Chapter 4
The Structural Transformation of the External Flow of Funds Between the U.S. And China

Abstract This chapter explores the concept of the External Flow of Funds (EFF) and examines the structural transformation and risk posed by changes in the EFF between the U.S. and China. The U.S.’s double-deficit and China’s twin-surplus in the balance of payments, and the risk of China’s huge foreign reserves are statistically analyzed through three lenses: savings and investment, international trade, and international capital flows. Finally, this paper proposes economic policy changes to mirror the structural adjustment required for China’s economic development.

Keywords Mirror image · Current balance · External flow of funds · Global imbalance · Capital gains · Financial risk

4.1 Introduction
The Treasury International Capital (TIC) system reports that U.S. capital in Chinese foreign exchange can be broken into three main parts: long-term debt (50%), long-term financial bonds (35%), and stock shares, corporate bonds, and short-term bonds (15%). As of September 2008, China owned 587 million dollars of U.S. bonds, surpassing Japan as the top foreign creditor. By September 2009, that amount increased to 938.3 million dollars.¹ This is a very rare occurrence. In other words, it was the first time that the largest developing country provided financing for the largest advanced country. When we examine inclusive trade flows and flows of funds, we can see that there is an unstable symmetrical mirror image between China and the U.S.: (1) high consumption in the U.S. mirrors high savings in China; (2) massive Chinese exports of cheap goods to the U.S. enable the excessive consumption of U.S. consumers; (3) the huge U.S. trade deficit coexists with the Chinese trade surplus; (4) the rapid increase of Chinese foreign exchange reserves reflects the significant increase in U.S. debt; (5) the Chinese purchase of U.S. bonds using its foreign exchange reserves allows the financing of the shortage of funds in the

¹U.S. Department of the Treasury, Treasury International Capital System https://www.ustreas.gov/tic/.
Although the 2008 financial crisis centered in Wall Street brought worldwide economic panic, China continued to purchase U.S. bonds. As a result, Chinese foreign exchange reserves and the flow of funds have caught the world’s attention, with the risks accompanying huge Chinese foreign exchange reserves reminding us of the Sword of Damocles. This potential threat demands that we investigate the direction of Chinese external flow of funds (EFF) with composure, assess the risks of huge foreign exchange reserves and U.S. bond holdings for the development of Chinese economy, and find a way to address with the U.S.–China mirror image in the EFF.

A mirror image is an identical but reversed duplication that results from the reflection of light off of a mirror. The term “mirror image” has often been used in the economics literature to analyze economic phenomena and changes in financial market. In this paper, we will use the concept along with the flow of funds and balance of payments statistics to explore the mirrored relationship between China and the U.S. and the risks therein.

This chapter cites a series of studies by Zhang (2002, 19–26) on the problem of Chinese EFF. These studies presented the theoretical framework for the analysis of external funding cycles using the results of previous work. Using national income, flow of funds, and balance of payments statistics, Zhang performed descriptive statistical analysis on the Chinese EFF, finding a massive net outflow of funds from China since the 1990s. In addition, he offered multiple policy recommendations for the currency basket system, suggesting that China keep moderate foreign exchange reserves while gradually lowering the percentage of U.S. dollars in Chinese foreign exchange reserves. Zhang (2008, 103–119) improved the theoretical framework of the global EFF using the perspective of savings and investment flows, trade flows, and foreign capital flows. Zhang also built an econometric model for the EFF. Using this model, Zhang performed econometric analysis on China’s EFF, exploring its structural problems, and identified the longstanding problem of the twin-surplus problem in the Chinese balance of payments.

Li and Yin (2007, 14–26) also performed valuable research on the Chinese flow of funds. They divided Chinese savings into its respective sub-portions, unearthing characteristics of the Chinese savings: the long-term and steady decline of the households’ sector savings rate, overall increase savings rate in the corporations sector, and rapid increase of the savings rate in the government sector since 2000. In other words, the factors of high Chinese savings were increased by the sector of the corporations and government. However, their research was limited in the savings aspect, and did not systematically explore the overall flow of funds. Lu (2008, 19–27) studied the causes and the practical performance of the mirror image relationship between China and the US, and from there decoded the characteristics of economic growth framework in both countries and realities facing both countries. Also from observational data, an uneven US external evolution and the fact that China is the largest mirror image country, Lu presented policy recommendations on the Chinese economic imbalances and increase, as well as conditions for a fast growth that is possible only through an adjustment in systemic reform.

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2Krugman (2009).
Tanaka and Nishimura (2009) argued that what is lurking behind expansion of the US current account deficit is an expanded US domestic demand (real estate bubble and decline in savings rate) and long-term decline in interest rates due to a huge overseas capital inflow, instead of trade surpluses from developing countries like China being the trigger of the financial crisis. Matubayashi (2009) explored in the structural and cyclical causes of the U.S. current account deficit in multiple dimensions, pointing out the effect of overseas capital inflows on the fluctuation of U.S. real estate prices. Tsujimura (2009) used the U.S. flow of funds statistics to build a financial input–output table, statistically verifying the transmission mechanism of the U.S. subprime debt crisis to the worldwide financial crisis.

Another viewpoint suggests that the difference in the maturity of financial market systems brought about the mirror image between the U.S. and China. According to Willen (2004), if the maturity of a financial market in a country is lower, the savings rate of that country will be higher; the imbalance of the EFF between the U.S. and China would thus be brought about. Caballero (2008) used an equilibrium model to research the relationship between global imbalances and low interest rates, claiming that global imbalances are decided by the difference in the capabilities and assets which each country provides to the world. Mendoza et al. (2009) also offered a similar viewpoint that promoting the integration of financial markets, reducing savings for financial development, and expanding loans from overseas will bring about a global imbalance over the long run.

Citing the studies above, this paper attempts to statistically observe the mirror image in the EFF between China and the U.S., analyzing the risk involved in the rapid growth of Chinese foreign exchange reserves and the structural problems in Chinese economic growth. In addition, this paper addresses the problems facing China after the financial crisis by offering a statistical description of the convergence of the domestic flow of funds and EFF. Moreover, this paper presents systemic analysis of the cause and result of the mirror image formed from the 1990s to 2018 China–U.S. EFF, its inherent risks, and required adjustments to maintain growth.

The remainder of this paper proceeds as follows. First, we build a theoretical framework for the analysis of the U.S.–China EFF based on the balance of savings and investment flows, external trade cycles, and the EFF. Second, we descriptively-statistically analyze the imbalance of the U.S. EFF and the reasons for the formation of a mirror image with China. Third, we analyze the twin-surplus phenomenon in the Chinese EFF and the risk it brings in terms of the rapid increase in foreign exchange reserves to shed light on the structural problem behind the mirror-image relationship. Finally, we inductively summarize the results of our analysis and present policy recommendations.
4.2 A New Framework for EFF Analysis

EFF refers to the flow of international capital brought by financing and current account imbalances due to the savings-investment gap. Therefore, the EFF includes three convergent parts: savings-investment flows, trade flows, and foreign capital flows. Statistically and definitionally speaking, a domestic capital surplus and deficiency in the flow of funds table coincide with the current account of the balance of payments through overseas net financial investment, and the overseas flow of funds in the table corresponds to the capital account of the balance of payments.

It is therefore possible to observe the systematic process of the EFF using the flow of funds and balance of payments statistics. We know that the analysis of the EFF involves two aspects: one is the relationship between the real economy and the financial economy; the other is the relationship between domestic funds and international capital flows. The key to solving these two relationships is the balanced development of savings-investment flows, trade flows, and foreign capital flows. The analysis of the EFF relates the domestic savings-investment gap, external financial surplus or deficit, and observes the international capital flows brought about by current account adjustments. In addition, it investigates the relationship between the real economy and the financial economy, and the mutual influence of the direction of domestic and international capital flows through savings-investment flows, trade flows, and foreign capital flows. The analysis of the EFF is a broader extension of the flow of funds analysis and an expansion of the analytical perspective from the domestic flow of funds to international capital flows.

As the flow of funds in financial markets is tied up with the balance of payments, the overseas sector will have a fund outflow excess (net capital outflows) if the current account is in surplus. Conversely, the domestic sector will have net negative inflows. Therefore, when the real economic side of the domestic and overseas economy is analyzed in an open economic system, the balance of savings and investment in the domestic economy corresponds to the current account balance. According to the dynamic process of the EFF and the definitional equations of the system of national accounts, the accounting identity becomes

\[ Y = C + I + G + EX - IM. \]

The equilibrium condition is obtained through rearranging the formula above as

\[ S - I = EM - IM. \]

The right side of the equilibrium condition is the current account, and the left side of the equilibrium condition is the balance of savings and investment, or net financial investment. Therefore, equilibrium conditions are reached as follows

\[ B = [EX - IM] + [FI - FO] \] (4.1)
where $B =$ the balance of payments, $EX =$ exports, $IM =$ imports, $FI =$ fund inflows, and $FO =$ fund outflows. From national accounting we have

$$S - I = EX - IM$$

where $S \equiv$ national savings and $I \equiv$ investment, which implies

$$B = [S - I] + [FI - FO] \quad (4.2)$$

where $S - I \equiv$ domestic financial markets and $FI - FO \equiv$ international (ROW) financial markets. However, the domestic net funds outflow corresponds with the capital account balance when we examine the financial relationship between domestic and overseas funds. Therefore, relationships among the domestic savings-investment balance, the financial surplus or deficit, the current account, and the overseas net funds outflow will be expressed in the following structural formulas.

Using (4.2), consider two countries A and B,

$$B_A = [S_A - I_A] + [FI_A - FO_A]$$
$$B_B = [S_B - I_B] + [FI_B - FO_B]$$

Assuming $B_A = B_B = 0$,

if for A, $S_A < I_A$, then $FI_A < FO_A$.
then for B, if $S_B > I_B$, then $FI_B < FO_B$.

If $B \neq 0$, then the deficits and surpluses will bring about changes in reserve assets, such as currencies, gold, and SDRs. We therefore have an overseas income and expenditures balance of

$$EX - IM = (FO - FI) + CRA \quad (4.3)$$

Regard $r_{t-1}FI_{t-1}$ as the interest payments on external debt, and set $CRA = FRA_t - FRA_{t-1}$, allows us to transform Formula (4.3) into

$$(EX_t - IM_t) - (FI_t - FO_t - r_{t-1}FI_{t-1}) - (FRA_t - FRA_{t-1}) = 0 \quad (4.4)$$

The EFF crisis can be shown as follows when the FRA minimum received was set to $FRA'$

$$(EX_t - IM_t) - (FI_t - FO_t - r_{t-1}FI_{t-1}) + FRA_{t-1} < FRA' \quad (4.5)$$

where $CRA =$ the change in reserve assets and $FRA =$ the stock of foreign reserves assets.

Formula (4.1) shows the relationship between international payments, domestic fund flows, and the current account balance. The balance of domestic financial markets and international financial markets is shown in Formula (4.2). It is clear
that the EFF and the international flow of goods are opposite sides of the same coin—a flow of trade is a flow of payments in reverse.

When the current account is in surplus, the capital account can be in a deficit ($FO > FI$, or a net outflow of funds). An increase in foreign reserves can cause a country’s external claims to increase. Otherwise, when domestic investment is larger than domestic savings, the current account is in deficit, and external debt can only increase through the inflow of funds ($FO < FI$, the capital balance is in surplus), or through decreasing foreign reserves as a compensation for the current account deficit. By changing Formula (4.3), we see the constitution of foreign reserves, which shows that the simultaneous existence of a current balance and capital balance surplus will increase foreign reserves. In other words, when the current balance is in surplus, net outflows should also be in surplus, creating an increase in foreign reserves. As a result of a rapid foreign reserves increase, there is a systematic problem in the EFF. Since the change in the current balance results from the balance of savings and investment, the change in foreign reserves actually depends on the change in the structure of the flow of funds. Some additional factors that affect foreign exchange reserves are a country’s foreign exchange rate, which often affects the current balance of payments, and the benchmark interest rate of the central bank.

Formula (4.5) highlights several possible areas where a crisis can take place in the international flow of funds. The first is when the current account deficit is too large ($IM > EM$) for pre-foreign exchange reserves to handle. The second comes from changes in stock market returns, market interest rates, and foreign exchange rates, which cause short-term capital outflows to be dramatically larger than international capital inflows. In this case, a shortage in foreign exchange reserves to address domestic capital’s needs may trigger a currency crisis. The third is a crisis in external debt payments due to current account and capital account deficits. The fourth case is when exchange rates rapidly fluctuate, causing a currency to go through significant appreciation or depreciation and eventually leading to systematic crises in the current account, capital account, external debt payments, and so on.

In order to test external financial stability and provide early warnings of a systemic financial crisis through the EFF, we need a new analytical framework that corresponds to the operational structure of the EFF, which can therefore become the foundation of a statistical monitoring system. This analytical framework which links the domestic savings-investment balance, current account balance, and international capital flows must reflect the dynamic changes in economic entities and financial statistics, along with the interdependence of the domestic flow of funds and international capital movements.
4.3 Structural Transformations of the EFF in the U.S.

4.3.1 The Imbalance of the Current Balance Between the U.S. and China

To begin, we provide a statistical overview of the long-term trend of changes in the U.S. EFF. Figure 4.1 shows these trends in the current balance of the U.S. with China and Japan from 1982 to 2019. For 36 years since the 1980s, the U.S. current balance has basically been in a deficit, going through two large cycles of increase and decline. The first cycle spanned from 1980 to 1991. In 1980, the U.S. current balance was a $231.7 million dollar surplus. However, by 1987 this had turned into a deficit of $1.607 trillion dollars, equivalent to 3.4% of U.S. GDP. During this time the U.S. and Japan had frequent trade frictions. In order to minimize the frictions, developed countries met in New York, on September 5th, 1985 to pass the “Plaza Accord,” wherein the five developed countries pledged to intervene in the market, reducing the U.S. deficit and raising the value of the Japanese yen. After the accord, the value of the yen against the dollar increased from 252 yen to 1 dollar in 1984 to 122 yen to 1 dollar in 1987. As a result, foreign capital outflows from Japan increased dramatically in magnitude, and capital inflows, including hot money inflows from overseas, increased from 62.1 million yen in 1984 to 430.3 million yen in 1988, a sevenfold increase over five years. On the other hand, capital outflows from Japan increased from 152 million yen in 1984 to 529 million yen in 1988. As a result of the yen’s appreciation, exports from Japan were seriously damaged, and factories were forced to move back to Japan, leading to the famous Japanese Bubble Economy with increased stock prices and premiums. Consequently, the U.S. deficit gradually

![Figure 4.1 Changes in the current balance in China and the U.S. (as % of GDP). Source IMF, World Economic Outlook, January 2020.](image)

3 The Bank of Japan, *Flow of Funds Accounts*. 
decreased. Figure 4.1 shows that, in 1991, the U.S. current balance turned into a surplus and GDP increased by 0.048%.

The next cycle in the U.S. current balance was from 1992 to 2019. In 1991, the U.S. current balance was a 2.9 million dollar surplus, which reverted to a 50.1 million dollar deficit after only a year. This deficit increased massively to 8.06 trillion dollars in 2006, consisting of 6% of U.S. GDP. Looking at the long-term trend from 1982 to 2018, the current balance deficit of the United States has clearly declined since 2008, and now accounts for 2.3% of GDP, returning to the levels of the early 1980s and completing the second cycle of the past 40 years. However, since 2004, China replaced Japan as the country with the largest trade surplus with the U.S. China’s economic growth rate continued to exceed 10% from 2003 to 2010, arguably displaying overheated economic growth. Correspondingly, the size of China’s current surplus increased and the ratio of current surplus to GDP kept rising. Figure 4.1 shows the peak period in China from 2004 to 2010. In 2008, China’s current surplus reached $353.83 billion, accounting for 9.9% of its GDP. This large current surplus mainly flowed to the United States. Figure 4.2 shows the historical trade deficit between the United States with China and Japan.

As can be seen from Fig. 4.2, while the current deficit between the U.S. and Japan has narrowed, the current deficit between the U.S. and China has increased. The current deficit of the United States with China grew from $132.25 billion in 2003 to $404.246 billion in 2018, accounting for 82.3% of the total current balance deficit of the United States. This has, in part, caused serious trade friction between the United States and China and become a major problem for the economic development of both countries. Therefore, from the perspective of the EFF, we must discuss why China and the United States have developed such a huge trade deficit over such a long period, and why solving this problem would be beneficial to the growth of the two countries and the world economy.

Fig. 4.2 The U.S. current deficit with China and Japan (USD billions). Source BEA, https://apps.bea.gov/iTable/iTable.cfm?ReqID=62&step=1

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4IMF, World Economic Outlook, January 2020.
Based on Formulas (4.1), (4.2), and Balance Eq. (4.3) above, we will discuss from both the U.S. and overseas perspectives the root causes and results of the steady increase of the deficit in the U.S. current balance. The steady increase of the deficit in the U.S. current balance suggests that there are structural problems in the U.S. economy. From Formulas (4.1) and (4.2), we know that the change in the current balance depends on the gap between savings and investment, as well as the flow of funds. Hence, we have to begin by examining the balance between savings and investment to analyze the problems in the U.S. current balance. The U.S. savings rate has gradually decreased since 1990, especially rapidly after 2008, with a decline in savings of 6% of GDP. The main driver of this change was the increase in governmental investment in IT infrastructure and residential consumption in the private sector. A domestic supply shortage inevitably leads to demand for foreign goods, and consequently the deficit in the current balance increases. The U.S. flow of funds statistics separate the gap between savings and investment into the private and public sectors. In order to observe changing trends, we use the U.S. flow of funds statistics to draw Fig. 4.3, where we observe that the net savings rate in the private sector decreased from 12.01% in 1984 to 4.71% in 2007. Private net savings rebounded until 2018, but did not return to the levels of the early 1980s. On the other hand, except for a brief period in the Clinton era from 1998 to 2001, the government savings rate was basically negative, and in 2008 even dropped to $-8.87\%$. The net savings of the public sector has been on a recovery trend from recent years up until 2018.

The negative savings rate in the public sector suggests excessive governmental investment or excessive private net saving, this is a question of macroeconomic equilibrium. Since 2002, with the steady decline in the private sector’s savings rate, the investment gap in the public sector greatly surpassed the net savings rate in the

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5IMF, *World Economic Outlook Database*, October 2019.

6Federal government: net saving including net capital transfers paid, insurance and pension fund reserves adjustment and contributions for government social insurance for U.S. affiliated areas.
private sector, leading to a sudden shortage in U.S. savings. In 2008, the investment gap in the public sector reached a peak of 13.15 trillion dollars. Negative savings rates in the public sector depend mainly on overseas financing, especially those from foreign governments. The fact that the only channel for dollars—the global reserve currency—in circulation to increase is through deficit spending and consequent borrowing.

The gap from a serious imbalance in U.S. domestic savings and investment can only be compensated by enlarging imports from foreign countries. On the other hand, China has enjoyed rapid economic growth since 1990 and has taken an export-oriented economic policy centered on cheap goods. Consequently, China became the best place for the U.S. to import goods from to satisfy its domestic demand. At the same time, the U.S. was the biggest foreign market for China under its export-oriented economic policy. Historically, this allowed for the formation of a mirror-image relationship between China and the U.S. However, because of a breakdown in the domestic bases of that structure in the U.S. and China (we will address the breakdown in China in the next section), the mirror-image relationship has gradually lead to an increase in the trade imbalance between the two countries, as shown by Fig. 4.2.

We observe a significant increase in the U.S. trade deficit with China from $1.32 trillion in the first quarter of 1999 to $7.62 trillion in the third quarter of 2008. In 2008, the U.S. trade deficit with China consisted of 35.7% of its entire deficit, far surpassing its 8.4% with Japan. As we saw in Formula (4.3) earlier, a deficit in the current balance brought about by a lack of savings needs overseas fund to be balanced; consequently, large amounts of capital flowed into the U.S. Part of this inflow was enabled by U.S. advantages: the U.S. possesses the best technology for development, and the U.S. dollar maintains its position as the global reserve currency. The U.S. capital markets and financial system provide investments with different levels of risks and financial derivatives that satisfy investors’ needs. With its relatively stable political situation, it is easier for the U.S. to attract fund inflows. This large amount of foreign capital not only compensated for the funding shortage from the deficit in the current balance, but also was used to invest overseas, stabilizing the U.S. trade imbalance.

### 4.3.2 The EFF Between the U.S. And China

In order to observe the U.S.’s EFF, we used the “Rest of the World” table in the U.S. flow of funds account. An increase in overseas assets means an inflow of overseas fund to the U.S.; an increase in overseas financial debt means an outflow of U.S. domestic capital. The EFF is not only affected by changes in the real economy (S-I), but is also affected by market interest rates and exchange rates. To illustrate the structural changes in the external flow of funds between the U.S. and China, the long-term changes in U.S. market interest rates and exchange rates over the past 30 years are statistically reported here, as shown in Fig. 4.4.
4.3 Structural Transformations of the EFF in the U.S.

Fig. 4.4 Changes in U.S. interest rates and exchange rates. Notes FFR = Federal Funds Rate, U.S.T = U.S. Treasury bills (10-year yields). REER = Real Effective Exchange Rates of the Dollar. The right axis is REER, and the left axis shows FFR and U.S.T. Source FRB, https://www.federalreserve.gov/data.htm

The federal funds rate (FFR) is the target for the rate of interest at which banks borrow and lend excess reserves to and from one another on an overnight basis. The Federal Reserve Committee sets a target FFR eight times a year based on prevailing economic conditions, which is the target interest rate of U.S. financial policy. U.S. 10-year Treasury yield (U.S.T) is the yield offered by treasury bonds purchased from the U.S. federal government. This note is the most popular debt instrument in the world because it is backed by the guarantee of the U.S. government. Compared to most other countries’ sovereign debt, there is little risk of a U.S. debt default. The 10-year treasury yield is one of the most important indicators for understanding the price movements of American bonds. From 1990 to 2018, the FFR and the 10-year yield were in a long-term downward trend but, as the FFR is a policy-induced target interest rate, it fluctuated significantly from 1994 to 2000 and from 2004 to 2008 due to changing macroeconomic and financial conditions in the U.S.

The real effective exchange rate (REER) is the weighted average of the value of a country’s currency in relation to an index or basket of other major currencies. The weights are determined by comparing the relative trade balance of a country’s currency against each country within the index. The U.S. dollar depreciated in the early 1990s but, when the Asian financial crisis unfolded in 1997, the RMB, Hong Kong dollar, and Thai baht adopted the “dollar peg” system, which made the U.S. dollar appreciate significantly. There had been a huge inflow of capital from developing countries to the U.S., which has increased the value of dollar holdings. At the same time, the American current account deficit rose from $113.571 billion (1.5% of GDP) in 1995 to $805.963 billion (5.83% of GDP) in 2006. We not only need to know why the U.S. current deficit has been sustainable for so long, but also need to

\[ \text{Lucas (1990).} \]
clarify the impact of the EFF on the U.S. balance of payments equilibrium. As we will see again, these are opposite sides of the same coin.

Figure 4.5 shows the change in the United States’ EFF and current balance from 1980 to the present. We observe an interesting phenomenon in terms of capital inflows overseas and outflows from the United States since the 1990s. This is that the United States often raises funds from abroad that account for more than twice the current deficit (as much as three times in the late 1990s and in the period from 2013–2017) and then uses those funds raised on a large scale for overseas financial investment.

First, let’s look at the inflow of foreign capital to the United States. In the 1980s, the inflow and outflow of American capital were not as large but gradually increased through the 1990s. In 1990, the inflow of funds to the U.S. was $153.6 billion while the current deficit was $78.965 billion. By 2006, the inflow of funds from abroad was $1,501.73 billion, while the current deficit grew to $805.96 billion. As we can see inflows were and are often twice the size of the current account deficit. As can also be seen from Fig. 4.5, the size of inflows to and outflows from the United States plummeted in 2008 and 2009, and the size of the current deficit declined as a result of the financial crisis. But capital inflows and outflows have reactivated since 2010, with total overseas capital inflows of $8.84 trillion over the nine years from 2010 to 2018, with only a total current deficit of $3.78 trillion over the same period, accounting for inflows 2.3 times the total current deficit over the same period.

The United States skillfully took advantage of huge foreign capital inflows, not only maintaining the persistent current balance deficit over a long period, allowing for soaring stock and bond prices, but also used its foreign capital inflows to actively carry out securities investments and direct investment in emerging markets in other parts of the world. In terms of U.S. external outflows, U.S. fund outflows also rose
from $90.79 billion in 1990 to $131.73 billion in 2007, which marked their highest value. After the 2008 U.S. financial crisis, U.S. capital outflows recovered to $1,141.8 billion by 2017. Through the constant expansion of the current balance deficit in the United States, good foreign investment returns have been maintained for a long period via the use of advanced financial commodity innovations and control of market rates (see: Fig. 4.6). This shows that the United States has used its reserve currency position and creditworthiness to raise a large amount of overseas funds which, in addition to making up for the current account deficit, has provided the international funds to increase overseas financial investment, enabling the United States to maintain a large trade deficit from the 1990s through 2007.

However, after the Global Financial Crisis of 2007–08, the EFF and the current account deficit of the U.S. changed greatly. The U.S. current account deficit has narrowed, and external financial investment income has also declined (see: Fig. 4.6). The depreciation in the subprime mortgage market in the United States kicked off the financial crisis in 2007, which developed into a full-blown international banking crisis with the collapse of the investment bank Lehman Brothers in September 2008. The crisis caused significant structural changes in the U.S. and in the global flow of funds.

As Formula (4.3) above shows for the balance of foreign trade flows, we know that if a country continues to have a current balance deficit, then that country’s external debt will increase as well. Figure 4.6 reflects the change trajectory of the U.S.’s current account deficit and net international investment position from the 1980s until 2018, which switched direction before and after the financial crisis of 2007–08. That is, from 2001 to 2007, the U.S. current account deficit declined while its net international investment position was slowly increasing; however, from 2009 to 2018, it was the U.S. current account deficit that narrowed, while the net international investment position declined significantly.
The left axis in Fig. 4.6 displays the U.S.’s current balance deficit (CA) and the right axis shows the net international investment position (NIIP). Although current balance deficit rates have been on the decline, falling from \(-3.68\%\) in 2001 to \(-6\%\) in 2006, NIIP recovered slowly during the same period from \(-16.62\%\) in 2001 to \(-3.62\%\) in 2007. NIIP did not decrease because of the increase in the current balance deficit, and actually increased after 2001. The reasons for this are, as we have argued above U.S. financing, foreign assets and debt have created huge capital inflows, enabling the U.S. trade imbalance to persist continuously. This analysis is consistent with the theory of financial integration.\(^8\)

However, after 2008, CA and NIIP switched directions. The current account deficit of the United States recovered from \(-4.9\%\) in 2007 to \(-2.3\%\) in 2018, but NIIP declined from \(-3.27\%\) in 2007 to \(-43.29\%\) in 2018. This implies a structural change in the U.S. EFF, with a lower current account deficit, but an increased risk of a debt crisis stemming from external financial investment. As can be seen from Fig. 4.4, the 10-year Treasury bond yield (UST) and interbank lending rate (FFR) of the United States both dropped substantially from 5% in 2007 to around 1.5% by January 2020, which was determined by financial market mechanisms. Let’s look at the composition of the U.S. IIP in terms of assets and liabilities.

### 4.3.3 The Composition of External Net Assets and Capital Gains

For a long time, while increasing its net foreign debt and maintaining its position as the world’s biggest debtor, America has still been active in global financing. U.S. high finance has derived solid investment benefits from this fact. Americans hold a much higher proportion of their foreign assets (including portfolio stocks) in bonds, stocks, and bank financing than foreigners hold in American assets.

Figure 4.7 shows that, at the end of 2018, Americans held nearly $25.2 trillion of foreign assets, 46% of which are stocks and bonds. Foreign direct investment accounted for 30% by market capitalization. By contrast, the U.S. holds foreign debt of $34.8 trillion, 54% of which is held in the form of equity or debt, while direct investment accounted for 24% (see: Fig. 4.8). Bonds and bank finance are almost in dollar-denominated debt. That is, the external credit of the United States is held in the form of risk equities, bonds, and investment fund shares denominated in foreign currencies, but the external debt of the United States is held in the form of low-risk security debt securities denominated in dollars. Debt denominated in U.S. dollars has no effect on the value of assets denominated in dollars due to exchange rate changes, but assets denominated in foreign currencies increase in value due to the depreciation of the dollar. As a result of the use of portfolios of foreign assets and liabilities and the operational mismatch of currency denominations, it is not surprising that the United States has a higher return on capital and remains a net recipient of investment.

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\(^8\)Cavallo and Tille (2006).
capital. To measure the impact of U.S. foreign financial investment, we measured U.S. capital gains and primary income using the U.S. balance of payments statistics and decomposed them into sub-categories of net foreign financial assets.

Total capital gains are calculated by subtracting the change in U.S.-owned assets abroad (change in foreign-owned assets in the United States) as reported in the financial accounts from the change in U.S. foreign assets (liabilities) at market value, as reported in the BEA international position data. In particular, capital gains are determined using the following methods: first, the capital balance is calculated from the balance of payments and, second, the change of external net debt is calculated net external financial liabilities from the international investment position (IIP). The difference between the two is regarded as the capital gain. If there is no capital gain in a certain period, the surpluses of the capital balance (net capital inflow) are less than or equal to the increase of net external debt.

For example, via the United States IIP, we know that the net debt at the end of 2006 and 2007 was $1.81 trillion and $1.28 trillion respectively, so we can determine that net external debt decreased by $0.53 trillion in 2007. On the other hand, following

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9Obstfeld and Rogoff (2005).
the BOP, the capital balance surpluses (net capital inflows) in 2007 were $0.633 trillion. According to the flow base (BOP), the external debt increased by $0.633 trillion, but from the perspective of the stock base (IIP), the external debt decreased by $0.53 trillion, giving a capital income of $1.163 trillion \([0.633-(-0.53)]\). Moreover, we derive additional data on income gain from primary income in the BOP, including the current transfers, according to which we compile a chart of the U.S.’s and China’s capital gains and primary income (see: Figs. 4.7 and 4.8).

Figure 4.9 shows the changes in the income and capital gains of the United States from 1990 to 2018. Although the income gains of the United States are small, they have risen steadily. The world’s biggest debtor has a surplus of income balances because the U.S. has huge capital gains. As can be seen from Fig. 4.9, capital have gains fluctuated greatly, especially after 2007. When the financial crisis occurred in the United States, capital gains suddenly plunged to $1,969.9 billion, but quickly recovered to $1,659.4 billion in 2009. Although capital gains fluctuate greatly, 2008 was the largest capital loss, while 2009 recorded the largest capital gain, but cumulative average returns are far higher than income gains. Where do such huge capital gains come from? They originate from two sources. First, from Fig. 4.4, it can be seen that, from 2007 to 2018, the U.S. dollar was appreciating, and the appreciation of the U.S. dollar led to an increase in capital gains. Another reason is the structure of the portfolio of gross foreign assets and liabilities held by the United States which, as shown in Figs. 4.7 and 4.8, use different currencies bases (foreign currencies or the dollar) to denominate different structures of assets and liabilities. The U.S. has thus derived huge capital gains from a phenomenon that the literature has aptly referred to as the “exorbitant privilege”.

The term exorbitant privilege refers to the benefit the United States has due to its own currency (i.e., the US dollar) being the international reserve currency. Accordingly, the US would not face a balance of payments crisis, because it purchased imports in its own currency. Exorbitant privilege as a concept cannot refer to currencies that have a regional reserve currency role, only global reserve currencies. Since 2007 America has maintained its current-account deficit through this extralegal privilege.
China has only published IIP data since 2004, so Fig. 4.10 only shows the change in income and capital gains from 2004 to 2018. Primary income was in deficit for most of the years from 2004 to 2018, while the capital income had huge surpluses from 2004 to 2013. Capital income returned to a deficit from 2014 to 2016 and demonstrated a decline in recent years. In other words, China used its foreign exchange income earned from current account surpluses to launch large-scale external financial investment, but the yield on that investment was not very good. The bulk of China’s external financial investment has been in U.S. Treasury bonds, which it purchased in the most in the world from 2009 to 2012 with an average annual amount of about $1.6 trillion. However, since 2015, the investment in U.S. bonds has decreased, and part of China’s foreign investment has been instead invested in Belt and Road countries. From 2013 to 2018, direct investment by Chinese enterprises in Belt and Road countries exceeded $90 billion, with an average annual growth rate of 5.2%. From this, we can see a strategic transfer of China’s overseas financial investment. Instead of storing its surpluses entirely in U.S. Treasury bonds, the stock of U.S. companies, and U.S. real estate, China has invested in other countries in line with the Chinese supply chain and political interests.

China has created a new dollar recycling system by investing the dollars it earns in infrastructure such as overseas ports and energy corridors, purchasing raw materials, and acquiring internationally important manufacturing and technology companies. China has broken the old dollar cycle, challenging the U.S. government’s ability to finance deficits in the future. This is one of the reasons that China and the U.S. have experienced diplomatic friction over trade imbalances in recent years. However, there is still substantial (and meaningfully limitless) appetite for U.S. debt, particular in low-growth and crisis periods. China is doing its part to break out of the old patterns.

Fig. 4.10 Capital gains and income gains of China (billions of USD). *Source* State administration of foreign exchange of China, balance of payments, IIP

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11 U.S. Department of the Treasury, [https://www.ustreas.gov/tic/](https://www.ustreas.gov/tic/).
12 China, *Xinhua News*, [https://www.xinhanet.com/fortune/2019-04/18/c_1124386214.htm](https://www.xinhanet.com/fortune/2019-04/18/c_1124386214.htm).
and has itself earned safe haven debt status, but the recent massive flight to the dollar indicates that the old dollar cycle is very much alive even during the Covid-19 crisis.

From the analysis above, it can be seen that the current account deficit of the United States has become unsustainable since 2010 and has recently been narrowed. Valuation effects generated by different currency allocations based on the combination of external assets and liabilities are also showing their limitations. The period of the U.S. deriving outsized benefits from its exorbitant privilege could soon be over.\textsuperscript{13} The rise of China has caused a structural change in the global economic landscape. According to the U.S. FFA, the ratio of U.S. net external debt to GDP has increased from 1.14\% in 1990 to 43.29\% (by stock basis) in 2018.\textsuperscript{14} The external debt problem could therefore become a serious risk point between the United States and China. However, the value of U.S. bonds is their perceived risk-free status, irreplaceable.

China has a lot of massive surplus capital and it needs to go somewhere, from the point of view of returns and risks, the problem is not the lack of credit risk, but the lack of other investment options, and lack of political trust. Therefore, despite the many contradictions between the US and China, there is still room for mutually reinforcing cooperation between them. Next, we will discuss the changes in external financial assets between the U.S.–China.

### 4.3.4 Factor Decomposition for Changes in External Net Financial Assets

According to the equilibrium Eq. (4.3) in Sect. 4.2, changes in external financial net assets are observed from the real economy and financial economy using the Contribution Rate. The so-called Contribution Rate refers to the level of influence of the change of a specific factor in the overall analysis.

First, following the statistical framework for the balance of payments, the following definition provides equilibrium:

\[
\text{Current account} + \text{Capital account} - \text{Financial account} + \text{Errors and omissions} = 0
\]

where the current account includes BGS (the balance from goods and services), II (investment income), KG (capital gains), and E (capital account and errors and omissions). If we set the change in external net assets in \( t \) period as net financial assets (NFA), we get

\[
NFA_t - NFA_{t-1} = BGS + II_t + KG_t + E_t
\]

\textsuperscript{13}Gourinchas and Rey (2007) and Mc Cauley (2015).
\textsuperscript{14}FRB, Flow of Funds Accounts (F.133 Rest of the World).
Table 4.1  Factor decomposition of external net financial assets (%)  

| Period   | NFA Changes in NFA | Trade balance | iA | iL | Investment income | Capital gain rate | Economic growth rate |
|----------|--------------------|---------------|----|----|-------------------|------------------|---------------------|
| 1990–2001 | −1.73             | −0.98         | −1.85 | 4.65 | 3.62              | 0.30             | −0.25               | −1.31               |
| 2002–2007 | −3.35             | −1.63         | −4.88 | 3.97 | 3.06              | 0.44             | 6.25                | −2.47               |
| 2008–2018 | −2.03             | 1.33          | −3.10 | 3.47 | 2.07              | 1.20             | −1.93               | −1.25               |

| Period   | NFA Changes in NFA | Trade balance | iA | iL | Investment income | Capital gain rate | Economic growth rate |
|----------|--------------------|---------------|----|----|-------------------|------------------|---------------------|
| China    |                    |               |    |    |                   |                  |                     |
| 2005–2008 | 24.1              | 12.10         | 7.47 | 3.20 | 5.20              | 0.01             | 4.77                | 8.40                |
| 2009–2018 | 18.1              | −6.00         | 2.36 | 3.06 | 5.65              | −0.53            | −0.04               | 2.09                |

Source BEA, U.S. balance of payments, U.S. international investment position. The People’s Bank of China (2019), flow of funds account. State Administration of Foreign Exchange of China, balance of payments. Notes Data on investment income is derived from the balance of payments.

The ratios of each item of the equation above to GDP are shown in lowercase in Formula (4.6).  

\[ nfa_t - nfa_{t-1} = bgs + \frac{iA_t - iL_{t-1}}{Y_t} + \frac{KG_t}{Y_t} - \frac{\gamma_t}{1 + \gamma_t} nfa_{t-1} + \varepsilon_t \]  

where, \( Y \) is nominal GDP, \( \gamma \) is the rate of growth of nominal GDP, \( A \) is gross external financial assets, \( L \) is gross external financial liabilities, \( iA \) is the nominal rate of return on investment income by credit, and \( iL \) is the nominal rate of return on investment income by debit.

Using the data from 1990 to 2018 and Formula (4.6), we compile Table 4.1, which attempts to measure the contribution of the trade balance, investment income, capital gains, and economic growth to changes in the external NFA of the U.S. and China. Table 4.1 divides the data into three periods from 1990 to 2001, 2002 to 2007 and 2008 to 2018 according to the different stages of growth of the U.S. EFF. Since China’s IIP data has been only published since 2004, China’s data are divided into two periods from 2005 to 2008 and 2009 to 2018 following the characteristics of China’s EFF.

First of all, for the United States, the current period’s NFA rate is the ratio between the accumulated net assets and accumulated GDP during the period. For example, the ratio between the accumulated NFA and the accumulated GDP from 1990 to 2001 is \( -1.73\% \). As a change in NFA is the increase or decrease in the ratio of net assets over the periods, America’s net external debt increased throughout the analysis period. However, the NFA in Table 4.1 deteriorated during the period from 1990 to 2007, out of which the most significant decline was due to the fact that the deficit in the goods and services balance increased to 4.88% from 2002 to 2007, resulting in a large trade deficit, which increased the net debt of the United States to 1.63%. Due to the appreciation of foreign assets and the rise in the stock market brought by the appreciation of the dollar during this period, U.S. investment returns and capital

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15 Because the value of capital transfer and the error term are small, this portion is omitted.
gains made a positive contribution to NFA. Looking at investment income, we can see that $i^A > i^L$ in three different periods, the foreign investment income of the United States was greater than the loss of financing from abroad, and leading to an investment income increase. At the same time, capital gains increased from $-0.25\%$ from 1990–2001 to $6.25\%$ from 2002–2007. In other words, capital losses turned into capital gains.

As noted in the previous section, United States dollar-denominated debt does not change in its dollar value if the exchange rate changes, but assets denominated in foreign currencies increase in dollar-denominated value as the dollar depreciates. It is this combination of foreign assets and liabilities, as well as the mismatches between different currencies, which brought huge capital gains to the United States. From 2008 to 2018, the NFA was still net indebted, but the ratio of accumulated external net debt to cumulative GDP from 2002 to 2007 was $-3.35\%$, while the ratio from 2008 to 2018 was $-2.03\%$. Therefore, the ratio of accumulated external net debt to cumulative GDP in 2008–2018 was lower than that in 2002–2007. This means that the net external debt of the United States has declined since 2008, with the deficit in goods and services still contributing a substantial $-3.1\%$, but the return on investment rising to $1.2\%$. The return on capital also fell to $-1.93\%$, which is consistent with the characteristics reflected in Fig. 4.9. That is, although the United States has maintained a portfolio of external assets and liabilities, along with exploiting foreign exchange differentials to increase capital gains, this practice has shown limitations since 2008.

Before the U.S. financial crisis, China’s NFA ratio from 2005–2008 increased to $12.1\%$. The contribution of the trade surplus of goods and services was higher than the U.S.’s at $7.47\%$, while the contribution of capital gains was $4.77\%$. However, the contribution of investment income was significantly lower at $0.01\%$, and $i^A < i^L$. The income from China’s external investment was less than the cost of financing from abroad. However, the period from 2009–2018 after the financial crisis in the United States showed completely opposite trends, with the ratio of NFA decreasing to $6\%$, the contribution of the trade surplus of goods and services decreasing to $2.36\%$, and the contribution of investment income and capital income becoming negative. This shows that the growth of China’s foreign net assets deteriorated after 2008, which also reflects the structural changes in Chinese economic growth after the 2008 financial crisis.

Another noteworthy factor that influences the NFA in the United States and China is GDP growth. Figure 4.11 shows that the economic growth rate of the United States was relatively low after the 1990s and became negative in 2008–2009, so that there was only a small negative impact on the NFA in the United States. On the other hand, although the absolute value of one percent shows that the size of the United States GDP is far higher than that of China, Chinese GDP growth is higher. The changing curve of China’s GDP growth shows a downward trend at the inflection point of 2007. Therefore, the contribution of GDP to China’s NFA also decreased after 2008. Next, we will discuss the basic characteristics of China’s EFF.
4.4 The Structural Problems of the EFF in China

Globally, the growth of China’s net external financial investment (NEFI) showed an inverted U-shaped pattern from 1992 to 2018, with its share of GDP rising from 1.28% in 1992 to 9.78% in 2008, then falling to 0.36% in 2018, returning to near the original level in 1992. Especially between 2004 and 2010, NEFI grew rapidly, ultimately accounting for more than 7% of GDP. The orange line in Fig. 4.12 shows that this period was also the period of expanding U.S. external financing. During the period, China’s NEFI increased more than tenfold from RMB 35.3 billion in 1992 to RMB 3.13 trillion in 2008. Following Formula (4.3) earlier, since this rapid increase...

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**Fig. 4.11** Comparison of the rate of economic growth. *Source* IMF, *World Economic Outlook*, January 2020

**Fig. 4.12** Changes in the net external flow of funds in China (as % of GDP). *Source* The People’s Bank of China (2019), flow of funds account. FRB, flow of funds accounts (F.133, Rest of the World)
change was affected by the domestic savings-investment imbalance and changes in the international market, we will discuss the structural problems of China’s EFF from both the domestic and international angles.

### 4.4.1 Factors Behind the Formation of High Savings Rates

First, we investigate the causes of the growth of China’s domestic flow of funds. While Chinese domestic investment increased from 1990 to 2018, national savings increased faster. The investment rate in China has been high and rose from approximately 36 percent of GDP in 1992 to 42% of GDP in 2008, as shown in Fig. 4.13. However, the savings rate rose even faster to about 52.3% of GDP in 2008. From 1992 to 2008, the balance of savings and investment (net lending) grew by RMB 266.7 billion annually on average. Since 2008, both savings and investment rates have fallen slightly, but by 2018 they still maintained a high level of 44%, which suggests strong growth.

Such strong economic growth is also reflected in the EFF. The Chinese current account surplus has increased considerably. Looking at the external economy, we can see that, except for 1993, the current balance witnessed a continuous current account surplus (see: Fig. 4.1). The current account surplus amounted to $118.8 billion dollars on average annually during the period. China’s foreign exchange reserves also increased to $1.2 trillion dollars in the first quarter of 2008 from a mere $19.4 billion dollars in 1992 and further ballooned to $3.168 trillion dollars in 2018. However, Chinese outflows of funds increased with foreign exchange reserves and capital flight after 1997. Capital inflows in the form of hot money were also

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Fig. 4.13  Savings and investment in China (as % of GDP). *Source* China Statistics Press, *China Statistical Yearbook-2019*

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c16 China Statistics Press, *China Statistical Yearbook-2019.*
conspicuous, because of an expected devaluation of the RMB. Since the 1990s, the patterns of overseas flow of funds changed significantly, especially during the periods from 1994 to 1997 and 2001 to 2008, the average savings rate, capital inflows, and foreign exchange reserves all increased. Reducing the imbalance of savings and investment, preventing future financial crises, and creating international and regional safety nets for large and volatile capital flows is a key challenge for China’s economy.

Stages in a country’s development are indicated by the double restriction on domestic financial deficits and shortages of foreign reserves. However, in China, both investment and savings have increased significantly since the 1990s, as Fig. 4.13 shows. China has been over-saving except for the outlier year of 1993, with the amount of excess savings increasing from RMB 1.04 trillion in 1992 to RMB 15.8 trillion in 2008. On the other hand, although domestic savings have occurred in excess since the 1990s, financing from overseas mainly through foreign direct investment (FDI) has remained significant. The inflow of FDI to China has surpassed that to the United States. The inflow of foreign capital increased from RMB 121.2 billion in 1992 to RMB 1.79 trillion in 2007, rising from 4.4% of GDP in 1992 to 6.6% in 2007. Moreover, from 1992 to 2008, capital outflows also gradually increased. The domestic outflow of funds amounted to RMB 4.34 trillion in 2008, increasing from 5.7% of GDP in 1992 to a peak of 15.98% of GDP in 2008.

Capital outflows and inflows in spite of high levels of domestic saving have resulted in net outflows, except in 1993. Net outflows were RMB 247 billion in 1997 during the Asian financial crisis and reached a peak of RMB 3.13 trillion in 2008. Accordingly, the current account surplus has increased considerably, with foreign exchange reserves also increasing from $19.4 billion in 1992 to $3.9 trillion in 2014 peak level until the present. However, as is shown in Fig. 4.14, 2007 was the turning point for both the outflows and inflows of external funds, with previous rapid growth showing a continuous decline thereafter. What do these drastic changes signify? We answer this question with the data from the flow of funds account.

4.4.2 The Expansion of the Net Outflow of Funds

As can be seen from Formula (4.3) regarding the EFF process, differences between savings and investment, such as saving more than investment, will cause the current account surplus to increase. The Chinese situation, however, sees the running of continuous current surpluses at the same time as capital account surpluses (Fund inflows, see: Fig. 4.15). This is called a twin surplus, which leads to a sharp rise in foreign exchange reserves.

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17 China Statistics Press, *China Statistical Yearbook*, (2019).
18 The People’s Bank of China Quarterly Statistical Bulletin, 1998–2010.
19 State Administration of Foreign Exchange, [https://www.safe.gov.cn/](https://www.safe.gov.cn/).
20 According to the sixth edition of the balance of payments manual (BPM6), capital inflows (increases in liabilities) on the debtor side are expressed as positive.
Following Formulas (4.2) and (4.3) in Sect. 4.2, we statistically grouped the data from the rest of the world in the flow of funds statements published by the People’s Bank of China. Our results are shown in Table 4.2. According to the fund inflows in the table, while domestic net savings increased year after year, the overseas fund inflow also increased from an average of $58 billion from 1992–96 to $227 billion from 2005–2012. The total inflows over 27 years amounted to $4.59 trillion. China’s external fund outflows also showed a strong increase, with an average annual value of $27 billion from 1992–2004 increasing more than five times on average to as
### Table 4.2 The external flow of funds in China (Billions of USD)

|                  | 1992–2004 | 2005–2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | Total | Average |
|------------------|-----------|-----------|------|------|------|------|------|------|-------|---------|
| **Inflows (A)**  |           |           |      |      |      |      |      |      | 4594  | 170     |
| **Outflows (B)** |           |           |      |      |      |      |      |      | 3845  | 142     |
| **Net inflows (B−A)** | −31       | −77       | −322 | −37  | 486  | 417  | −149 | −131 | −749  | −28     |
| **Reserve assets (C)** | −43       | −354      | −431 | −118 | 343  | 444  | −92  | −19  | −3270 | −121    |
| **Errors and omissions (D)** | −8        | −17       | −63  | −67  | −213 | −229 | −213 | −160 | −1190 | −44     |
| **Net financial investment (E)** | 21        | 294       | 172  | 148  | 356  | 203  | 156  | 49   | 3710  | 137     |

*Sources: PBC, The People’s Bank of China Quarterly Statistical Bulletin. Note: E = (B−A) − C − D (Reserve assets is foreign exchange reserves with a minus sign representing an increase). The data for 1992–2004 and 2005–2012 are the average values in this period. Data are converted to U.S. dollars using the nominal exchange rate.*
much as $150 billion from 2005–2012. Afterward, the increase continued, jumping to $661 billion in 2016. Over the past 27 years, total domestic fund outflows totaled $3.85 trillion, with an average annual rate of $142 billion.

Deducting the external inflow of funds from the domestic outflow of funds, China basically maintained net fund inflows during the entire period (except for the emerging markets crisis of 2015 and 2016). The total net inflow of funds over the past 27 years was $749 billion, with an annual average of $28 billion. These statistics suggest a phenomenon that led to the unbalanced development of the Chinese economy. That is, although China already had held large net savings and a current account surplus, China still received huge net capital inflows from overseas every year. Therefore, we need to examine what happened with China’s EFF.

As is shown in the second half of Table 4.2, while the current and capital balances continued to see twin surpluses, the flow of foreign exchange reserves increased from an annual average of $43.4 billion from 1992–2004 to $354 billion from 2005–2012 and $431.4 billion in 2013. Since 2013, the size of foreign exchange reserves has gradually decreased, even declining substantially in 2015 and 2016. From 2005 to 2013, China’s foreign exchange reserves grew substantially. This shift corresponds to the change in the peak period of the EFF shown in Fig. 4.14, i.e., China’s foreign capital flows have shifted from growth to decline after the 2007 U.S. financial crisis. The change in foreign exchange reserves is a major part of China’s foreign capital flows, meaning that China’s flow of funds underwent structural changes before and after the U.S. financial crisis. Since 2015, China’s holdings of foreign exchange reserves decreased slightly, with an increase of $19 billion in 2018 and a foreign exchange reserve balance of $3.27 trillion at the end of 2018.

China’s foreign exchange reserves, which are mainly used to buy U.S. bonds, have risen steadily since the 1990s (see: Fig. 4.16), from $18.2 billion in early 1994 to $1.46 trillion in 2009, when China surpassed Japan as the largest U.S. creditor for three consecutive years. Since 2016, China’s holdings of U.S. treasuries have decreased slightly, totaling $1.6 trillion in 2018. The constitutive mix of U.S. debt held by China as foreign reserve assets can be broken into three parts: long-term government

![Figure 4.16](image-url) Changes in treasury security holdings (billions of USD). Source U.S. Department of the Treasury, Treasury International Capital (TIC)
bonds (50%), medium-to-long-term corporate bonds (about 35%), and short-term corporate shares, etc. (about 15%). Right now, an effort to narrow America’s trade deficit by pushing down the value of the U.S. dollar would pose serious risks for China, as the large amount of Treasury bonds held by China could decline in value. This has essentially formed a chain between China’s trade surpluses with the United States deficits through the purchase of U.S. Treasury bonds. The model depends on China remaining a net lender and the U.S. remaining a net borrower. From the point of view of economic stability and the rational allocation of resources, holding U.S. treasuries is a safe financial investment, and it should be a win–win move for both the Chinese and U.S. economies. But with the implementation of China’s Belt and Road strategy, the scale of China’s holdings of U.S. debt has been gradually reduced, implying that the way forward will depend on mutual cooperation and political trust.

As an aside, the errors and omissions in Table 4.2 imply a degree of uncertainty. The errors and omissions are caused by incomplete data in the preparation of balance of payments statements, and they reflect the imbalances resulting from imperfections in source data and the compilation of balance of payments accounts. However, the numerical value of China’s errors and omissions are much too large and mostly negative, surging in the 2015–2018 period to an average of $203.9 billion a year. To some extent, this reflects capital flight, which can affect policy authorities’ ability to accurately understand the global flow of funds.

Due to the surge in foreign exchange reserves and the existence of errors and omissions, most of the net financial investment in Table 4.2 is positive (except for 1993), and China’s EFF shows a general trend of capital export. Especially after 2005, China’s foreign net financial investment showed significant growth, reaching a peak of $465.93 billion in 2008 but declining recently to $49 billion in 2018. From 1992 to 2018, China’s net foreign financial investment amounted to $3.71 trillion, while the annual increase in NFA was $137.4 billion. To more clearly illustrate the changes in China’s EFF during the financial crisis in 2007, we compiled Table 4.3. Table 4.3 illustrates the structural changes in China’s EFF. Following Formula 4.3 and taking 2017 as the inflection point for China’s EFF, we calculated the annual average values of each indicator from 1992 to 2007 and 2008 to 2018, respectively expressed as $A$ and $B$. According to the equilibrium relationship between the real economy, finance, and the EFF discussed in Sect. 4.2, the balance of savings and investment, the current balance, external funds inflow and outflow, foreign exchange reserves, errors and omissions, net financial investment, and GDP are listed in Table 4.3.

By comparing the indicators in Table 4.3, we can see that China’s annual net domestic savings before 2007 were $64 billion, but after 2008 the average annual value was $217 billion, and increase of almost three-and-a-half-fold ($B/A$). The current account surplus is also 3.5 times larger. It is precisely because of the increase in net savings and the current surplus that capital outflows increased 5.1 times, more than capital inflows. Net capital inflows were only 0.6 times larger after 2008,

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21U.S. Department of the Treasury, *Treasury International Capital System*, [https://www.ustreas.gov/tic](https://www.ustreas.gov/tic).
Table 4.3 Changes in the external flow of funds in China (Annual average, billions of USD)

|                                | A (1992–2007) | B (2008–2018) | B/A |
|--------------------------------|---------------|---------------|-----|
| Savings-investment balance     | 64            | 217           | 3.4 |
| Current account surplus        | 63            | 217           | 3.5 |
| Inflows (a)                    | 80            | 301           | 3.8 |
| Outflows (b)                   | 46            | 282           | 6.1 |
| Net inflows (b − a)            | −34           | −19           | 0.6 |
| Reserve assets (c)             | −98           | −155          | 1.6 |
| Errors and omissions (d)       | −4            | −102          | 24.0 |
| Net financial investment (e)   | 68            | 238           | 3.5 |
| GDP                            | 1420          | 9085          | 6.4 |

Sources PBC, The People’s Bank of China Quarterly Statistical Bulletin. Note $e = (b − a) − c − d$

suggesting that China’s EFF and economic growth did change structurally after the 2008 financial crisis. The ratio of foreign exchange reserves in the later period to the earlier is 1.6 times. This ratio is not particularly high as the peak increase in foreign exchange reserves was from 2003 to 2013, after which foreign exchange reserves declined. But the ratio of errors and omissions items is 24 times larger in the latter period, which is an abnormal value. On the one hand, this shows an excessive level of statistical error, on the other hand, it also reflects the increase of capital flight.

Due to the influence of the factors above, China’s financial investment was 3.5 times high after 2007 than it was beforehand. At the same time, the ratio of contribution to Chinese GDP in the second period is 6.4 times greater. This shows that the growth of China’s foreign financial investment is not only affected positively by the current account surplus brought by the expansion of trade with the United States and others, but also by the rapid growth of the domestic real economy.

However, a new change is observable in the EFF between the U.S. and China recently. Since the scale of the EFF has been quickly reduced with reduction of the U.S. current account deficit since 2008, the U.S.’s external imbalance has improved little by little (see: Fig. 4.1). On the other hand, Chinese foreign financial net investment remained at a significant average size of $238 billion annually after 2008, the expansion of the external imbalance has continued. That is, although the problem of the U.S. external imbalance has been gradually addressed by U.S. fiscal and monetary policy after the 2008 financial crisis, China’s external imbalance has continued to expand.
4.5 Conclusion

This chapter analyzed the mirror-image relationship between the U.S. and China EFF. Although there are limitations in terms of data availability and the dynamics that can be explained by EFF analysis, a few suggestions emerge from the results of our analysis.

As we can see from the analysis above, although there are imbalances in the external flow of funds between the United States and China over the long term, both countries need each other, which allowed for the formation of a mirror-image relationship in the EFF. The U.S. runs a trade deficit with China, China uses this trade surplus to increase its foreign exchange reserves, then uses those reserves to buy U.S. treasuries, which enables the United States to buy imports from China again. For 20 years, this has maintained an unbalanced trade relationship between China and the United States. But this model has reached a turning point in its sustainability as the EFF between the United States and China faces four major risks. The first is that the trade imbalance is unsustainable. The second is the structural imbalance that results from uneven patterns of growth and development. The third is that the EFF mirror-image relationship between the U.S. and China formed over the past 20 years will not be sustainable. The fourth is the risk of China holding U.S. bonds and U.S. holdings of foreign debt. Finally, the United States and China no longer have a relationship of relative political trust. We summarize the economic and political implications of these problems as follows.

4.5.1 The Disequilibrium in Trade Between the U.S.–China

The main reason for the U.S.–China trade imbalance is an imbalance in domestic industrial structures. U.S. GDP was as high as $20 trillion in 2018, which is one-and-a-half times greater than China’s and four times the size of Japan’s.\(^{22}\) In that total, services contributed more than $8 trillion, ranking first as a share of GDP at over 40%. The financial sector is the biggest pillar of this economic structure and its ultimate beneficiary, including the consumer credit market, the stock market, insurance market, and so on, and especially the mortgage market, which is the largest segment of the financial sector. But, to lower costs, American manufacturing has been moving overseas, such that manufacturing only accounted for only 12% of GDP in 2018. To meet this gap in production, the United States had to increase imports. This is one of the main reasons why the U.S. foreign trade deficit has increased gradually. The structure of China’s economy is also not completely reasonable, as the total proportion of China’s services and finance in GDP is only 9.5%, while the proportion of real estate in GDP was 6.6% in 2018. China’s industrial value added remains low, with revenue much lower than in the United States.\(^{23}\) Therefore, in order

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\(^{22}\)IMF, World Economic Outlook Database October 2019.

\(^{23}\)China Statistical Yearbook-2019.
to reduce the trade deficit between the United States and China, both countries need
to adjust their industrial structures to enable the long-term balanced development of
their own economies.

There are two main causal relationships in the U.S.–China EFF cycles: (1). An
increase in the current account deficit leads to an increase in the inflow of funds; and
(2). An increase in the outflow of funds leads to an increase in the current account
surplus. In other words, the U.S. has been increasing its inflow of funds in order
to compensate for its deficit, which results from shortages in private and public
savings. On the other hand, China has seen a current account surplus versus the U.S.
through its purchase of U.S. bonds while, due to the income gap, the average Chinese
household suffers from a consumption shortage in contrast to the excess savings of
the industrial and public sectors.

4.5.2 The Structural Imbalance in Economic Growth

Economic growth in the United States depends on a savings and consumption struc-
ture imbalance, namely having to rely on the increase of imports to satisfy consumer
needs, often forming a long-term balance of accounts deficit. China’s model derives
from long-term insufficient domestic demand and consumption, and resulting high
savings rates, which creates an economic growth model based on expanding exports.
Therefore, another cause of the U.S.–China trade imbalance is the domestic economic
structure of both countries.

The existence of China’s large surplus is due partly to internal reasons and partly
to external reasons. Internally, it is due to excess savings, externally, it is thought to
be due to a changing exchange rate that maintains a competitive advantage in inter-
national markets. Of course, the U.S. has been pressuring the Chinese government
by highlighting the Chinese RMB as an important cause of the U.S.–China external
imbalance, which we will not discuss here. However, from the EFF perspective,
during the Asian financial crisis from 1997 to 2008, Chinese gross EFF increased
12 times, whereas the RMB did not see much change from 1994 to 2004 during
which the current balance was liberalized. From 2004 to 2008, the RMB appreciated
from 8.2768 to 6.9451 against the U.S. dollar, but from 2009 to 2018, the range
of RMB exchange rate movements has been small, fluctuating only from 6.831 to
6.6174 against the dollar (see: Fig. 4.17). Since the exchange rate adjusts the supply
and demand relationship between international trade and currency, the RMB did not
play a role in adjusting fund flows, which was supposed to be its duty. As a result,
exchange rates did play a major function in the fluctuation in Chinese foreign reserves
and the overseas flow of funds, necessarily causing a structural problem in the EFF.
Hence, given relevant financial regulations, the RMB should be allowed to reflect
the markets more systematically. Allowing the RMB to trade will cause it to rise,
increasing domestic purchasing power and helping to generate a more sustainable
domestic consumer base, reducing dependence on U.S. trade flows.
4.5.3  The Mirror-Image Relationship Between the U.S.–China

Despite the funds shortage in developing countries from 1992 to 2002, there has been active inflow of funds from developing countries to developed countries from 2003 onward, which has changed the global economy little by little. Developed countries as represented by the U.S. have suffered from relative stagnation, whereas emerging market and developing economies like China have grown significantly. The imbalance in the EFF originates from this trend. In order to compensate for its huge current account deficit, the U.S. has absorbed large amounts of funds from Japan and Europe. At the same time, it has received the same from China and other developing countries, which forms the historical background of the U.S.–China mirror-image relationship.

Because of long-existing trends in economic growth and industrial structure imbalances, a mirror-image relationship in the EFF has been formed between the United States and China. The U.S. trade deficit with China depends on China’s current balance surplus being used to buy U.S. treasuries. Although the United States can use its capital gains for a certain period to maintain the current account deficit, due to the unsustainable industrial and growth structures of China and the United States, the mirror relationship between China and the United States also faces an unsustainable critical point. Both China and the United States need to change their respective industrial structures and patterns of economic development.
4.5.4 On U.S. Debt Risk

At the end of 2018, the U.S. debt reached $29.6 trillion, with annual interest payments of more than $600 billion, which seems unsustainable. If existing cuts in interest rates and unconventional policies like Quantitative Easing do not help, the remaining trick may be to simply print banknotes to buy bonds. The economic crisis ignited by the coronavirus pandemic is bound to affect the whole world, especially vulnerable emerging markets. Most of the premium of emerging market assets is supported by imported dollars. If the Federal Reserve cuts interest rates, U.S. bond yields fall sharply. China holds $1.6 trillion in U.S. bonds (see: Fig. 4.15) and it naturally bears considerable pressure to avoid risks. Therefore, the U.S.-China mirror relationship formed since the 1990s will be difficult to sustain, and a new model of cooperation is required. However, as a mutually-beneficial relationship has been maintained since the 1990s, although China may decrease the amount of U.S. bonds that it holds, Treasury bond purchases still seem an inevitable option.

Due to the financial crisis, the U.S. cannot maintain its traditional excess consumption model as it did before 2008. By the end of 2018, the U.S. net private savings rate increased to 8.52%, and the current account deficit dropped to $−2.39% in 2018. Until the U.S. economy recovers completely, the shrinkage of the current account deficit will continue. China faces serious risks because of the “twin surplus” structure of its EFF which has led to large holdings of foreign reserves. Therefore, China is trying to modify its imbalanced EFF structure so as to reduce its foreign reserve balance through foreign operations in the international market. However, these policy adjustments have thus far been unable to stop the increase in foreign reserves. Therefore, China should adjust its economic structure by broadening domestic demand and diversifying its external financing. This would change not only the U.S.–China relationship, but also lead to a new structure in the world economy. International collaboration, including with G7 and emerging economies, will be even more necessary.

4.5.5 Changes in the Political Relationship Between the U.S.–China

China’s contribution to the world’s nominal GDP was merely 0.04% in 2001 when it joined the World Trade Organization, but it leaped forward to account for 16% in 2018. On the other hand, the United States’ share of world GDP rose from 25% in 1990 to 31% in 2001, before declining to 24% in 2018. Changes in relative power have led to political and economic tension between the U.S. and China, with a growing China flexing its muscle, and the U.S., of course, unwilling to give up its dominance of the world. The contradiction between China and the United States stems from the law of the jungle still operating in international relations. But, with China and the
United States accounting for 40% of the world’s GDP, economic friction between the two nations poses the greatest risk to the world economy.

Since the 1990s, the United States has been China’s biggest customer and trading and investment partner. In turn, China is an important supplier to the United States and a similarly unbreakable trade and investment partner. This is a fundamental relationship in global political economy. However, at this stage, there is a lack of mutual political trust. Even if China offers to pay more money, it is not certain that high-end U.S. goods and technology will be sold to it. However, there are still possibilities for beneficial interaction in other sectors related to people’s livelihoods and financial commodities, there is still plenty of space for each to take what is needed, and peace and development should remain the aim of human society. The U.S. and China should avoid the zero-sum game of who conquers who and achieve peaceful coexistence, which would be an innovation in the long history of mankind.

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