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Research Article

The Complexity of Global Capital Flows: Evidence from G20 Countries

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With the high volatility of capital flow and the imbalance of capital flow between emerging and advanced economies, the complexity of capital flow management is always attractive to researchers and policymakers. This study explores how capital flows in G20 countries are significantly impacted by pull and push factors by using regressions, dynamic system GMM, and Panel-VAR models. The results show that international capital flows are significantly associated with domestic financial development, which is measured by stock-market liquidity and domestic credit. Moreover, international capital flows are affected by push factors, such as the growth of the world economy and fluctuations of the crude oil price. This study controls for real interest rate, foreign currency, and capital restriction because the government and macroprudential policies are critical influences on stabilizing capital flows.

1. Introduction

Since globalization accelerates capital integration between advanced and emerging economies after the 1970s, a large number of studies argue that capital flows from rich to poor countries. Capital inflows increase the standards of living and promote economic growth in developing nations. Moreover, international capital flows diversify investment portfolios and achieve a better return on pension funds and retirement accounts for developed countries. However, the capital inflows suddenly slowed down in the late 1990s, increased rapidly throughout the mid-2000s, contracted sharply during the 2007–2009 financial crisis, and then rebounded after 2010 [1]. Facing the high volatility of capital flow and the imbalance of capital flow between emerging and advanced economies, the complexity of capital flow management is always attractive to researchers and policymakers.

Some studies show that external factors are the primary drivers of capital flow, such as financial crisis, mature economy, interest rates, mature economic growth, and shocks in U.S. equity markets [2–5]. In the era of globalization, international capital flows are not only driven by mature economies but also impacted by global economic changes. By extending previous empirical evidence, this study hypothesizes that the international capital flows are impacted by external factors, such as world economic growth and the fluctuations of crude oil. Some studies, however, emphasize the pull factors are the primary drivers of capital flow after 2010's subsequent recovery [5]. In the literature, several empirical evidence shows that capital flows are impacted by domestic factors, such as opening-up policies in emerging countries, domestic economic growth, asset return indicators, country risk indicators, financial liberalization, macroeconomic policies, and reserve accumulation [6–8].

The G20 is a global forum, which brings together the world's advanced and emerging economies. Currently, there are 8 advanced economies (i.e., Australia, Canada, France, Germany, Italy, Japan, the U.K., and the U.S.), 11 emerging economies (Argentina, Brazil, China, India, Indonesia, Korea, Mexico, Russia, Saudi Arabia, South Africa, and Turkey), and the European Union. The development of the G20 plays a critical role in the world economy since the G20 accounts for eighty-five percent of the world GDP and two-thirds of the world population [9]. The G20 heads of

government have periodically conferred at summits to discuss policy issues about the promotion of international financial stability.

According to G20 Guiding Principles for Investment Policymaking, the G20 countries agree to move towards better openness for global capital flows and facilitate investments that occur in a nation with weak growth [10, 11]. However, in the 2008 global financial crisis and the 2010 recovery, the shocks of capital flows have highly heterogeneous effects across countries [5]. Global leaders are seeking cooperative solutions to prevent further crises. Also, the G20 summit works on macroprudential policy frameworks, including tools (i.e., capital controls and foreign currency reserves) to mitigate the impact of excessive capital flows [12]. In the future, efficient capital flow management, from a practical economic and financial risk management perspective, will facilitate the stability of capital flows between advanced and emerging nations.

This paper contributes some new empirical evidence for solving the complexity of problems in the fields of global capital flow management and international monetary policies. This study applies panel vector autoregression (Panel-VAR) to capture the linear interdependencies among stock traded/GDP, real-world GDP growth, and FDI inflows. Next, further study examines how capital flows are associated with pull and push factors by using the system GMM methodology and fixed-effect regressions. First, this study hypothesizes that international capital flows are significantly impacted by the liquidity of the stock market because domestic financial developments can help absorb capital flows and deal with their volatility. Second, push factors also play important roles to drive capital flow. For example, the growth of the global economy significantly impacts the size and composition of capital flows across G20 countries; the capital inflows from advanced economies to emerging economies are greatly affected by U.S. monetary policy and the supply of U.S. dollars; the volatility of crude oil price has some spillover effects on capital flows. Third, this study controls for foreign currency reserves and capital restrictions, because government intervention on capital accounts should have a noticeable impact on capital flows, especially in emerging countries.

2. Literature Review

After the 1990s, some studies support the neoclassical growth model, in which capital flows from richer countries with the relatively high capital-to-labor ratio to poorer countries with relatively low rates [13]. However, since the Mexican currency crisis in 1994 and the Asian crisis in 1998, there was a substantial decrease in capital inflows to emerging countries. Thus, some studies have questioned the neoclassical economic framework and showed "Lucas Paradox" and "allocation puzzle," which indicate a lack of capital flow from rich to poor countries [14–17]. According to theoretical and empirical studies, the drivers of global capital flow can be directly determined by the push-pull framework: pull (or domestic) factors and push (or external) factors. Koepke [18] shows that push factors (i.e., U.S. interest rate and U.S. economic growth) significantly matter in most of the portfolio flows, while pull factors (i.e., domestic economic growth and country risk indicators) are most important for banking flows.

2.1. Theoretical Background about Global Capital Flows. In neoclassical growth theory, capital flow moves from rich countries with the relatively high capital-to-labor ratio to poor countries with relatively small ratios, due to the effect of diminishing returns of capital. However, the empirical evidence shows that the volume of capital flow to GDP in emerging countries is surprisingly low, which is the so-called Lucas Paradox. Lucas [17] proposes that the capital transmission from rich to poor countries can be influenced by two categories: (1) international market imperfections, such as sovereign risk and information asymmetry, and (2) huge differences in fundamentals, such as institutional quality, production capability, and technology. Some studies show that institutional quality, corporate governance, and quality of the financial systems are the primary causal variables explaining the Lucas Paradox [14, 19].

The allocation puzzle states that international capital flows do not move to countries with high growth and high investment rates but flow to low growth and low investment rates [16, 20]. Because Asia has experienced relatively great growth and high investment rates, it should have imported capital rather than exporting it. However, the reality is that high-growth and high-investment Asian countries tend to experience capital outflows. Some studies try to explain why such imbalances are originating in Asia and not in other emerging regions. Benhima [15] shows that Asia growth has not been compensated by matching the increase in human wealth, although it has increased a large capital accumulation. Thus, the asset demand of Asia is high relative to the asset supply, leading to capital outflows. Gourinchas and Jeanne [16] argue that emerging countries resist the real appreciation of their currency for export by the accumulation of foreign assets and restrictions on capital inflows. And then, emerging countries with higher growth in the tradable sector led to higher trade surpluses and so (as a matter of accounting) higher net capital outflows. In addition, excess net saving arises from excessive savings rather than an investment shortage among some emerging countries that run large current account surpluses.

Financial integration is not always Pareto improving. Phelan and Toda [21] show the effect of collateralized lending and securitization on global capital flows and welfare in a two-country equilibrium model with idiosyncratic investment risk. They suppose that the low-margin country (US) endogenously supplies more safe assets and enables more risk sharing. When the low-margin country receives capital inflows after financial integration (which is driven by the high-margin country's demand for relatively safe assets and low-margin country's ability to intermediate capital), the degree of risk sharing decreases through a lower interest rate, which can hurt welfare despite high investment levels.

Malmendier et al. [22] introduce the notion of experience-based learning into the international macromodels and show its potential to jointly explain some of the long-standing puzzles on capital flows and portfolio investment: home bias, fickleness, and retrenchment. Experience-based learning describes that agents overweight realizations observed during their lifetimes when forecasting output. Home bias means that investors choose to hold more equity wealth in their home countries even though they observe the global market yields because they are more confident about their knowledge of their own country than of a foreign country. Fickleness means the pattern of foreign capital outflows increasing during periods of domestic or global crises. Retrench indicates the pattern of domestic capital inflows increasing during periods of domestic or global crisis.

2.2. Push Factors of Global Capital Flows. First, in the 1990s, the falling interest rates in the U.S. attracted investors to high yields and high-growth economies in Asia and Latin America [3, 13, 23]. At the same time, most emerging countries appear to increase borrowing from the U.S. under the low interest rate. However, in the mid-1990s, a rise in interest rate by the tightening of monetary policy in the U.S. made an investment in Asia and Latin America relatively less attractive [13, 23]. Second, some empirical studies show that global risk aversion robustly impacts capital flows [1]. During the financial crisis, foreigners reduce their investment, and domestic agents also reduce capital outflows [5, 24, 25]. Third, mature economic growth, especially U.S. economic growth, positively drives global capital flows [1, 3, 4]. Fourth, Fed's unconventional monetary policy has a significant effect on international capital flows, including four main channels: portfolio channel, signaling channel, confidence channel, and liquidity channel. "The portfolio channel is that the Fed can reduce the supply of a specific security and investors with certain degree of preference for the asset will push its price up. The signaling channel works when announcements made by the Fed change expectations regarding the future stance of monetary policy. The confidence channel is that, in addition to the signals that announcements give about the future stance of monetary policy, they could give information about the economic performance. The liquidity channel operates through liquidity measures and purchases of MBS aimed at restoring the functioning of key markets and reducing the liquidity premium" [26].

Fifth, international portfolio diversification stimulates the U.S. and other investors to hold foreign securities. Some studies show that U.S. investors obtain significant benefits from international diversification [27]. Finally, international capital flows are positively associated with worldwide stock returns, consistent with positive feedback trading by international investors [28]. Market microstructure studies show that investors are more likely to invest in foreign assets in periods when the return on foreign assets is high and to sell when the return is low if domestic investors have a cumulative information advantage over foreign investors about their domestic market [29, 30]. When there are barriers to international capital flows and when the expectations of foreign investors are more extrapolative than those of domestic investors, unexpectedly high global stock returns lead to net equity inflows in small countries at the daily frequency [31].

2.3. Pull Factors of Global Capital Flows. First, domestic economic growth is an important driver of capital flows [3], but Kim [32] argues that domestic factors are relatively less important than push factors. Second, there are many studies showing how international capital flows interact with domestic market liquidity. Some studies show that financial development is positively associated with domestic firms investing abroad [33, 34]. Second, country risk indicators do influence capital flows. Kim and Wu [35] show that the better sovereign credit rating on foreign and local debt tends to attract capital flows. Third, Asiedu [36] shows that the foreign direct investments in Africa are promoted by large market size, natural resource endowments, great infrastructure, low inflation, good institutional quality, and good investment framework. Fourth, some studies argue that domestic institution quality has a substantial impact on international flows [19, 37, 38]. Finally, after the 1970s, increasingly emerging countries adopt open-up policies and offer special tax incentives and subsidies to attract foreign investments [39]. Also, some studies show that policy environments, such as liberalizing capital controls and policies of reserve currency, significantly impact capital flows [40–43].

2.4. Limitations of the Push-Pull Framework. A push-pull framework is an efficient approach to analyzing drivers of capital flows, but some factors do not fit into either push or pull categories, such as contagion effects and information asymmetries [18]. Since international capital markets are fictional, they are segmented by asymmetric information or home biases. Some studies show that asymmetric information, measured by geographic distance, is an important barrier to capital flows [44, 45]. Some studies show that push factors to developing economics can be a source of contagion, because a large capital shift from one or two countries (i.e., Mexico and Chile) may generate externalities for most Latin American countries [13]. Also, capital flows are driven by shifts in market sentiment or "hot" money [3]. The investor's speculative behaviors would result in volatile movements of capital flows between emerging and developed countries.

3. Hypotheses Development

This study supposes that both push and pull factors play significant roles in determining international capital flows. With economic globalization and political multipolarization, G20 countries include 8 advanced economies, European Union, and the 11 largest emerging economies. Under the complexity of global financial and political situations, each of the 20 largest economies plays an important role in global capital flows. The first hypothesis is that

domestic financial development should be an important determinant of output and investment, and it should have positive effects on outputs and investments. Well-developed capital markets that provide a rich pool of investment opportunities and plenty of exit options are likely to be found in large, stable, and growing economics [34]. On the contrary, the second hypothesis is that a well-developed financial market will attract more capital from foreign nations. According to the investment development path hypothesis [46], the capital inflows, in turn, promote economic and financial development as well.

In the complexity of globalization, all countries share global risks and liquidity problems. The third hypothesis is that the volatility of global economic conditions and oil prices significantly affect international capital flows. The final hypothesis is that financial policies in each county should affect global capital flows. Some studies show that macroprudential policies in Asian nations encourage reserve accumulation and maintain high levels of capital inflows [7, 47]. This study controls for interest rate, reserve accumulation growth, and capital restriction in our models.

4. Data and Methods

4.1. Data. This study explores how push and pull factors impact global capital flows in G20 countries. First, this study describes and analyzes G20 capital flows and the world's capital flows, which are collected from IMF-International Financial Statistics from 2000 to 2015 at an annual frequency, including foreign direct investment and foreign portfolio investment (FDI inwards, FDI outwards, and FPI inwards). This study also collects net FDI inwards/GDP, net FDI outwards/GDP, and net FPI inwards/GDP from World Development Indicators (WDI).

The international capital flows mainly include foreign direct investment (FDI) and foreign portfolio investment (FPI) and bank lending. The FDI represents establishing a long-term business in a foreign country, such as international mergers and acquisitions, and manufacturing transfers to countries with a cheap labor force. Moreover, the FPI typically indicates the short-term investment in financial assets, such as portfolio equity and portfolio debt. The empirical evidence shows that FDI is driven more by domestic financial development or economic growth and less by global financial fluctuations [34, 48]. By contrast, FPI is more driven by short-term changes than FDI. Specifically, portfolio equity is highly associated with fluctuations of the global stock market, and portfolio debt is more related to risks of currency markets [3, 6, 24, 49]. Moreover, some studies show that cross-border bank lending has been increasing rapidly, and the financial crisis significantly impacts bank lending [50, 51].

Second, the domestic financial development, the stock traded/GDP, and domestic credit by banks/GDP are collected from WDI as well. Third, the international capital flows are not only associated with domestic factors but also impacted by global factors. This study collects the price of WTI crude oil and the growth of world GDP from WDI. Finally, besides full-push factors, this study also controls for real interest rates, capital controls, and international currency reserves. Global capital flows have increased significantly in recent years, but the costs of capital flows are not eliminated, especially in some emerging countries. This study describes capital restrictions on inflows and outflows from 2002 to 2015 based on a new measure of capital controls developed by Fernández et al. [52]. The growth of reserve accumulation is collected from IMF-International Financial Statistics. The real interest rate from WDI is calculated as $(\mathrm{i} - P)/(1 + P)$, where I is the nominal lending interest rate and P is the inflation rate (as measured by the GDP deflator).

4.2. Methods. This study first explores relationships between pull-push factors and international capital flows by applying a VAR method, which treats all variables as endogenous. Moreover, the Granger causality test is applied to examine whether a time series factor is useful in predicting another, and forecast error variance decomposition (FEVD) is used to investigate the amount of information each factor contributes to the other factors in the VAR model. According to the Panel-VAR methodology developed by Love and Zicchino [53]; a first-order VAR model is proposed as follows:

$$Z_{i,t} = \alpha_0 + \alpha_1 Z_{i,t-1} + f_i + v_t + e_t, \tag{1}$$

where $i = 1, 2, \ldots, 19$ countries and $t = 1990, 1991, \ldots, 2015$ years. $Z_{i,t}$ is a three-variable vector (real-world GDP growth, either stock traded/GDP or domestic credit/GDP, and either FDI/GDP or FPI/GDP) from 2000 to 2015. This study transforms time series to become stationary by taking the first difference. f_i and v_t indicate unobserved individual effect and year effect. The order of the input variables is also following Love and Zicchino [53] assumptions: the variables that appear earlier in the VAR systems are more exogenous, and the ones that appear later are more endogenous. In the VAR models with three variables, this study assumes that the most endogenous variable is FDI or FPI inflows.

It also assumes real-world GDP growth as the most exogenous variable because world GDP growth is not explained by one country's capital flows and stock-market liquidity, especially for some small countries. Jansen and Stokman [54] show that countries that have comparatively intensive FDI relations also have more synchronized business cycles. Both larger inward and outward investment positions may make the domestic economy more susceptible to synchronized global business cycles. Moreover, this study assumes that financial development reaches a middle ground between world GDP and capital inflows because it is necessary for financial intermediation and the efficient allocation of investments within global economies. Financial development is measured by stock traded/GDP. Some studies show that stock-market development has positive effects on foreign investments, especially in low-income countries [55–57]. On the contrary, foreign investments also might promote or decrease stock-market development [58–60].

This study employs the system GMM methodology to explore how international capital flows are impacted by both pull and push factors and macroeconomic policies. Some

studies show that the system GMM is an efficient approach to testing long-run growth and the availability of macroeconomic data for large panels of countries [61–63]. Because the system GMM allows independent variables that are not strictly exogenous [64, 65], this study assumes the one lag of dependent variables (capital flows) as endogenous variables. Some studies find that the role of stock markets as a channel through which foreign capital flows could promote economic growth [66] and countries with well-developed stock markets gain significantly from capital flows [58]. In addition, cross-border financial flows can influence domestic credit through multiple channels [57]. Since international capital flows experience interaction with stock traded/GDP, the lags of stock traded/GDP and domestic credit/GDP are used as instruments for financial development. The basic specification is as follows:

$$\begin{aligned}\mathrm{FLOWS}_{i,t} = {} & \alpha_0 + \beta_1 \mathrm{FLOWS}_{i,t-1} + \beta_2 \mathrm{FD}_{i,t} + \beta_3 \mathrm{FD}_{i,t} \times \mathrm{CLASS} + \beta_4 \mathrm{OIL}_{i,t} + \beta_5 \mathrm{WD_GDP}_{i,t} \\ & + \beta_6 \mathrm{RESERVE}_{i,t} + \beta_7 \mathrm{INT}_{i,t} + \beta_8 \mathrm{CONTROL}_{i,t} + \beta_9 \mathrm{CRISIS} + f_i + v_t + e_{i,t},\end{aligned} \tag{2}$$

where $i = 1, 2, \ldots, 19$ countries and $t = 1990, 1991, \ldots, 2005$ years. $\mathrm{FLOWS}_{i,t}$ is either the net FDI inwards/GDP, net FDI outwards/GDP, or net FPI inwards/GDP; $\mathrm{FLOWS}_{i,t-1}$ is the first lag of the dependent variable; $\mathrm{FD}_{i,t}$ is a measure of financial development (stock traded/GDP or domestic credit by banks/GDP); CLASS is country classification: developed countries (0) and emerging countries (1); $\mathrm{OIL}_{i,t}$ is WTI crude oil price; $\mathrm{WD_GDP}_{i,t}$ is real-world GDP growth; $\mathrm{RESERVE}_{i,t}$ is foreign currency reserves/GDP; $\mathrm{INT}_{i,t}$ is real interest rate; $\mathrm{CONTROL}_{i,t}$ is the index of capital restrictions on inflows and outflows; CRISIS is dummy variable: 2007–2009 financial crisis (1) and other periods (0); v_i is the country-specific effect; v_t is a time-specific effect; and $e_{i,t}$ is the error term. The sample size is 19 countries (i) and covers 16 years (t) from 2000 to 2015. The European Union (EU) is excluded from G20 because the data of capital flows are unavailable in the IMF.

Financial market development should be positively associated with capital inflows because the better domestic financial markets would smoothly absorb enough sharp capital movements and reduce the risk of capital flows having adverse effects on the real economy [67]. A more liquid equity market is likely to attract foreign investors. Also, a reversal of capital flows becomes less likely if both local and foreign investors are confident that markets will remain liquid even under adverse conditions. In turn, Levine [68] shows that the effects of capital flows on economic growth occur through the channel of domestic financial intermediation. In other words, capital inflows promote the development of domestic financial markets and then have a positive influence on domestic growth. In addition, some studies show that surges in private capital inflows lead to domestic credit booms [69]. However, FDI inflows may also crowd out domestic credit if foreign capital costs are lower than costs of domestic bank lending [70]. This study also supposes that countries with too much domestic credit tend to have a lower level of capital inflows.

Advanced economies provide stable economic and political surroundings for domestic and foreign investors, but emerging countries are different. Equation (2) creates an interaction term by using a dummy variable (emerging countries (1) and developed countries (0)) to distinguish the effects of domestic financial development on capital flows between developed and emerging countries. Moreover, the robustness tests use two subsamples to avoid inappropriate pooling of developed and developing countries.

Push factors are the primary drivers of capital flows. In the previous studies, some studies show that the U.S. interest rate is the primary push factor [71]. Different from these studies, this study hypothesizes that world GDP growth and global oil price should be positively associated with capital flows. Some studies show the comovements between capital flows and business cycles [72]. Kim and Kim [73] argue that increased capital flows due to financial integration generate substantial impacts on business cycles. The increased financial linkages among global economies should have a significant impact on fluctuations in global external financing conditions. Financial contagion and the attendant financial crises may be one factor behind the increased business cycle comovement and affect capital flows among global markets. In addition, some studies show that commodity price cycles are associated with capital flow cycles and declines in both might lead to the financial crisis [74]. This study hypothesizes that the fluctuation of the oil price might affect international capital flows as well.

Finally, this study also controls for real interest rates, levels of capital controls in each country, and foreign exchange reserves. Interest rates are important to capital flows because capital flows move to countries with higher interest rates. However, compared with mature economies, emerging countries tend to use international reserves and capital controls to defend against currency crisis and intervene in the foreign exchange market to offset to some extent the effects on their economies of large capital flows [75–77]. Thus, the accumulation of foreign exchange reserves is usually employed by policymakers in emerging countries in an attempt to stem the tide of capital flows.

5. Results and Discussion

5.1. Descriptive Analysis. This section describes capital flows and push-pull factors. Figure 1 highlights each country's net capital inwards (or outwards) to the world's net capital inwards (or outwards). Combined U.S. and U.K. economies contribute the most, about 20% of the world's capital flows. Some other advanced economies, such as Germany, France, and Japan, have much more capital inwards of the world total than capital outwards. The rest of the countries appear

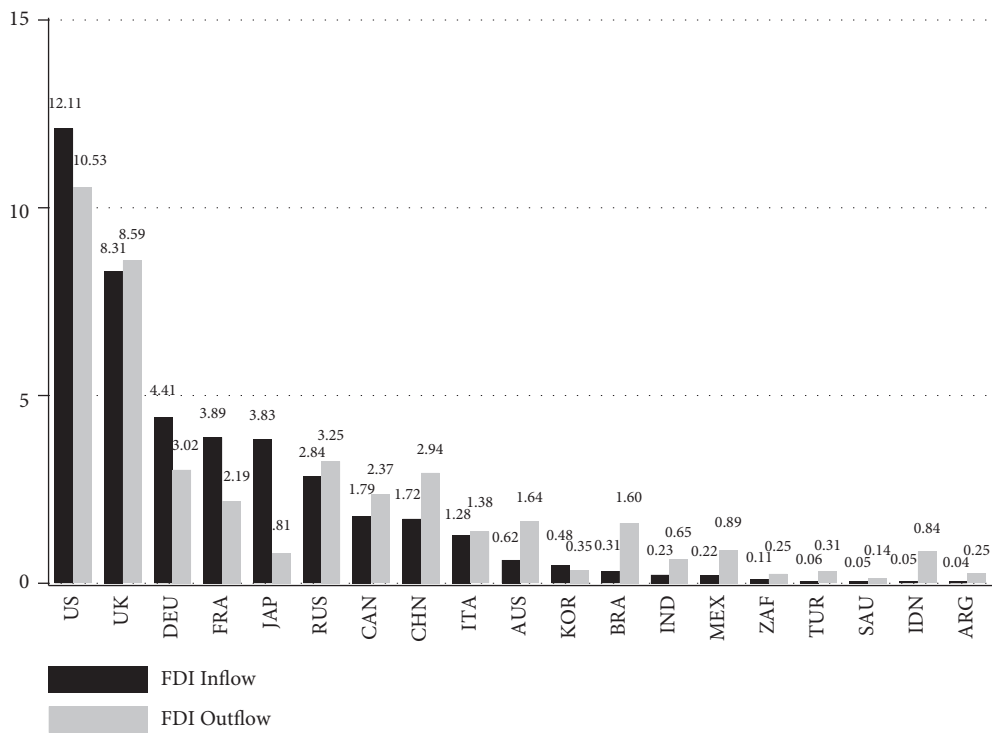

Figure 1: The volume of FDI inwards and outwards.

to have more capital outwards than capital inwards except South Korea. Besides developed countries, most emerging countries in G20, such as Russia, China, Brazil, Mexico, India, and Indonesia, contribute very high levels of FDI inwards and outwards. These results show that both advanced and emerging G20 members are important participants in the global capital flows. By contrast, Tables 1 and 2 show net capital inwards and outwards to domestic GDP. All developed countries have some higher capital outwards/GDP than capital inwards/GDP except Australia, while most emerging countries are just the opposite except South Korea and Russia.

Figure 2 compares FDI flows in high-income countries and middle and low-income countries. World Bank defines high-income economy (or developed country) as a country with a gross national income per capital over US$12,236 in 2016. The middle and low-income economy is a gross national income per capital less than US$12,236. The global capital flows are influenced by the changing international economic environment. For example, in 2007, the capital inflows and outflows significantly raised in both advanced and emerging countries, but the 2008–2009 global financial crisis triggered a global liquidity drought. In the high-income countries, the changes of FDI inflows were basically in agreement with the tendency of FDI outflows. From 2000 to 2014, FDI outflows were significantly higher than inflows, but outflows and inflows were the same in 2015. In the middle-low-income countries, capital inflows gradually descended after 2010, but capital outflows were rising year by year. So far, the volume of FDI inflows is still much larger than outflows in the middle-low-income countries. The weaker inflows and stronger outflows in emerging countries (or weaker outflows in developed countries) can be explained by the narrowing differential in economic growth between emerging and advanced economies.

This study also examines whether capital flows are driven by WTI crude oil prices. From Figure 2, from 2002 to 2007, both global capital investments and the oil price showed rising trends from 2002 to 2007, and they fell sharply in the 2008–2009 financial crisis. In the descriptive analysis, it is difficult to show the direct relationship between capital flows and oil prices since they are impacted by global economic development. Thus, the following multivariate analysis will further discuss the spillover effects between global capital investments and the oil price. Moreover, Figure 3 describes how capital flows between the U.S. and five regions. The global capital flows are mainly distributed between the U.S. and Europe, followed by the U.S. and Asia, the U.S. and Latin America, and the U.S. and Africa. In addition, the capital inflows are very close to outflows between the U.S. and Europe and Asia, while the U.S. outflows to Latin America and Africa are significantly larger than inflows from them.

Tables 1 and 2 show some important pull factors of capital flow: the liquidity of the domestic stock market and domestic credit. Based on the mean values in Table 1, the liquidity of stock markets is very high in some emerging countries, such as China, Korea, and Saudi Arabia, and domestic credit provided by banks is very strong in China, Korea, and South Africa. However, the financial development is low in some countries of Latin America, such as Argentina (14.15%) and Mexico (21.39%). By contrast, Table 2 shows that all developed countries have a relatively high level of financial liquidity in stock markets and banks, especially in U.S. markets (i.e., 223% of stock traded/GDP and 184% of domestic credit/GDP, respectively).

Table 1: Descriptive statistics in eleven emerging countries.

	Argentina	Brazil	China	India	Indonesia	Korea	Mexico	Russia	Saudi Arabia	South Africa	Turkey
FDI net inward/GDP	2.116	3.185	3.501	1.614	1.179	1.045	2.735	2.349	1.702	1.702	1.729
(std. dev.)	(0.760)	(1.016)	(0.731)	(0.820)	(1.654)	(0.419)	(0.654)	(1.237)	(1.482)	(1.482)	(1.000)
FDI net outward/GDP	0.308	0.747	0.780	0.638	0.971	1.586	0.745	2.543	0.455	0.458	0.336
(std. dev.)	(0.351)	(0.745)	(0.356)	(0.528)	(0.278)	(0.734)	(0.509)	(0.962)	(0.377)	(1.247)	(0.213)
FPI net inward/GDP	−0.020	0.603	0.054	0.015	0.001	0.001	0.009	−0.001	0.001	0.154	1.885
(std. dev.)	(0.187)	(0.605)	(0.037)	(0.016)	(0.001)	(0.001)	(0.038)	(0.013)	(0.001)	(0.230)	(2.474)
Stock traded/GDP	1.371	26.042	92.364	48.372	10.817	118.611	8.111	30.187	112.128	57.309	43.615
(std. dev.)	(1.004)	(11.731)	(86.097)	(24.332)	(4.244)	(37.275)	(2.660)	(26.417)	(108.956)	(17.608)	(9.250)
Domestic credit/GDP	14.151	45.060	121.292	43.309	27.740	125.911	21.393	35.316	36.395	140.507	38.398
(std. dev.)	(3.691)	(15.163)	(13.543)	(9.477)	(5.847)	(19.121)	(5.980)	(13.837)	(7.999)	(13.753)	(22.759)
Int'l Reserve/GDP	0.098	0.112	0.342	0.156	0.129	0.238	0.099	0.218	0.599	0.090	0.105
(std. dev.)	(0.037)	(0.043)	(0.106)	(0.035)	(0.026)	(0.036)	(0.031)	(0.077)	(0.369)	(0.030)	(0.012)
Real interest rate	−0.062	36.639	2.104	5.438	4.255	3.782	2.032	−1.586	N/A	4.304	N/A
(std. dev.)	(10.846)	(9.323)	(2.575)	(2.657)	(4.610)	(1.506)	(2.219)	(6.387)	N/A	(1.588)	N/A
Inflow control	0.546	0.457	0.992	0.907	0.692	0.221	0.532	0.596	0.739	0.371	0.339
(std. dev.)	(0.248)	(0.315)	(0.026)	(0.018)	(0.047)	(0.125)	(0.031)	(0.123)	(0.068)	(0.025)	(0.094)
Outflow control	0.739	0.575	0.985	0.975	0.589	0.282	0.550	0.560	0.553	0.853	0.450
(std. dev.)	(0.222)	(0.140)	(0.036)	(0.042)	(0.062)	(0.267)	(0.100)	(0.269)	(0.013)	(0.074)	(0.181)

Note. The mean value of each variable is shown. Standard deviation is provided within parentheses. The capital flows include net FDI inwards/GDP, net FDI outwards/GDP, and net FPI inwards/GDP. The financial development is measured by stock traded/GDP and domestic credit/GDP. The International Reserve Growth measures macroeconomic policies of reserve accumulation. The real interest rates are collected from WDI. This study also describes capital restrictions on inflows and outflows from 2002 to 2015 based on a new measure of capital control [52].

Table 2: Descriptive statistics in eight developed countries.

	Australia	Canada	France	Germany	Italy	Japan	U.K.	U.S.
FDI net inward/GDP	3.322	3.518	2.139	2.449	0.952	0.183	4.355	1.711
(std. dev.)	(2.186)	(2.416)	(1.169)	(2.913)	(0.604)	(0.164)	(3.271)	(0.639)
FDI net outward/GDP	1.203	3.827	3.921	2.974	1.556	1.610	4.648	2.144
(std. dev.)	(2.020)	(1.247)	(2.858)	(1.306)	(0.993)	(0.794)	(5.776)	(0.726)
FPI net inward/GDP	0.796	0.603	1.248	0.537	0.272	0.008	2.419	0.898
(std. dev.)	(1.225)	(0.949)	(1.572)	(1.426)	(0.733)	(0.011)	(4.888)	(0.801)
Stock traded/GDP	81.054	79.924	62.792	55.308	55.900	84.755	94.353	222.965
(std. dev.)	(28.902)	(16.474)	(20.053)	(24.358)	(21.806)	(34.001)	(26.166)	(51.792)
Domestic credit/GDP	113.899	152.359	87.963	95.419	80.539	181.386	153.328	184.085
(std. dev.)	(15.505)	(31.089)	(8.896)	(12.052)	(12.243)	(9.519)	(25.874)	(12.323)
Int'l Reserve/GDP	0.041	0.038	0.020	0.020	0.020	0.184	0.024	0.007
(std. dev.)	(0.013)	(0.007)	(0.004)	(0.005)	(0.005)	(0.055)	(0.007)	(0.002)
Real interest rate	3.829	1.985	4.939	4.662	3.580	2.425	0.953	2.889
(std. dev.)	(1.651)	(1.498)	(0.940)	(2.325)	(0.618)	(1.328)	(1.924)	(1.634)
Inflow control	0.278	0.100	0.003	0.064	0.001	0.001	0.007	0.100
(std. dev.)	(0.037)	(0.001)	(0.013)	(0.049)	(0.001)	(0.001)	(0.026)	(0.001)
Outflow control	0.314	0.001	0.089	0.257	0.050	0.001	0.001	0.182
(std. dev.)	(0.146)	(0.001)	(0.056)	(0.198)	(0.001)	(0.001)	(0.001)	(0.024)

Foreign exchange reserve is a critical macroprudential policy to manage capital flows and exchange rates. Table 2 shows that all developed countries have a relatively lower foreign exchange reserve/GDP, except for Japan (0.184). Table 1 shows that some emerging countries also have much more international reserves, especially in Saudi Arabia (0.599), China (0.342), Korea (0.238), and Russia (0.218). Moreover, every country has some restrictions on capital flows, but the average capital controls on both inflow and outflows are much higher in emerging countries than in developed countries. In the developed countries, Australia has significant capital controls on both inflows and outflows, and Germany and the U.S. limit capital outflows.

Finally, the correlation matrix in Table 3 detects multicollinearity among some of the independent variables. This study finds a high correlation coefficient between world GDP growth and oil price (0.715) and the stock traded/GDP and domestic credit/GDP (0.598). In the following

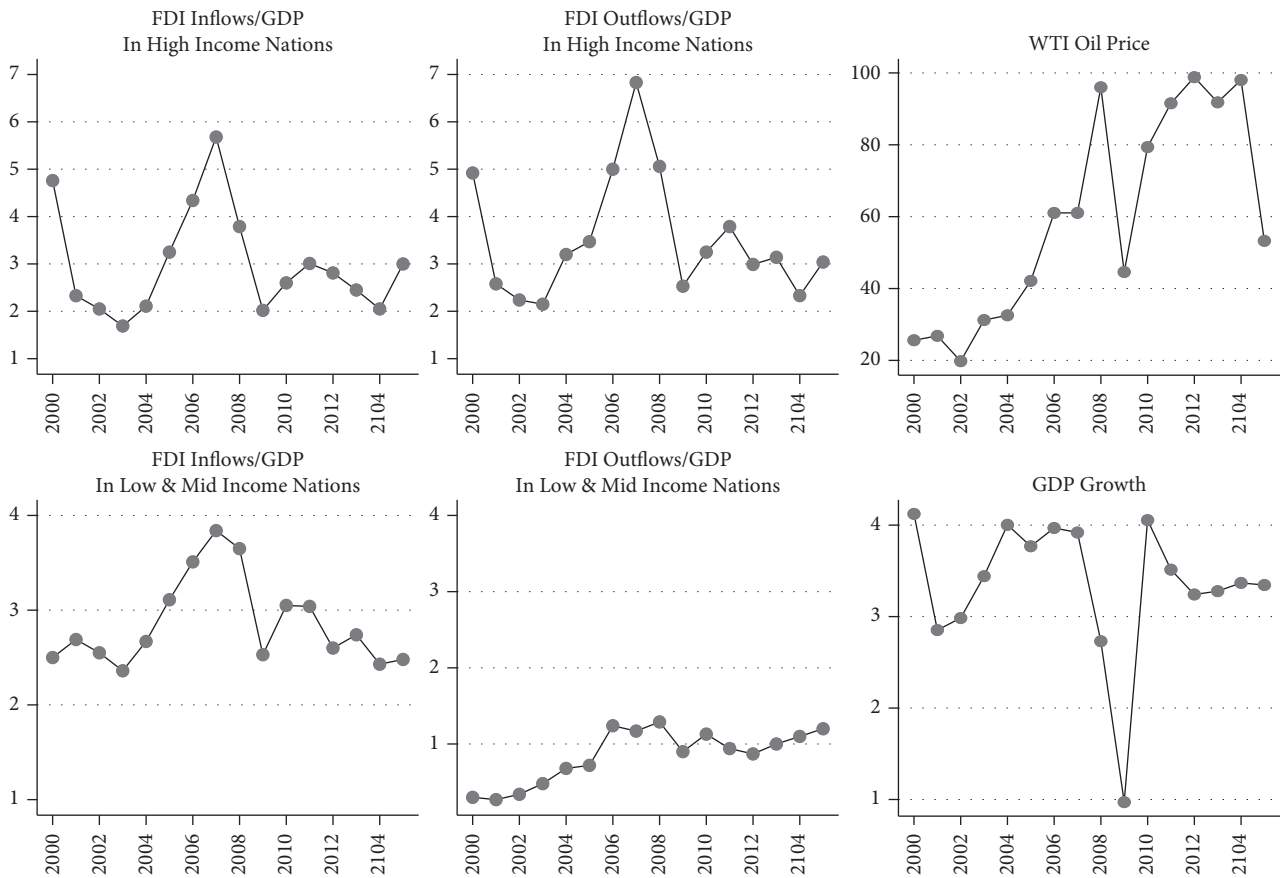

Figure 2: World trends. Source: FDI inflows/GDP and FDI outflows/GDP in high-, mid-, and low-income nations are available in World Development Indicators (WDI). The WTI oil price and real GDP growth are collected from DataStream.

regression analysis, this study estimates (1) world GDP growth and crude oil price and (2) stock traded/GDP and domestic credit/GDP in separate models.

5.2. Granger Causality and FEVD. This section examines the Granger causality between FDI/FPI inwards/GDP, financial development (stock traded/GDP and domestic credit/GDP), and world GDP. Panels A and B in Table 4 show that the inflows of FDI and FPI are significantly affected by shocks of stock traded and world GDP growth. However, Panels C and D show FDI inflows are insignificantly impacted by shocks of domestic credit.

The variance decompositions for the VAR model, presented in Table 5, show how much of the forecast error for each variable can be influenced by exogenous shocks to the other variables. Panel A in Table 5 shows that the variation of FDI inflows is affected by 73.3% of itself after 5 years, 16.5% shocks of world GDP growth, and 10.3% shocks of stock traded/GDP. Panel B shows that the variation of FPI inflows is impacted by 65.2% of itself, 27.2% shocks of world GDP growth, and 7.6% shocks of stock trading. However, Panels C and D show that the shock of domestic credit/GDP has a minor effect on FDI/FPI inflows. In addition, the variations of world GDP growth, the stock traded/GDP, and domestic credit/GDP are most affected by themselves (over 90%). Thus, the VAR models show that international capital flows are significantly affected by the world business cycle and domestic stock-market liquidity. However, world business cycles have a stronger influence on capital flows than domestic financial development.

5.3. Results of Regressions. Table 6 shows the effects of pull-push drivers on international capital flows in G20 countries from 2000 to 2015. Table 7 examines capital flows in 8 emerging countries (i.e., Australia, Canada, France, Germany, Italy, Japan, the U.S., and the U.K.) and Table 8 examines capital flows in 11 emerging countries (i.e., Argentina, Brazil, China, India, Indonesia, Korea, Mexico, Russia, Saudi Arabia, South Africa, and Turkey), respectively.

Domestic financial development can help absorb capital flows and deal with their volatility, so this study proposes that the liquidity provided by stock markets and banks will significantly impact capital flows. Table 6 shows that the liquidity of stock markets is positively associated with FDI and FPI flows. In the literature, some studies show that the liquidity of stock markets positively influences capital inflows [28, 29]. It seems plausible that foreign investors are attracted by liquid stock markets. The high liquidity of stock markets enhances investors' capacity to materialize potential gains quickly and at low costs. Alternatively, countries with

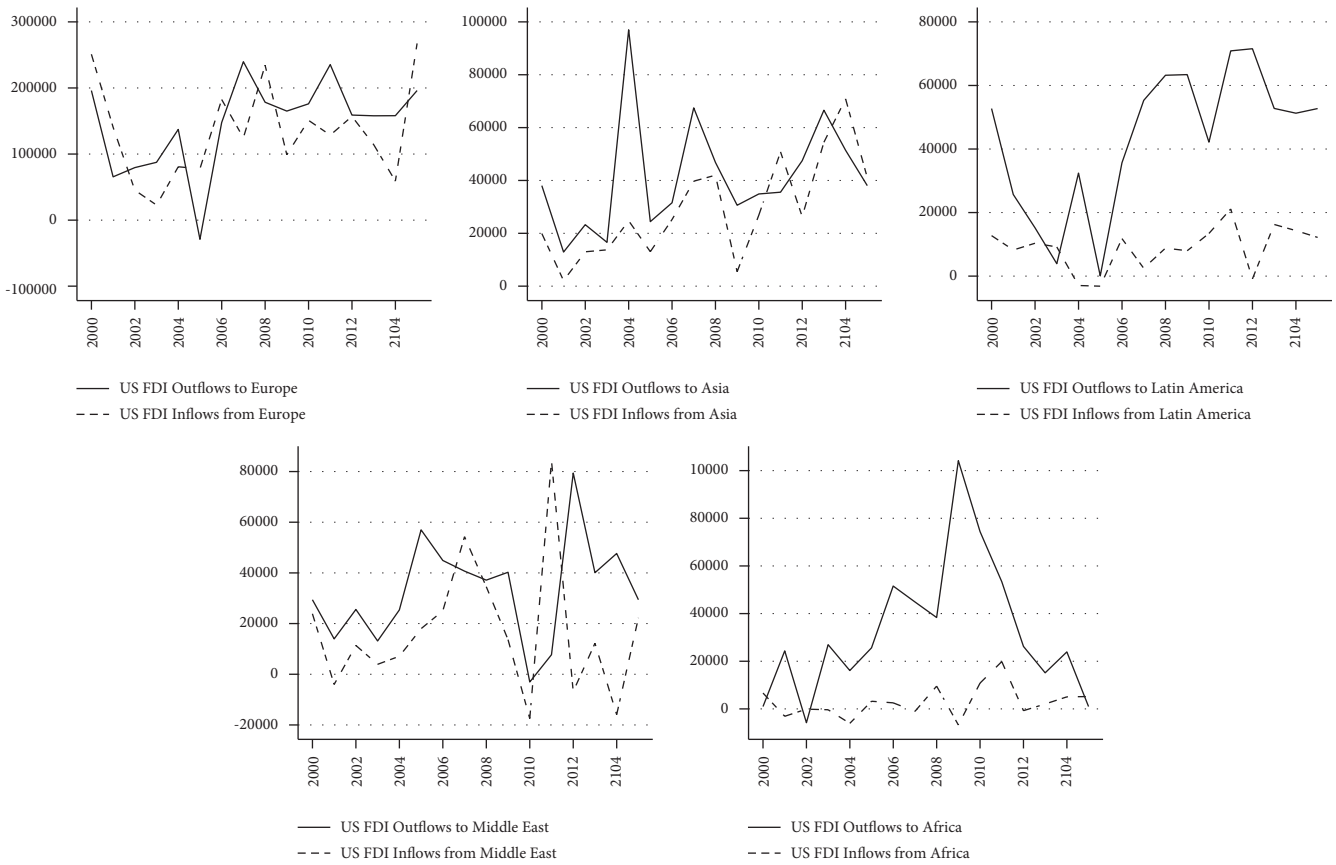

Figure 3: Capital flows between the U.S. and five regions. Sources: The U.S. FDI inflow and outflows are collected from IMF World Economic Outlook.

Table 3: Correlation matrix.

	Stock traded/GDP	Domestic credit/GDP	World GDP growth	Crude oil	Real interest rate	Reserve accumulation growth	Capital restriction
Stock traded/GDP	1.000						
Domestic credit/GDP	0.598	1.000					
World GDP growth	0.045	−0.016	1.000				
Crude oil	0.042	0.003	0.715	1.000			
Real interest rate	−0.131	−0.075	−0.077	−0.072	1.000		
Reserve accumulation growth	−0.054	−0.112	0.128	−0.040	0.046	1.000	
Capital restriction	−0.235	−0.258	0.009	−0.067	−0.269	−0.090	1.000

high liquidity in stock markets are also likely to invest abroad to diversify portfolio risks and seek higher-return investments.

Moreover, columns (1) and (7) of Table 6 show that the interaction effects terms (stock traded/GDP ∗ country classification) have significant effects on FDI outflows and FPI inflows, suggesting effects of stock-market liquidity on capital flows work differently between advanced and emerging economies. Tables 7 and 8 split the sample into advanced and emerging countries. These results show that there are some positive effects between stock-market liquidity and capital flows in developed economies in Table 7. In contrast, columns (9) and (10) in Table 8 show that stock-market liquidity is only positively related to capital outflows, suggesting emerging countries tend to increase capital outflows when stock markets are well-developed. Domestic financial development in emerging countries has no significant spillover effects on capital inflows.

Under financial integration, local banks can seek funding from foreign portfolio investors, foreign direct investors, interbank markets, money markets, and international bond issues. Thus, some studies show that domestic credit growth is affected by international capital flows [57, 78]. Some empirical evidence shows that FDI flows flood into domestic banks and markets when domestic credit grows slowly. However, if foreign firms can borrow heavily from local banks, domestic credit may crowd out foreign capital inflows [79]. However, this study does not find a significant relationship between domestic credit and capital flows in Table 6.

Table 4: Granger causality.

	CHI^2/DF	*P* value		CHI^2/DF	*P* value
Panel A			Panel C		
World GDP growth⟶stock traded/GDP	0.275/1	0.600	**World GDP growth⟶domestic credit/GDP**	**12.101/2**	**0.002**
World GDP growth⟶FDI inflow/GDP	**3.974/1**	**0.046**	**World GDP growth⟶FDI inflow/GDP**	**6.901/2**	**0.032**
Stock traded/GDP⟶world GDP growth	0.410/1	0.522	**Domestic credit/GDP⟶world GDP growth**	**6.633/2**	**0.036**
Stock traded/GDP⟶FDI inflow/GDP	**4.952/1**	**0.026**	Domestic credit/GDP⟶FDI inflow/GDP	0.815/2	0.665
FDI inflow/GDP⟶world GDP growth	1.613/1	0.204	FDI inflow/GDP⟶world GDP growth	0.795/2	0.672
FDI inflow/GDP⟶stock traded/GDP	2.073/1	0.150	FDI inflow/GDP⟶domestic credit/GDP	0.381/2	0.827
Panel B			Panel D		
World GDP growth⟶stock traded/GDP	3.141/3	0.370	**World GDP growth⟶domestic credit/GDP**	**11.330/2**	**0.003**
World GDP growth⟶FPI inflow/GDP	**9.182/3**	**0.027**	**World GDP growth⟶FPI inflow/GDP**	**7.279/2**	**0.026**
Stock traded/GDP⟶world GDP growth	**42.61/3**	**0.001**	**Domestic credit/GDP⟶world GDP growth**	**6.552/2**	**0.038**
Stock traded/GDP⟶FPI inflow/GDP	**8.186/3**	**0.042**	Domestic credit/GDP⟶FPI inflow/GDP	0.058/2	0.971
FPI inflow/GDP⟶world GDP growth	4.654/3	0.199	**FPI inflow/GDP⟶world GDP growth**	**13.127/2**	**0.001**
FPI inflow/GDP⟶stock traded/GDP	**13.731/3**	**0.003**	FPI inflow/GDP⟶domestic credit/GDP	1.352/2	0.508

Note. The Granger causality is a statistical hypothesis for exploring whether each time series can forecast another. The model in Panel A examines a large number of hypotheses in the three-variable vector: world GDP growth, the stock traded/GDP, and FDI inwards/GDP. Panel B tests a VAR model in a three-variable vector: world GDP growth, the stock traded/GDP, and FPI inwards/GDP. Panel C tests a VAR model in a three-variable vector: world GDP growth, domestic credit/GDP, and FDI inwards/GDP. Panel D tests a VAR model in a three-variable vector: world GDP growth, domestic credit/GDP, and FDI inwards/GDP. Based on the Bayesian information criterion (BIC), the appropriate one lag is selected in Panel A, three lags in Panel B, and two lags in Panels C and D.

Table 5: FEVD.

	Steps	World GDP growth	Stock traded/GDP	FDI inflow/GDP		Steps	World GDP growth	Domestic credit/GDP	FDI inflow/GDP
		Panel A					Panel C		
World GDP growth	1	1.000	0.001	0.001	World GDP growth	1	1.000	0.001	0.001
	3	0.976	0.013	0.011		3	0.953	0.037	0.010
	5	**0.972**	**0.015**	**0.013**		5	**0.927**	**0.063**	**0.010**
Stock traded/GDP	1	0.022	0.978	0.001	Domestic credit/GDP	1	0.024	0.976	0.001
	3	0.036	0.955	0.009		3	0.091	0.908	0.001
	5	**0.037**	**0.950**	**0.013**		5	**0.093**	**0.903**	**0.004**
FDI inflow/GDP	1	0.047	0.005	0.948	FDI inflow/GDP	1	0.039	0.002	0.958
	3	0.158	0.071	0.771		3	0.159	0.003	0.838
	5	**0.165**	**0.103**	**0.733**		5	**0.173**	**0.003**	**0.824**
		Panel B					Panel D		
World GDP growth	1	1.000	0.001	0.001	World GDP growth	1	1.000	0.001	0.001
	3	0.855	0.129	0.015		3	0.919	0.043	0.038
	5	**0.878**	**0.109**	**0.013**		5	**0.897**	**0.064**	**0.040**
Stock traded/GDP	1	0.001	1.000	0.001	Domestic credit/GDP	1	0.028	0.972	0.001
	3	0.012	0.924	0.064		3	0.070	0.929	0.001
	5	**0.030**	**0.902**	**0.068**		5	**0.063**	**0.936**	**0.001**
FPI inflow/GDP	1	0.029	0.060	0.912	FPI inflow/GDP	1	0.002	0.010	0.987
	3	0.160	0.066	0.774		3	0.029	0.010	0.961
	5	**0.272**	**0.076**	**0.652**		5	**0.032**	**0.011**	**0.957**

Note. The FEVD investigates how much the forecast error variance of each variable can be influenced by exogenous shocks to the other variables. This study specifies the maximum steps or periods are five.

Push factors are also important drivers of capital flows. Columns (1), (2), (4), and (5) in Table 6 show that world GDP growth significantly impacts international capital flows. Along with the good development of the global economy, all countries tend to expand their international capital flows. Forbes and Warnock [1] explain capital flow waves: surges, stops, flight, and retrenchment. They find that many investments moved from developed countries to emerging countries since the GDP and global stock markets increased rapidly in some emerging countries from 2000 to 2007. After 2010, global economic development slowed down and the U.S. dollar became stronger while investments flowed back to advanced economies. At present, global FDI is expected to decline due to the fragility of the global economy and the president's weakness of aggregate demand. This study controls for the 2007–2009 financial crisis. The negative relationship between the financial crisis and capital flows suggests that all countries tend to reduce capital inflows and outflows during the financial crisis.

Fluctuations in the oil price also affect foreign capital flows. The G20 members, such as Russia, Saudi Arabia, Canada, and Latin America, are the main oil-exporting

Table 6: Results of system GMM in G20 countries.

Variables	(1) FDI inwards	(2) FDI inwards	(3) FDI inwards	(4) FDI outwards	(5) FDI outwards	(6) FDI outwards	(7) FPI inwards	(8) FPI inwards	(9) FPI inwards
A lagged dependent variable	0.426***	0.383***	0.392***	0.496***	0.448***	0.386***	0.389**	0.326***	0.390**
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.025)	(0.001)	(0.022)
Stock traded/GDP	0.081*	0.204*		0.399*	0.600*		0.251**	0.142**	
	(0.064)	(0.075)		(0.072)	(0.076)		(0.027)	(0.026)	
Stock traded* classification	−0.098*			−0.359			−0.420***		
	(0.072)			(0.127)			(0.003)		
Domestic credit			0.073			−0.096			0.035
			(0.804)			(0.647)			(0.874)
Domestic credit* classification			−0.355			−0.245			−0.289**
			(0.258)			(0.241)			(0.040)
World GDP growth	0.128**	0.119**		0.146*	0.155*		−0.042	0.059*	
	(0.019)	(0.042)		(0.067)	(0.060)		(0.227)	(0.051)	
Crude oil			0.023**			0.024			−0.014
			(0.022)			(0.123)			(0.411)
Real interest rate	0.010*	0.021*	0.015*	−0.005		−0.001	0.005		0.010
	(0.052)	(0.036)	(0.085)	(0.703)		(0.958)	(0.619)		(0.205)
Reserve accumulation growth	0.535			−0.216			0.478		
	(0.353)			(0.693)			(0.346)		
Crisis 2007–2009 dummy	−0.508*	−0.209*	−0.376*	−0.444	−0.412	−0.490	0.035	−0.172	0.008
	(0.062)	(0.066)	(0.060)	(0.231)	(0.191)	(0.104)	(0.874)	(0.338)	(0.963)
Capital restriction			0.866			−1.305**			−0.422
			(0.182)			(0.028)			(0.321)
Observations	282	282	278	278	278	274	271	271	267
Number of countries	19	19	19	19	19	19	19	19	19
Sargan (P value)	0.318	0.522	0.721	0.335	0.553	0.344	0.514	0.495	0.333
Arellano-Bond (2) (P value)	0.503	0.325	0.381	0.666	0.625	0.368	0.318	0.332	0.494

Note. The system GMM regressions are used to examine all hypotheses. The dependent variables are FDI inwards/GDP, FDI outwards/GDP, and FPI inwards/GDP. The pull factors are measured by stock traded/GDP and domestic credit by banks/GDP. The push factor is measured by world GDP growth and the price of WTI crude oil. The models control for a lagged dependent variable, the stock traded/GDP, and domestic credit provided by banks as endogenous variables. The rest of independent variables are exogenous. The null hypothesis of Sargan test is that the instruments are valid instruments. The null hypothesis of Arellano-Bond test is no autocorrelation in the second order. Robust P value is provided within parentheses: $^{***}P < 0.01$, $^{**}P < 0.05$, and $^{*}P < 0.1$.

Table 7: Regression analysis in eight developed countries.

Variables	(1) FDI inwards	(2) FDI inwards	(3) FDI outwards	(4) FDI outwards	(5) FPI inwards	(6) FPI inwards
Stock traded/GDP	**0.068****	**1.202***	**0.065***	**1.024***	**0.171***	**0.255***
	(0.016)	**(0.099)**	**(0.053)**	**(0.066)**	**(0.075)**	**(0.057)**
World GDP growth	**0.246****		**0.332****		-0.204	
	(0.032)		**(0.020)**		(0.517)	
Crude oil		−0.001		−0.009		−0.009
		(0.877)		(0.335)		(0.279)
Real interest rate	**0.214****	**0.477*****	0.193	0.437	0.032	0.142
	(0.040)	**(0.001)**	(0.432)	(0.310)	(0.683)	(0.341)
Reserve accumulation growth	−1.582		−0.358		0.132	
	(0.111)		(0.769)		(0.858)	
Capital restriction		−8.979		−6.530		0.137
		(0.266)		(0.117)		(0.988)
Crisis 2007–2009 dummy	**−0.876***	−0.249	**−1.519****	−0.301	−0.198	−0.024
	(0.075)	(0.633)	**(0.013)**	(0.630)	(0.588)	(0.967)
Constant	1.286	0.275	1.912*	0.605	1.026	0.701
	(0.161)	(0.838)	(0.093)	(0.682)	(0.135)	(0.637)
Observations	117	112	117	112	117	112
Number of countries	8	8	8	8	8	8
R^2	0.140	0.201	0.141	0.153	0.163	0.135

Note. The fixed-effect regressions are used to examine all hypotheses. The dependent variables are FDI inwards/GDP, FDI outwards/GDP, and FPI inwards/GDP, respectively. The independent variables include stock traded/GDP, world GDP growth, and WTI oil price. Also, the models control for real interest rate, foreign exchange reserves, capital account restriction, and the 2007–2009 financial crisis (dummy variable). Table 8 examines capital flows in 8 developed countries (i.e., Australia, Canada, France, Germany, Italy, Japan, the U.S., and the U.K.). Robust P value is provided within parentheses: $^{***}P < 0.01$, $^{**}P < 0.05$, and $^{*}P < 0.1$.

Table 8: Regression analysis in eleven emerging countries.

Variables	(1) FDI inwards	(2) FDI inwards	(3) FDI outwards	(4) FDI outwards	(5) FPI inwards	(6) FPI inwards
Stock traded/GDP	−0.294	−0.052	**0.616*****	**0.529****	0.058	0.121
	(0.261)	(0.909)	**(0.001)**	**(0.048)**	(0.335)	(0.244)
World GDP growth	**0.103****		**0.112****		−0.009	
	(0.029)		(0.020)		(0.585)	
Crude oil		**0.018***		**0.010*****		−0.001
		(0.064)		**(0.001)**		(0.395)
Real interest rate	**0.034****	**0.007***	0.006	0.001	−0.004	−0.005
	(0.030)	**(0.054)**	(0.581)	(0.937)	(0.288)	(0.342)
Reserve accumulation growth	−0.556		−0.278		**0.275*****	
	(0.189)		(0.351)		**(0.006)**	
Capital restriction		**0.678***		**−1.074*****		**0.410****
		(0.080)		**(0.009)**		**(0.014)**
Crisis 2007–2009 dummy	**−0.667*****	−0.286	−0.207	−0.090	−0.003	−0.030
	(0.006)	(0.281)	(0.227)	(0.558)	(0.961)	(0.625)
Constant	2.746***	1.512**	0.542**	0.733	0.089	−0.097
	(0.001)	(0.040)	(0.021)	(0.125)	(0.243)	(0.559)
Observations	165	165	162	162	154	154
Number of countries	11	11	12	13	14	15
R^2	0.106	0.173	0.168	0.333	0.189	0.105

countries. Columns (2) and (4) in Table 8 show that the oil price has a positive effect on capital flows in emerging countries. For the Russian economy, in particular, some studies show that the oil and gas sector accounts for 30% of FDI [80]. FDI in Russia has been adversely affected by the fall of the oil price since June 2014. However, fluctuations in the oil price have insignificant effects on international capital flows in developed countries.

This study also controls for real interest rate, capital control, and growth of reserve accumulation, which play a major role to avoid excessive imbalances in central banks and intervene in foreign exchange rates, thus affecting capital flows. The high domestic interest rate leads to capital inflows in columns (1) and (2) in Tables 6–8. Moreover, compared with developed countries, emerging countries have higher capital reserves and capital controls. Since most emerging countries have inefficient capital markets and low levels of capital development, governments need foreign exchange reserves to help them stabilize their currencies. The results indicate reserve accumulation growth might increase capital inflows and slightly decrease outflows. Table 7 shows that capital controls and growth of reserve accumulation have no significant influence on capital flows in developed countries. Table 8 shows that reserve accumulation growth is positively related to FPI inwards in developed countries. In addition, columns (2), (4), and (12) show the positive relationship between capital restriction and FDI/FPI inwards and negative linkage between capital restriction and FDI outwards, indicating emerging countries with more stringent capital restriction tend to increase capital inflows and reduce capital outflows.

6. Conclusions and Implications

With the rise of emerging countries, regional cooperative organizations, and multilateral activities, international capital flows do not simply move from rich (advanced) with the relatively high capital-to-labor ratio to the poor (emerging) with relatively low rates. IMF's report on foreign direct investment in emerging market countries in 2003 shows that some certain general factors consistently determine which emerging countries attract the most FDI. First, the market size and growth prospects of the host country significantly affect investment location because FDI emerging countries are increasingly being undertaken to serve domestic demand rather than to tap cheap labor. Second, the wage-adjusted productivity of labor and availability of infrastructure are still the main factors that influence the FDI. Third, legal protection for investors and institution quality are especially important factors when investors decide on whether to enter a new country.

This study contributes to the existing body of knowledge in an attempt to explore some drivers of international capital flows, such as (1) domestic financial development (i.e., domestic stock traded and domestic credit provided by banks), (2) some external factors (i.e., world GDP growth and crude oil fluctuation), and (3) some other control variables, such as capital restrictions and reserve accumulation growth. The domestic development of the stock market has a significant spillover effect on international capital inflows and outflows, especially in developed countries. In emerging countries, capital inflows and outflows are highly influenced by levels of capital openness and governance policies, while this study still finds that emerging countries with well-developed stock markets significantly increase capital outflows.

This study shows that global capital flows have been impacted by the changes in the global economy, the world's oil price, and the U.S. interest rate. For example, the Brazilian economic recession of 2014–2017 is mainly impacted by slowing global economic growth and falling commodity prices weighing on FDI flows to emerging countries. According to a report from the 2016 ECB Economic Bulletin

[81], the development of oil producers such as state-owned Petrobras accounts for 10% of total Brazilian investments and almost 2% of GDP. The firm had to reduce investments by 33% to adjust to the crash of oil prices from 2014 to 2015. In addition, global investors suddenly sold off large shares of securities in emerging markets because the U.S. announced it would wind down asset purchases (the "taper tantrum") in 2013. After December 2015, the U.S. Federal Reserve began to raise interest rates. Brazil's economy suffered capital outflows and entailed a surge in interest payments on public borrowing according.

Capital account liberalization is an ultimate objective in the G7 countries, but many developing nations in G20 need to liberalize gradually. History has taught us that the excesses of capital inflows into Mexico in 1994, Thailand in 1996–1997, and Russia in 1998 became the roots of the domestic financial crisis and quickly spread to a global currency and equity markets. At the same time, the falling interest rates in the U.S. attracted investors due to high yields and high-growth economies in Asia and Latin America. Although some emerging countries have integrated into the global capital markets, for a long time, they will still need capital controls and macroprudential policies because their macroeconomic and domestic financial systems are not sufficiently strong to deal with the high volatility of capital flows. However, in the current global capital markets, capital controls and macroprudential policies in emerging countries also can incur the imbalance of capital flows between emerging and advanced economies. Thus, both macroprudential measures and capital flow management measures are key topics at the G20 summit.

Adams-Kane and Lopez [82] show that strong economic and financial fundamentals in place and an effective supervisory and regulatory policy framework are two primary aspects to attract capital from different types of investors. "However, the main policy challenge is to design a set of standards appropriate for a specific country's stage of economic development that will promote capital inflows while preserving the resilience of its banking and financial system" ([82], p. 2). "The G20 is an essential platform to discuss and design such cross-border policy frameworks and standards. The diversity of its members, with very different levels of economic and financial development, ensures the representation of a broad range of views" ([82], p. 3). Adams-Kane and Lopez [82] argue that the G20 summit can seek further global collaboration on the following four priorities: an adaptable and flexible global framework, the generalization of international standards and best practices, a strong global data depository, and regulatory and monitoring cooperation.

Data Availability

The data used to support the findings of this study are included in the article. The sample is available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Authors' Contributions

The authors contributed equally to this study.

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