The Effects of Capital Flight on Growth and Investment in Emerging Markets*

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Abstract

We investigated the impact of massive foreign-asset purchases by domestic agents (capital flight) on domestic countries' real GDP growth and investment by employing diverse generalized method of moments estimators. Capital flight is a matter for concern because it may indicate that domestic investors are fleeing domestic markets. However, our results show that capital flight is only harmful if there are not enough capital inflows from foreign investors. These results suggest that domestic investors do not significantly substitute foreign assets for domestic assets and, even if they do, domestic firms may not be severely damaged if they can borrow from non-residents.

Keywords: gross capital flows, flight, stop, GMM estimation, emerging market economies

JEL Classification: E22, F21, F32, F40

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1. Introduction

Thanks to the development of liberalized financial markets, domestic investors in emerging markets have more opportunities than ever before to diversify their portfolios. Both capital inflows by foreign investors and capital outflows by domestic investors play a significant role in domestic financial accounts. Figure 1 describes domestic investors' contribution to financial accounts in selected emerging markets. Before 2000, the magnitude of gross capital outflows (percentage of GDP) was small and did not fluctuate much. This behavior of gross capital outflows contrasted with that of gross capital inflows, which was much larger and more volatile. For that reason, net capital flows were almost the perfect proxy for gross capital inflows.[3] Since 2000, however, the magnitude and volatility of gross capital outflows have been getting closer to that of gross capital inflows.[4] This raises the possibility that large and volatile capital outflows may have a substantial impact on domestic economies.

These stylized facts prompted us to answer the following three questions:

- What is the impact of massive capital outflows on emerging markets' economic growth?
- Is the impact of capital flight different from that of capital stop in capital inflows?
- Is the impact of capital flight conditional on the amount of capital inflows in the country?

Here "capital flight" designates a sharp increase in gross capital outflows.[5] We also use the term

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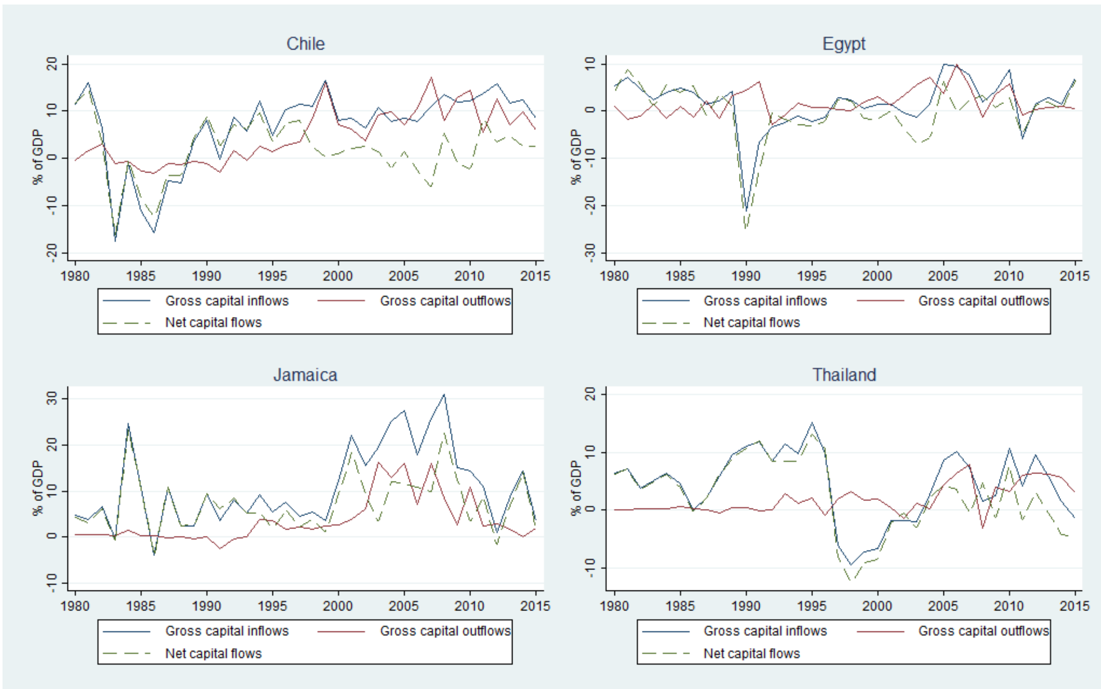
[3] Net capital flows = gross capital inflows – gross capital outflows.

[4] For the stylized facts on gross capital inflows and outflows, see Broner et al. (2013).

[5] Note that a diverse terminology exists for the phenomenon of capital flight. Some examples are outflow-driven sudden stop (Cowan, De Gregorio, and Nelson, 2008), sudden flight (Rothenberg and Warnock, 2011), flight (Forbes and Warnock, 2012), and sudden start (Cavallo et al., 2015). Although their technical definitions are somewhat different, they designate the same phenomenon.

"capital stop" to designate a sharp decrease in gross capital inflows. Therefore, net capital flows in countries are significantly decreased when these two events occur.

Figure 1. Capital flows in emerging markets between 1980 and 2015 (Source: IMF BOPS and WEO)



To some extent, foreign assets are a substitute for domestic assets. Capital flight might, therefore, imply domestic companies' loss of working capital loans by allowing domestic agents to invest abroad. Although this traditional view has represented one of the main concerns about flight events,[6] the impact of capital flight could be conditional on foreign investment. For example, if there are enough external loans in the country and if domestic investors have access to financial markets, they may not need to sell their domestic assets to finance overseas investments. In this

[6] For example, see Cuddington (1986).

case, capital flight would not necessarily depress domestic investment. Rather, it may promote economic growth by allowing investors to take fruitful investment opportunities.

We also investigated capital flight and stop to determine if they are similar events because both reduce net capital flows. There is a large amount of literature that warns of the potential costs of capital stop,[7] so the government may need to be cautious of capital flight, as well, and implement similar policies. However, the drivers of the two events are completely different. Capital stop is driven by foreigners, and capital flight is driven by domestic agents. Because the two groups are distinguished by specific characteristics,[8] the impacts of the two events might be different. This information is important to policymakers, and we aim to answer the second question: Is the impact of capital flight different from that of capital stop in capital inflows?

It is important to define the underlying causality of capital flight and stop when addressing the abovementioned issues. For example, if flight is fleeing behavior to avoid domestic turmoil, the estimation of flight on the domestic economy will overstate the damage from them because simple association cannot tell which came first. Therefore, we need to address endogeneity bias and, for that purpose, we employ three kinds of generalized method of moments (GMM) estimators: difference, system, and orthogonal deviation GMM.

This paper makes three contributions to the existing literature. First, unlike previous research, which focused on the association between macro variables and gross capital flows, this research measures unbiased estimates of capital flight on domestic economies. Second, this paper tests the hypothesis that the impact of capital flight is conditional on the amount of gross capital

[7] Section 2 introduces some of them.

[8] Information asymmetricity and home-bias are some examples (Caballero and Simsek, 2020).

inflows. Third, it investigates whether flight reduces domestic investment and sheds light on the reasons why the impacts of flight and stop are different.

Previewing the results, we cannot find evidence that capital flight alone depresses GDP growth, but we do find that the estimates of flight are remarkably different from those of stop. However, flight depresses growth when there are not enough gross capital inflows (coincident with capital stop). This is new empirical evidence that has not been discussed in the existing literature, which has emphasized the negative effects and similarity with stop only. It was necessary to review previous research to examine the reason as to why the effects of capital flight are different from that of capital stop. Most studies agree that stop in capital inflows severely reduces domestic investment although there are different reasons for the reduction. On the contrary, this paper shows that the impact of capital outflows on domestic investment is insignificant. This proves that capital flight and stop are different phenomena, although both decrease net capital flows. The government therefore needs to see these two events from different perspectives to implement proper policies to prevent them if that becomes necessary.

This paper is organized as follows. Section 2 reviews existing literature on capital flight. Section 3 explains the data, defines capital-flow episodes, and presents stylized facts about them. Section 4 demonstrates estimation strategies and reports the results, and Section 5 summarizes the paper and concludes it.

2. Related Literature

The negative interpretation of capital flight stems from the Latin American experience in the 1970s and 1980s. When several countries in Latin America were in domestic turmoil, domestic investors moved their funds to safer global markets and this behavior certainly worsened the countries' economic situations. Following that experience, many researchers studied the factors that make capital flight costly. For example, Cuddington (1986) suggested seven reasons why capital flight is harmful, Alesina and Tabellini (1989) argued private capital outflows are associated with low domestic investment because of political uncertainty, and Bennett (1988) asserted that capital flight brings high external debt through case studies in four Caribbean countries.

In recent years, several attempts have been made to estimate sudden increases in gross capital outflows. For example, Cowan, De Gregorio, and Nelson (2008) called large drops in net capital inflows by gross capital outflows an outflow-driven sudden stop. They argued that this drop is destructive for emerging markets although the adverse effect is smaller than that of a sudden stop. Similarly, Rothenberg and Warnock (2011) called it as a sudden flight and argued that the differences in pain experienced during sudden flights and stops are not severe. Cavallo et al. (2015) investigated if the effect of reversal in gross capital outflows changes by corresponding reversals in gross capital inflows and net flows. There have been several studies on this effect, but many of them estimate the cyclical behavior of macro variables around capital flight events using time-trend models; that is, they focus on the association between macro variables and gross capital outflows. On the contrary, this paper estimates the causal effects of gross capital outflows using GMM estimators and shows that capital flight does not depress GDP growth directly and, therefore, is harmless to domestic economies.

Recent studies have also focused on illicit capital outflows. Cheung, Steinkamp, and Westermann (2016) studied China’s illicit capital outflows before and after the global financial crisis (pre- and post-2007). They determined that there was a different pattern of capital flight in China between these two periods. This is mainly because of quantitative easing in the United States and China’s more liberalized financial markets after 2007. Consequently, the role of covered interest parity in capital outflows has weakened in China, which necessitates a new way of looking at post-crisis capital flight. This may also apply to other countries. Ndikumana (2016) reviewed eight case studies on the causes and effects of capital flight from Africa. He derived three common lessons from these studies. First, capital flight from Africa is mainly associated with external debts. Second, trade mis-invoicing is an important channel for capital flight. Third, high-quality institutions alleviate the risks of capital flight. These single-country studies provide a closer look at the phenomenon of capital flight and a better understanding of and an improved solution to the specific cases. However, our study considers only licit capital such as foreign direct investment (FDI), portfolio investment, and other investments.

This study focuses on the impact of capital flight on domestic investment to prove that flight and stop are different phenomena. Capital stop depresses growth by hurting domestic investment. For instance, Calvo (1998) and Calvo and Reinhart (2000) emphasized the incidence of nonperforming loans and the bankruptcies that followed caused by capital inflows slowdown. Mendoza (2010) also emphasized the role of collateral constraint binding, which might be caused by a cessation of capital inflows. In this case, companies were required to pay extra financing premia or liquidate their assets. As a result, they were forced to reduce working capital and production and factory demands dropped. For this reason, if capital flight fails to depress domestic investment, it indicates that the channels through which capital stop depresses domestic economies do not work for capital flight. Our paper shows that capital flight does not reduce domestic investment and proves that stop and flight are different.

3. Data, Definitions, and Stylized Facts

3.1. Data

The data is from 56 emerging market economies from 1990 to 2014, but it excludes major oilexporting countries, bank havens, and countries that are categorized as low-income groups according to the 2008 GNI per capita by the World Bank because these countries might function as strong outliers in the group. (See Table 1 for the list of countries included.) All countries have at least 15 years of gross capital outflow data and the data for 10 of these years are consecutive (source: IMF, BOPS).

Gross capital outflows (inflows) are net foreign-asset purchases made by domestic agents (net domestic-asset purchases by foreign agents) that include FDI, portfolio investment (equities and debts), and other investments (e.g., trade credits, loans, and deposits). Total domestic investment is a gross capital formation. The data sources and the definition of the variables are detailed in Table 2.

3.2. Definitions of Capital-Flow Episodes: Flight and Stop

The formal definitions of capital flight and stop are as follows:

- Flight: a large purchasing of foreign assets by domestic agents
- Stop: a large selling (or large reduction in purchases) of domestic assets by foreigners

These flows should be considered large deviations in country-specific and global experiences. Accordingly, each episode is defined by dummies as follows:

- Flight:

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

- Stop:

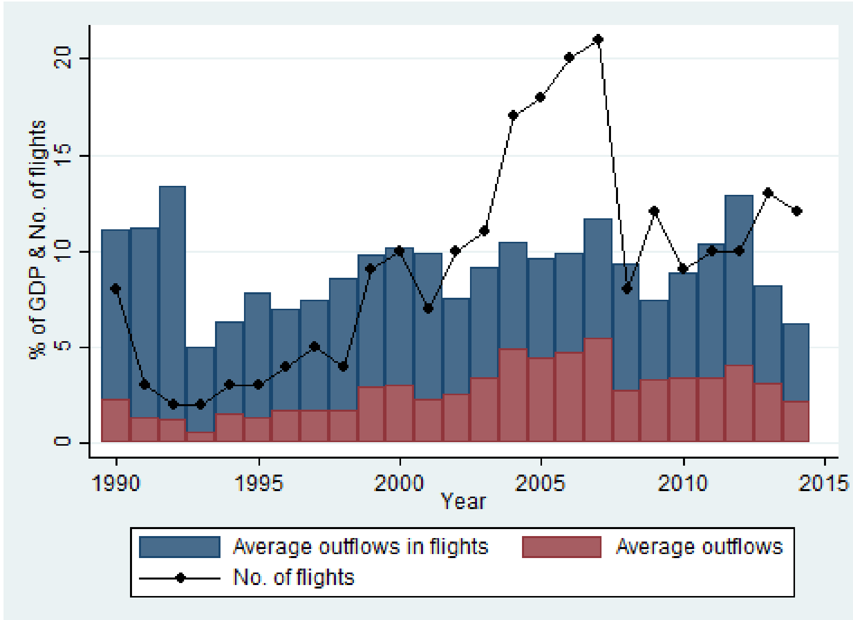
$$\begin{cases} 1 \; if \; KI_{jt} \; \in \left\{ bottom \; 30\% \; of \; \left(KI_{js}\right)_{s=1}^{T} \right\} \cap \left\{ bottom \; 30\% \; of \; \left(KI_{js}\right)_{j=1,s=1}^{N,T} \right\} \\ 0 \; otherwise \end{cases}$$

where KO_{jt} is gross capital outflow (percentage of GDP) in country *j* at time *t*. Likewise, KI_{jt} is gross capital inflow (percentage of GDP) in country *j* at time *t*. Therefore, the top 30% of $\left(KO_{js}\right)_{s=1}^{T}$ implies gross capital outflows that are remarkably large by country *j*'s experience. The top 30% of $\left(KO_{js}\right)_{j=1,s=1}^{N,T}$ implies remarkably large outflows by cross-country experiences. Using these dummy variables, we estimate the impact of capital flight and stop in emerging markets.

3.3. Stylized Facts

This subsection provides some stylized facts about capital flight. Figure 2 shows the number of flights and the annual average of gross capital outflows for the sample countries. Two interesting points emerge. First, except in 2008 (during the global financial crisis), the number of flights has been increasing consistently. The gross capital outflows were normalized by the current GDP, which indicates that the growth rate of capital outflows surpassed GDP growth in emerging market economies. Second, there is a remarkable change in gross capital outflows when a country experiences capital flight. We can see that gross capital outflows are at least three times larger during flight periods compared to those during tranquil times. This confirms that capital flight is a distinctive event in which domestic agents strongly prefer foreign assets.

Figure 2. Annual capital flights and average gross capital outflows



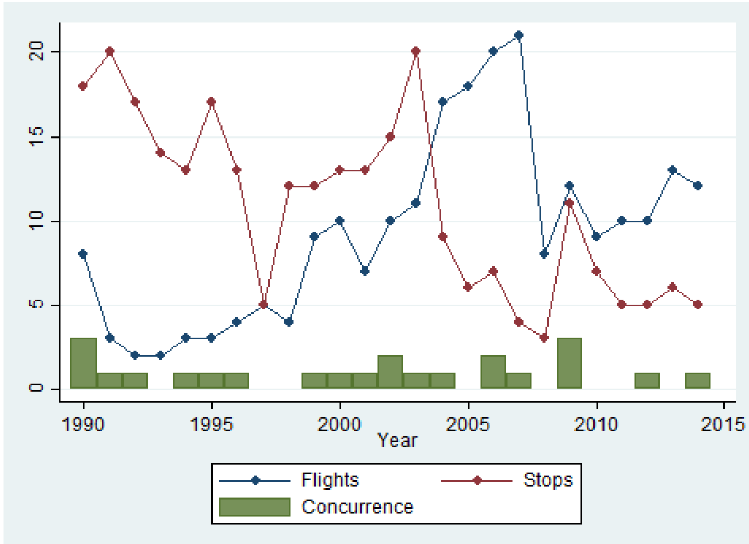
Note: The *y*-axis represents average overall outflows (red bar) and average outflows in flights (blue bar) in % of GDP and the number of flights (black line).

Figure 3 and Table 3 report the relationship between capital flights and stops. Note that Figure 3 and Table 3 exhibit negative correlations between two episodes because only 10% of the flights coincided with stops.[9] This might indicate that foreigners were actively investing in the domestic economy when these countries were experiencing capital flights. In this case, the loss of working capital by domestic agents would be minimized through borrowing from abroad. For this reason, not only the amount of capital outflows but also the amount of capital inflows in a country needs to be considered to precisely estimate the impact of capital flight.[10]

[9] The correlation between flight and stop in this paper is −0.1193.

[10] This does not mean that we need to study net capital flows rather than gross capital flows because the former do not differentiate the roles of domestic agents and foreigners in the economy.

Figure 3. Relationship between flights and stops



Note: The *y*-axis represents the number of flights (blue line), the number of stops (red line), and the number of their concurrences (green bar).

Variables in our models are summarized in two separate periods—when flights occurred and when they did not—to see how they changed between the two episodes. Table 4 shows the summary. Gross capital outflows were almost seven times larger but gross capital inflows also doubled during flights. Private savings were also smaller during flight, but it was assumed that people were more dependent on external loans rather than on savings to increase foreign-asset purchases. A more interesting result is that emerging markets were enjoying higher growth during flights, while domestic investment was hardly affected. This brief summary suggests that capital flight is not detrimental to economic growth and is, therefore, different from capital stop.

4. Estimation Strategy and Results

4.1. GMM Estimators

This subsection briefly introduces GMM estimators.[11] We begin with the following panel data model:

$$y_{it} = X_{it}'\beta + u_{it} \quad and \quad u_{it} = \eta_i + \epsilon_{it} \tag{1}$$

where y_{it} is the dependent variable for country *i* at time *t*. X_{it} is a vector of *k* independent variables, and u_{it} is the error term that may contain country-fixed effects (η_i) and time-varying components (ϵ_{it}). In the first step, difference GMM (DGMM) generates the equations in first differences to get rid of individual fixed effects: $\triangle y_{it} = \triangle X_{it}'\beta + \triangle \epsilon_{it}$ where $\triangle y_{it} = y_{it} - y_{it-1}$. We then constructed the instruments set that contain twice and further lagged independent variables (i.e., $\mathrm{X}_{\mathrm{it-2}}, \mathrm{X}_{\mathrm{it-3}}, \ldots, and\ X_{i0}$). Two conditions should be satisfied for them to be valid instruments. First, they have to be orthogonal to error terms:

$$E[(X_{it-s} \triangle \epsilon_{it})] = 0 \quad for \ \ t \geq 3 \ and \ s \geq 2. \tag{2}$$

Second, transformed error terms should not be serially correlated:

$$E[(\epsilon_{it} - \epsilon_{it-1})(\epsilon_{it-2} - \epsilon_{it-3})] = 0 \quad for \ \ t \geq 3. \tag{3}$$

Hansen tests prove Equation 2, and Arellano and Bond AR(2) tests prove Equation 3.

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[11] See Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (2000) for the detailed descriptions of GMM estimators.

However, the difference equation may cause the instruments to be weak if independent variables are persistent. To resolve this issue, Blundell and Bond (2000) suggest system GMM (SGMM) which extends the system by adding level equations:

$$\begin{pmatrix} \triangle y_{it} \\ y_{it} \end{pmatrix} = \begin{pmatrix} \triangle X_{it} \\ X_{it} \end{pmatrix}' \beta + \begin{pmatrix} \triangle u_{it} \\ u_{it} \end{pmatrix}. \tag{4}$$

Lagged differences are used as the instruments for level equations under the assumption that differenced lags are orthogonal to fixed effects (e.g., $E[\triangle X_{it-1}(\eta_i)] = 0$). Blundell and Bond (2000) show that this condition is satisfied if x_{it} and y_{it} both have stationary processes.

Another disadvantage of DGMM is that it might not work well with unbalanced panel data because if some observations are missing, available equations may significantly decrease. Furthermore, Bun and Windmeijer (2010) argue that SGMM for the dynamic panel data models might have a weak instrument problem similar to DGMM. In this case, orthogonal deviation GMM (OGMM) could be a solution. The OGMM requires each equation to be subtracted from the average of future available samples. That is,

$$\triangle^* y_{it} = \triangle^* X_{it}'\beta + \triangle^* \epsilon_{it} \quad and \quad \triangle^* x_{it} = c_{it}\left(x_{it} - \frac{1}{T_{it}}\sum_{s>t} x_{is}\right) \tag{5}$$

where $c_{it} = \sqrt{T_{it}/(T_{it}+1)}$. T_{it} is the number of observations from time *t* for individual *i*. As a result, only one equation is unavailable for a missing observation with unbalanced panel data, which improves the efficiency of GMM.

An important caveat of GMM estimators is that they generate too many instruments from a dataset with a long time span. Roodman (2009) warned of two potential problems that may occur with too many instruments in GMM. First, GMM estimators may fail to expunge endogenous components in estimates and, second, the Hansen test may become invalid. For these reasons, he suggested reducing the number of instruments to less than the number of individuals, and we followed his suggestion. The number of instruments is reported in the main results.

4.2. Similarities and Differences in the Impacts of Stop and Flight

We used four different estimators of the impacts of capital flight and stop on real GDP growth (*zgdp*) and total investment (*toinv*). The OLS estimator with fixed effects (*FEOLS*) is our baseline model. We also used difference, system, and orthogonal deviation GMM estimators (DGMM, SGMM, and OGMM, respectively) for more robust estimates.

The regression models are

$$zgdp_{it} = \beta_1 flight_{it} + X_{it}'\gamma + u_{it} \tag{6a}$$

$$zgdp_{it} = \beta_2 stop_{it} + X_{it}'\gamma + u_{it} \tag{6b}$$

$$zgdp_{it} = \beta_1 flight_{it} + \beta_2 stop_{it} + X_{it}'\gamma + u_{it} \tag{6c}$$

where stop and flight are dummies, and X_{it} is the matrix of independent variables that includes a lagged dependent variable (*lzgdp*), an exchange rate regime (*exregime*), capital market openness (*kaopen*), and time-fixed effects. Flight and stop are separated from these variables to emphasize that they are the main interests. The two episodes were estimated separately first and then estimated together to perform a Wald test to see whether they were significantly different ($H_0 : \hat{\beta}_1 = \hat{\beta}_2$). As stated in subsection 4.1, u_{it} is the disturbance term that may contain individual-fixed components.

Likewise, the impacts of the two episodes on total investment (*toinv*) are estimated to provide empirical evidence that the channel through which stop hurts the domestic economy is not the same as for flight. The regression models are

$$toinv_{it} = \beta_1 flight_{it} + X_{it}'\gamma + u_{it} \qquad (7a)$$

$$toinv_{it} = \beta_2 stop_{it} + X_{it}'\gamma + u_{it} \qquad (7b)$$

$$toinv_{it} = \beta_1 flight_{it} + \beta_2 stop_{it} + X_{it}'\gamma + u_{it} \qquad (7c)$$

where X_{it} includes real GDP growth (*zgdp*), private savings (*save*), capital market openness (*kaopen*), and time-fixed effects because controlling for these variables is especially important to estimate precise impacts of capital flows on domestic investment. A Wald test was again performed to see whether $\hat{\beta}_1$ and $\hat{\beta}_2$ are significantly different. In equations 6 and 7, not only are capital-flow episodes but also all other independent variables treated as endogenous except the lagged dependent variable (which is predetermined) and the time dummies.

Table 5 shows the results on real GDP growth. As is already well-known through existing literature, capital stops depress emerging markets' growth. On the other hand, flights fail on average to depress emerging markets' growth and positively, but not significantly, contribute to domestic economies. More importantly, the result from the Wald test indicates the impacts of the two episodes are significantly different (at a less than 5% level). This confirms that capital flight and stop are different phenomena.

The coefficients on the lagged dependent variable are moderate, significant, and range from 0.23 to 0.34. This justifies the employment of the dynamic model. For example, with the coefficient of 0.3 for the lagged dependent variable, the damage from stops increases about 43%

in the long run. The estimates of the exchange regime are all negative and significant, which indicates that a flexible regime hurts the domestic economy. This is probably because of the negative impact on net exports. The impact of capital market openness on real GDP growth is inconclusive. Not all coefficients of capital market openness are statistically significant, and the sign of the coefficient also changes according to the control variables. This is consistent with Stiglitz' (2000) argument that capital market liberalization is not always beneficial for growth because in many cases it increases economic instability.

Table 6 shows the impacts of capital-flow episodes on domestic investment. The results show that capital flight does not depress domestic investment. If the opportunity cost of foreign-asset purchases equals purchases of the same amount of domestic assets, capital flight must reduce domestic investment, but the results contradict this speculation. As previously suggested, capital flight might indicate that domestic agents mostly use foreign borrowing rather than their savings to substantially increase foreign-asset purchases. If so, savings do not necessarily flow overseas during capital flights, and as a consequence, domestic investment might not be hurt. Moreover, the results from FEOLS and DGMM show that the impacts of the two episodes are significantly different. The results from OGMM and SGMM contradict this, but they are the results of large standard errors in capital flight.[12] For this reason, we can also conclude from Table 6 that capital flight is different from capital stop because the former does not reduce domestic investment.

As expected, real GDP growth and liberalized capital markets promote domestic investment. However, it is not clear whether private savings also promote domestic investment. Assuming private sectors have two options with their savings (domestic markets and global

[12] Large standard errors from flights may imply the impact of capital flight varies substantially across countries.

markets), they would not always finance domestic companies by savings in the short term. Their decisions may vary according to the surrounding environment. Finally, the estimates of control variables rarely change in both equations 6 and 7, regardless of estimators.

The dummy variables for capital-flow episodes were replaced with gross capital outflows (outflow) in equations 6 and 7 for the robustness check. Accordingly, the models are as follows:

$$zgdp_{it} = \beta outflow_{it} + X'_{it}\gamma + u_{it} \tag{8a}$$

$$toinv_{it} = \beta outflow_{it} + X'_{it}\gamma + u_{it} \tag{8b}$$

Table 7 shows the results of the robustness check, which reveals that most of the coefficients for the independent variables are similar to previous results. This confirms the previous conclusions that capital flight does not depress real GDP growth and domestic investment in emerging market economies and that capital inflow stops and capital outflow flights are different phenomena.

4.3. The Impact of Capital Flight Conditional on the Existence of Capital Stop

This subsection investigates the impact of capital flight conditional on the existence of capital stop using time-trend models. Flight episodes were separated into two different groups: the flights that concurred with capital stops and the ones that occurred alone. We also considered stop episodes that occurred without flight events. This tests the hypothesis that the country is damaged most when flight and stop occur simultaneously. We expected that the damage from two simultaneous events would outweigh the damage from a single-stop event. Each episode is separated as: {Flight only}, {Flight with Stop}, or {Stop only}.

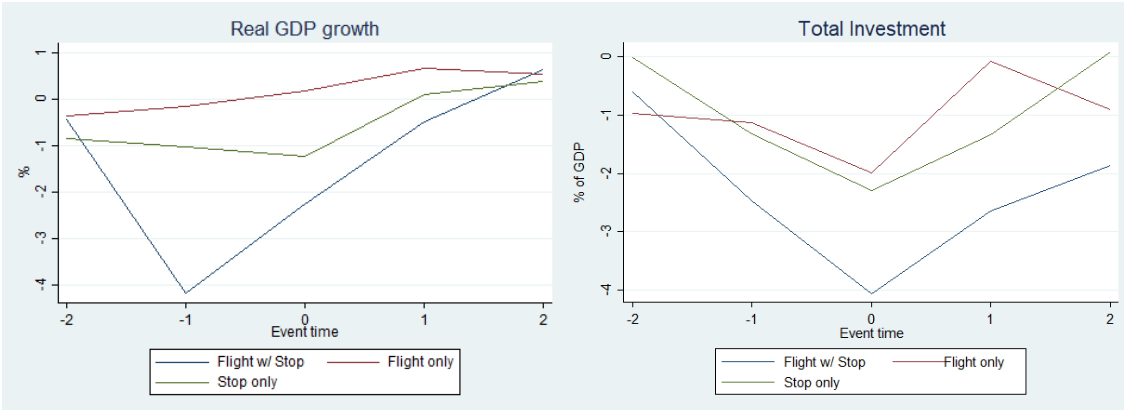
The estimation model is

$$y_{it} = \alpha + \sum_{0 \leq s \leq 4} \beta_s episode_{i,t-2+s}^{j} + \gamma year + \eta_i + \epsilon_{it} \tag{9}$$

where j is an index for the three sets {Flight only}, {Flight with Stop}, and {Stop only}. The time trend to get rid of the linear trend in GDP growth and investment is *year*. Therefore, the model estimates the behavior of real GDP growth and total investment around two events from $t-2$ to $t+2$ where t is the year when the event occurred.

Table 8 reports the results of the estimation model, and Figure 4 summarizes it. The behaviors of real GDP growth and domestic investment around the two events are starkly different according to the presence of capital stop and flight. For example, during simultaneous flight and stop, GDP growth is lowest at $t-1$ (−4.1767%) and recovers slowly after that. Likewise, total investment is lowest at t (−4.0543% of GDP) when the two events occur simultaneously. In other words, GDP growth decreased about 1.8% compared to GDP growth two years before the event, and it took two years to fully recover. The damage to domestic investment was worse. Domestic investment decreased about 3.4% of GDP compared to domestic investment two years before the event. Moreover, even two years after the event, it had not fully recovered, which indicates that it takes longer to recover from the shocks.

Figure 4. Trend of real GDP growth and total investment around episodes



On the other hand, although GDP growth and domestic investment also significantly decreased during "stop only" events, the decrease was much smaller than that during simultaneous flight and stop. Gross domestic product growth and domestic investment were lowest at *t* (−1.241% and −2.2016% of GDP, respectively), which is still higher than *t* during simultaneous flight and stop. Furthermore, there is little change in GDP growth when flights occur alone. Domestic investment decreases slightly during single-flight periods, but it was already at a low level at *t* – *2*, so it is doubtful that they played a major role in domestic investment at *t*. Recovery is also quicker than when "stop only" occurs, which again indicates that flight and stop are different. The results from the time-trend models, therefore, confirm the hypothesis that the impact of flight is conditional on the amount of gross capital inflows in the economy.

If countries do not have access to domestic financial markets, they will try to borrow from global financial markets to prevent the loss of working capital. They may be damaged most when they cannot borrow from both markets simultaneously. Furthermore, this circumstance arguably occurs more frequently in emerging market economies than in advanced economies. Our results therefore suggest that governments should monitor not only capital outflows but also capital inflows when they observe capital flight from the country.[13]

5. Summary and Conclusion

This paper estimated the effect of capital flight on emerging market economies by employing diverse GMM estimators. Moreover, it adopted time-trend models to test the hypothesis that the effect might be conditional on the amount of gross capital inflows available for working capital. This aspect differs from previous research that focused on the association between capital flight and economic variables and assumed that the impact of flight is absolute. As a result, this paper provides a quite different conclusion. Namely, capital flight alone does not depress emerging markets' growth and investment. This effect differs from the effect of stop in capital inflows by foreigners, which has consistently depressed domestic economies. On the contrary, we found that growth and investment were severely affected during two simultaneous capital-flow events. It is likely that capital flight coinciding with sudden capital stop worsens the shocks that damage domestic economies. It suggests that flight could still be dangerous if domestic companies and banks do not have access to international financial markets.

Our research necessitated seeing capital flight from a new perspective and suggests the possible implementation of appropriate capital outflow policies, such as capital outflow restrictions. Liberalized capital markets allow domestic agents to diversify their portfolios while

[13] We also used GMM estimators to estimate the impact of interactions between two capital flow events in an earlier draft of this paper (i.e., $y_{it} = \beta_1 flight_{it} + \beta_2 stop_{it} + \beta_3 flight_{it} * stop_{it} + X_{it}'\gamma + u_{it}$). Although the results were similar, we failed to draw conclusions because of strong multicollinearity between interaction terms and constitutive terms. For this reason, the results from interaction models are not reported here, but they are available upon request.

reducing the risks and to take advantage of overseas investments. However, if the benefits are derived through the loss of the country's investments and growth, social welfare would eventually decrease as a consequence. This paper denied this possibility and argued that more liberalized gross capital outflows are beneficial for emerging market economies unless sudden reductions in capital inflows are expected.

This paper provided empirical evidence that capital flight is harmless to the overall emerging economy. Nonetheless, flight might still affect specific economic sectors under certain circumstances. For example, capital flight might indicate currency attacks on their own currency by domestic investors in an effort to depreciate it. In this case, a country might experience currency crises and subsequent inflation crises, and economic growth might decrease as a result. Another important caveat is that capital flight might be associated with a surge in capital inflows. As emphasized in this paper, domestic investment is severely depressed if companies cannot simultaneously borrow from domestic and foreign agents. Therefore, the companies would be tempted to increase foreign borrowing if they observe domestic agents fleeing domestic markets. The country might then experience "capital inflow bonanzas" and subsequent financial crises.[14]

These situations have been left for a future research agenda. Although there has been significant research on capital inflow reversals, there has been relatively little research on capital outflow flights caused by domestic agents. Considering the increasing role of capital outflows in emerging market economies, more complete knowledge of this phenomenon would help the design and implementation of sound policies.

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[14] See Reinhart and Reinhart (2008) and Ghosh, Ostry, and Qureshi (2016).

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Table 1. List of countries

Country	Year	Country	Year
Angola	1990	Lesotho	1990
Armenia	1995	Lithiania	1995
Belarus	1997	Malaysia	1990-2009
Belize	1990	Maldives	1990
Bolivia	1990	Mexico	1990
Bosnia and Herzegovina	1998	Moldova	1995
Botswana	1990	Mongolia	1990
Brazil	1990	Morocco	1990
Bulgaria	1990	Namibia	1990
Chile	1990	Nigeria	1990
Colombia	1990	Pakistan	1990
The Rep. of the Congo	1990-2007	Paraguay	1990
Costa Rica	1990	Peru	1990
Cote d'Ivore	1990-2013	Philippines	1990
Dominica	1990-2013	Poland	1990
Dominican Republic	1990	Romania	1990
Egypt	1990	Russia	1995
El Salvador	1990	Saint Lucia	1990-2013
Georgia	1997	Seychelles	1990
Grenada	1990-2013	South Africa	1990
Guatemala	1990	Sri Lanka	1990
Honduras	1990	Syria	1990-2010
India	1990	Thailand	1990
Indonesia	1990	Tunisia	1990
Jamaica	1990	Turkey	1990
Jordan	1990	Ukraine	1995
Kazakhstan	1994	Uruguay	1990
Latvia	1995	Venezuela	1990-2013

Note: Total 56 countries. Year indicates available gross capital outflow data in each country. Unless specified, the time period covered is 1990–2014.

Table 2. Variable data sources

Variable	Definition	Source
Gross capital inflows (% of GDP)	Net domestic-asset purchase by foreigners. Domestic assets consist of foreign direct investment, portfolio investment, and other investment.	IMF BOPS
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
GDP (nominal and real)		IMF WEO
Real GDP growth (%)		IMF WEO
Total investment (% of GDP)	Gross capital formation	IMF WEO
Capital market openness	The index ranged from 0 to 1. 1 means the most liberalized market.	Chinn and Ito (2006)
Exchange rate regime	The index ranged from 1 to 16. 16 means the most flexible regime.	Ilzetzki et al. (2016)
Private saving	(Gross national saving) - (Gross public saving) Gross national saving = (Gross national disposable income) - (Consumption expenditure)	Alfaro et al. (2014)

Table 3. Concurrence of capital flights and stops, 1990–2014

	Flight	No flight	Total
Stop	23 (2%)	240 (18%)	263 (20%)
No stop	208 (16%)	827 (64%)	1,035 (80%)
Total	231 (18%)	1,067 (82%)	1,298 (100%)

Note: The number of episodes as a percentage of total observations in parenthesis. The data cover the years 1990–2014.

Table 4. Summary of selected variables

Flight

	Obs.	Mean	Std. Dev.	Min	Max
Gross capital outflows (% of GDP)	231	9.468***	5.638	3.405	50.815
Gross capital inflows (% of GDP)	231	11.015***	11.778	−24.566	71.014
Real GDP growth (%)	229	4.708***	5.228	−15.136	22.593
Exchange rate regime	231	6.653**	4.175	1	14
Capital market openness	228	0.486	0.353	0	1
Total investment (% of GDP)	230	24.053	8.385	2.212	58.151
Private saving (% of GDP)	194	11.996*	12.971	−51.706	48.131

No flight

	Obs.	Mean	Std. Dev.	Min	Max
Gross capital outflows (% of GDP)	1,067	1.409	3.128	−15.048	15.029
Gross capital inflows (% of GDP)	1,067	5.406	7.049	−38.985	47.089
Real GDP growth (%)	1,066	3.751	4.142	−23.983	25.788
Exchange rate regime	1,067	7.371	4.045	1	15
Capital market openness	1,047	0.45	0.326	0	1
Total investment (% of GDP)	1,043	23.356	7.148	3.824	59.464
Private saving (% of GDP)	850	13.873	11.081	−69.272	61.769

Note: ***, **, and * indicate significant differences between two periods at the 1%, 5%, and 10% level, respectively. Welch's approximation was used.

Table 5. Impacts of stops and flights on real GDP growth

	Dependent Variable: Real GDP growth											
	FEOLS	DGMM	SGMM	OGMM	FEOLS	DGMM	SGMM	OGMM	FEOLS	DGMM	SGMM	OGMM
STOP	−1.0586***	−2.4375***	−2.293*	−1.565*					−1.0031**	−2.0012**	−2.0907	−1.0872
	(0.3708)	(0.9446)	(1.2413)	(0.8681)					(0.3927)	(0.933)	(1.302)	(0.8341)
FLIGHT					0.5211	1.6967	1.5866	2.1086	0.4229	1.3773	1.6323	1.9567*
					(0.3394)	(1.8273)	(2.0582)	(1.319)	(0.3571)	(1.6749)	(1.9623)	(1.1152)
LZGDP	0.2306***	0.3133***	0.3458***	0.2733***	0.2382***	0.3454***	0.3297***	0.3086***	0.2242***	0.3207***	0.334***	0.276***
	(0.0609)	(0.9818)	(0.1016)	(0.069)	(0.0618)	(0.1227)	(0.1199)	(0.078)	(0.0625)	(0.1076)	(0.1146)	(0.0662)
EXREGIME	−0.1843***	−0.2944*	−0.3168**	−0.2368**	−0.2132***	−0.3589*	−0.2552*	−0.284**	−0.199***	−0.2622	−0.3428**	−0.2666**
	(0.0438)	(0.1708)	(0.1311)	(0.1187)	(0.0487)	(0.2064)	(0.1339)	(0.1424)	(0.0468)	(0.169)	(0.1565)	(0.124)
KAOPEN	−0.2108	−2.3198	0.1191	−0.3474	0.0772	−0.0368	0.5341	1.7335	−0.1695	−1.7339	0.6527	0.7754
	(0.409)	(2.5261)	(1.314)	(1.9068)	(0.4578)	(2.3289)	(1.6)	(1.7308)	(0.4345)	(2.4744)	(1.9569)	(1.7895)
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries	56	56	56	56	56	56	56	56	56	56	56	56
Observations	1,257	1,201	1,257	1,201	1,231	1,168	1,231	1,175	1,231	1,168	1,231	1,175
R2	0.2374				0.2263				0.2326			
Hansen test		0.429	0.161	0.484		0.229	0.184	0.602		0.541	0.311	0.740
A-B AR(2) test		0.705	0.614	0.917		0.823	0.879	0.898		0.748	0.668	0.919
No. of Instruments		39	44	39		39	44	39		43	44	43
Diff-in-Hansen test			0.256				0.388				0.506	
$H_o: \hat{\beta}_1 = \hat{\beta}_2$									0.0005	0.0414	0.0269	0.0088

Notes: FEOLS is a fixed-effects estimator, DGMM is a two-step difference GMM estimator, SGMM is a two-step system GMM estimator, and OGMM is a two-step orthogonal deviation GMM estimator. Robust standard errors are in parentheses (clustered by country in FEOLS and Windmeijer-corrected in GMMs). *, **, and *** indicate statistical significance at the 10, 5, and 1 percent levels, respectively. P-values are reported in each test.

Table 6. Impacts of stops and flights on total investment

	Dependent Variable: Total investment											
	FEOLS	DGMM	SGMM	OGMM	FEOLS	DGMM	SGMM	OGMM	FEOLS	DGMM	SGMM	OGMM
STOP	−2.0792***	−2.6073	−3.9509***	−4.6054**					−2.1843***	−1.909*	−2.279**	−4.4067*
	(0.436)	(1.6304)	(1.412)	(1.9201)					(0.4302)	(1.1533)	(1.1257)	(2.3916)
FLIGHT					−0.0008	1.0664	1.7056	7.3081	−0.2283	2.9894	2.7036	3.9547
					(0.5336)	(3.9527)	(4.4889)	(4.6617)	(0.5579)	(2.8832)	(4.0255)	(6.0705)
ZGDP	0.3642***	0.2263	0.0746	0.2785	0.3953***	0.3284*	0.3528*	0.2995	0.3555***	0.3153**	0.3632*	0.3579
	(0.1123)	(0.2281)	(0.2345)	(0.3277)	(0.1144)	(0.1733)	(0.2132)	(0.3144)	(0.1094)	(0.1293)	(0.2036)	(0.3867)
SAVE	0.0794**	−0.0845	−0.1387*	−0.06	0.0809*	−0.0615	0.0187	−0.2426	0.098**	−0.0813	0.0261	−0.0383
	(0.03)	(0.1112)	(0.0718)	(0.1191)	(0.0423)	(0.1361)	(0.1366)	(0.1982)	(0.0425)	(0.1077)	(0.1101)	(0.1942)
KAOPEN	4.026**	10.4392	−5.6739	3.5788	4.6024**	14.5049***	3.1345	4.7833	3.8077**	9.9203*	1.1698	4.2443
	(1.9007)	(6.2452)	(3.5976)	(5.488)	(1.8654)	(5.4208)	(3.2007)	(5.5774)	(1.8069)	(5.9282)	(3.2068)	(6.1792)
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries	55	55	55	55	55	55	55	55	55	55	55	55
Observations	1,033	949	1,033	978	1,018	929	1,018	963	1,018	929	1,018	963
R2	0.164				0.1481				0.1807			
Hansen test		0.167	0.305	0.162		0.257	0.263	0.453		0.327	0.270	0.193
A-B AR(2) test		0.916	0.694	0.505		0.441	0.545	0.875		0.866	0.725	0.528
No. of Instruments		40	45	40		40	45	40		49	50	49
Diff-in-Hansen test			0.559				0.100				0.105	
$H_o: \hat{\beta}_1 = \hat{\beta}_2$									0.0035	0.0552	0.2148	0.1643

Notes: FEOLS is a fixed-effects estimator, DGMM is a two-step difference GMM estimator, SGMM is a two-step system GMM estimator, and OGMM is a two-step orthogonal deviation GMM estimator. Robust standard errors are in the parentheses (clustered by country in FEOLS and Windmeijer-corrected in GMMs). *, **, and *** for statistical significance at the 10, 5, and 1 percent levels, respectively. P-values are reported in each test.

Table 7. Impacts of gross capital outflows on real GDP growth and total investment

	Dependent variable: real GDP growth					Dependent variable: total investment			
	FEOLS	DGMM	SGMM	OGMM		FEOLS	DGMM	SGMM	OGMM
OUTFLOW	0.0777*	−0.0054	0.0424	0.0282	OUTFLOW	−0.0124	0.1614	0.271	0.4318
	(0.039)	(0.1065)	(0.0904)	(0.0933)		(0.0936)	(0.1791)	(0.2235)	(0.4019)
LZGDP	0.2374***	0.2867***	0.2989***	0.2861***	ZGDP	0.3964***	0.313**	0.4558*	0.3067
	(0.0611)	(0.0958)	(0.0892)	(0.0772)		(0.1137)	(0.1495)	(0.2391)	(0.3062)
EXREGIME	−0.2107***	−0.3644*	−0.2947**	−0.2586*	SAVE	0.0811*	−0.0869	−0.0261	−0.2154*
	(0.0488)	(0.211)	(0.1224)	(0.1408)		(0.0428)	(0.1056)	(0.1048)	(0.1223)
KAOPEN	0.017	−0.3667	0.6058	1.5888	KAOPEN	4.6202**	8.6508	2.7691	6.32
	(0.479)	(0.249)	(1.4634)	(1.4784)		(1.8884)	(5.7189)	(3.2)	(4.9546)
Time Dummies	Yes	Yes	Yes	Yes	Time Dummies	Yes	Yes	Yes	Yes
Countries	56	56	56	56		55	55	55	55
Observations	1,231	1,168	1,231	1,175		1,018	929	1,018	963
R2	0.2252					0.1466			
Hansen test		0.227	0.166	0.504			0.453	0.451	0.445
A-B AR(2) test		0.954	0.988	0.960			0.247	0.302	0.260
No. of Instruments		39	44	39			40	45	40
Diff-in-Hansen test			0.428					0.189	

Notes: FEOLS is a fixed-effects estimator, DGMM is a two-step difference GMM estimator, SGMM is a two-step system GMM estimator, and OGMM is a two-step orthogonal deviation GMM estimator. Robust standard errors are in the parentheses (clustered by country in FEOLS and Windmeijer-corrected in GMMs). *, **, and *** for statistical significance at the 10, 5, and 1 percent levels, respectively. P-values are reported in each test.

Table 8. Trend of real GDP growth and total investment

	Real GDP growth			Total investment		
	Fligths w/ Stops	Flights only	Stops only	Fligths w/ Stops	Flights only	Stops only
T-2	−0.4397	−0.3549	−0.8463**	−0.6036	−0.9715*	−0.0132
	(1.1359)	(0.4318)	(0.3654)	(1.363)	(0.4955)	(0.4541)
T-1	−4.1767***	−0.1695	−1.0249***	−2.462*	−1.1374**	−1.3211***
	(1.1689)	(0.4519)	(0.3642)	(1.4028)	(0.5189)	(0.4526)
T	−2.2541**	0.1787	−1.241***	−4.0543***	−1.997***	−2.2016***
	(1.1367)	(0.4595)	(0.3623)	(1.3645)	(0.5249)	(0.4502)
T+1	−0.4853	0.6487	0.1074	−2.641*	−0.075	−1.3423***
	(1.135)	(0.4619)	(0.3555)	(1.3623)	(0.5275)	(0.4417)
T+2	0.6218	0.5171	0.367	−1.8576	−0.9023*	0.0795
	(1.059)	(0.4573)	(0.3422)	(1.271)	(0.5223)	(0.4252)
Wald test						
$y_{t-1} - y_{t-2}$	−3.737**	0.1854	−0.1786	−1.8584	−0.1629	−1.4079*
$y_t - y_{t-1}$	1.9226	0.3482	−0.216	−1.5923	−0.8596	−0.9705
$y_{t+1} - y_t$	1.7688	0.47	1.3485**	1.4133	1.922**	0.9492
$y_{t+2} - y_{t+1}$	1.1071	−0.1316	0.2595	0.7834	−0.8273	1.4219**
$y_t - y_{t-2}$	−1.8144	0.5336	−0.3946	−3.4507*	−1.0255	−2.2784***
$y_{t+2} - y_t$	2.8759*	0.3384	1.608***	2.1967	1.0947	2.3711***
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Time trend	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.1348	0.1242	0.1509	0.4947	0.5552	0.5559
Countries	56	56	56	55	55	55
Observations	1,155	1,044	1,102	1,139	1,023	1,081