

China's Economic Growth and International Capital Flows

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Abstract

In contrast with Japan's high growth experience, post-reform China's growth and development have largely depended on foreign capital. China has accumulated huge amounts of foreign reserves through current surplus and inward foreign direct investment (FDI). To the extent that the management of foreign assets has been inefficient and the huge amount of foreign reserves represents some degree of international disequilibrium, reforming the foreign reserve holding management is a high priority. From the mid-1990s to the outbreak of the Global Financial Crisis, inward FDI to China has been large and relatively stable. However, the source of funds has been concentrated in some particular areas and the investment destinations concentrated in eastern coastal regions. Hence the use of foreign capital has likely exacerbated regional imbalances. Except for some special periods, both the inflow and outflow of portfolio investments have been relatively small. The so-called hot money has been highly correlated with other investments, which means that more attention should be paid to capital flows through the banking sector.

By the time-series analysis, we found that after the Global Financial Crisis, hot money flowing into China has responded to the US monetary policy stance in a way which is more consistent with economic theories than before. Although foreign direct investment does not largely react to US monetary policy, portfolio investment is more sensitive to interest rate spreads.

Keywords: Chinese economy, international capital flows, spillover effects, hot money

JEL classification: E4, F2, F4

I. Introduction

In this paper, we focus on the flows of international capital to China and discuss some relevant issues. After surveying the impacts of international capital on China's economic growth and development and their consequences for economic reform, we analyze the influences of unconventional monetary policy that started in Japan and some other developed countries on the international capital flows to China.

After the Global Financial Crisis, both policy makers and academic researchers began to pay more attention to the effects of spillover. Although economic policies mostly focus on domestic problems, the unconventional monetary policy started in Japan in the late 1990s is believed to have had profound consequences on the performance of other countries. Many studies have researched the impact of unconventional monetary policy of developed coun-

tries after the Global Financial Crisis on other countries, especially on emerging countries (Ahmed and Zlate (2014), Anaya et al. (2017), Ho et al. (2018), Punzi and Chantapacdepong (2017)). However, the results for China, an important emerging country, are not clear. For example, Ahmed and Zlate (2014), in their pioneer paper on the influences of the US' unconventional monetary policy on capital flows to emerging countries, did not include China in their empirical sample. In another study on the similar issue, Anaya et al. (2017: 279) said, "we exclude China as it plays a distinct role through its trade and financial linkages to the US and its particular institutional settings".

Our first concern in this paper is to look at whether China shared the same characteristics of international capital flows with other emerging countries. We also apply some time-series methods to analyze the impact of developed countries' monetary policy on capital flows to China.¹ The post-reform economic growth and development of China are often compared with the experience of Japan from 1950s to 1970s. However, there exists a sharp distinction between the two countries regarding the utilization of foreign capital. In Japan's high-growth era, few foreign firms invested and managed in Japan. In contrast, China progressively and actively promoted inward flows of foreign capital.

In the case of China, foreign capital not only stimulated the economic growth but also made it possible for China to accumulate huge current surpluses and foreign reserve holdings. The latter also laid the seed of international imbalance. By understanding more about the mechanisms of international capital flows to China, we may gain better insight into how to realize a balanced global economy.

As a general matter, the recent upsurge in the concerns of international capital flows closely relates to the challenges to the traditional theories. In fact, it is difficult to explain the realized patterns of demand and supply of international capital by a life cycle-like theory that asserts the existence of development stages in determining the patterns.²

Recently Rey (2018) challenged the trilemma view which is widely believed to be one of the most important principles of international transactions. She empirically confirmed that with free capital mobility, monetary policies were constrained by the global financial cycle regardless of the exchange rate regime. This fact is inconsistent with the traditional trilemma hypothesis, which suggests that under full capital mobility, floating exchange rates enable monetary policy independence. To know what principle is at work, we need more analyses.

Under these circumstances, we focus on the international capital flows to China, trying to explain the influential factors and compare some distinct characteristics with those of other emerging countries. The remainder of this paper is organized as follows. Section II summarizes post-reform policies promoting foreign capital flows to China and compares the degree of foreign capital dependence with that of Japan in the high-growth era. Section III

¹ Recently, some studies also paid attention spillover effects from China to other countries (Fukuda and Tanaka, 2017) and some other studies focused on outward capital flows from China (Aizenman et al., 2017). In this paper, we concentrate our attention on problems of inward capital flows to China.

² See Crowther (1957).

analyses the patterns of capital flows to China based on descriptive statistics. We also compare the results on China with those of other emerging and developed countries. Section IV discusses the issue of hot money and some relevant problems. In Section V, we empirically confirm the impact of developed countries' monetary policy on international capital flows to China. We pay attention to different periods and different fund items. In the final section, we conclude the paper and discuss some unsolved problems.

II. Reform and Opening, and Foreign Capital Utilization

II-1. Reform and Opening Policy

Needless to say, in most cases, international capital flows occur as the result of international trade and international investment. Since the announcement of China's reform and opening policy at the end of 1978, foreign capital has been the most important source of economic growth.

This is the result of progressive and active policies promoting the utilization of foreign capital. These policies were strongly supported by the leaders of the country. Deng Xiaoping was the dominant leader in the early stage of the reform. The word "opening" appears in Deng's essays much more frequently than other words such as "reform" or "legal."³ One of the top priorities for the Chinese government right after the announcement of reform was to introduce new legislation providing favorable treatment to foreign capital. The "Sino-foreign joint-stock management Enterprise Law" was passed in the National People's Congress in July 1979, much earlier than reforms for other sectors. Ironically, the reform was started by establishing new rules in favor of "bourgeois" in a socialist country such as China, in which "overthrow of the bourgeois supremacy" is her final goal. As a result, investment from abroad dramatically increased, especially in the form of FDI.

The economic developments in China after the reform have largely depended on foreign capital. This is quite different from what happened in the case of Japan, which also experienced a miracle of economic growth some decades ago. Japan hardly used foreign capital in its high-growth era.⁴ One of the exceptional examples was loans from the World Bank, which were placed from 1953 to 1966. While it is true that these project loans were qualitatively important in transferring new technologies from abroad to Japan, the total dollar value of the loans in that 14 years came to USD 863 million. This is a negligible figure when considering the scale of the economy.⁵ Table 1 compares the ratios of inward FDI to GDP for Japan and China. Before the 21st century, Japan's FDI to GDP ratio never exceeded 0.1%. For China, the ratios of inward to GDP during 1990 to 2014 were between 3% and 5%. Of course, these facts heavily reflect differences in the government policies of these two countries in promoting foreign capital inflows.

³ See Ma (2007: 53).

⁴ For a thoughtful discussion of the inward foreign investment into Japan, see Fukao and Amano (2004).

⁵ See Bytheway (2014: 187–204).

Table 1. Ratios of Inward FDI to GDP for Japan and China

year	Japan, %	China, %
1960–1964	0.08	--
1965–1969	0.04	--
1970–1974	0.04	--
1975–1979	0.02	--
1980–1984	0.02	0.32 a
1985–1989	0.01	0.80
1990–1994	0.04	3.38
1995–1999	0.09	4.39
2000–2004	0.20	3.51
2005–2009	0.25	3.95
2010–2014	0.15	3.22
2015–2017	0.44	1.71

(note) a, average of 1982–1984.

(data source) World Bank WDI Database Archives
<http://databank.worldbank.org/data/>

Figure 1 reports the ratio of foreign trade dependence (the percentage ratio of exports and imports to GDP) and the share of trade facilitated by foreign capital-related companies. In China, the foreign trade dependence ratio had once been more than 60%. In that sense, foreign trade is the most important engine for economic growth. The figure also shows that foreign capital played an active role in promoting foreign trade. From the mid-1990s, for all of the imports and exports (and their sum), the share of foreign capital-related companies had been from 40% to 60%.

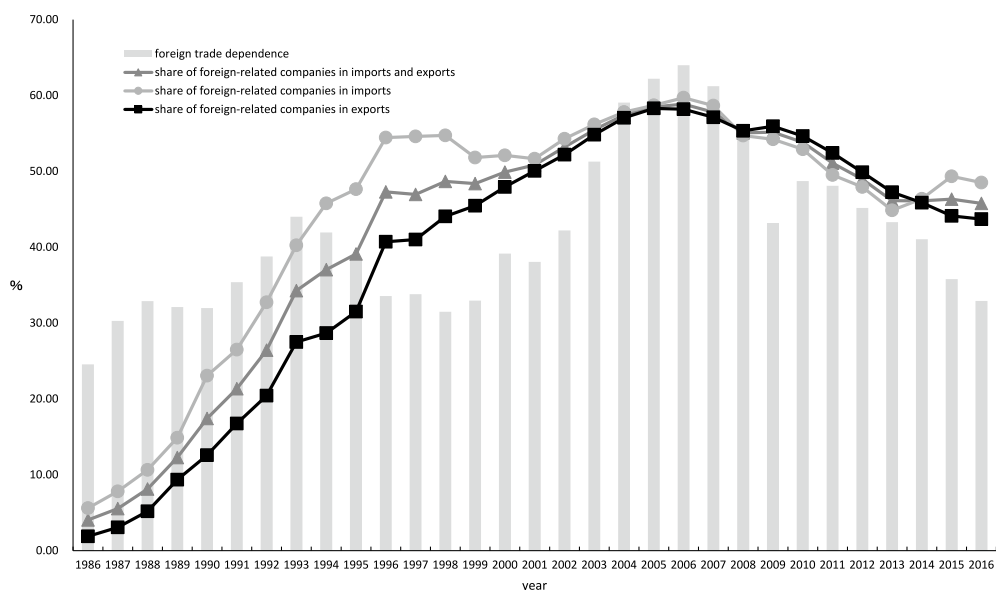
Figure 2 shows the ratio of foreign capital utilization to the total amount of national capital formation and the share of foreign-related tax revenues to the national tax revenues.⁶ In the mid-1990s the ratio of foreign capital utilization to the total amount of national capital formation was more than 10%. After the national economic scale became larger, this ratio gradually became lower over time. In 2016, foreign capital utilization contributed 2.7% of national capital formation. The share of foreign-related tax revenues to national tax revenues had steadily increased until the first few years of the 21st century. Recently, the share of foreign-related tax revenues to national tax revenues has declined. The average share for the years since 2000 is about 20%.

Nowadays China's financial intermediary industry as a whole is still not as efficient as those of developed countries. The institutional infrastructure such as legislative regimes and accounting principles, which are believed to be crucial for economic growth and development, is by no means well developed. Economists often argue that China, as one counterexample to the conventional understanding, succeeded in keeping a high level of growth rate for quite a long time span, despite its poor institutional infrastructure.⁷ The history of foreign

⁶ Besides FDI, foreign capital utilization also includes foreign borrowings. However, after 2000, the amount of foreign capital utilization is of the same level with FDI. (Statistical Yearbook of China (2017), table 11-13)

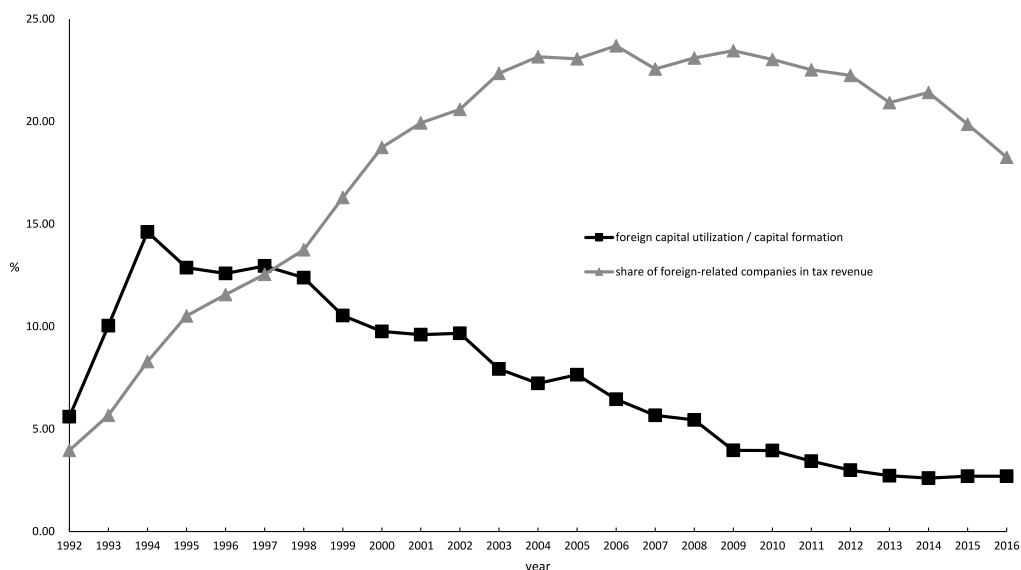
⁷ For example, Allen et al. (2015: 59).

Figure 1. Foreign Trade Dependence and the Share of Foreign-related Companies



(data source) “Statistics on FDI in China,” Ministry of Commerce, China.

Figure 2. Capital Formation and Share of Foreign-related Companies in Tax Revenue



(data source) “Statistics on FDI in China,” Ministry of Commerce, China.

capital utilization after the reform may offer some explanations to the argument. The inflows of foreign capital, especially in the form of FDI, not only helped to solve the shortage of funds but also provided new technologies and knowledge on modern management into China. These transformations accompanied by foreign capital may have played an important

role in promoting China's economic growth.

The high degree of foreign capital dependence will increase the potential risk of the economy. In the past few decades, the dependence on and the sudden halt of foreign capital flows has constituted a key factor causing financial or currency crises in some Latin America and East Asian countries. In this sense, the issues of preventing the potential risk accompanied by the inflows of foreign capital have placed a high priority on the policy of exchange rate management and capital regulation.

We will analyze the characteristics of the international capital movements in China using balance of payments statistics. Before that, we next consider issues of measures on international capital movements and problems of data reliability related to China's economy.

II-2. Measures on International Capital Movements and Reliability of Data on China's Economy.

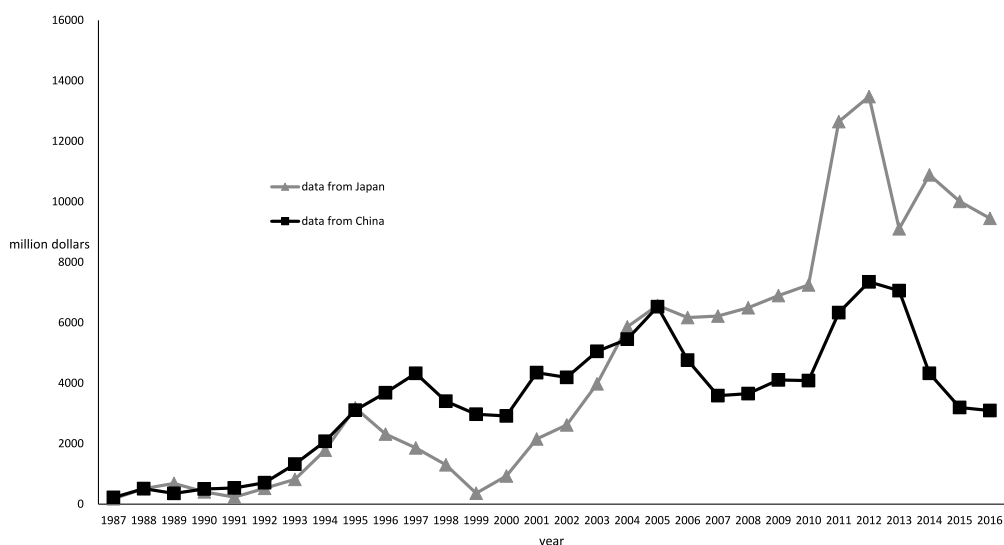
The financial accounts in balance of payments are the most widely used measures of international capital flows. By definition, financial accounts indicate the differences between (1) sum of current accounts, capital accounts, and errors and omissions and (2) foreign reserves. Financial accounts are further divided into the following four sub-categories: direct investment, portfolio investment, financial derivatives and other investment. Assets and liabilities record transactions between residents and nonresidents. Balance of payments are the most comprehensive records for international capital flows. We will discuss each category in detail for China in the following sections. For now, we want to point out the limitations of data. Firstly, balance of payments provides quarterly information only, which means that high-frequency analysis is impossible by using data from this source. Secondly, transactions between residents and nonresidents may not be completely consistent with transactions from country to country in the usual sense. Thirdly, the terms of errors and omissions in balance of payment statistics are often too big to ignore which means in some cases large parts of international fund flows could not be found by other categories. Lastly, when international capital mobility is under strict control, there may exist strong incentives to disguise international capital transactions under current accounts.⁸ Recently, other sources of data have been recognized as important in analyzing international capital flows. These are (1) the data on international capital transaction by banking sector provided by Bank for International Settlement (BIS), (2) the international fund transactions data provided by Emerging Portfolio Fund Research (EPFR), and (3) the records of American investors through international portfolio investments provided by Treasury International Capital Reporting (TIC). The data sources of (1) are restricted to the banking sector only. EPFR data concentrate on the international transactions of portfolio funds and (3) the TIC data is limited to transactions of one country, although transactions by American investors occupy the largest part in the whole world. All these data sources from (1) to (3) have certain advantages in terms of data frequency and accuracy. Although these sources do offer some high frequency data, and data

⁸ Tang and Liang (2007) analyzed the scale of hot money under the categories of current account.

that are more accurate for certain categories, none of them provide the whole picture of a country's international capital inflows and outflows. With the limitations mentioned above in mind, we use data from balance of payments and some other related data sources from the Chinese government and international organizations to describe the characteristics of international fund inflows and outflows for China.

While many economic figures on China's economy get larger and larger during growth and development, their quality, accuracy and reliability have long been questioned. It now seems that confirming the consistency and reliability of data on China comprises a new research area.⁹ In what follows, we first discuss the problem of data reliability of China's economic statistics. In order to gauge how serious of this kind of data accuracy and reliability problem is, we compared data on direct investment from Japan to China published by the Chinese government and the same data published in Japan. Data from China are based on FDI statistics published by China's Ministry of Commerce. Data from Japan are based on figures from Japan's Ministry of Finance converted from JPY into USD by Japan External Trade Organization (JETRO). Figure 3 shows the results. We can observe that while the two series are strongly correlated, the gap between them is also quite large. FDI from Japan reported by the Chinese government is larger than that reported by Japan during 1994 to 2004. However, after 2006, the figures published by the Japanese government are much larger than those reported by China. While there may exist many potential factors to explain this gap,¹⁰

Figure 3. Data Comparison, FDI from Japan to China



(data source) "Statistics on FDI in China," Ministry of Commerce, China.

JETRO HP: <https://www.jetro.go.jp/world/japan/stats/fdi.htm>

⁹ See Fernald et al. (2013), Fernald et al. (2015), and Yu (2014).

¹⁰ For example, the way to separate FDI originally from Hong Kong and that of a third country simply using Hong Kong as an intermediate area, may be one of the important factors explaining the gap.

in this study, we use data published by the Chinese government, the IMF, and the World Bank as our sources. We must keep in mind that the data limitations and reliability problems may be serious. Analysis using different sources of data, and from different perspectives, should be important in supporting unbiased solutions.

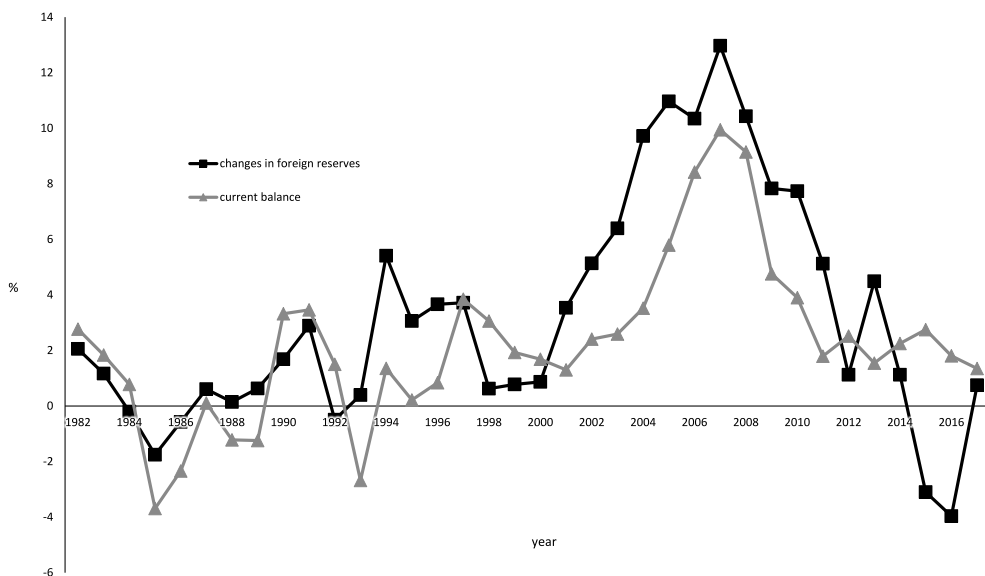
In the next subsection, we analyze the characteristics and trends of international capital inflows and outflows for China based on balance of payments information.

II-3. Current Balance and Foreign Reserves

Figure 4 shows the ratio of current balance to GDP of China from 1982 to 2017. Especially after accession to the World Trade Organization (WTO), China quickly increased its current surplus. The ratio of current balance to GDP peaked at 9.94% in 2007. Although the figure shows a clear downward trend in recent years, it is still around 2% at the end of the period. Considering that Japan, which experienced fierce trade frictions with America, never exceeded 5%, it is easy enough to interpret China's ratio of current balance to GDP as a sign of trade imbalance between China and the rest of the world. In fact, China and America are engaged in a new trade war from the beginning of 2018. Although the American government repeatedly criticizes the behavior of the Chinese government, on matters such as violating intellectual property rights or unfair imports controlling, there is no doubt that the magnitude of imbalance is the most crucial reason underlying the conflicts between the two countries.

Figure 5 shows the ratio of net asset position to GDP and the ratio of foreign reserves to

Figure 4. Raio of China's Current Balance and Changes in Foreign Reserves to GDP

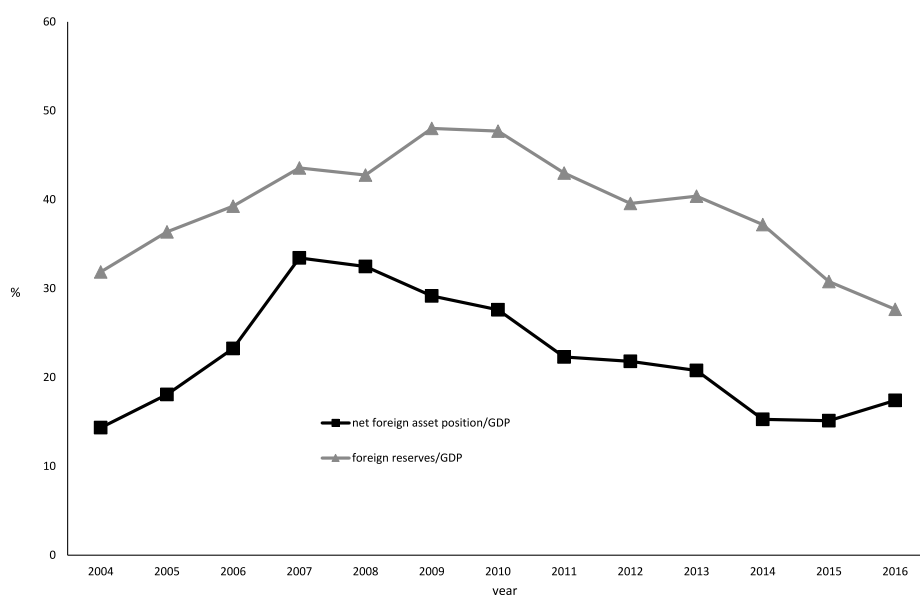


(data source) World Bank, DataBank.

GDP. A natural result of running a current account surplus for a long period is the accumulation of a net asset position, since the current account surplus is equivalent to excess savings. Until 2007, the ratio of net asset position to GDP kept rising. After 2007, although current account continued to be positive, the ratio of net asset position to GDP went down because the GDP growth outpaced the growth rate of the current balance. The ratio of foreign reserves to GDP exhibits an interesting trend.

The scale of foreign reserve accumulations and their changes, in some sense, are very symbolic of China's economic growth and its economic relations with other countries. As the results of foreign trade and investment from abroad, especially after accession to the WTO, China accumulated huge amounts of foreign reserves. In 2014, the amount of foreign reserves approached USD 4 trillion, which was roughly 30% to the sum of the whole world. Usually foreign reserves are a part of a nation's total net asset position. However, in China, the scale of foreign reserves is much larger than the scale of net foreign assets holding. This means, at least, some of China's foreign reserves are financed by other financial liabilities. In Table 2, we compare net foreign asset positions, foreign reserve holdings and net investment incomes among China, Japan and America. From 1996 to 2017, America maintained a negative net foreign asset position. Needless to say, this is the result of the accumulation of current account deficits. In 2017, the US' negative net foreign asset position was equivalent to about 40% of GDP. By contrast, Japan maintained a positive net foreign asset position. In 2017, Japan's positive foreign asset position was equivalent to more than 60% of Japanese GDP. In the case of China, from 2004 to 2017, the period in which data are available, the scale of positive net foreign asset position has been in the range of 14-30%.

Figure 5. Ratios of China's Net Foreign Asset Position and Foreign Reserves to GDP



(data source) World Bank, DataBank.

Table 2. Comparasion of Foreign Asset Holdings and Investment Income among China, Japan and America

Year	Net foreign asset position/GDP	Net investment income/GDP	Foreign reserves/ GDP	Net foreign asset position/GDP	Net investment income/GDP	Foreign reserves/ GDP	Net foreign asset position/GDP	Net investment income/GDP	Foreign reserves/ GDP
	China	China	China	Japan	Japan	Japan	America	America	America
	%	%	%	%	%	%	%	%	%
1996		-1.44	12.16	18.43	1.17	4.50	-4.05	0.33	1.98
1997		-1.16	14.55	21.72	1.29	5.00	-9.16	0.20	1.57
1998		-1.61	14.09	28.61	1.25	5.35	-11.37	0.10	1.61
1999		-1.29	14.14	18.17	1.25	6.31	-10.37	0.19	1.41
2000		-1.17	13.67	23.69	1.46	7.39	-14.94	0.24	1.25
2001		-1.39	15.84	31.60	1.57	9.30	-21.61	0.33	1.22
2002		-1.00	19.48	35.53	1.51	11.36	-21.96	0.28	1.44
2003		-0.63	24.29	36.30	1.68	15.14	-19.92	0.37	1.59
2004	14.34	-0.29	31.86	37.06	1.99	17.50	-19.25	0.51	1.54
2005	18.07	-0.77	36.37	32.21	2.27	17.73	-14.19	0.50	1.44
2006	23.25	-0.26	39.27	39.91	2.70	19.75	-13.05	0.28	1.59
2007	33.44	0.10	43.56	48.61	3.10	21.42	-8.84	0.66	1.91
2008	32.48	0.48	42.76	49.41	2.74	20.34	-27.14	0.96	2.00
2009	29.17	-0.31	48.01	55.75	2.58	20.15	-18.22	0.86	2.80
2010	27.61	-0.62	47.71	55.12	2.72	19.24	-16.79	1.18	3.27
2011	22.30	-1.13	42.99	55.53	2.97	21.01	-28.71	1.41	3.46
2012	21.80	-0.41	39.57	55.75	2.83	20.39	-27.97	1.34	3.54
2013	20.78	-0.98	40.39	60.00	3.52	24.59	-32.19	1.29	2.69
2014	15.29	-0.12	37.20	62.13	3.82	25.83	-40.13	1.27	2.50
2015	15.12	-0.62	30.78	64.22	4.03	28.13	-41.55	1.07	2.13
2016	17.42	-0.58	27.66	60.51	3.53	24.71	-44.80	1.01	2.19
2017	14.68	-0.40	26.18	60.88	3.48	24.70	-40.46	1.19	2.32

(note) net investment income

= investment income (credit) – Investment income (debit)

(data source) IMF, Balance of Payments Standard Presentation

IMF, International Investment Position

IMF, World Economic Outlook

Data of foreign reserves before 2003 are from People's Bank of China.

Because the USD is the key currency, the United States holds a relatively low level of foreign reserves. The US' ratio of foreign reserve holdings to GDP is around 2-3%. In Japan, the amount of foreign reserves has always been lower than 50% of the country's total net foreign asset position. Interestingly, in China, the amount of foreign reserves is roughly two times larger than net foreign asset holdings. It is well known that the expected return of foreign reserves is low because of high liquidity and low risk. A natural result of the composition of foreign asset holdings in cases such as China's is the sacrifice of investment income. This point is very clear when compared to the case of the United States and Japan. For example, in 2017, the ratio of net liabilities to foreign countries to GDP is 40% for the United States. However, the ratio of net investment income to GDP for the United States is 1.2%. In

the case of Japan, the net foreign asset position to GDP is about 60%, and the ratio of investment income to GDP is 3.5%. In contrast, although China had a huge positive net foreign asset position, which amounts to 15% of its GDP, the amount of net investment income was -0.4% to its GDP, about USD 50 billion. This is a large burden to the economy.

A sudden decline in reserve holdings is often thought to be a sign of financial or currency crisis. In that sense, the huge amount of reserve holdings contributed to the stability of China's economy. However, too much reserve accumulation may represent an external economic imbalance and internally hurt the efficiency of fund allocation. The fact that the scale of reserves dominated the net foreign asset position also means that foreign asset holdings are overly concentrated in the government sector. In Japan, the amount of total net foreign assets is twice as large as foreign reserves, which means that large parts of foreign assets are held by the private sector. In recent years, some developing countries received huge amounts of aid from the Chinese government. This may be related to the unique foreign reserve system of China.

Why does China keep such a large scale of foreign reserves? A quick answer, as mentioned above may come from the necessity to lower the potential risk of financial or currency crisis. The Chinese authorities may have strong incentives to prevent the fruits of reform from any kind of economic crises like the Asian currency crisis in the late 1990s, even by sacrificing a certain amount of income from foreign asset investment. Other possible answers may relate to aspects of inertia in the old system. In the planning era, foreign exchange holdings by the household or industry sectors were strictly prohibited by the government. The legal and regulatory systems may fail to adjust quickly in the new development stage. In contrast, Steinberg (2014) asserts that it is difficult to explain the motivation of the huge reserve holdings without considering some political or bureaucratic factors. He further suggests that the foreign reserve accumulation is the result of conflicts between different interest groups. Although each explanation may be potentially important, we need empirical support to know the true story. What we can definitely say is, from the viewpoints of both efficient asset allocation and external imbalance correction, the reform of the current reserve holding regime is needed.

III. The Capital Flows under Financial Accounts

In this subsection, we explore China's capital flows under financial accounts¹¹ and compare them with other group, such as those of developed and emerging countries.

As mentioned above, there exist many ways to approach international capital flows with the available statistics. After all, the standard explanation of current balance is that it simply stands for the differences between domestic savings and investment, that is to say, the current balance equals the total supply of capital to the rest of the world.¹² Yet, most researchers

¹¹ In the new manual provided by the IMF (International Monetary Fund (2009)), direct investment, portfolio investment etc. are classified under the name of financial accounts, which were conventionally termed as capital accounts. To avoid confusion, we follow the IMF's new definition.

and policy makers focus on short-term capital flows or capital flows with high liquidity when discussing international policies.

By the IMF definition of IMF, the identity equation in the balance of payments is as follows,

$$\begin{aligned} & \text{current account} + \text{capital account} + \text{net errors and omissions} \\ & = \text{financial account} + \text{reserves and related items}, \end{aligned}$$

Usually the scale of the capital accounts of a certain country is small. Errors and omissions stand for the mismatch of other items, and as the name suggests are the result of some transactions that are not well identified. Besides capital account and errors and omissions, financial account corresponds with the part of excess domestic savings that are incurred by current accounts and the capital flows into the private sector.

Financial account is further divided into the following four parts.

$$\begin{aligned} & \text{financial accounts} \\ & = \text{direct investment} + \text{portfolio investment} + \text{financial derivatives} \\ & + \text{other investment} \end{aligned}$$

Direct investment is the investment by foreign residents having control or a significant degree of influence on domestic enterprises. Portfolio investment is the investment involving debt or equity securities by nonresidents other than those included in direct investment, aiming at speculative purposes. Other investment includes trade credit between foreign and domestic enterprises, loans and deposits of banks engaged in international transactions. In the following analyses, we focus on direct investment, portfolio investment and other investment while ignoring financial derivatives, because in countries like China or other emerging countries the scale of financial derivatives is relatively small. We check these three items both by time series and by cross-sectional comparisons. For the comparative opponent groups, we define the follow three groups. These are the G7 developed group (G7), the emerging group defined by Ahmed and Zlate (2014) (Group Ahmed), and the emerging group defined by Khatiwada (2017) (Group Khatiwada).¹³

III-1. Direct Investment

Figure 6 shows the ratios of inward and outward direct investments and the differences between them to GDP from 1982 to 2017. Figure 7 shows the ratio of net direct investment to GDP of China compared with those for the above-mentioned three groups.

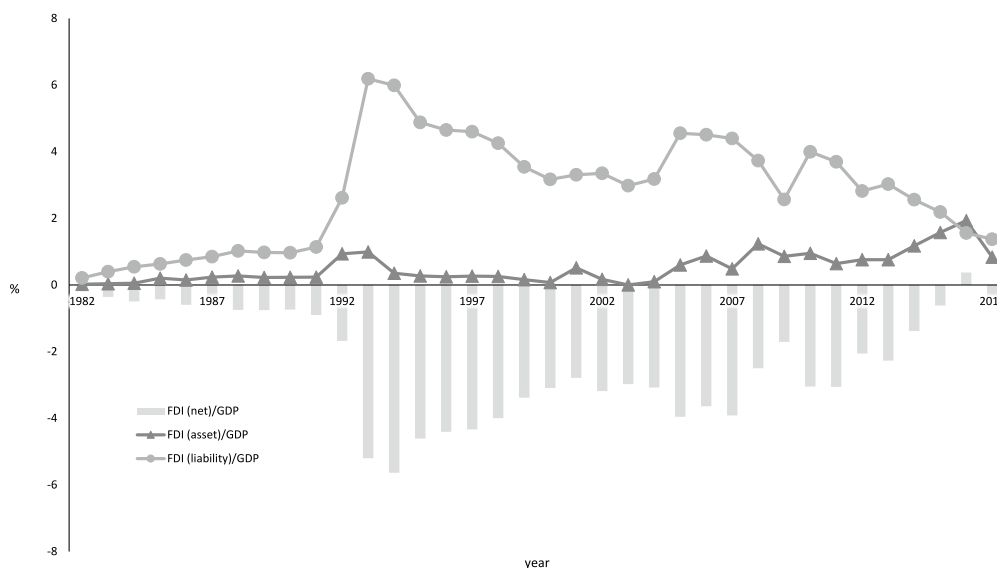
By definition, net direct investment stands for capital net outflow and the negative value of net direct investment means the occurrence of capital net inflow. In the data available period from 1982 to 2017, except the year of 2016, capital inflows of direct investment have outpaced that of outflows. During 1994–1995, the amount of net inflows was over 5% of

¹² Prasad et al. (2007a) take current balance as a measure of capital inflows or outflows.

¹³ Ahmed and Zlate (2014) define 10 countries, not including China, as their emerging country group. Khatiwada (2017) define 22 countries, including China as their emerging country group. Some countries from Eastern Europe are added in Khatiwada's study. Here we exclude China in Group Khatiwada as our second definition of the emerging country groups.

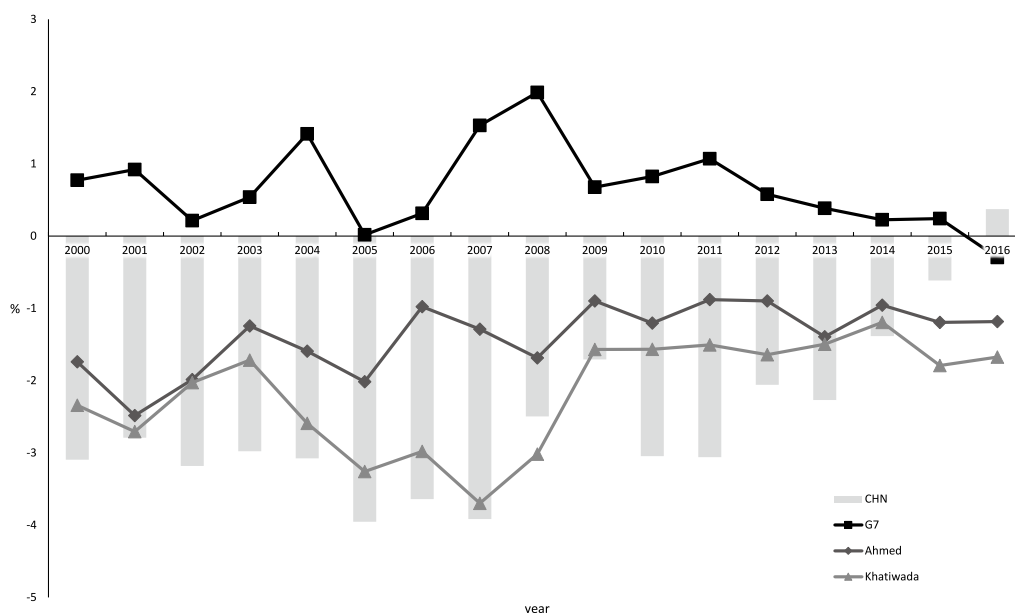
GDP. Such a high level of capital inflow corresponds to the active role played by foreign companies after the reform, as we mentioned in Section II. After 2010, there is a clear upward trend for outward direct investment and a downward trend for inward direct investment. After 2015, the outward and inward direct investment were at about the same level.

Figure 6. Ratio of China's Foreign Direct Investment to GDP



(data source) World Bank, DataBank.

Figure 7. Comparison of FDI between China and Other Country Groups



(data source) World Bank, DataBank.

Compared to other country groups, Figure 7 shows that the scale of inward FDI relative to GDP in China is much higher than that of other emerging countries in Group Ahmed, although Group Khatiwada countries also record high levels in some individual years, because Khatiwada (2017) includes some Eastern countries compared to Ahmed and Zlate (2014). Some studies assert that capital inflows happened from developed to emerging countries right after the financial crisis.¹⁴ However, for FDI this is not the case.

One of the prominent characteristics of FDI into China is that the inflows from Hong Kong are dominantly large. We can confirm the share of inward FDI from Hong Kong in Table 3. It shows that the share from Hong Kong averages more than 60%. Needless to say, foreign direct investment from Hong Kong does not mean investment funds that are all originally provided by Hong Kong residents. However, the high share of FDI from Hong Kong does reflect the influences of certain kinds of cultural or regional factors along with other factors such as tax savings.

The areas in China that accept FDI are also unevenly distributed. Table 4 shows the distribution of inward FDI compare to the distribution of GDP for different areas from 2011 to 2016. Eastern China absorbed the bulk of capital from abroad, much larger than the share of GDP in the same area. While the share of GDP for Eastern areas is about 50–60%, share of FDI acceptance is over 80%. These factors indicate that foreign capital inflows may enlarge the gaps of economic development between different regions.

Table 3. Distributions of FDI Investors' Country and Region

Year	Hong Kong	Japan	America	Tax Heaven Area	Others
	%	%	%	%	%
2006	34.67	7.92	4.62	23.78	25.42
2007	38.46	5.15	3.42	17.85	31.62
2008	46.93	4.21	3.00	16.54	25.86
2009	53.19	5.06	2.91	16.00	19.72
2010	59.45	4.27	2.73	16.38	14.91
2011	63.14	5.67	2.05	14.13	12.75
2012	61.29	6.89	2.26	16.00	10.97
2013	64.89	6.15	2.32	16.17	8.58
2014	66.35	3.67	1.78	13.97	11.06
2015	65.80	2.47	1.69	13.87	14.56
2016	63.43	2.40	1.61	15.16	14.95
2017	68.78	2.54	2.49	13.94	10.83

(note) Tax heaven area includes

Virgin Islands, Cayman Islands, Mauritius etc.

(data source) CEIC.

¹⁴ For example, Guichard (2017: 6).

Table 4. Distributions of FDI Investment and GDP Growth

	FDI share, %			GDP growth rate, %		
	Eastern	Middle	Western	Eastern	Middle	Western
2011	83.27	6.75	9.97	56.30	24.48	19.22
2012	82.81	8.31	8.88	55.63	24.61	19.76
2013	82.39	8.59	9.02	55.49	24.50	20.01
2014	81.90	9.08	9.02	55.34	24.48	20.18
2015	83.85	8.27	7.88	55.57	24.36	20.06
2016	86.73	5.64	7.63	55.44	24.46	20.10

(note) East area includes

Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu
Zhejiang, Fujian, Shandong, Guangdong and Hainan.

Middle area includes

Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan,
Henan, Hubei, and Hunan.

Western area includes

Inner Mongolia, Guangxi, Sichuan, Chongqing
Guizhou, Yunnan, Shaanxi, Gansu, Ningxia
Xinjiang and Tibet.

(data source) “Statistics on FDI in China,” Ministry of Commerce, China.

“Statistical Yearbook of China,” National Bureau of Statistics, China.

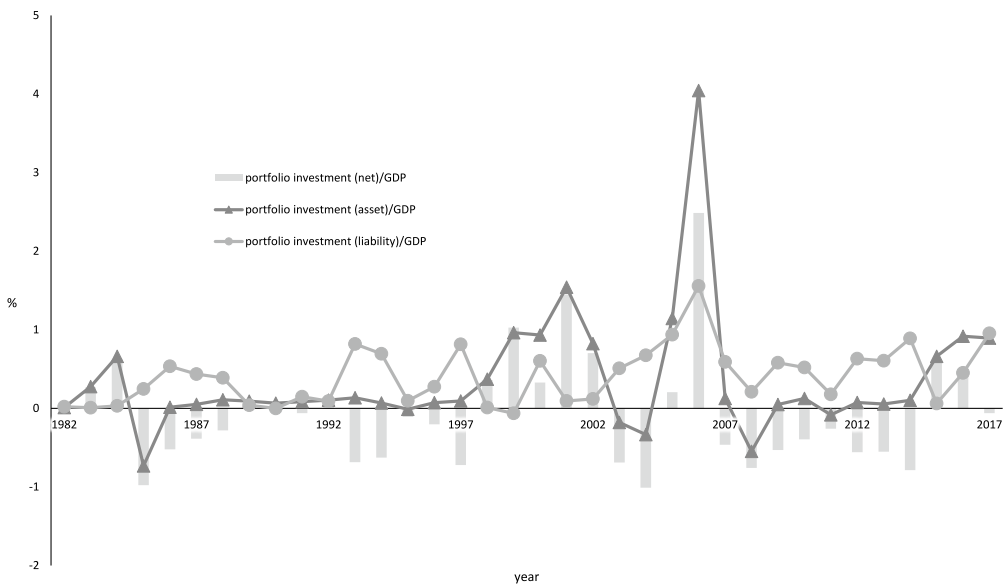
III-2. Portfolio Investment

Figure 8 shows the inward, outward and net portfolio investments in percentage of GDP from 1982 to 2017. For the whole period, the scales of portfolio investments are low for both inward and outward investments except in some individual years. In 2006, inward and outward portfolio investments recorded high levels. Their scale to GDP were 4.0% and 1.6%, respectively. The year 2006 was when the government launched the qualified domestic institutional investor (QDII) scheme to allow domestic financial institutions to invest in securities abroad.¹⁵ The sudden increase in international security investment reflects this schematic change. However, since 2007, both inward and outward portfolio investment has remained low and stable. From 2007 to 2017, the ratio of net portfolio investment to GDP fluctuated between the range of -0.76% and 0.47%. We can observe that China’s portfolio investment is even lower and more stable than that of other emerging countries in Figure 9. These facts indicate the regulation is effective and binding the security transactions between China and the rest of the world.

As discussed previously, there were large-scale capital inflows from developed countries into emerging countries right after the financial crisis. Capital flows in portfolio investment are considered to have the character of speculative investment. The low and stable speculative investments in China during the whole period of financial crisis, the unconventional

¹⁵ QFII (qualified foreign institutional investor) system started in 2002.

Figure 8. Ratio of China's Portfolio Investment to GDP



(data source) World Bank, DataBank.

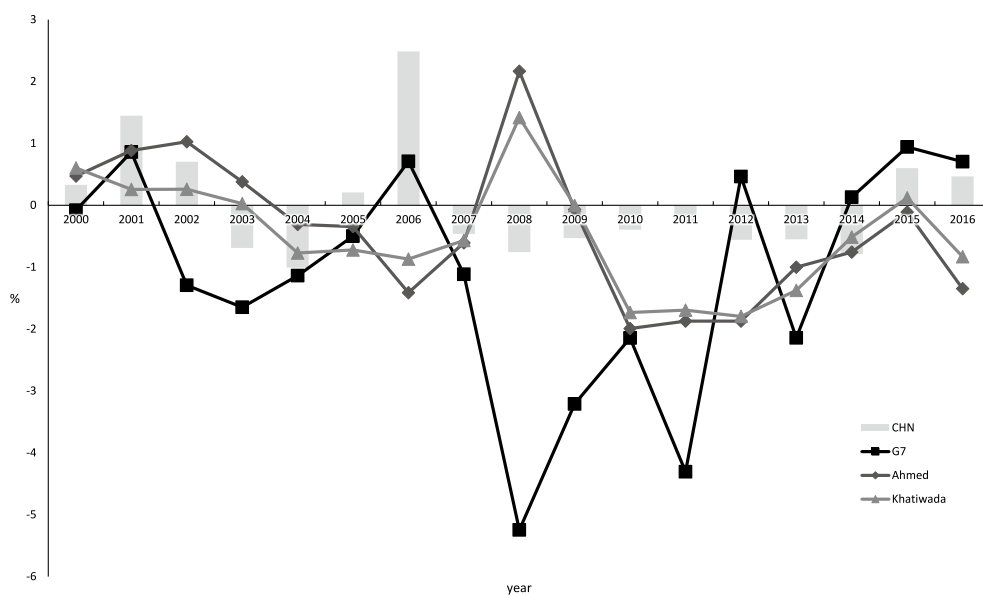
monetary policy and security purchase tapering by FED indicate that mechanism of the capital flows through portfolio investments in China may be different from that of other emerging countries. Figure 9 shows that in other emerging country groups, net inflows of portfolio investment reached their highest level during 2010–2013. The relatively large scale of inflow portfolio investment happened in 2004, a period much earlier than the beginning of financial crisis or nonconventional monetary policy in developed countries.

III-3. Other Investment

The characteristics of other investment are different from that of both direct investment and portfolio investment. These are shown in Figure 10 and Figure 11. As discussed previously, other investment includes bank loans, bank deposits and trade credit etc. We can consider that this category of investment lies in the middle of direct investment and portfolio investment in the sense that other investments may not be as speculative as the latter and may not be as long-term an investment as the former. Figure 10 shows that the scale of other investments of China is relatively large and the volatility is high. We also observe from Figure 11 that for many years, there are no obvious differences of the scale and volatility of other investment in China comparing with other groups. In recent years, the fluctuation of other investment in China tend to be large. From 2015 to 2016, China's foreign reserves holdings dropped by USD 787 billion. The outflows of other investment in these two years were of roughly the same order (USD 751 billion).

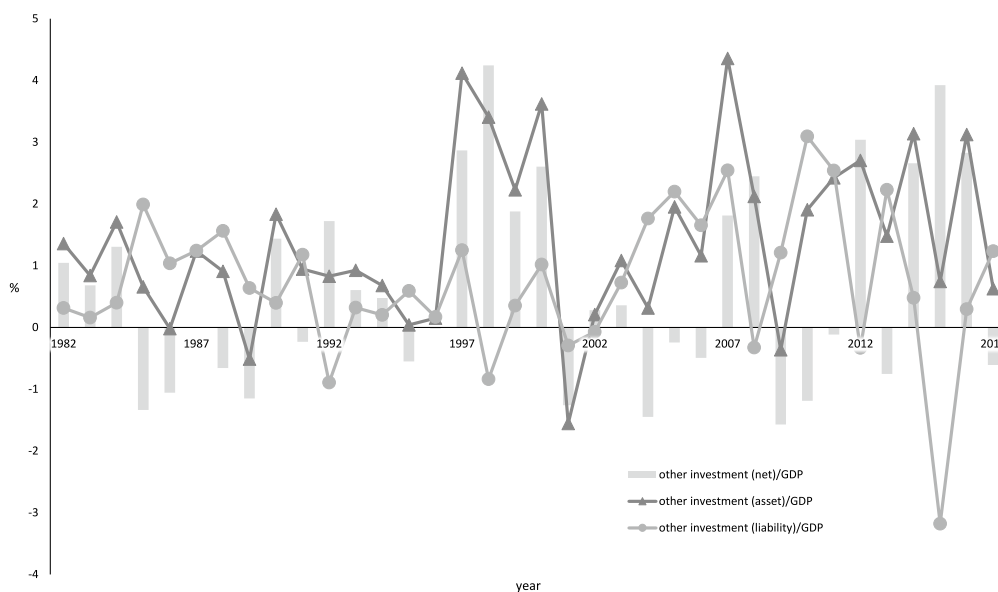
The main features of capital flows to China under the financial accounts can be summa-

Figure 9. Comparison of Portfolio Investment between China and Other Country Groups



(data source) World Bank, DataBank.

Figure 10. Ratio of China's Other Investment to GDP

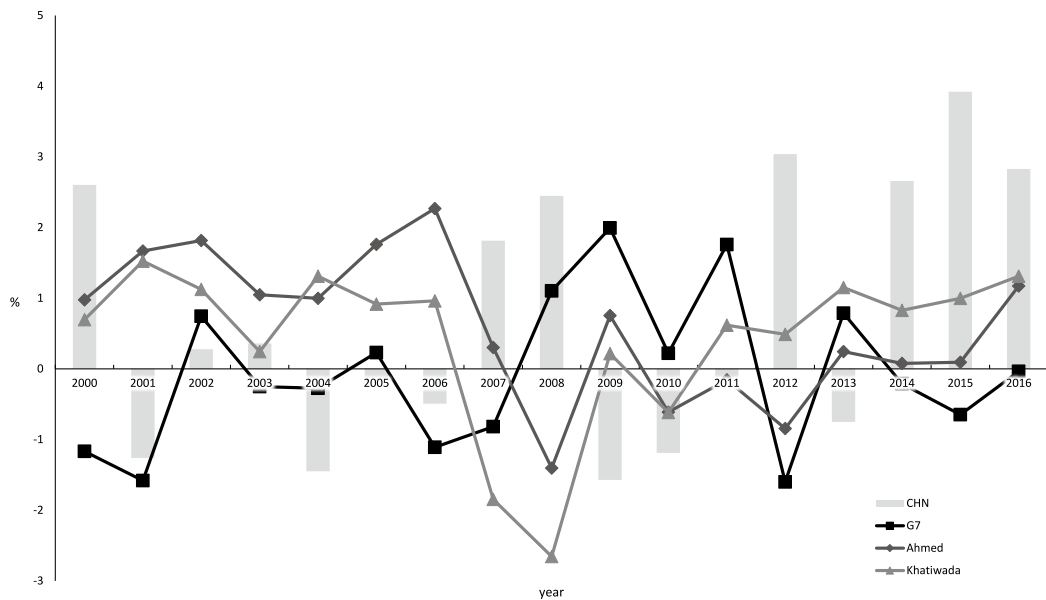


(data source) World Bank, DataBank.

rized as follows.

From the first half of the 1990s until recent years, inward direct investment has far outpaced outward direct investment. For most years of this period, the ratio of net inward direct

Figure 11. Comparasion of Other Investment between China and Other Country Groups



(data source) World Bank, DataBank.

investment to GDP lies between 2% and 4%. Before 2014 the ratio of outward direct investment to GDP had been lower than 1% for almost every year.

The year 2006 is an exceptional year in which the scale of portfolio investment was sizeable. For other years, the scale of portfolio investment was small and the fluctuation was low. We cannot observe corresponding changes in this category related to either the financial crisis or the monetary policy stance in developed countries.

Other investments consist of banking transactions and trade credits. The scale and fluctuation of this category are larger and greater than those of other emerging countries. Besides direct investment, capital flows to the private sector are dominated by other investments.

IV. About Hot Money

There exist many different ways to approach international capital flows. Prasad et al. (2007a) focus on the balance of current account as the measure of international capital flows to research the relations between economic development and growth, financial institutions and international capital flows. Their definition is based on the gaps between domestic savings and investments. We have already discussed China's current account balance. China has maintained a positive current account balance since the mid-1990s. The surplus reached its peak in the mid-2000s and kept a relative stable scale at around 2% in terms of GDP in recent years. However, researchers tend to focus on some more specific definitions in considering international capital flows. Hot money is one example researched in recent studies.

(Chari and Kehoe, 2003; Bouvatier, 2010; Ho et al., 2018). Usually hot money is defined as follows:¹⁶

$$\text{hot money} = \text{increase in foreign reserves} - \text{trade surplus} - \text{net inflows of FDI}$$

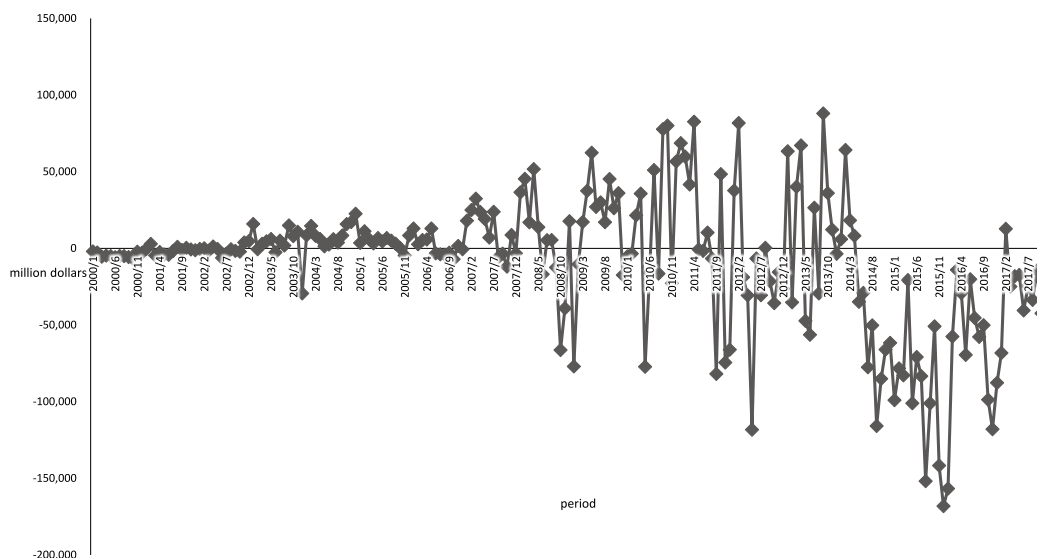
We plot monthly data on hot money in Figure 12. Until 2006, the amount of hot money was approximately zero, except for a large decline in December 2003 when the government decided to use some of the funds from the accumulated foreign reserves to tackle nonperforming loan problems in the banking sector.

Hot money is considered important in international capital flows. It is often characterized as shortsighted and speculative investment that may tend to disrupt macroeconomic stability. Assuming that the current account balance is approximately equal to trade surplus, by the identity of balance of payments, we can transfer the above definition into the following equation:¹⁷

$$\begin{aligned} \text{hot money} = & \text{capital account} + \text{errors and omissions} - \text{portfolio investment} \\ & - \text{other investment} - \text{financial derivatives} \end{aligned}$$

We have analyzed that the categories of capital account, portfolio investment and financial derivatives are relatively small for China, and errors and omissions do not systemically influence the capital flows. It is easy to see that hot money should highly correlate with the

Figure 12. China's Hot Money (Changes in Foreign Reserves-Trade Balance-FDI)



(data source) Nation Bureau of Statistics, China. <http://www.stats.gov.cn/tjsj/>

¹⁶ In order to get monthly net inflows of FDI we need both gross inward and outward information on FDI. However, the National Bureau of Statistics provides only monthly inward FDI data. Here we use the quarterly information from balance of payments data to estimate the ratio of gross outward and inward FDI, and assume that this ratio in each month of the same quarter is unchanged.

¹⁷ The identity equation is as follows: current account+capital account+errors and omissions=changes in reserves+FDI+portfolio investment+financial derivatives+other investment

category of other investment. In fact, the correlation coefficient between quarterly hot money and other investment from 1998 to 2017 is 0.9124.¹⁸ Table 5 calculated the accumulated level of hot money with its related categories in three periods, 1982–1997, 1998–2007 and 2008–2017. We can observe that the categories of other investment and errors and omissions highly correspond to hot money. In China, hot money may not correspond to shortsighted and speculative investment from abroad. However, the results by many of these studies are less clear-cut.¹⁹

Figure 13 shows the number of academic papers in China focused on hot money. In the next section, we will use time series method to analyze how the US and Chinese monetary policy influences hot money in China. There has been a boom in China focusing on hot money,²⁰ with the number of related academic articles reaching its peak in 2008. Considering the time of preparation and publication of academic articles, we can conclude that the academic concern about hot money reached its climax before the financial crisis. This boom may reflect the temporary increase of portfolio investment in 2001 and 2006 as we discussed previously. After 2014, however, this boom seemed to fade away.

Table 5. Hot Money and its Composition

Item	1982–1997	1997–2007	2008–2017
	100 million dollars	100 million dollars	100 million dollars
Hot money	–1,120	–1,535	–18,698
Capital account	0	110	243
Portfolio investment	201	–742	1,773
Other investment	–343	–1,058	–10,942
Financial derivatives	0	0	–70
Errors and omissions	–981	156	–9,706

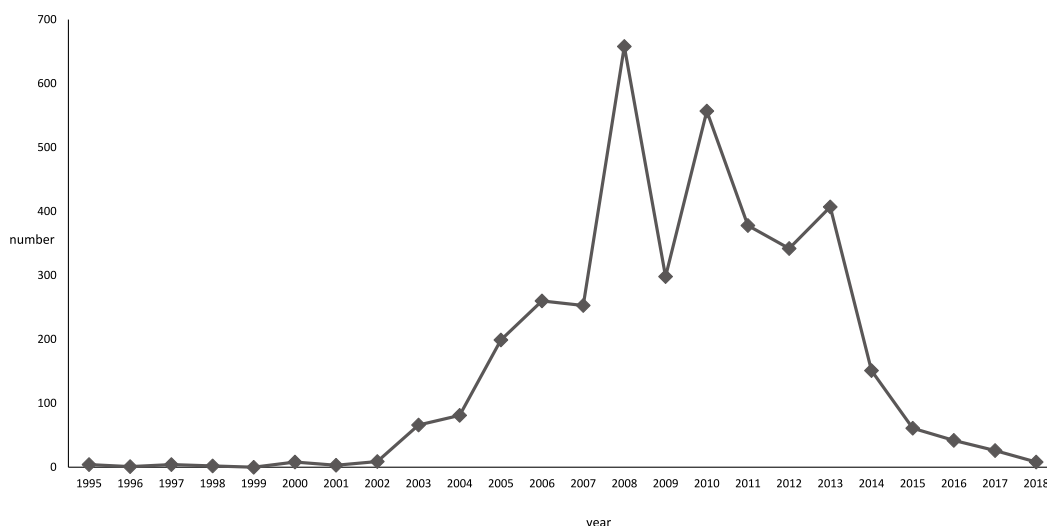
(data source) Balance of Payments,
State Administration of Foreign Exchange, China.
<http://www.safe.gov.cn/>

¹⁸ The correlation coefficients between hot money and FDI, and portfolio investment are 0.2876 and 0.1523 respectively.

¹⁹ Wang and Huang (2016) stress the impact of hot money on China's economy. However, as they wrongly estimate trade surplus, the scale of hot money in their study is inadequately large.

²⁰ For example, Tang and Liang (2007), Zhang (2008).

Figure 13. Number of Academic Articles on “Hot Money”



(note) Number of academic articles with “hot money” in the title.

(data source) China National Knowledge Infrastructure.

<http://www.cnki.net/>

V. An Analysis by VAR Approach

In this section, we analyze how the capital flows to China respond to US and Chinese monetary policies by the VAR approach. We will show two kinds of results. In the first analysis, we analyze the impacts of monetary policy on capital flows to China before and after the financial crisis. In order to keep sufficient degrees of freedom, we use monthly hot money as a measure of international capital flows. The pre- and post-crisis periods are set as 1999 m1-2007 m12 and 2009 m1-2017 m10. The purpose of this analysis is to see how the influence from the US Federal Reserve’s monetary policy on capital flows to China changed due to the financial crisis. In our second analysis, we estimate the influences of American monetary policy on each category separately. We use quarterly data and ignore the category of financial derivatives, given the available data. The estimation period in the second analysis is 1998 q1-2017 q3.

We use a five-variable VAR model for the two analyses. The order of the variables is as follows: (1) VIX (volatility index) shows the potential uncertainty of the international financial markets. (2) Measures of monetary policy stance. We define two measures. One is calculated by the differences in money supply growth rates between the United States and China. The other is the differences in interest rates between the two countries, which are calculated using the difference in the yields of the 10-year government bond. (3) Real effective exchange rate of RMB. (4) Variables showing the real economic activities, which are calculated by the differences in the growth rates of industrial indexes for the two countries.

(5) Capital flows, which are defined as growth rate of hot money (for monthly date) or the growth rate of each category under the financial account (net FDI, net portfolio investments or net other investments). The VIX data are from the Federal Reserve Bank of St. Louis.²¹ All other data are from the CEIC.

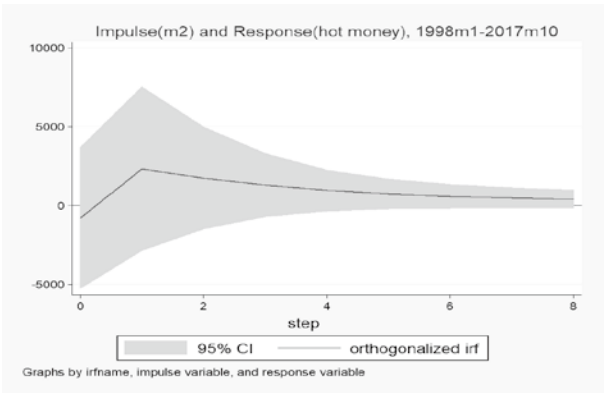
The results based on monthly data analysis are shown in Figure 14 and Figure 15. Figure 14 is the result using the differences of the growth rate of money supply as monetary policy measure and Figure 15 is the result using interest rate differences. We can observe that before the financial crisis, hot money to China negatively (outflow) reacted to the relative increase of money supply in the United States for the first month, and then returned to the normal level. In contrast, in the period after the financial crisis, hot money did not immediately respond to the relative changes in money supply and positively (inflow) reacted after one month and then returned to the normal level after six months. If the increase of money supply in the United States means the overall downward changes of expected returns in US financial markets, we can interpret the results as that the reaction of hot money to China is more consistent with the theoretical prediction.

In the results based on interest rate differences, before the financial crisis, hot money to China hardly reacted to the policy changes. However, in periods after the financial crisis, hot money negatively responded to the increase of interest rate in the United States and returned to the normal level after six months. The interpretation is the same as what is shown in Figure 14. That is, after the financial crisis, hot money changed more consistently with the theoretical prediction.

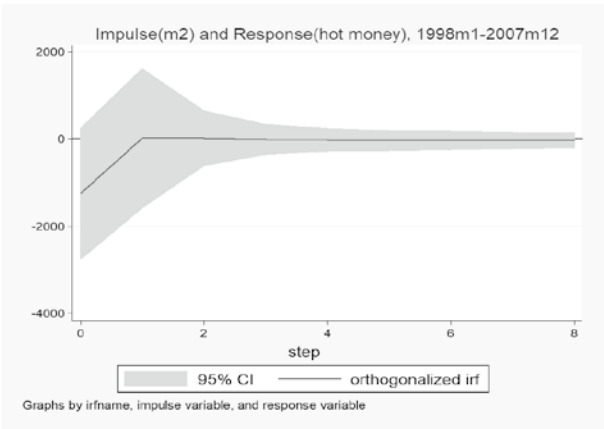
Figure 16 and Figure 17 show the changes of capital flows corresponding to monetary policy for different categories. The results show that the reactions of FDI are weak. Portfolio investments and other investments largely respond to the changes in monetary policy. However, compared to portfolio investments that immediately reacted to the changes in monetary policy, other investments began to change only after one quarter.

²¹ <https://research.stlouisfed.org/>.

Figure 14. Impulse and Response of Hot Money to US Money Supply
All period



Before Financial Crisis



After Financial Crisis

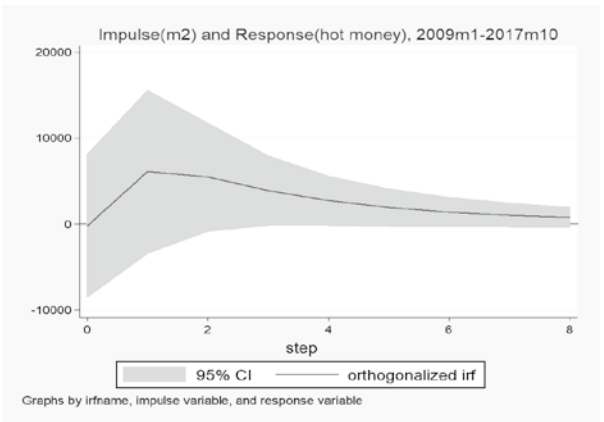
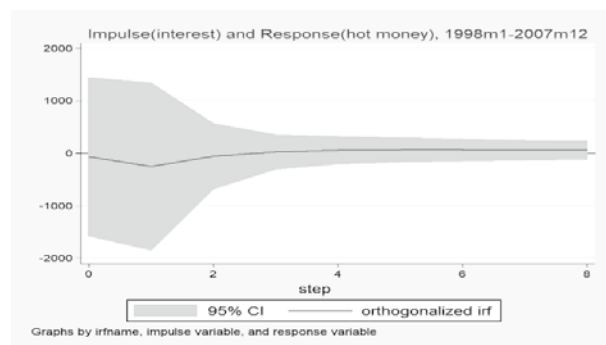


Figure 15. Impulse and Response of Hot Money to US Interest rates

All period



Before Financial Crisis



After Financial Crisis

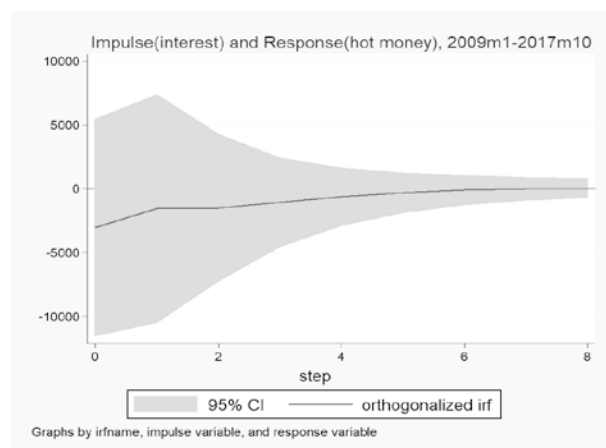
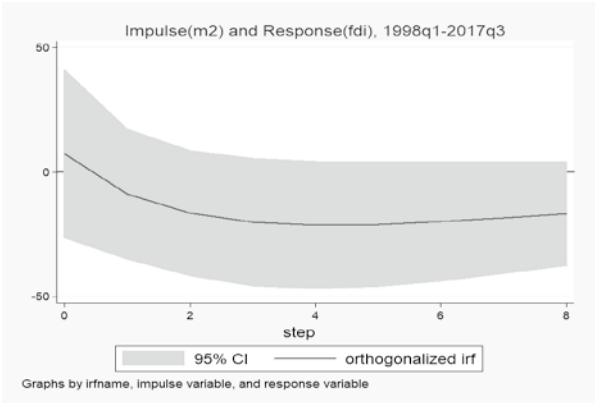
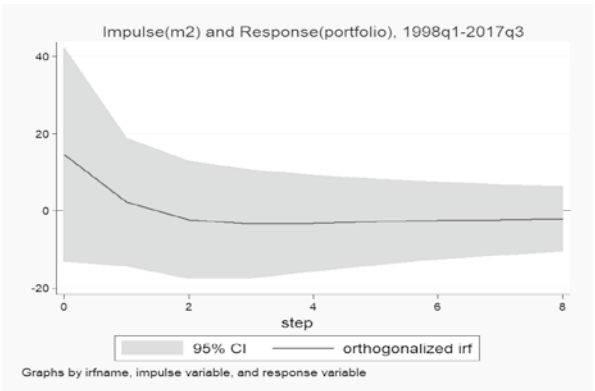


Figure 16. Impulse and Response of Financial Accounts to US Money Supply

FDI



Portfolio Investment



Other Investment

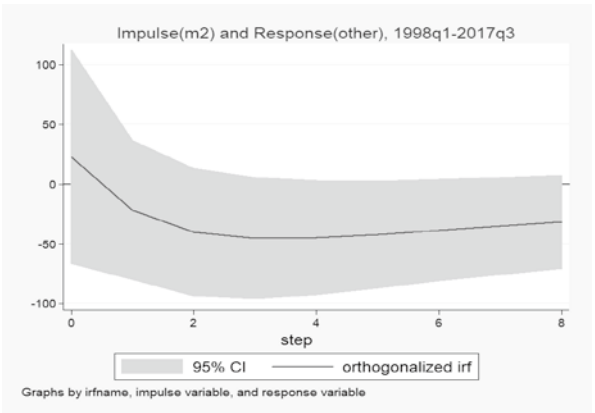
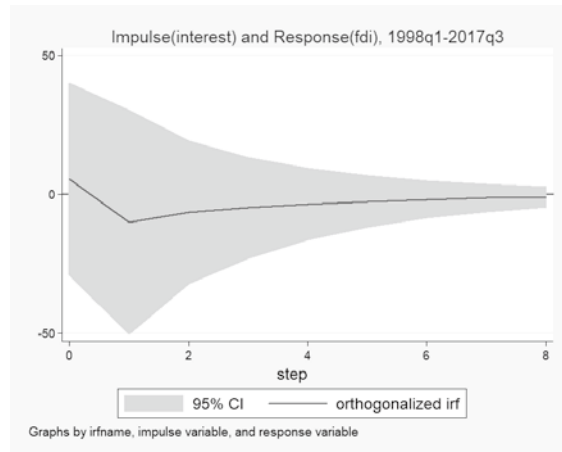
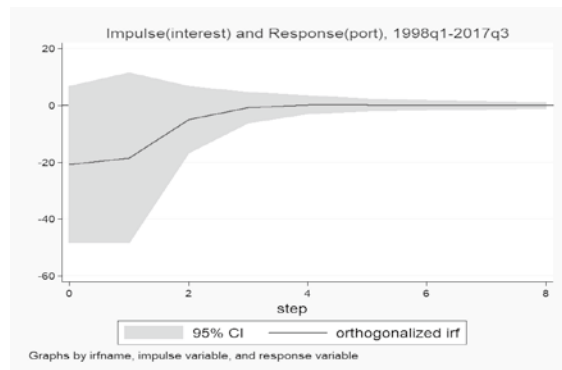


Figure 17. Impulse and Response of Financial Accounts to US Interest Rates

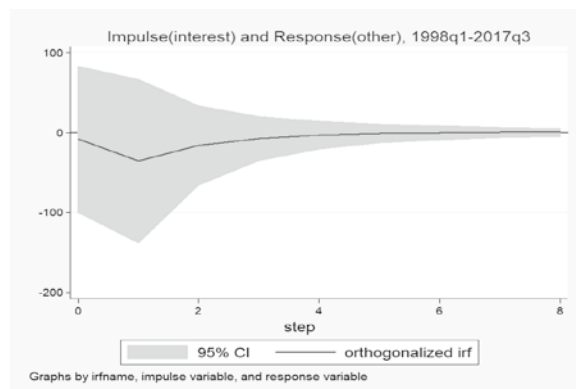
FDI



Portfolio Investment



Other Investment



VI. Conclusions

The main points of this study are as follows.

After China's reform and opening, economic development and growth heavily depended on foreign capital. This experience is largely different from that of Japan in its high-growth era.

The allocation of foreign asset holdings is inefficient. From the viewpoints of international economic imbalance correction and efficient fund allocation, a reform on the management and the scale of foreign reserve holdings should be given high priority.

The scale of inward FDI is large and relatively stable. However, the distributions of foreign capital are concentrated in the eastern area and may form a factor to enlarge the development gaps among different regions.

The so-called hot money is highly correlated with the category of other investments, which means that we should pay more attention to the capital flows through the banking sector.

After the financial crisis, hot money reacted to the differences of monetary policy between the United States and China in a way that is more consistent with theory. FDI hardly reacted to the policy changes and portfolio investment and other investment changed in a way that is more consistent with theoretical prediction.

Finally, we must point out that some of the issues raised here need further exploration. Firstly, while there seems to be a consensus on the desirability of capital or financial account liberalization in the long-run, there are problems that need to be answered, such as on what schedule, under what kind of preconditions and what will be the potential impacts on the real economy. Secondly, although we have discussed the necessity of reform of the foreign reserve holding regime, a further analysis from a wide array of perspectives on the potential benefits and costs of reserve holdings is needed. Thirdly, in China, the central bank holds almost all of the foreign reserves as assets on its balance sheet, compared with the case of Japan in which the central bank holds foreign assets equivalent to less than 10% of the nation's total reserves. It is possible that such a huge amount of foreign reserve holdings burdened the monetary policy operation. All these problems need to be further analyzed.

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