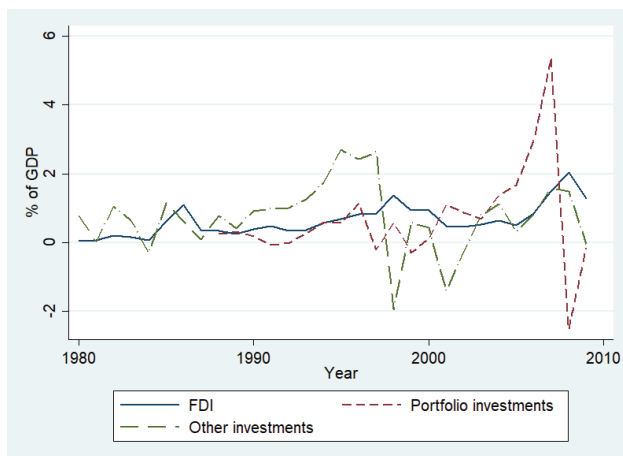
4. Robust standard errors in the parentheses.

Source: Author's own calculations.

4.3. Implications for the Korean Economy

The results presented above prove that financial crises and capital flights may be related to each other in diverse ways. This section discusses the relations between them in South Korea in detail. Korea experienced one banking crisis (1997) and two currency crises (1998 and 2008) between 1980 and 2009. Fig. 2 shows three kinds of capital outflows during these years.

Fig. 2. FDI, Portfolio-investment, and Other-investment Outflows in Korea between 1980 and 2009



Source: IMF BOPS and WEO.

There are three noteworthy features of this figure.

First, it confirms that gross capital outflows and financial crises are positively associated even in Korea. We have used panel data from 61 countries to derive the main results but there was still one question unanswered: can we apply the main results of this paper to the case of Korea? The figure tells we can and suggests the Korean government may have to monitor gross capital outflows to predict domestic financial crises.

Second, although capital outflows have surged before the crises, they then have sharply dropped after them. This implies capital outflows are leading rather than lagging indicators in the Korean economy. If so, they might have contributed to the damage from financial crises in Korea worsening. Economists argue that one of several reasons for the Korean financial crisis between 1997 and 1998 is maturity mismatch (e.g., see Kim Ki-Hwan, 2006). Many banks and firms especially increased short-term foreign-currency debts to finance long-term investments during these years. As a result, other-investment outflows increased and this eventually had increased the probability of financial crises in Korea. Moreover, it is likely that such a large volume of capital outflows had contributed to depreciating the Korean currency further during two currency crises. As Kim Ki-Hwan (2006) argues, if the Korean government had properly managed capital inflows and outflows during the crises, the damage induced by them might have been reduced.⁹

Third, it is interesting to notice that portfolio-investment outflows had surged during the currency crisis in 2008. This feature is distinctive from the main results because they showed PI outflows are negatively correlated with financial crises. A possible explanation is that this is because of much more liberalized capital markets in Korea in the late 2000s (Fernández et al., 2016). However, Stiglitz (2000) argues that rapidly liberalized capital markets might increase instability and depress economic growth in the countries. In this sense, surging PI flows might have been the signal for instability of capital markets in Korea. Furthermore, more liberalized capital markets would promote a transfer of global shocks to the domestic economy. This could explain the relation between PI outflows and the currency crisis in Korea in 2008 but further research is warranted, of course.

To summarize, 1) the Korean economy follows the main results of this paper, 2) large capital outflows in Korea before the financial crises might have worsened the damage from them increasing the probability of crises, and 3) PI outflows have especially surged before the global financial crisis in Korea because of its market liberalization. They indeed suggest the Korean government has to monitor capital outflows and implement macroprudential policies properly (e.g., taxing capital outflows).

5. Conclusions

This paper has shown that capital flight, especially other-investment flight, is positively associated with financial crises. The estimation results may be summarized as follows:

- Banking crises and capital flights are positively associated. To be specific, capital flight is a leading and lagging indicator of a banking crisis, suggesting that banking crises could be self-fulfilling prophecies brought about when domestic agents believe domestic banks are likely to go bankrupt. Moreover, banking flows to other countries will increase if severe financial distress is present in the domestic economy.

⁹ Nonetheless, we do not exclude the possibility that capital flight could be a lagging indicator of financial crises in Korea. For example, Yoo Sung-Jin and Chung Sang-Kuck (2019) show the empirical evidence of “flight-to-safety” hypothesis in Asian countries.

- Currency crises and capital flights are positively associated. The empirical evidence may imply that, in this case, flights of capital are speculative attacks by domestic investors, which, in many cases, are successful.
- Debt crises and capital flights are positively associated only if outflows are extraordinarily large. If domestic agents expect sovereign default, they may purchase foreign rather than domestic assets for fear of expropriation risk. However, further research is warranted because the result is not robust.
- Inflation crises and capital flights are positively associated. This is not surprising considering the positive association between currency crises and flights and the fact that several emerging market economies dollarized their currencies during inflation crises.

Overall, financial crises are reliable indicators of capital flights and it implies capital flights in Korea around two financial crises were no coincidence. Note that the results are remarkable considering that only the initial years of crises were considered for the study while financial crises have been very persistent in many countries. We, therefore, conclude that the Korean government needs to pay attention to its domestic economy to implement sound policies when investors are purchasing large amounts of foreign assets. Moreover, this paper suggests banking flows are critical to monitor because they are most closely correlated with crises. For example, tight banking outflow controls may prevent domestic agents from converting their domestic deposits into foreign deposits and save domestic banks from systemic bankruptcies. Capital outflows especially need to be managed when they indicate currency attacks by domestic investors. Otherwise, a severe currency collapse and subsequent inflation crisis are likely outcomes.

This paper has described general relationships between extreme capital outflow movements and financial crises. Based on the empirical evidence presented here, an interesting topic for future research would be to study detailed relationships (particularly causality) between capital flights and each type of crisis, and the mechanisms behind them.

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