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From the World's Factory to a World Creditor: China's External Wealth and Excess Returns, 1997-2016

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Abstract

We study China's external wealth, its net foreign assets position with valuation adjustment, and its excess returns. The net foreign assets of China, which are mainly dominated by foreign reserve assets and foreign direct investment liabilities, have grown rapidly since its entry to the World Trade Organization in 2001 and exceeded 14 percent of its gross domestic product at the end of 2016. In contrast, the excess returns of gross assets over gross liabilities, which mostly correspond to the sizable capital gains from the latter, are negative. These results occur mainly because of the composition effect between risky liabilities and safe assets, where China takes a short position in equity and a long position in debt. Our findings help elucidate the mechanism through which a high-growth economy like China transfers its external wealth to the rest of the world when the domestic financial markets are less developed and safe assets are scarce in the international monetary system.

Keywords: Net Foreign Assets, Excess Returns, China

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1 Introduction

After three decades of spectacular growth, China has become the largest emerging economy and is having an increasing impact on the rest of the world. In 2008, China surpassed Japan and became the second-largest economy after the US. Real gross domestic product (GDP) is growing by about 10 percent annually and China’s share of world trade has increased nearly tenfold to about 9 percent over the past three decades, while its share of global GDP has risen to 13 percent IMF (2011). In the process of rapidly integrating into the global economy, China runs a large current account surplus, reaching 10 percent of GDP in 2008, and has accumulated more than 3 trillion dollars in foreign reserves (Figure 1 and Figure 2). Does the “world’s factory” play the leading role in the assets trade in addition to the goods trade? In order to explore the cross-border financial assets trade, its composition and the returns, it is important to analyze the international investment position¹ of the country at a market value.

Most of the recent literature is dedicated to extracting stylized facts from international evidence²(Lane and Milesi-Ferretti (2001, 2007b, 2009); Habib (2010)) or the “exorbitant privilege” of the countries with a safe reserve currency (Obstfeld and Rogoff (2007); Tille (2008, 2017); Gourinchas and Rey (2007a,b, 2014); Gourinchas (2008); Forbes (2010); Eichengreen (2011); Curcuru *et al.* (2008, 2013); Rogoff and Tashiro (2015)). The evolution of external wealth and the excess returns of China as one of the important counterparts of the US are rarely studied. The US experiences positive excess returns (i.e. “exorbitant privilege”) in normal times and provides insurance to the rest of the world (known as its “exorbitant duty”) in times of global financial turmoil (Gourinchas *et al.* (2010)). We provide a comprehensive study on the external wealth and the excess returns of China between 1997 and 2016, a period that witnessed both economic boom and slowdown. To our knowledge, we are the first to study the external wealth of China using an extensive dataset hand-collected from numerous government agencies and financial institutions and containing information about the international investment position, geographical assets allocations and the composition of the external balance sheet (see Appendix A for a detailed description).

The empirical evidence shows that net foreign assets, which are mainly dominated by foreign reserve assets and foreign direct investment (FDI) liabilities, have grown rapidly since 2002 and exceeded 28 percent of GDP in 2008. Even when there was a significant decline during the global financial crisis, the external wealth of China has recovered steadily and reached 14 percent of GDP at the end of 2016. On average, the external wealth of China accounted for approximately 10 percent of GDP during 1997-2016

¹In this study, the net international investment position (net IIP) at the market value refers to the net foreign assets, which is the measure of external wealth. Also, the position of external assets/liabilities refers to the gross assets/liabilities. By definition, the difference between gross assets and gross liabilities gives the net foreign assets.

²See the chapter of “External Adjustment, Global imbalances, Valuation Effects” in the recent Handbook of International Economics by Gourinchas and Rey (2014)

and increased to 18 percent of GDP in the post-financial crisis period. As a matter of fact, China has become one of the world’s leading creditor nations and its external wealth has been fluctuating with global financial markets, especially the financial assets holdings in the US. Our results are in line with those of Lane and Milesi-Ferretti (2011) and we provide a more detailed composition of the external wealth adjusted by the assets price movements accompanying the emerging economy’s high growth as well as during the period of international financial market turmoil and shrinking external demand (Appendix B compares our analysis with theirs).

The most persistent finding is the considerable magnitude of the negative valuation component, calculated as the difference between the market value and the cumulated current account of the external wealth: on average, the negative valuation component exceeded 9 percent of GDP from 1997 to 2016. The asymmetric structure of the external balance sheet and the composition effects between risky liabilities and safe assets both lead to a sizeable and persistent valuation loss for a rising creditor like China. For our entire sample period, China takes a short position in equity and a long position in debt ³, which is the opposite of the US experience as Gourinchas *et al.* (2010) have documented. The valuation component of Chinese external wealth declined by more than 3 percent between 2008 and 2016.

We include the post-financial crisis period and estimate the excess returns of the external wealth of China. Between 1998 and 2016, on average, the real excess returns exceeded negative 8 percent while deteriorating to negative 9 percent after the 2008 financial crisis despite the dramatic drop in US Treasury bond yields. We find that the underlying driver of the excess returns is the capital gains from gross liabilities, especially during China’s fast-growing period, which is also in line with the high investment returns in China. Consistent with what Rogoff and Tashiro (2015) and Maggiori (2017) have discussed, our findings also show that China has a claim on safe foreign assets, namely US Treasury bonds, to hedge against a domestic economy slowdown and the external demand has been shrinking in recent years as the Figure 1 and Figure 2 show.

We also compare the evolution of the equity investment in China and debt investment in the US to explore the structural feature of the returns differentials. We find investment return in China’s stock market is more profitable than that in the US Treasury bond. Equity investment in China is still able to capture handsome dividends from the country’s rapid growth. Therefore, despite the dramatic increase in US Treasury return in 2008, investment in China is still more profitable than returns from fixed income assets given China’s strong growth momentum. This explains the worsening negative real excess returns of China’s foreign wealth after the 2008 financial crisis.

³Lane and Shambaugh (2010) also show that China takes long foreign currency positions especially during its fast-growth period. Therefore, an appreciation of the domestic currency against foreign currencies, mainly the US dollar, would trigger substantial valuation losses. In this paper, we focus on the composition effects and assets price movements since IIP statistics from central bank do not provide any information about the currency exposure.

Similar to Lane and Milesi-Ferretti (2007a) and Curcuru *et al.* (2008, 2013) suggested, we include extensive robustness checks to test the accuracy of the stock-flow methodology by making different assumptions about omissions and errors. Our results are similar to the main findings about the valuation component and negative excess returns and share similar trends across subperiods even when different assumptions are made.

This paper contributes to a growing body of research on the external wealth of China. Important research has been conducted by Lane and Schmukler (2006) who document China’s net foreign assets and compare them with India’s from 1985 to 2004 in terms of gross positions, external structure, and bilateral investment patterns. Using Lane and Milesi-Ferretti’s External Wealth of Nation (EWN) dataset, Sheng and Ng (2008) find that during the period between 1980 and 2004, China has emerged as a more important global net creditor than before. As Ma and Zhou (2009) have pointed out, Lane and Milesi-Ferretti (2007a) historical IIP data were constructed prior to the first official publication of Chinese IIP data. The conflicting empirical results of Lane and Schmukler (2006), and Ma and Zhou (2009) on the one hand, and Lane and Schmukler (2006) and Dollar and Kraay (2006) on the other, show that the existing empirical evidence on Chinese external wealth is far from conclusive. The aim of this paper is to fill this gap.

Last but not least, our empirical findings about the wealth transfer from a high-growth economy like China to the rest of the world are related to the recent research on the international monetary system, the new Triffin dilemma, safe assets and their effects on the financial globalization (Eichengreen (2011); Farhi *et al.* (2011); Caballero *et al.* (2016); Farhi and Maggiori (2016); Maggiori (2017); He *et al.* (2016); Broner and Ventura (2016); Bolton and Huang (2017)). The negative excess returns are also a result of the domestic financial market functioning less well than global markets—a topic also studied by Mendoza *et al.* (2009) and Gourinchas and Jeanne (2013).

The remainder of the paper is structured as follows: Section II discusses the main empirical specification, data, and estimations. The empirical evidence of Chinese external wealth is presented in Section III. Section IV shows stylized facts on excess returns on net foreign assets. Section V concludes with the main findings.

2 Data and Methodology

In this section, we estimate the external wealth of China. Data from the balance of payments⁴ on cross-border flow data and international investment position are officially reported by the People’s Bank of China and the State Administration of Foreign Exchange (SAFE). Alternatively, Lane and Milesi-Ferretti (2009) report the gross external wealth data from 1982 to 2011 complemented by cumulated capital flows with valuation adjustment. Their dataset divides gross assets and liabilities into four major categories: portfolio equity investment, FDI, portfolio debt and other investment, and foreign exchange reserves. Our study provides complementary analysis using detailed information regarding the assets allocation and composition of China’s foreign reserve assets.

As a matter of fact, China’s assets allocation and currency exposure have not been decomposed and made public until June 2015. In other words, currency composition is available only for 2015 and 2016. Therefore, we rely on any information we can collect in order to make reasonable assumptions to estimate the market value of the external wealth. After cleaning the data we hand-collected from China Investment Corporation (CIC), China Securities Regulatory Commission (CSRC), China Banking Regulatory Commission (CBRC), Ministry of Commerce (MOC), and SAFE⁵, we were able to adjust for the market value of each class of assets using asset price movements. The official BOP and IIP data is derived from SAFE. The BOP ranges from 1980 to 2016 while the IIP covers the period after 2004. Portfolio equity asset distribution data is from China Investment Corporation (CIC) to adjust portfolio equity asset and FX equity asset. Portfolio equity price is proxied by stock price in the corresponding countries collected from CEIC. Portfolio bond distribution data is from China’s big-5 banks’ balance sheets to adjust portfolio bond asset and FX bond asset. The bond price is proxied by US Treasury bond (and German government bond, Japanese government bond) yield collected from CEIC. Housing price is from IMF global house index to adjust global real estate investment. Portfolio equity liability price is proxied by China’s stock index collected from CEIC. Portfolio bond asset price is proxied by China’s bond index collected from China Bond. We also conduct extensive robustness checks to test the accuracy and consistency of assumptions (see Appendix A for a detailed description). The dataset of Chinese external wealth at market value is estimated on an annual basis from 1997 to 2016 by asset category.

Starting with the methodology of Lane and Milesi-Ferretti (2007a), we estimate China’s external as-

⁴In 1996, the State Administration of Foreign Exchange began to report the balance of payment data following IMF’s fifth edition of BOP (BPM5). China started to open up the current account on December 1, 1996. Therefore, we adopt a consistent time series from 1997. China started publishing the official IIP data in the 2004 survey and has been accumulating the flows as the book value of the net foreign asset positions. Online appendix Figure 1 compares the official book value of IIP across the world.

⁵Assets allocation of the sovereign wealth fund from CIC; stock markets and bond market information from CSRC, the balance sheets of the banks with international exposure from CBRC; FDI country allocation from MOC; and portfolio equity/debt, qualified domestic/international institutional investors and FX reserves from SAFE.

sets and liabilities at market price. We document the valuation effects of gross assets, liabilities and net foreign assets. We also study the historical evolution of China’s globalization: financial integration and trade integration. Then we compare valuation effects and historical values using cumulated current accounts as proxy.

Then, we decompose gross assets and liabilities into four major categories: portfolio equity investment, FDI, portfolio debt and other investment, and foreign exchange reserves. Importantly, we take the composition of forex (FX) reserves seriously into the FX liquid assets (cash in US dollars), FX bonds and FX equities. With the decomposition, we are able to show the asymmetry of the external balance sheet between safe and risky financial assets as well as the capital structure of China, i.e. the net debt vs. net equity. We also compare the evolution of the investment returns in China and that in the US to explore the channels of the valuation components. Our results are consistent with those of Lane and Milesi-Ferretti (2007a) and our study provides complementary evidence using information regarding the assets allocation and composition of the foreign reserve assets covering both the periods of high growth and the global financial crisis (see Appendix B for details).

Moreover, as the SAFE statistics and other public documents do not decompose the sources of the excess returns on gross assets and liabilities, we compute the implied returns following the approaches of Gourinchas and Rey (2007a); Gourinchas (2008); Gourinchas *et al.* (2010) and Lane and Milesi-Ferretti (2007a) and Habib (2010). We estimate the implied rates of returns on gross assets and liabilities and the excess returns on net foreign assets from investment yields and capital gains (see Appendix C for details). We also take inflation into account to obtain the real returns on gross assets and liabilities.

Finally, as Lane and Milesi-Ferretti (2009) and Curcuru *et al.* (2008, 2013) have suggested, we also take measurement errors into account to correct for any potential bias due to the stock-flow approach we are applying. Appendix D discusses the different assumptions about measurement errors so that we can compute the excess returns under sensible estimates.

The positions of gross assets and liabilities are reported in US dollars for the period from the end of 1997 to the end of 2016. The returns of the external wealth cover the period from the end of 1998 to the end of 2016.

We employ the stock-flow method by Lane and Milesi-Ferretti (2007b) to conduct value adjustment for China’s external wealth. The basic idea is described as below:

$$PA_t = \frac{P_t}{P_{t-1}}PA_{t-1} + \frac{P_t}{AP_t}Flow_t$$

PA_t represents the position of investment assets at year t . P_t is the price index of year t . AP_t is the average price index from year t to the initial year. The first part on the right hand side is the adjusted

value for past-year asset position according the year-end asset price level. The second part on the right hand side is the adjusted value for current asset investment flow according to the year-end asset price and year-average asset price.

Our estimation differs from that of Lane and Milesi-Ferretti (2007b) in the following aspects. First, we take FX reserve seriously into account while LMF simply calculated the FX reserve from the IMF IFS dataset by deducting gold assets from the reported FX reserve. We break down the FX reserves into three categories: foreign currency, bond asset, and equity asset. We adjust the value of FX bond and FX equity respectively using CIC balance sheet and top-5 bank balance sheet while keep the FX cash holding in accordance with IMF recommendation.

Second, thanks to the newly released data by MOC on the FDI geographical distribution since 2013, we are able to obtain a detailed geographical breakdown. We adjust the FDI value using the stock indexes in the corresponding countries.

Third, our estimation differs from that of Lane and Milesi-Ferretti (2007b) in portfolio equity. They divide the portfolio equity assets into QDII assets reported by SAFE and CIC assets.⁶ They adjust part of QDII assets with stock price and part of QDII with commodity price. The IIP statistics (IMF BPM6) and discussions with Chinese officials reveal that CIC assets are not included in portfolio equity or portfolio debt. We followed their Lane and Milesi-Ferretti (2011) EWN project and collect portfolio equity allocation from the top-five state-owned commercial banks. We follow allocate 70 percent of total portfolio equity to the US market, 20 percent to the UK market and 10 percent to the EME market.

Forth, we adjust other investment assets using global housing prices from the IMF dataset as we assume that most of the investment flowed to real estate markets in Australia, Canada, Hong Kong, the UK and the US.

3 External Wealth of China

In this section, we describe in great detail the external wealth of China based on the newly constructed dataset from 1997 to 2016. Firstly, we report the gross assets and liability positions of China at market prices and the historical evolution of the international integration of the Chinese economy. Secondly, we decompose the gross assets and gross liabilities by assets category and characterize them. Thirdly, we explore safe and risky investment of assets and liabilities. Finally, we decompose the positions of net debt

⁶CIC was established by the Ministry of Finance on September 29, 2007 with the issuance of special bonds worth RMB 1.55 trillion. These were, in turn, used to acquire approximately USD 200 billion as China’s foreign exchange reserves and formed the foundation of its registered capital. In 2004, the state-owned Central Huijin Investment Corporation received 45 billion USD in foreign reserves which it injected into the Bank of China and the China Construction Bank before their IPO in Hong Kong. In 2008, the company merged with CIC as a wholly-owned subsidiary company.

and net equity.

3.1 Gross Asset and Liability Positions and Net Foreign Assets

Has China become one of the world’s top creditor nations? Figure 3 plots the average gross asset and liability positions of China. In particular, gross assets exceeded gross liabilities from 2002 onwards and that gap continued to widen through 2016. In 2016, gross assets and gross liabilities reached 63 percent and 50 percent of GDP respectively.

In Figure 3, we also illustrate the evolution of net foreign assets from 1997 to 2016. The figure clearly shows China’s rising external wealth, which grew rapidly and exceeded 28 percent of GDP in 2008. During the financial turmoil period, the net foreign position declined slightly to 15 percent of GDP in 2009. However, the external wealth of China increased by more than 20 percent and reached 27 percent of GDP in 2013. By the end of 2016, the external wealth of China reached 14 percent of GDP. To sum up, the evolution of China’s external wealth position demonstrates the country’s transformation from a major goods trader to an active assets trader: from the “world’s factory” to a foremost global investor.

Figure 4 documents the gross assets, gross liabilities and net foreign assets in absolute terms. During the period 1997-2016, the gross assets and gross liabilities exceeded 7.1 trillion USD and 5.6 trillion USD respectively. Net foreign assets exceeded 1.5 trillion USD and represented more than 14 percent of Chinese GDP at the end of 2016. Before 2000, the market value of net foreign assets was at negative 18 billion USD and was approximately 2 percent of GDP. Between 1997 and 2008, the average value of net foreign assets reached 173 billion USD, equivalent to 4 percent of GDP. Between 2009 and 2016, the average value of net foreign assets reached 1.4 trillion USD, equivalent to 17 percent of GDP. Overall, the external wealth of China accounted for approximately 10 percent of GDP on average (Panel A of Table 1).

According to the flow and stock dynamics identity and Gourinchas and Rey (2007a), we define the valuation effects as the difference between the net foreign assets at the market price and the cumulated current account. The valuation effects result from changes in assets prices and the exchange rate, which are missing from the cumulated current account balance. In China’s case, the official IIP statistics and data reporting standards⁷ are such that the valuation effects only capture the assets price movements.

Figure 5 shows a substantial change in the valuation component: the gap between the market value of the external wealth and the historical cost according to the cumulated current account. The cumulated

⁷Unfortunately, SAFE does not provide detailed information about the currency exposure. The assets and liabilities have been reported in dollar terms. In the future, we will investigate the valuation effect with the currency structure. In 2015 SAFE revised the official IIP statistics (BPM6) to include the exchange rate adjustment, in line with the Special Data Dissemination Standard (SDDS) of the IMF.

current account and market value of net foreign assets represented 34 percent and 14 percent of GDP by the end of 2016, which indicates losses in the valuation of China’s external position of approximately 20 percent. The dynamics of the valuation component are consistent with the asset price movements corresponding to both the international and domestic financial markets. Figure 5 shows that the gap due to the valuation effects is sizable. At the beginning of the global financial crisis, the gap widened but narrowed when US financial assets rose and finally widened again when China’s capital market took off.

For China, the magnitude of the valuation effects tended to be negative and economically large. Panel B of Table 1 reports several estimations of the valuations effects based on the different assumptions following Lane and Milesi-Ferretti (2007a) and Curcuru *et al.* (2008, 2013) and their careful discussions on the measurement issue of omissions and errors. The average magnitude of the valuation effects between 1997 and 2016 was approximately negative 9 percent of GDP. The valuation losses were smaller from 2009 to 2016. In the next section, we will discuss the potential drivers of the valuation effects, the composition effects between risky liabilities and safe assets as well as the assets price movements, especially the US Treasury bond and investment returns in China. Even when we make different assumptions about the omissions and errors, the results are similar and the difference is within a narrow range. Overall, over the period of 1997 through 2016, China experienced a sizable valuation loss, unlike the US which experienced a gain in valuation (Gourinchas *et al.* (2010)).

Our estimation results differ from that of LMF mainly due to China’s fluctuate stock price. We adjust FDI liability and portfolio equity by Shanghai Composite Index, the fluctuation in stock price will inevitably affect the market value of two items. Since FDI liability and portfolio equity accounts for the majority of China’s gross liability, it is plausible that the market value of gross liability is fluctuated simultaneously with the stock price. Note in 2000, 2006-07, and 2015, there were stock price bubble in China’s stock market followed by the bubble bust in the next years. Hence, our results imply a surge in the market value of gross liability and a drop in net foreign asset in the corresponding years.

After its entry to the World Trade Organization in 2001, China transformed from a goods trader to an assets trader and became an important player in the global markets. Between 2001 and 2008, China accumulated a large volume of FX reserves by running massive and continuous trade surpluses. However, the trade balance and current account surplus declined significantly after 2008, suggesting that the accumulation of FX reserves was slowing down (Figure 1 and Figure 2). Following Lane and Milesi-Ferretti (2001 and 2007), we also investigate the effects of trade integration and financial integration in China from 1997 to 2016. We define the sum of gross assets and liabilities as a share of GDP to indicate the degree of financial integration. Similarly, we define trade integration as the sum of export plus import of goods and services over GDP.

Figure 7 shows that both financial integration and trade integration⁸ increased rapidly after 2001. Although there was a significant decrease in both trade and financial integration due to the shrinking external demand and the global financial turmoil in 2008, the surging trends indicate the effect of globalization taking place in China. In contrast with trade integration, financial integration increased sharply by more than 20 percent of GDP in 2009. Our findings indicate that in China, financial integration was more pronounced than trade integration, in line with the situation in other emerging countries as Gourinchas and Rey (2014) have shown. By the end of 2016, our measures of financial integration and trade integration reached 113 percent and 37 percent of GDP respectively. These findings instill confidence that the Chinese economy has indeed become an integral part of the global economy.

3.2 Composition of External Wealth

Figures 8 and 9 describe the composition of gross assets and liabilities. Figure 8 shows that the share of FX reserve assets exceeded 30 percent of GDP and represented approximately 60 percent of the gross assets between 1997 and 2016. The FX reserve consisted mainly of US assets, especially Treasury bonds. The second and third largest shares came from outward FDI and portfolio debt, which reached approximately 5 percent and 4 percent of GDP respectively. The fourth largest share came from bank loan assets, which reached approximately 3 percent of GDP. The remaining shares belonged to the portfolio equity investment and real estate assets. Our results reflect the aim of the recent policy reforms to promote cross-border investment and capital account liberalization.⁹

Figure 9 shows that the share of FDI liabilities exceeded 26 percent of GDP and represented 60 percent of gross liabilities on average between 1997 and 2016. The second largest share came from bank loan liabilities, which were almost 5 percent of GDP. The third largest share came from portfolio equity liabilities, which reached approximately 4 percent of GDP on average. Portfolio debt liabilities nearly reached 1 percent of GDP on average. Interestingly, portfolio equity liabilities had been rising since 2006 and exceeded 12 percent of gross liabilities when China opened up its domestic equity market through the Qualified Foreign Institutional Investor program in 2006.

We also study the asymmetry of the external balance sheet of China arising from heterogeneous investments: risky and safe investments. Following Gourinchas and Rey (2007a), we further classify FDI, FX equity and portfolio equity assets as risky assets whereas portfolio debt, FX bond, bank savings and

⁸In fact, financial integration is a stock measure and trade integration is a flow measure. In this paper, we simply point out the time series trend instead of conducting further analysis.

⁹Recent developments in cross-border investment follow the policies of new development banks/funds such as the Asian Infrastructure Investment Bank, BRIC Bank, Silk Road Fund, and the Belt and Road Initiative. The reform of liberalizing capital accounts is also taking place, albeit slowly, and private outflow from China has been increasing since 2009.

loans and trade credit assets as safe assets. Figure 10 shows that the share of safe assets exceeded 60 percent of gross assets on average between 1997 and 2016. In contrast, the share of risky assets reached 16 percent of gross assets. In recent years, the share of risky assets increased and reached almost 30 percent of total assets while the share of safe assets declined to less than 50 percent of total assets by the end of 2016.

On the contrary, Figure 11 illustrates that on average, the share of risky liabilities accounted for 65 percent of gross liabilities and the share of safe liabilities accounted for less than 30 percent of gross liabilities. The gap between the shares of risky liabilities and safe liabilities amounts to a sizable 35 percent and has widened substantially since 2013. Overall, China's asymmetric external balance sheet is dominated by safe assets and risky liabilities.

Finally, we examine the external capital structure of China. Following the pioneering work of Gourinchas and Rey (2007a), we define the net equity holding as the assets of FDI and portfolio equity, FX equity and other equity investment minus the liabilities of FDI, portfolio equity, and other equity investment. Also, the net debt is calculated as the assets of portfolio bond, bank loan and FX bond minus the liabilities of debt investment, portfolio bond and bank loan.

Figure 12 presents the dynamics of net equity and net debt position. Starting from 2001, the ratio of positive net debt to GDP rose rapidly before falling again after 2009. By contrast, the ratio of negative net equity to GDP declined gradually before plunging in 2008. On average, the net debt and net equity were 17 percent and negative 20 percent of GDP respectively. This indicates that China takes a short position in equity and a long position in debt, consistent with it being the counterpart of the US as the world venture capitalist (Gourinchas and Rey (2007b)).

Summing up, the external wealth (net foreign assets) of China rose rapidly over the past 10 years and exceeded 1.5 trillion USD (14 percent of GDP) in 2016. China swung from being a debtor to a creditor in 2001, and the average value of its net foreign assets at the market price reached more than 9 percent of GDP between 1997 and 2016. The FX reserve assets and FDI liabilities accounted for roughly 60 percent of total positions and thus dominated the gross positions of assets and liabilities respectively. Furthermore, safe assets and risky liabilities dominated China's external balance sheet. Finally, the asymmetric external capital structure shows that the composition effect of a long position in net debt and a short position in net equity is the fundamental source of valuation losses.

4 Excess Returns on Net Foreign Assets

Has China successfully transformed from the “world’s factory” to a profitable global investor? What are the excess returns on the net foreign assets of China? In this section, we first report the excess returns between external assets and liabilities estimated from the yield of investment income and the rate of capital gain. We then show the alternative measures of the excess returns. Finally, we explore the structural feature of returns differentials between foreign assets, namely US Treasury bonds, and domestic investment returns, to study the source of external excess returns.

4.1 Excess Gross Returns: Yield and Rate of Capital Gain

In the previous sections, we introduced the method used by most of the existing literature on returns differentials to estimate the returns of gross assets and liabilities (Lane and Milesi-Ferretti (2007a)). Here we analyze the yield of investment income and the rate of capital gain to study the returns of external wealth. The yield of gross assets equals the returns attributable to investment income from assets held abroad, including the dividends, coupons, and earnings of FDI and other portfolio investment. The yield of gross liabilities is the investment income from assets held in China by foreigners. The rate of capital gain is calculated based on assets price movements. The total return of gross assets or liabilities is the sum of the yield and rate of capital gains. Therefore, the excess returns are the difference between the total returns of gross assets and gross liabilities. Finally, we adjust the inflation factor and compute the real return.

Table 2 reports the average real returns of gross assets and gross liabilities by time period. Firstly, the yield of gross liabilities was substantial. On average, the annual yield of gross liabilities exceeded 3 percent from 1998 to 2016. The yield of gross assets was consistently smaller than the yield of gross liabilities over the sample period and reached almost 1 percent by 2016.

Secondly, the rate of capital gain from gross assets was also small at negative 1 percent from 1998 to 2016, mainly due to the considerable losses before 2008. In contrast, the rate of capital gain from gross liabilities was slightly higher at more than 5 percent between 1998 and 2016. Interestingly, during the post-financial crisis period of 2009-2016, the average capital gains from gross liabilities were an impressive 6.5 percent. Along the same line, the capital losses from gross assets also reduced. Overall, the real return of gross assets (0.3 percent) was substantially smaller than the real return of gross liabilities (9.2 percent) from 1998 to 2016. Therefore, the real excess returns of the external balance sheet of China approximately exceeded negative 8 percent over all subperiods. On the one hand, the real return of gross assets turned

positive after 2008. On the other hand, the real return of gross liabilities rose with the investment return in China. Overall, the real excess returns exceeded negative 8 percent on average from 2009 to 2016.

Following the suggestion of Lane and Milesi-Ferretti (2007a) and Curcuru *et al.* (2008, 2013), we include alternative measures to improve the accuracy of the stock-flow methodology by making different assumptions about measurement omissions and errors. Our results are similar to the main findings about the negative excess returns and share similar trends across time.

Table 3 reports the average real returns of gross assets and liabilities by time period. As noted before, the real excess returns are adjusted by omissions and errors. On average, real excess returns exceeded negative 9 percent when the omissions and errors are allocated to the flows. By contrast, real excess returns reached negative 7.8 percent when the omissions and errors are allocated to the valuations. Finally, real excess returns exceeded negative 8 percent when the omissions and errors are excluded. The results of excess returns are similar under different subperiods and different assumptions.

Besides estimating the real excess returns, we also explore the sources and evolution of the excess returns. Unfortunately, the SAFE statistics and other public documents do not decompose the sources of the excess returns from gross assets and liabilities. In order to reveal the underlying sources of the negative excess returns, we start with the characteristics of the external balance sheet of China. As we discussed in the previous sections, the gross assets are mainly dominated by foreign reserve assets, and the FDI liabilities¹⁰ contributed more than 60 percent of the gross liabilities and the market value of FDI liabilities adjusted by the equity price. In addition, the capital gains from the gross liabilities with a higher exposure to equity investment and the composition effects of a short equity position and a long debt position could suggest the potential drivers of the negative returns.

Furthermore, we show the evolution of China’s asymmetric external balance sheet and excess returns before and after the global financial crisis. From Panel (a) to Panel (d), Figure 13 illustrates an increasingly unbalanced external position after 2008. This partly explained China’s worsening excess return from negative 8 percent before 2008 to negative 9 percent afterwards. Since the global financial crisis in 2008, China held more safe FX reserves and held more risky FDI liabilities. In addition, China remained a negative position on net equity, while accumulated more net debt after 2008. The asymmetric external balance sheet went in line with a declining excessive return.

Figure 14 plots the China stock market index, the proxy for the domestic equity investment, and US Treasury yields, the proxy for FX reserve investment. China’s equity market started to rise from the beginning of our sample period and the stock market index tripled between 1997 and 2016. On the other

¹⁰We are well aware of the issues regarding the FDI valuation at the market price. Following the common practice (Lane and Milesi-Ferretti (2007a); Gourinchas and Rey (2014)), we rely on the equity price as the index and employ the investment return (Bai *et al.* (2014)) in the robustness check.

hand, the five-year US Treasury yield started to decline from more than 6 percent in 1997 to 2 percent in 2016. The return differentials between the declining Treasury yields and the rising domestic equity market may have been driving the negative excess returns of the external balance sheet of China.

Interestingly, China lost additional external wealth after the 2008 financial crisis despite the dramatic drop in the US Treasury bond yield in 2008. As discussed above, the dominant feature of China’s foreign wealth is its long position in net debt and short position in net equity. While investment return in China decreased after the 2008 financial crisis, its growth momentum remained strong compared to most of the developed countries across the world. Equity investment in China was still able to capture handsome dividends from the country’s continuous rapid growth. On the other hand, while the demand for safe assets in 2008 pushed up the US Treasury bond yield temporarily, the return on such assets was still much lower than China’s equity return given the dynamic feature of China’s economy. Therefore, despite the sharp drop in US Treasury bond yields when the US performed its “exorbitant duty” in 2008, investment in China has still been more profitable than income earned from fixed income assets. This explains the worsening negative real excess returns of China’s foreign wealth after the 2008 financial crisis.

Overall, we found persistent negative excess returns of gross assets over gross liabilities that mostly correspond to the sizable capital gains from gross liabilities. The alternative measures based on different assumptions produce similar magnitudes of negative returns. Indeed, the evolution of excess returns is in line with the fluctuations of the excess returns of capital gain¹¹ and the return differentials between US Treasury bonds and domestic stocks. The considerable size of the negative returns of gross assets over gross liabilities is astonishing and indicates that China has not yet fully transformed from the “world’s factory” to a profitable global investor.

5 Concluding Remarks

In this paper, from the valuation adjustment perspective, we have estimated the external wealth of China and the excess returns on its net foreign assets using a newly constructed database of the external balance at the market price between 1997 and 2016. We have shown the evolution of China’s gross assets and liabilities and analyzed the positions of external assets and liabilities in the context of a burgeoning literature on external adjustment and return differentials on net foreign assets. Meanwhile, we have decomposed the external balance sheet into different assets classes and studied the exceptional features of the external capital positions and return differentials.

¹¹Habib (2010) claims that over the long run, small but stable yields may have a stronger impact on foreign assets than large and volatile rates of capital gain. Over the short run, the rates of capital gain drive the behavior of total returns.

What are the lessons from China? First, China transitioned from a debtor to a creditor in 2002 after joining the World Trade Organization¹² (WTO), and the average value of its external wealth reached more than 9 percent of GDP between 1997 and 2016. Since 2001, the external wealth of China has grown rapidly and exceeded 1.5 trillion USD (14 percent of GDP) in 2016. Second, financial integration and trade integration indicate that the Chinese economy has become an integral part of the global economy. During the periods when global trade slowed down, financial integration was more pronounced, which represents a new feature of the emerging Chinese economy. Third, the FX reserve assets and FDI liabilities account for more than 60 percent of total positions and thus dominate the gross position of assets and that of liabilities. Because of the asymmetric structure of the external balance sheet between risky liabilities and safe assets, on average, the negative valuation component exceed 9 percent of GDP. The composition effect of a long position in net debt and a short position in net equity, represents the fundamental source of valuation losses. Finally, the magnitude of the real excess returns exceeds negative 8 percent over the period of 1998 through 2016, mainly caused by the capital gain on the gross liabilities and return differentials between China’s equity market and the US Treasury bond market. Despite the dramatic drop in US Treasury bond yields when the US performed its “exorbitant duty” in 2008, investment in China was still more profitable than investment in fixed income assets given the dynamic feature of China’s economy. This accounts for the worsening excess returns of China after 2008. To sum up, the evolution of China’s external wealth position demonstrates its ongoing transformation from a major goods trader to an active assets trader. The sizeable and persistent negative excess returns, however, indicate that China has not yet transformed from the “world’s factory” to a profitable world creditor.

Due to data limitations and measurement issues, our empirical results are sensitive to the sample period and assumptions, particularly the results regarding the valuation of FDI liabilities. This paper relies on a newly constructed dataset containing all available information about the composition of the external balance sheet, assets allocations and geographical allocations to make sensible estimations. Our results might still be biased toward the valuation component and excess returns, which have been carefully discussed by Lane and Milesi-Ferretti (2007b); Gourinchas (2008); Curcuru *et al.* (2013); Gourinchas *et al.* (2010). To mitigate concerns about the accuracy of the stock-flow methodology, we have also conducted additional robustness checks with several assumptions about omissions. The results of the valuation component and excess returns are similar under different assumptions and subperiods.

The findings have several policy implications. It is worth mentioning the connection between the external wealth of China and the international monetary system. The fundamental feature of the international monetary system is the scarcity of safe assets. While growing economies like China can and do

¹²For a detailed description, see “China’s Growing Role in World Trade” by Wei (2010).

enjoy the benefits of the financial globalization, they suffer from significant valuation losses at the same time. On one hand, FX reserve assets, mainly holding of low-yield US government bonds, dominate the gross assets. On the other hand, as the center of the international monetary system, the US provides safe assets and faces the new Triffin dilemma when the dollar plays the international currency.¹³ Recent research suggests that safe assets should be produced from the multiple global providers rather than private or regional providers (Farhi *et al.* (2011); Gourinchas and Jeanne (2012); Gourinchas and Rey (2016); Gourinchas (2017), among others). At the current pace of Renminbi internationalization and the capital account liberalization reform, can we expect the effectiveness of coordination between China and other safe assets providers?

Second, the source of valuation losses, i.e. the asymmetric structure between risky liabilities and safe assets, indicates that the domestic financial markets are less developed. Why does China take a short position in equity and a long position in debt in its external balance sheet? One potential answer is that FDI and equity investors have enjoyed more than a decade of high growth and reform dividends in China. This could be reversed once China developed its debt markets to cater to foreign investors and a mature legal system to protect creditor rights. Another possible answer is that Chinese investors have not benefited from the financial globalization or enjoyed diversification and international risk-sharing. Can we expect more outward FDI or portfolio equity investment in the near future? After 10 years of reforms in capital account management policy, it has become much more difficult to further open up the market given the recent slowdown in the domestic economy, the massive capital outflows and the decreasing reserve accumulation, not to mention the depreciation (expectation) of the domestic currency. In addition, due to lack of international investment experiences, Chinese households mainly invest in global property markets, which creates new challenges in the form of international spillover and real estate bubble.

Last but not least, the accumulation of foreign reserves is partly as a result of China's fixed exchange rate policy. The importance of exchange rate flexibility deserves further study as do the roles of financial market development and international monetary system reforms.

In this paper, we have provided empirical evidence of the external wealth and excess returns of China. Further research on return differentials (Gourinchas and Rey (2007b, 2014)) could shed light on the determinants of excess returns.

¹³Gourinchas and Rey (2016) study the new Triffin dilemma and safe assets providers, who face a trade-off between external exposure and real appreciation of the their currency. Gourinchas and Jeanne (2012) highlight the importance of fiscal sustainability when a country decides to provide a safe asset.

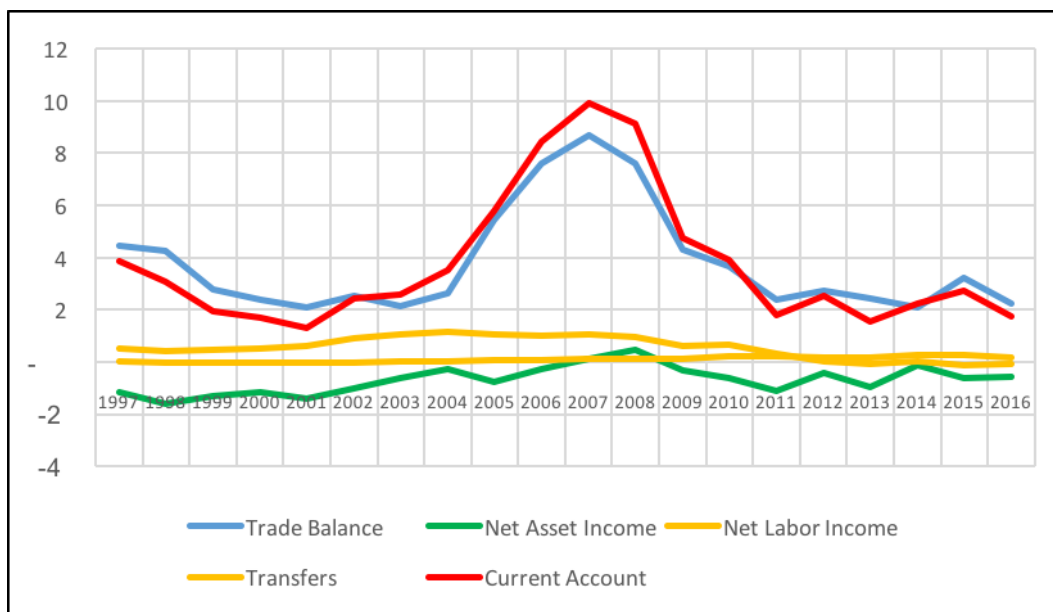
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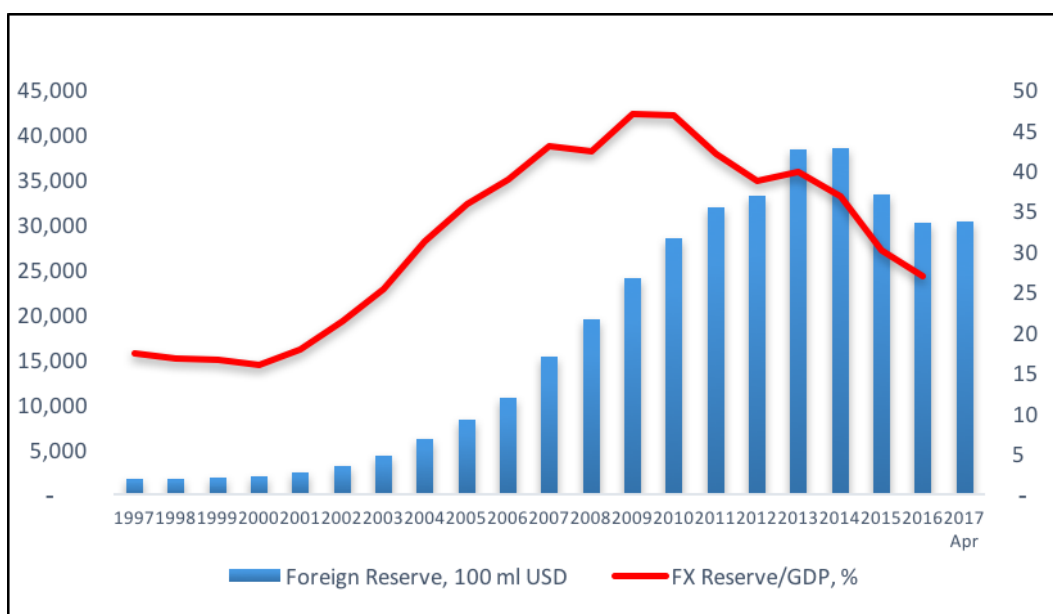
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Figure 1: Composition of China's Current Account (% of GDP)



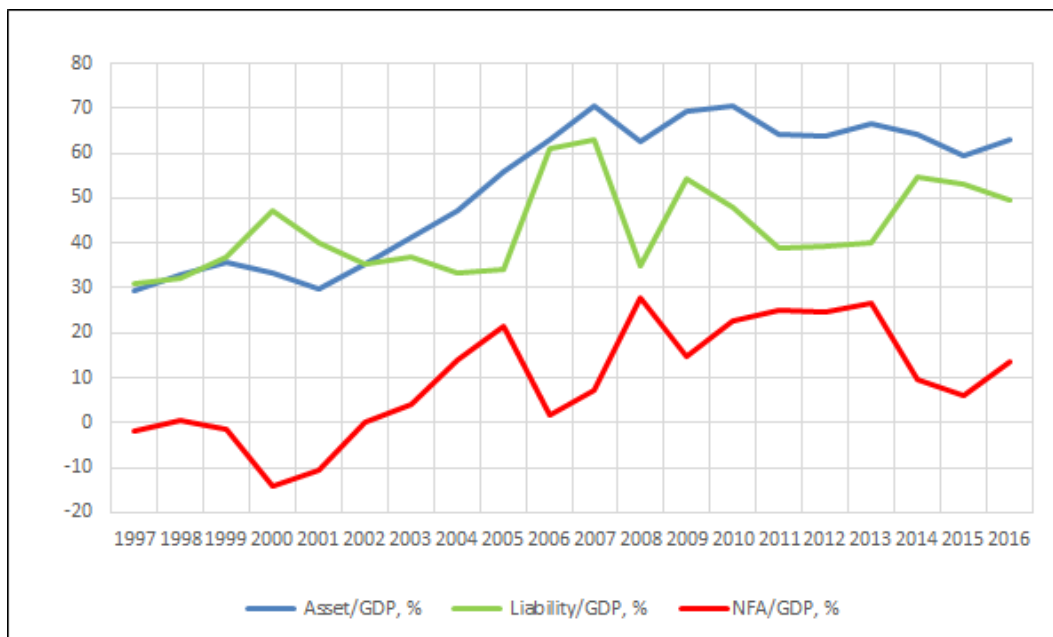
Sources: China Premium Database of CEIC and the State Administration of Foreign Exchange (SAFE)

Figure 2: Foreign Exchange Reserves of China



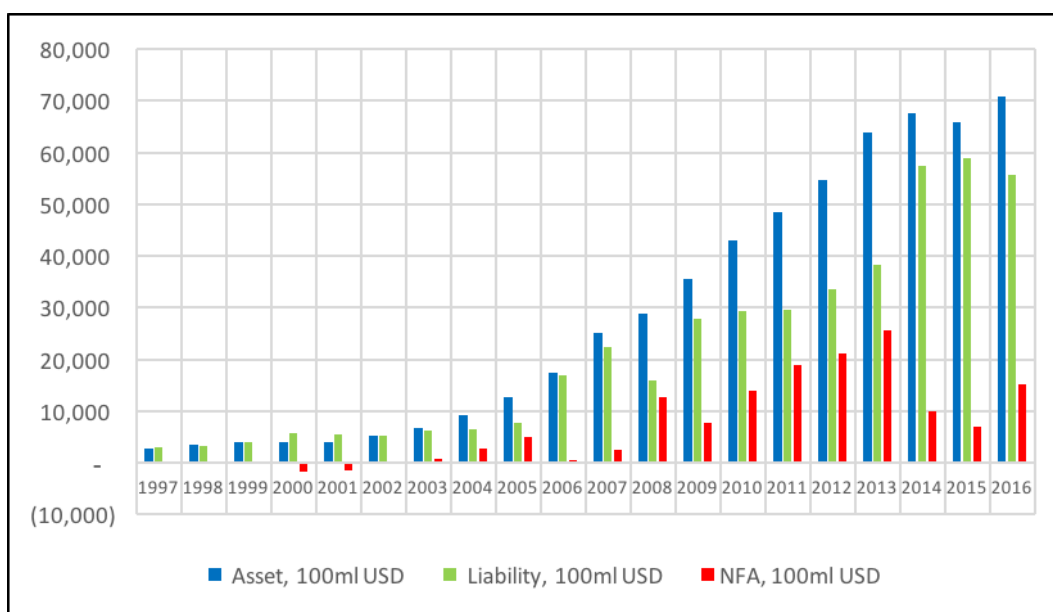
Sources: China Premium Database of CEIC and the State Administration of Foreign Exchange (SAFE)

**Figure 3: External Wealth of China: Gross Assets and Liabilities
(% of GDP)**



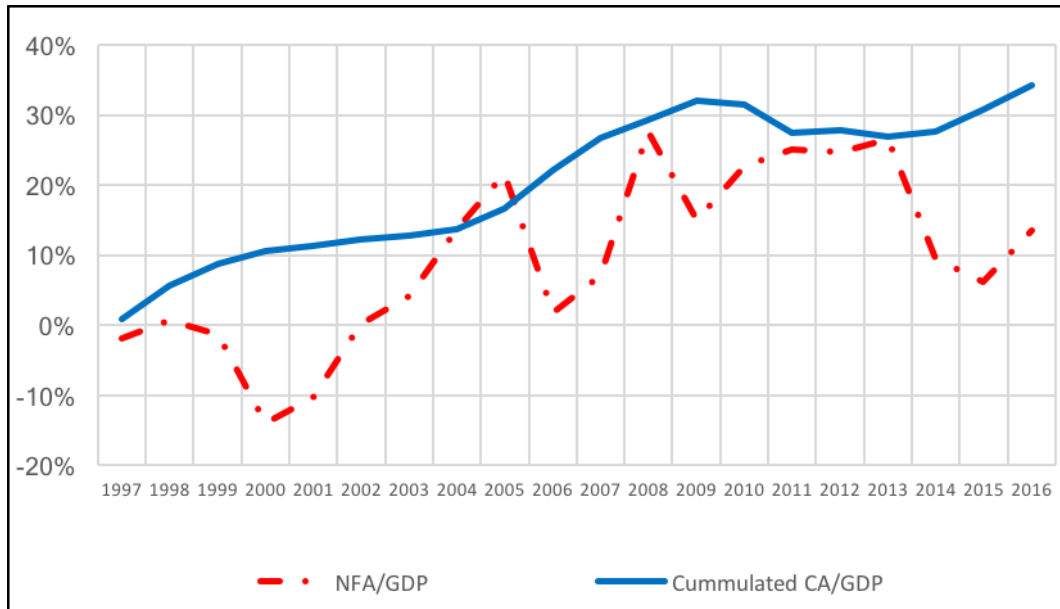
Sources: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations

Figure 4: External Wealth of China: Gross Assets and Liabilities



Sources: the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations

Figure 5: Cumulated Current Account and Net Foreign Assets (% of GDP)



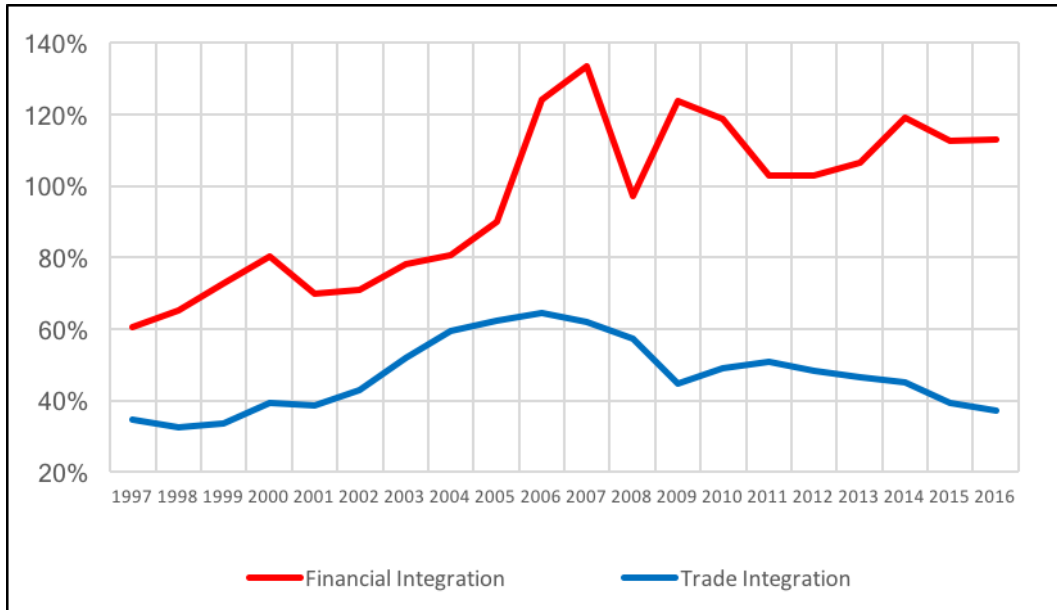
Sources: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations

Figure 6: Comparison of Net Foreign Assets: Alternative Estimations (% of GDP)



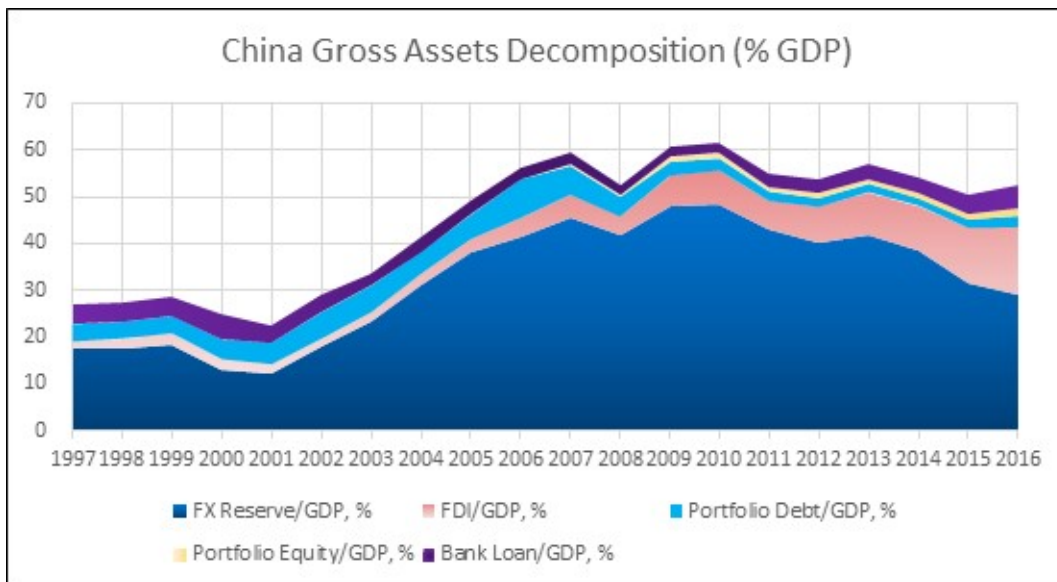
Sources: Lane and Milesi-Ferretti (2011) and Author's own Calculations

Figure 7: Trade Integration and Financial Integration (% of GDP)



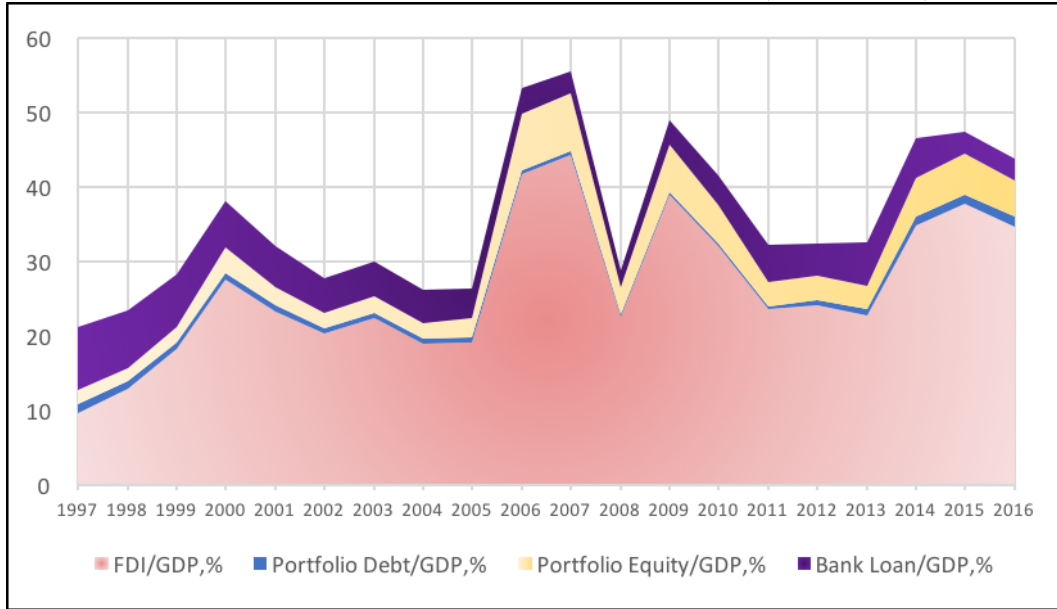
Sources: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations

Figure 8: Composition of Gross Assets (% of GDP)



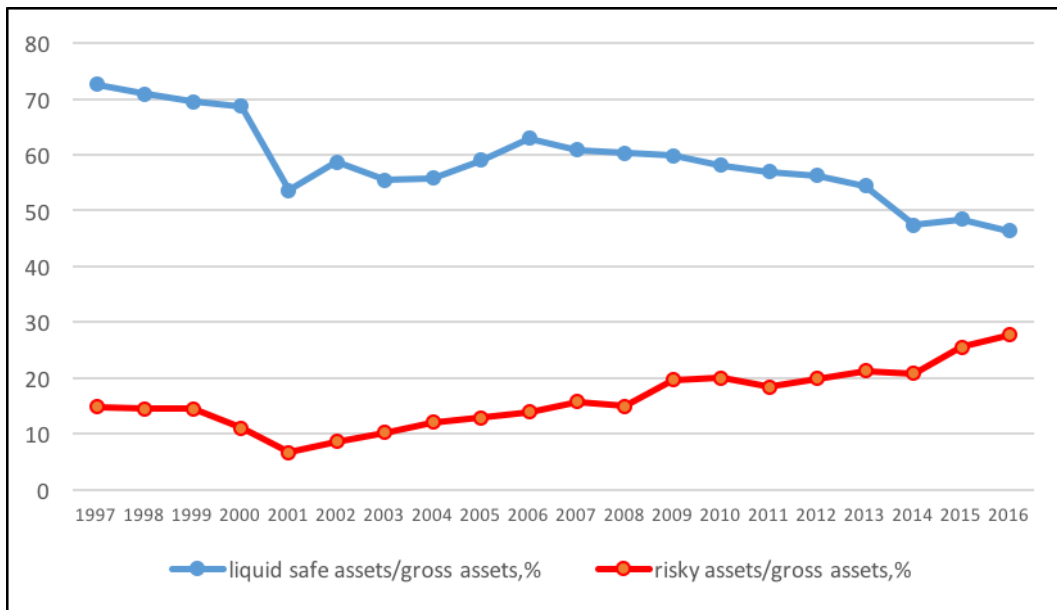
Sources: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations

Figure 9: Composition of Gross liabilities (% of GDP)



Sources: the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations

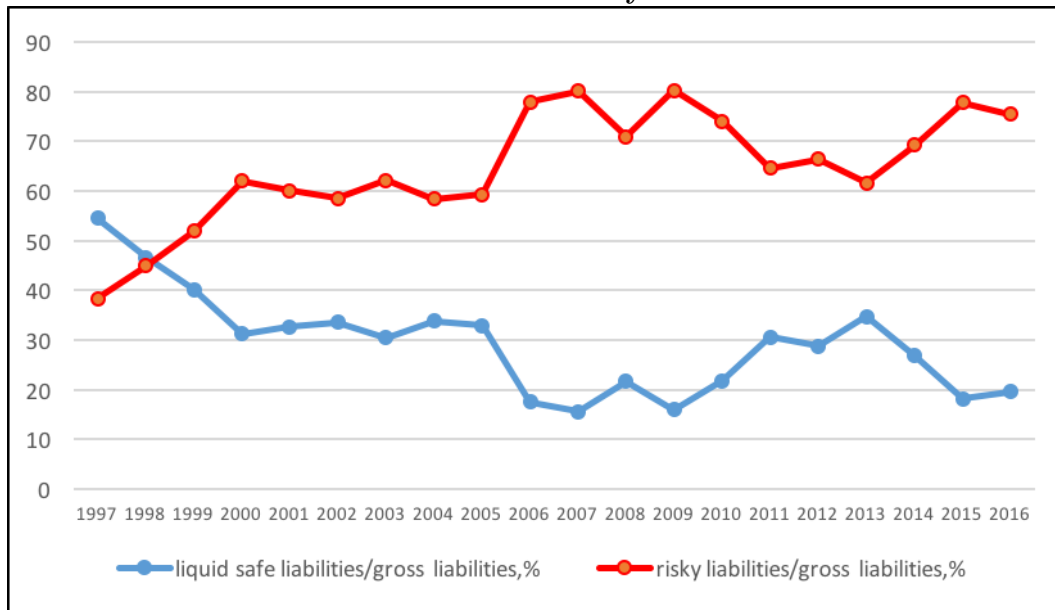
**Figure 10: Compositions of China's External Wealth of China:
Safe Assets vs. Risky Assets**



Sources: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations

Note: Following Gourinchas et al. (2017), we further classify FDI, FX equity and portfolio equity assets (liabilities) as **risky assets** (liabilities) whereas portfolio debt, FX bond, bank savings and loans and trade credit assets (liabilities) as **safe assets** (liabilities).

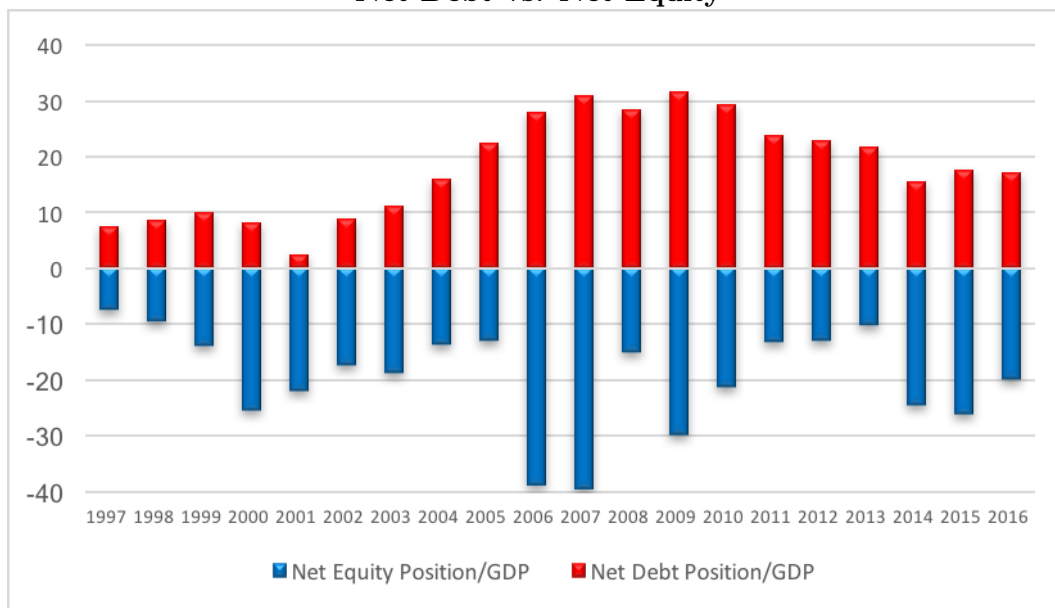
**Figure 11: Compositions of China's External Wealth of China:
Safe Liabilities vs. Risky Liabilities**



Sources: the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations

Note: Following Gourinchas et al. (2017), we further classify FDI, FX equity and portfolio equity assets (liabilities) as **risky assets** (liabilities) whereas portfolio debt, FX bond, bank savings and loans and trade credit assets (liabilities) as **safe assets** (liabilities).

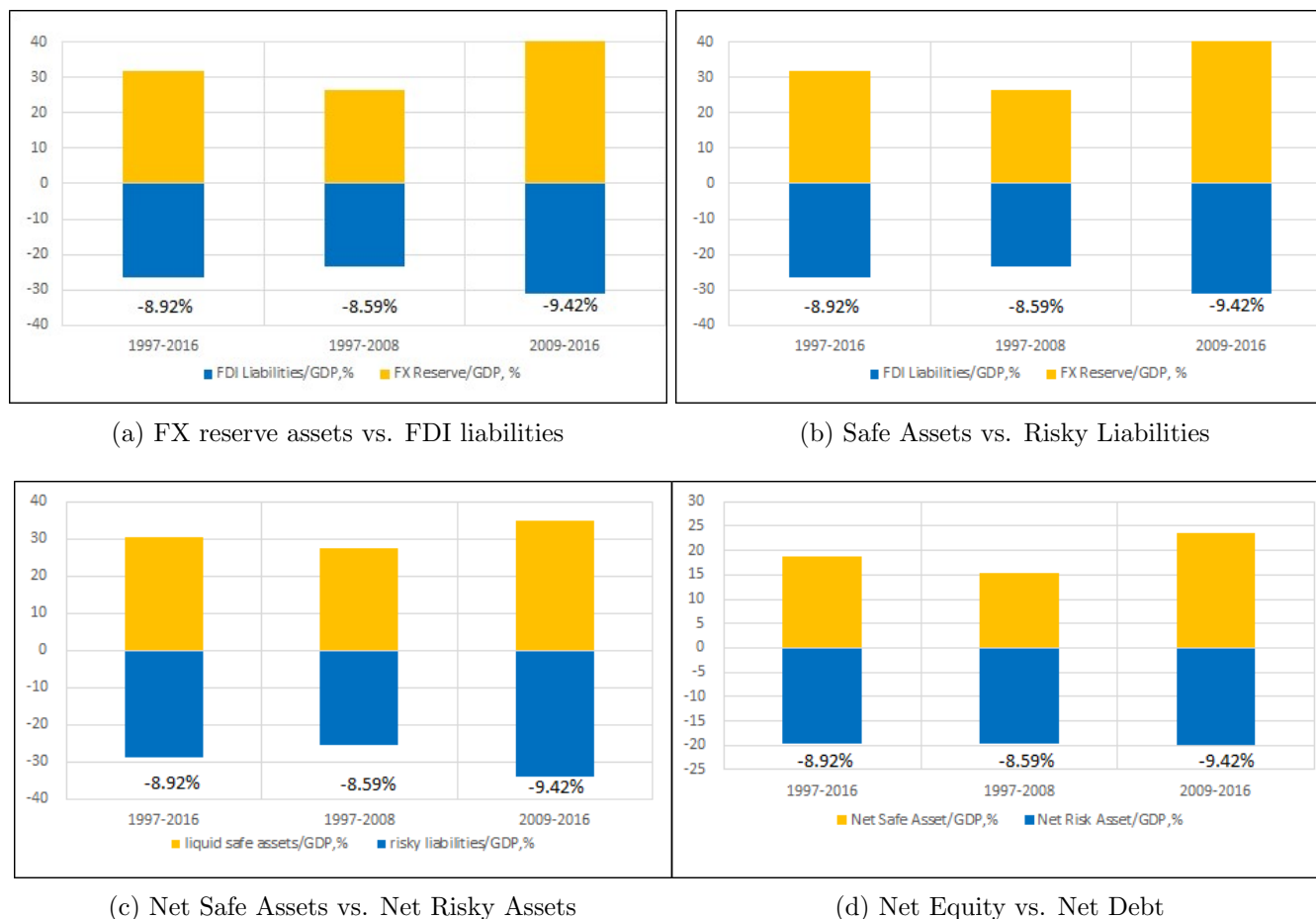
**Figures 12: Compositions of China's External Wealth of China:
Net Debt vs. Net Equity**



Sources: the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations

Note: Following Gourinchas *et al.* (2010), in our study **net debt** includes net portfolio bond, net bank loan, and FX bond, whereas **net equity** includes net FDI, net portfolio equity, FX equity and net other equity investment.

Figure 13: Excess Returns and Structure of External Balance Sheet



Sources: the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations

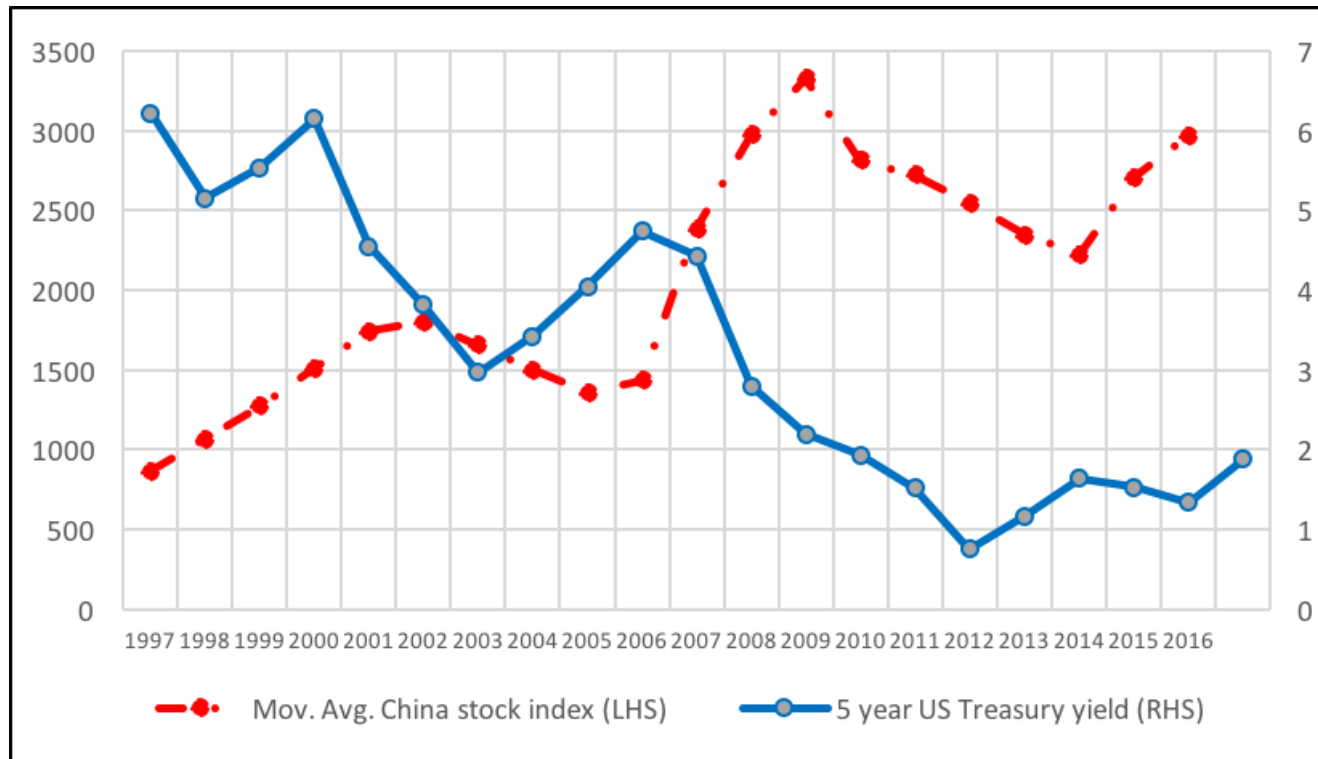
Note: FDI, FX equity and portfolio equity assets (liabilities) as **risky assets** (liabilities) whereas portfolio debt, FX bond, bank savings and loans and trade credit assets (liabilities) as **safe assets** (liabilities).

Net safe assets: safe assets minus safe assets.

Net risky assets: risky assets minus risky assets.

Horizontal line documents the real excess returns of China during the corresponding period.

Figure 14: China Stock Return vs. US Treasury Yield



Sources: China Premium Database of CEIC, China Securities Regulatory Commission (CSRC), and US Treasury International Capital (TIC)

Table 1: External Wealth of China: Book Value vs. Market Value

Panel A: Net Foreign Asset Positions				
		1997-2016	1997-2008	2009-2016
Assets/GDP, %	Book Value	52.5	46.2	61.9
	Market Value	52.9	44.7	65.2
Liabilities/GDP, %	Book Value	35.6	32.0	40.9
	Market Value	43.2	40.6	47.3
NFA/GDP, %	Book Value	16.9	14.2	21.0
	Market Value	9.6	4.1	17.9

Panel B: Valuation Effects				
		1997-2016	1997-2008	2009-2016
Omissions and Errors allocated to flows, %		-9.0	-10.6	-7.1
Omissions and Errors allocated to valuations, %		-10.8	-10.9	-10.8
Without Omissions and Errors, %		-9.9	-10.7	-8.9

Sources: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations.

Following Gourinchas *et al.* (2010), we define the valuation component as the difference between our measure (net foreign assets) and the cumulated current account (ΣCA). This component reflects exactly the cumulated value of the capital gains.

$$VA_t = NFA_t - NFA_{t-1} - CA_t - OE_t$$

Table 2: Real Returns on Gross Assets and liabilities

Average Returns	1998-2016	1998-2008	2009-2016
Real yield of investment: assets,%	1.23	1.51	0.84
Real yield of investment: liabilities,%	3.94	4.07	3.77
Real rate of capital gains: assets,%	-0.91	-1.54	-0.05
Real rate of capital gains: liabilities,%	5.30	4.46	6.45
Real returns: assets,%	0.32	-0.03	0.80
Real returns: liabilities,%	9.24	8.53	10.22
Real excess returns,%	-8.92	-8.56	-9.42

Sources: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations.

Table 3: Real Excess Returns on Gross Assets and Liabilities: Alternative Measures

	1998-2016	1998-2008	2009-2016
Omissions and Errors allocated to flows,%	-9.99	-9.17	-11.11
Omissions and Errors allocated to valuations,%	-7.85	-7.95	-7.73
Omissions and Errors (excluded),%	-8.92	-8.56	-9.42

Sources: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Own Calculations.

Appendix A: Market Value Estimation

The State Administration of Foreign Exchange (SAFE)¹⁴ conducted the first survey on China’s international investment position (IIP) in 2004. After 2004, SAFE added up the financial flow data to report the official IIP statistics. Therefore, the official IIP from 2005 to 2016 is the book value of China’s external wealth without any valuation adjustments. In this section, we introduce detailed methods of obtaining the positions of gross assets and liabilities at market value.

In line with Lane and Milesi-Ferretti (2007b), we report the gross external wealth data¹⁵ from 1997 to 2016 by first dividing gross assets and liabilities into four major categories: foreign exchange reserves (FX reserves), foreign direct investment (FDI), portfolio equity investment, portfolio debt and other investment. On the assets side, we adjust FDI, portfolio equity, portfolio debt, FX reserves, and other investment. On the liability side, we adjust the FDI, portfolio equity, portfolio debt.

1 Gross Assets adjustment

1.1 Foreign Direct Investment

Firstly, we obtain Ministry of Commerce (MOC) data with a detailed geographical breakdown.¹⁶ The data is at market value in 2004, so we use the 2004 stock (based on survey data) and cumulated flows based on the corresponding stock indexes for valuation adjustment. As a matter of fact, the MOC only started to release the geographical allocation of outward FDI after 2003. Therefore, we have to make assumptions for the period before 2003. We allocate 70 percent of total FDI to the US, 20 percent to the UK, and 10 percent to emerging market economies (EMEs) and this assumption is the line with the United Nations Conference on Trade and Development (UNCTAD) reports and our assumption for portfolio equity. We use the S&P index, FT index, and MSCI EME index to make valuation adjustments before 2003.

Overall, we estimate the following to adjust the market value of outward FDI.

$$FDIA_t = \frac{P_t}{P_{t-1}} FDIA_{t-1} + \frac{P_t}{AP_t} Flow_t$$

where $FDIA_t$ represents the position of FDI assets at year t , P_t is the price index of year t , and AP_t is the average price index in year t . We use the stock price in the corresponding countries to adjust FDI assets.

Data sources:

FDI data: Ministry of Commerce, “Annual Report on Outward Investment and Economic Cooperation”.

Stock indexes are from CEIC on a monthly basis.

1.2 Portfolio Equity

In terms of the portfolio equity stock, our estimation differs from that of Lane and Milesi-Ferretti (2007a). They divided the portfolio equity assets into QDII assets reported by SAFE and China Invest-

¹⁴The State Administration of Foreign Exchange (SAFE) is a deputy-ministerial-level state administration under the People’s Bank of China. The SAFE Investment Company is responsible for the balance of payment and international investment position statistics and importantly management of China’s foreign exchange reserve. In terms of reserve management, SAFE mainly invests in the FX market and fixed income assets.

¹⁵Following Lane and Milesi-Ferretti (2007b), we measure the net purchases of foreign assets by residents and the net purchases of domestic assets by nonresidents with a positive sign.

¹⁶The aggregate numbers are not exactly identical to the IIP reported by SAFE due to different statistics standards. However, SAFE does not report the geographical outward FDI in detail. For the full country list, please refer to the online appendix.

ment Corporation (CIC) assets.¹⁷ They adjust part of QDII assets with stock price and part of QDII with commodity price. The IIP statistics (IMF BPM6) and discussions with Chinese officials reveal that CIC assets are not included in portfolio equity or portfolio debt. Its net gains are recorded in FX reserve flow.

In their EWN project, Lane and Milesi-Ferretti (2011) collect the balance sheets of China's top-five state-owned commercial banks. We follow a similar approach and allocate 70 percent of total portfolio equity to the US market, 20 percent to the UK market and 10 percent to the EME market. These percentages are also in line with our assumption of FX equity assets.¹⁸

The corresponding stock indexes namely S&P, FT, and MSCI EME index are employed to conduct the valuation adjustment for portfolio equities.

$$PEA_t = \frac{P_t}{P_{t-1}} PEA_{t-1} + \frac{P_t}{AP_t} Flow_t$$

PEA_t represents the position of equity investment assets at year t . P_t is the price index of year t . AP_t is the average price index in year t . The price of equity is proxied by the stock price in the corresponding countries. Therefore, we use S&P, FT, and MSCI EME indexes as the price for valuation adjustment.

Data sources:

U.S. S&P, UK FT indexes price are obtained from CEIC on a monthly basis. The EME stock index is obtained from the MSCI EME index on a monthly basis from 1997 to 2016.

1.3 Portfolio Debt

We follow Gourinchas *et al.* (2012) who obtained as much detailed data as possible from individual banks reports between 2007 and 2010. Portfolio debt is held mainly by the top five Chinese state-owned international banks (Bank of China, Industrial and Commercial Bank of China, China Construction Bank, Agricultural Bank of China, and Chinese Development Bank). We allocate 60 percent, 30 percent, and 10 percent of the portfolio debt assets to the US, German, and Japanese government bond markets respectively. This is generally in accordance with the aggregated information of the banks' balance sheets.

$$PDA_t = \frac{P_t}{P_{t-1}} PDA_{t-1} + \frac{P_t}{AP_t} Flow_t$$

PDA_t represents the position of portfolio debt assets at year t . P_t is the price index of year t . AP_t is the average price index from year t to the initial year. For portfolio debt, we collect US, German and Japanese five-year government bond yields as the price index.

Data sources:

Five-year US, German, UK, and Japanese government bond yields are collected from CEIC on a monthly basis. The position is calculated at the end of year in US dollars.

Investment allocation by country information: China Banking Regulatory Commissions (CBRC).

¹⁷CIC was established by the Ministry of Finance on September 29, 2007 with the issuance of special bonds worth RMB 1.55 trillion. These were, in turn, used to acquire approximately USD 200 billion as China's foreign exchange reserves and formed the foundation of its registered capital. In 2004, the state-owned Central Huijin Investment Corporation received 45 billion USD in foreign reserves which it injected into the Bank of China and the China Construction Bank before their IPO in Hong Kong. In 2008, the company merged with CIC as a wholly-owned subsidiary company.

¹⁸SAFE only began reporting portfolio debt and equity geographical allocation after June 2015 in the Coordinated Portfolio Investment Survey (CPIS). The results are consistent with our assumption of the assets allocation.

1.4 Foreign Exchange Reserve Assets

Foreign exchange reserve assets are held by SAFE and CIC, who mainly invest in US, European and Japanese markets. The total amount of foreign exchange reserve reached 3,011 billion USD at the end of 2016. We use the official FX reserve data provided by SAFE from 1997 to 2016.

SAFE and CIC are the major managers of FX reserves who hold both portfolio equity and portfolio debt investments abroad. SAFE mainly invests in US, UK and Japanese bond markets, while CIC mainly invests in US, UK and EMEs equity markets. CIC was launched in 2007 and direct investments constitute majority of its global investment portfolio.

Therefore, we break down the FX reserves into three categories: foreign liquid assets, bond assets, and equity assets.

$$FX = FX \text{ liquid assets} + FX \text{ bond assets} + FX \text{ equity assets}$$

FX liquid assets: we assume the amount of FX liquid assets equals the three-month import volume plus the total short-term foreign debt outstanding. This is in line with the IMF recommendation for national FX reserves policy. In 2016, this amounted to 1,267 billion USD, about a third of the total FX reserves (3,011 billion USD). In the robustness check, we assume that one-third of the total FX reserves are held as dollar deposits. We do not make adjustment to FX liquid assets.

$$FX \text{ liquid assets} = 3 \text{ month import volume} + \text{short term foreign debt outstanding}$$

Besides the FX liquid assets, we allocate 80 percent of FX portfolio assets to debt (FX bond assets) and the remaining 20 percent FX reserves to the equity (FX equity assets).

FX bond assets: for the FX bond assets, FX bond assets are allocated to the US, Germany, UK, and Japan. Since we have US Treasury bond assets at market value published by Treasury International Capital (TIC), we can calculate the FX bond assets as the amount of negative US portfolio debt out of total portfolio debt value. Then we allocate 70 percent of the remaining FX reserve bond assets to German government bonds, 20 percent to the UK government bonds, and 10 percent to Japanese government bonds according to the fixed income assets allocation by SAFE. We use the five-year government bond yield in the corresponding countries as the price to adjust the FX bond assets value.

$$FXBA_t = \frac{P_t}{P_{t-1}}FXBA_{t-1} + \frac{P_t}{AP_t}Flow_t$$

$FXBA_t$ represents the position of FX bond assets at year t . P_t is the price index of year t . AP_t is the average price index in year t . We calculate the bond price using bond yield in year t .

FX equity assets: we allocate 50 percent of equity to the US, 40 percent to developed countries except the US, and 10 percent to EMEs before 2011. The prices for the US stock, developed countries' stock and EME stock are proxied by the S&P index, FT index, and MSCI EME index respectively. After 2011, the equity allocation is in line with CIC's portfolio derived from its annual report.

$$FXEA_t = \frac{P_t}{P_{t-1}}FXEA_{t-1} + \frac{P_t}{AP_t}Flow_t$$

$FXEA_t$ represents the position of FX equity assets at year t . P_t is the price index at year t . AP_t is the average price index at year t . We proxy the equity price using the stock price in the corresponding countries.

Lane and Milesi-Ferretti (2001) simply calculate the FX reserve from the IMF IFS dataset by deducting gold assets from the reported FX reserve.

Data sources:

Chinese import data are derived from official SAFE data on both quarterly and annual bases.

Foreign debt outstanding is collected from SAFE.

FX equity is collected from the CIC.

US bond asset is obtained from TIC:

<https://www.treasury.gov/resource-center/data-chart-center/tic/Pages/ticsec2.aspx>

Five-year bond yields for Germany, the US, Japan and the UK are obtained from CEIC.

U.S. S&P, UK FT indexes are obtained from CEIC on a monthly basis. The EME stock index is obtained from the MSCI EME index on a monthly basis from 1997 to 2016.

1.5 Other Investment Assets

Due to China's capital account management policy and assets classes, other investment assets mainly reflect the rising capital outflow from China to the global property investment market.

We adjust other investment assets using global housing price from the IMF dataset as we assume that most of the investment flowed to real estate markets in Australia, Canada, Hong Kong, the UK and the US.

Data source:

IMF Global Housing Watch: <http://www.imf.org/external/research/housing/index.htm>

2 Gross Liabilities adjustment

2.1 Portfolio Equity

We employ the Shanghai Composite Index (SHCI) as the price for portfolio equity value adjustment. We replicate the process for year-end SHCI and year-average SHCI.¹⁹ Then we estimate the market value of the equity liability position:

$$PEL_t = \frac{P_t}{P_{t-1}} PEL_{t-1} + \frac{P_t}{AP_t} Flow_t$$

PEL_t represents the position of equity investment liabilities at year t . P_t is SHCI at year t . AP_t is the average SHCI in year t .

Data sources:

China portfolio equity data are derived from official IIP statistics on an annual basis and China Securities Regulatory Commission (CSRC).

Stock market indexes are obtained from the China Premium Database of CEIC.

2.2 Foreign Direct Investment Liabilities

$$FDIL_t = \frac{P_t}{P_{t-1}} FDIL_{t-1} + \frac{P_t}{AP_t} Flow_t$$

$FDIL_t$ represents the position of foreign direct investment liabilities at year t . P_t is the price index at year t . AP_t is the average price index in year t . We use the 2004 stock (based on survey data) and cumulated flows based on the Shanghai Composite index (SHCI) for valuation adjustment.

Data sources:

China inward FDI data are derived from official IIP statistics on an annual basis.

Stock market indexes are collected from the China Premium Database of CEIC.

¹⁹We also use the capital investment return from Bai *et al.* (2014) as a proxy for the stock market price and obtain similar results to our main findings.

2.3 Portfolio Debt

We adjust portfolio debt liability based on the 2004 portfolio debt stock. We employ the China bond index as the domestic bond price to adjust for portfolio debt stock and flow.

$$PDL_t = \frac{P_t}{P_{t-1}}PDL_{t-1} + \frac{P_t}{AP_t}Flow_t(12)$$

PDL_t represents the position of portfolio debt liabilities at year t. P_t is the price index at year t. AP_t is the average price index in year t. We employ the China bond index as the price index.

Data sources:

China portfolio debt data are derived from CSRC and official IIP statistics on an annual basis. Bond market indexes are collected from the China Premium Database of CEIC.

Appendix B:

Comparison of our study with Lane and Milesi-Ferretti (LMF, 2011)

Our Adjustment method compared to Lane and Milesi-Ferretti (LMF, 2011) method

Author	Huang(2017)	Lane and Milesi-Ferretti (LMF,2011)
Assets	<p>FDI Assets: The only market value estimates of Chinese FDI were made in 2004. It was the first survey ever conducted on Chinese FDI. After 2004, government agencies added up flow data to estimate the official IIP. Therefore, the official IIP of 2005-2016 are not at market value. We obtain Ministry of Commerce data with a detailed geographical breakdown. The aggregate numbers of MOC are not identical to that of SAFE as the Ministry of Commerce applies a different statistics standard than SAFE. The data in 2004 is at market value so we use the 2004 stock (based on survey data) and cumulated flows using the stock market indexes in the corresponding countries for valuation adjustment.</p> <p>Portfolio equity assets: We find that QDII accounts for less than 40 percent of the portfolio equity assets. As our discussion with Chinese officials indicates, CIC assets are not included in portfolio equity or portfolio debt. The net gains are recorded in the FX reserve flow. Therefore, we assume that 70 percent is allocated to the US market, 20 percent to the UK market and 10 percent to the EMEs markets according to the top-five banks' balance sheets. Consequently, we use S&P, FT, and MSCI EME indexes as the price for valuation adjustment.</p>	<p>FDI data from UNCTAD</p> <p>Portfolio equity assets: Equity investment overseas is strictly regulated. QDII is a quota system for domestic investors to hold equity abroad. LMF obtained a record of all authorized investments in foreign equity for the years 2006-2010 from SAFE. According to Chinese sources, most of the investment reported in QDII is in equity, exchange-traded funds or commodities. They assume that about 50 percent of the QDII allocation is equity, out of which about 40 percent is in Hong Kong market 5 percent to the US and 5 percent to Singapore. LMF adjust the remaining QDII assets using a global commodity price index (Source IMF: PALLFNF_Index).</p>

Foreign exchange reserves: The currency composition of Chinese reserves is not disclosed. We assume FX reserves take three forms: equity, debt and FX liquid assets. First, we assume the amount of FX liquid assets is equal to the three-month import value plus short-term foreign debt outstanding. This amount is in line with IMF recommendation for national FX reserves policy. For robustness checks, we assume that one-third of FX reserves are kept as FX liquid assets. Second, we further assume that 80 percent of the remaining FX reserves are debt and 20 percent are equity. Debt assets are allocated to the US, Germany, the UK, and Japan. Since we have US Treasury bond assets at market value published by TIC, Treasury bonds are recorded in both portfolio debt and FX market. We have to further assume 60 percent of portfolio debt assets is US treasury bond. Therefore, we can calculate the remaining FX debt other than dollar-denominated portfolio debt by subtracting the US treasury bond adjusted the portfolio debt assets. Then we allocate 70 percent of the remaining FX reserve debt assets to German government bond, 20 percent to British government bond, and 10 percent to Japanese government bond. Third, we adjust the equity assets of FX reserves. Before 2008, we allocate 50 percent to S&P index, 40 percent to FT index, and 10 percent to MSCI EME index. After 2008, we use CIC balance sheet data which published its foreign assets location into US, other developed capital market, and EME capital market.

Portfolio Debt and Other Investment: We allocate 60 percent, 30 percent, and 10 percent portfolio debt assets to US, German, and Japanese government bond respectively. This is generally in accordance to the aggregated information of the bank balance sheet. We adjust the other investment using global housing price from IMF dataset as we assume most of the investment flew to global real estate market.

Foreign exchange reserves: IFS data (reserves minus gold)

Debt and Other Investment: The same method as Huang(2017) until 2011 on portfolio debt; No adjustment for other investment.

Author	Huang(2017)	Lane and Milesi-Ferretti (LMF,2011)
Liabilities	<p>FDI Liabilities: We use the 2004 stock (based on survey data) and cumulate flows using the Shanghai stock index for valuation adjustment.</p> <p>Portfolio debt liabilities: We adjust portfolio debt liability based on 2004 portfolio debt stock. By employing the China bond index as domestic bond price to adjust for portfolio debt stock and flow.</p> <p>Portfolio Equity Liabilities: we use China stock price (Shanghai Stock Composite Index) for valuation adjustment. Specifically we use year end price to adjust stock value of portfolio equity and use year average and year end price to adjust portfolio equity flow.</p>	<p>The same method as Huang(2017) until 2011</p> <p>Portfolio debt liabilities: LMF took the official International Investment position(IIP) numbers.</p> <p>The same method as Huang(2017) until 2011</p>

Appendix C

First, we follow Lane and Milesi-Ferretti (2007b) to break down the total returns of assets or liabilities into investment yields and capital gains. Investment yield is recorded in the balance of payment items as investment income on assets and investment income on liabilities. Capital gain is derived from the net flow of assets or liabilities at market value minus the net flow of assets or liabilities at book value.

We will discuss the calculation method in detail later. At this stage, we can obtain the investment yields of gross assets and liabilities at year t , y_t^A and y_t^L , from the income from assets held abroad II_t^A and payments to foreigners holding domestic assets II_t^L . A_{t-1} and L_{t-1} are equal to gross assets and gross liabilities at year $t-1$ respectively. Also, we can calculate the rate of capital gains from gross assets and liabilities, cg_t^A and cg_t^L , from capital gains from gross assets CG_t^A and capital gains from gross liabilities CG_t^L . Finally, we can obtain the total returns r_t^A and r_t^L from the sum of investment yields and capital gains:

$$\begin{aligned} \text{Investment Yields } y_t^A &= \frac{II_t^A}{A_{t-1}}; \quad y_t^L = \frac{II_t^L}{L_{t-1}} \\ \text{Capital Gains } cg_t^A &= \frac{CG_t^A}{A_{t-1}} \quad cg_t^L = \frac{CG_t^L}{L_{t-1}} \\ \text{Total Returns } r_t^A &= \frac{II_t^A + CG_t^A}{A_{t-1}} \quad r_t^L = \frac{II_t^L + CG_t^L}{L_{t-1}} \end{aligned}$$

where r_t^A (r_t^L) is the nominal returns on assets (liabilities) at year t , II_t^A (II_t^L) is the investment income on assets (liabilities) at year t , CG_t^A (CG_t^L) is the capital gains from assets (liabilities) at year t , and A_{t-1} (L_{t-1}) is the total assets (liabilities) at market value at year $t-1$.

Second, we estimate the capital gains on assets or liabilities. As mentioned above, Balance of Payment (BOP) records the investment income in nominal terms. The major obstacle lies in the estimation of capital gains. Following Lane and Milesi-Ferretti (2007a), we combine stock and flow data to obtain the implied capital gains:

$$CG_t^A = A_t - A_{t-1} - CO_t; \quad CG_t^L = L_t - L_{t-1} - CL_t$$

where CG_t^A (CG_t^L) denotes capital gains on assets (liabilities) at year t . CO_t and CL_t represent capital outflow and capital inflow at year t , which equal the flow values of assets and liabilities at book value in the financial accounts. These equations indicate the capital gains on assets (liabilities) equals the difference between the flow of assets (liabilities) at market value and the flow of assets (liabilities) at book value.

Finally, employing Fisher equations, we calculate the real rate of returns of gross assets and liabilities. The differences between the real return on assets and the real return on liabilities are the real excess returns.

$$\begin{aligned} \text{Real Yield of Investment Income } ry_t^A &= \frac{1 + y_t^A}{1 + \pi_t} - 1; \quad ry_t^L = \frac{1 + y_t^L}{1 + \pi_t} - 1 \\ \text{Rate of Capital Gains } rcg_t^A &= \frac{1 + cg_t^A}{1 + \pi_t} - 1; \quad rcg_t^L = \frac{1 + cg_t^L}{1 + \pi_t} - 1 \\ \text{Real Total Returns } rr_t^A &= \frac{1 + y_t^A + cg_t^A}{1 + \pi_t} - 1; \quad rr_t^L = \frac{1 + y_t^L + cg_t^L}{1 + \pi_t} - 1 \end{aligned}$$

where π_t equals the inflation rate at year t . ry_t^A , ry_t^L , rcg_t^A , rcg_t^L , rr_t^A and rr_t^L represent the real yields on gross assets, real yields on gross liabilities, real capital gains from gross assets, real capital gains from

gross liabilities, real returns on gross assets and real returns on gross liabilities at year t respectively.

$$\begin{aligned} \text{Nominal Excess Returns : } NER_t &= r_t^A - r_t^L; \\ \text{Real Excess Returns : } RER_t &= rr_t^A - rr_t^L \end{aligned}$$

where NER and RER represent the nominal excess returns and real excess returns of China's external wealth at year t respectively.

The positions of gross assets and liabilities are reported in US dollars. The position data cover the period from the end of 1997 to the end of 2016. The real excess returns of external wealth cover the period between the end of 1998 and the end of 2016.

Alternative measure of the investment return of China

Return Differentials	1997-2016	1997-2008	2009-2016
China Investment Return,%	18	21	14
US Treasury Bond Yield,%	3	4	2

Sources: China Premium Database of CEIC and Bai *et al.* (2014)

Note: Bai *et al.* (2014) estimate the capital return of investment in China.

Appendix D: Alternative Estimation of Real Excess Rate of Return

Here we deal with the omissions and errors (OE) reported in China's BOP. We did not take OE into our previous estimation of excessive returns. In the robustness checks, we allow OE to affect the excessive returns on China's foreign assets.

The first challenge lies in including OE in our model. The total excess returns on China's foreign assets consist of the real excess investment yields and the real excess capital gains. We assume OE affects the real capital gains. Investment income is reported to China's authority on a regular basis. Any unreported investment income would be deemed as illegal money laundering. Therefore, we include OE in the real capital gains.

Following the same method as that described in Appendix C, we include OE in the estimation of the real excess capital gains. Note that the capital gains consists of capital gains on assets and liabilities.

$$\text{Rate of Capital Gains } cg_t^A = \frac{CG_t^A}{A_{t-1}}; \quad cg_t^L = \frac{CG_t^L}{L_{t-1}}$$

We allocate OE either to flow or to valuation:

$$\begin{aligned} \text{OE to flow : } cg_t^A &= \frac{CG_t^A + OE_t}{A_{t-1}}; \quad cg_t^L = \frac{CG_t^L}{L_{t-1}} \\ \text{OE to valuation : } cg_t^A &= \frac{CG_t^A - OE_t}{A_{t-1}}; \quad cg_t^L = \frac{CG_t^L}{L_{t-1}} \\ \text{Without OE : } cg_t^A &= \frac{CG_t^A}{A_{t-1}}; \quad cg_t^L = \frac{CG_t^L}{L_{t-1}} \end{aligned}$$

The version without OE is our previous estimation. Then following Appendix C, we can calculate the real investment yields, real capital gains, and real returns using China's CPI.

$$\begin{aligned} \text{Real Investment Yields } ry_t^A &= \frac{1 + y_t^A}{1 + \pi_t} - 1; \quad ry_t^L = \frac{1 + y_t^L}{1 + \pi_t} - 1 \\ \text{Real Capital Gains } rcg_t^A &= \frac{1 + cg_t^A}{1 + \pi_t} - 1; \quad rcg_t^L = \frac{1 + cg_t^L}{1 + \pi_t} - 1 \\ \text{Real Total Returns } rr_t^A &= \frac{1 + y_t^A + cg_t^A}{1 + \pi_t} - 1; \quad rr_t^L = \frac{1 + y_t^L + cg_t^L}{1 + \pi_t} - 1 \end{aligned}$$

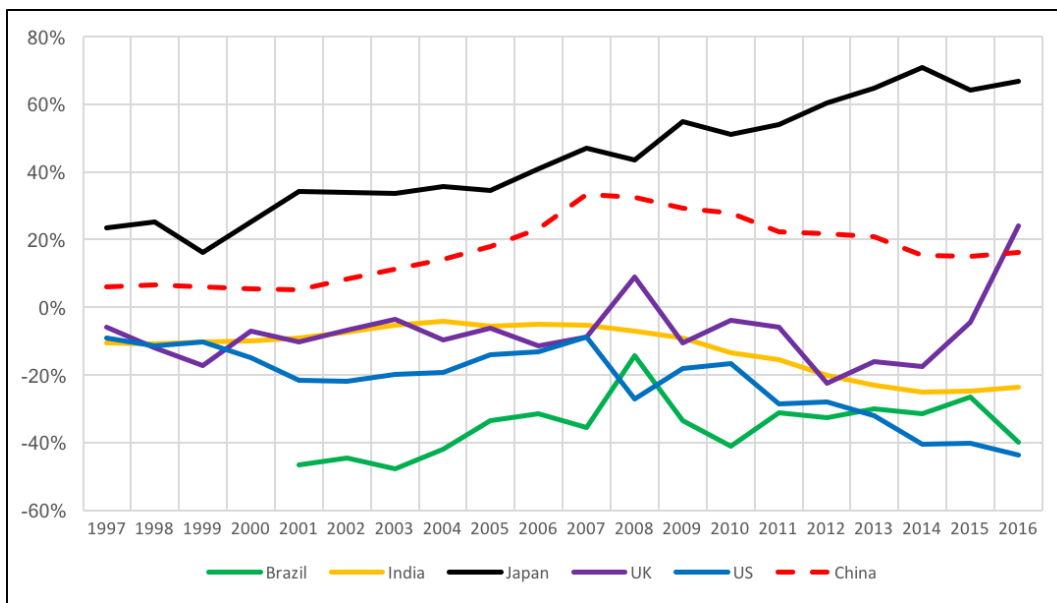
where π_t equals the inflation rate at year t. $ry_t^A, ry_t^L, rcg_t^A, rcg_t^L, rr_t^A$ and rr_t^L represent the real investment yields on gross assets, real investment yields on gross liabilities, real capital gains from gross assets, real capital gains from gross liabilities, real returns on gross assets and real returns on gross liabilities at year t respectively.

Internet Appendix

Not for Journal Publication

From the World's Factory to a World Creditor:
China's External Wealth and Excess Returns, 1997-2016

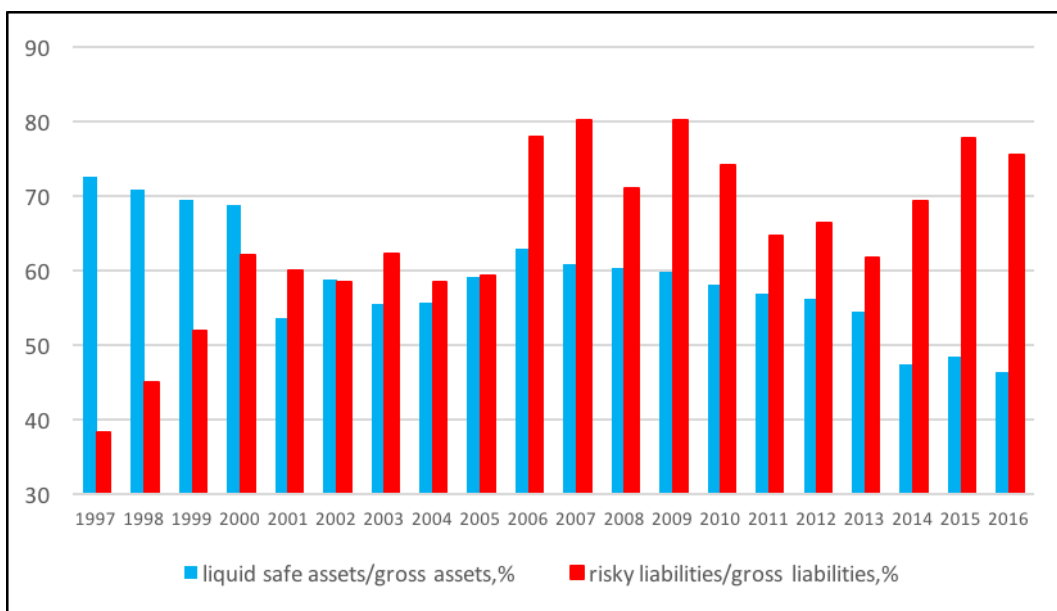
Figure 1: Comparison of International Investment Position (% of GDP)



Sources: SAFE, IMF and Author's Own Calculations

Note: Brazil, China, India, Japan, the UK, and the US use the book value of net foreign assets from their official IIP data.

**Figures 2: Compositions of China's External Wealth of China:
Safe Assets vs. Risky Liabilities**



Sources: SAFE and Author's Own Calculations

Note: Following Gourinchas et al. (2017), we further classify FDI, FX equity and portfolio equity assets (liabilities) as **risky assets** (liabilities) whereas portfolio debt, FX bond, bank savings and loans and trade credit assets (liabilities) as **safe assets** (liabilities).

Table 1: China Gross Assets Position, %GDP

(% of GDP)	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Assets	29.3	32.9	35.7	33.2	29.7	35.5	41.1	47.2	55.7	63.0	70.4	62.5	69.3	70.7	64.0	63.8	66.5	64.4	59.4	63.2
1 FDI	1.7	2.2	2.6	2.2	1.9	1.9	2.1	2.4	2.7	4.0	4.9	4.0	6.4	7.2	6.2	7.7	9.2	9.5	11.7	14.6
2 Portfolio Assets	3.7	3.5	3.7	4.2	4.6	5.6	5.7	4.7	5.1	8.3	6.6	4.5	4.3	3.8	3.0	2.8	2.7	2.6	3.0	4.1
2.1 Portfolio Equity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.3	1.2	1.3	1.0	0.9	1.0	1.0	1.2	1.6
2.2 Portfolio Debt	3.7	3.5	3.7	4.2	4.6	5.6	5.7	4.7	5.1	8.3	6.1	4.2	3.0	2.5	2.0	1.9	1.7	1.6	1.9	2.4
3 Financial Derivatives	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Other Investments	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.1 Other Equity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.2 Cash and Savings	7.2	6.7	5.2	5.2	5.0	4.7	4.5	2.8	3.0	2.7	3.9	3.3	2.6	3.4	3.9	4.6	3.9	4.2	3.3	3.4
4.3 Bank Loans	4.3	4.2	4.3	5.4	3.7	3.7	2.5	3.0	3.1	2.4	2.5	2.3	1.9	1.9	2.9	3.2	3.2	3.6	4.1	5.0
4.4 Insurance Pension	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
4.5 Trade Credit	-3.2	-0.8	1.3	2.3	2.0	1.8	1.6	2.2	2.9	3.4	3.3	2.4	2.8	3.4	3.7	4.0	4.2	4.5	4.6	5.5
4.6 Others	-2.6	-1.2	-0.3	0.2	-0.4	-0.6	0.9	0.4	0.3	0.2	3.1	3.7	2.2	1.4	0.5	0.4	0.8	0.8	0.1	0.8
5 Reserve Assets	18.2	18.4	18.9	13.6	12.9	18.4	23.7	31.6	38.5	42.0	46.1	42.3	49.1	49.5	43.9	41.0	42.4	39.2	32.3	29.7

Source: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Calculations.

Table 2: China Gross Liability Position, %GDP

(% of GDP)	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Liabilities	31.2	32.2	36.9	47.2	40.1	35.3	37.0	33.4	34.2	61.2	63.2	34.8	54.4	48.0	39.1	39.1	39.9	54.9	53.2	49.7
1 FDI	9.6	12.9	18.2	27.6	23.3	20.3	22.3	18.9	19.1	41.7	44.4	22.5	38.9	32.0	23.6	24.1	22.7	34.7	37.8	34.6
2 Portfolio Assets	3.0	2.8	2.9	4.2	3.3	2.7	3.1	2.9	3.3	8.1	8.2	4.0	6.9	5.5	3.7	4.1	4.0	6.4	6.6	6.3
2.1 Portfolio Equity	1.9	1.7	2.0	3.4	2.5	2.0	2.4	2.2	2.6	7.5	7.7	3.6	6.4	5.1	3.3	3.4	3.1	5.1	5.4	4.9
2.2 Portfolio Debt	1.2	1.1	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.7	0.9	1.3	1.2	1.4
3 Financial Derivatives	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
4 Other Investments	18.5	16.5	15.8	15.3	13.6	12.3	11.6	11.6	11.7	11.4	10.6	8.3	8.6	10.4	11.8	11.0	13.2	13.7	8.7	8.8
4.1 Other Equity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.2 Cash and Savings	4.6	3.8	3.2	2.9	2.7	2.4	2.2	1.9	2.1	2.2	2.2	2.0	1.8	2.7	3.3	2.9	3.6	4.8	3.0	2.8
4.3 Bank Loans	8.5	7.6	7.1	6.3	5.5	4.8	4.6	4.5	3.8	3.6	2.9	2.2	3.2	3.9	4.9	4.3	5.9	5.5	3.0	2.9
4.4 Insurance Pension	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
4.5 Trade Credit	2.7	2.5	3.6	4.7	4.1	3.9	3.8	4.1	4.6	4.3	4.2	2.8	3.2	3.5	3.3	3.4	3.5	3.2	2.5	2.6
4.6 Others	2.7	2.5	1.9	1.4	1.3	1.2	1.0	1.0	1.1	1.4	1.3	1.2	0.2	0.2	0.1	0.3	0.1	0.2	0.2	0.3
4.7 SDR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1

Source: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Calculations.

Table 3: China Foreign Assets Return

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Real yield of investment: assets,%	3	4	3	2	3	2	-1	2	2	0	-2	4	0	-2	0	0	1	1	1
Real yield of investment: liabilities,%	8	8	6	4	5	4	0	6	6	0	-2	8	3	2	4	5	4	3	2
Real rate of capital gains: assets,%	4	3	-14	-15	8	6	3	0	-1	3	-14	9	0	-7	2	2	-5	-4	2
Real rate of capital gains: liabilities,%	0	11	27	-14	-12	4	-15	-9	86	12	-40	61	-14	-20	2	-5	37	3	-11
Real total return: assets,%	6	6	-11	-13	10	9	6	4	3	7	-11	13	3	-4	5	5	-2	-1	5
Real total return: liabilities,%	7	18	33	-9	-8	8	-11	-1	93	16	-36	68	-8	-13	8	3	42	7	-7
Real excessive yield,%	-5	-4	-3	-3	-2	-2	-1	-4	-3	0	0	-4	-2	-4	-3	-5	-2	-2	-1
Real excessive gain,%	4	-8	-41	-1	20	3	18	9	-87	-9	25	-52	14	13	0	7	-42	-6	14
Real excessive return,%	-1	-12	-44	-4	18	1	17	5	-90	-9	26	-56	12	9	-3	3	-44	-8	12

Source: China Premium Database of CEIC, the State Administration of Foreign Exchange (SAFE) and Author's Calculations.

Table 4: China Outward FDI Stock
(Top 10 countries)

Rank	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong
2	USA	USA	S. Korea	USA	USA	Australia	Australia	Australia	Australia	USA	USA	USA	USA
3	Macau	Macau	USA	S. Korea	Australia	Singapore	Singapore	Singapore	Singapore	Australia	Australia	Australia	Singapore
4	Iraq	S. Korea	Macau	Russia	Singapore	South Africa	USA	Luxembourg	USA	Singapore	Singapore	Singapore	Australia
5	Australia	Australia	Australia	Australia	Russia	USA	Luxembourg	USA	Luxembourg	Luxembourg	UK	Luxembourg	Netherlands
6	S. Korea	Iraq	Russia	Macau	Canada	Russia	South Africa	South Africa	South Africa	UK	Luxembourg	UK	UK
7	Singapore	Singapore	Iraq	Sudan	S. Korea	Macau	Russia	Russia	Russia	Kazakhstan	Russia	Russia	Russia
8	Thailand	Bermuda	Sudan	Germany	Pakistan	Kazakhstan	Macau	Canada	Canada	Canada	Kazakhstan	France	Canada
9	Zambia	Thailand	Bermuda	Singapore	UK	Pakistan	Canada	Macau	France	Russia	Canada	Canada	Indonesia
10	Peru	Sudan	Singapore	Iraq	Macau	Canada	Kazakhstan	Myanmar	Kazakhstan	South Africa	Norway	Kazakhstan	Luxembourg

Source: Ministry of Commerce, “Annual Report on Outward Investment and Economic Cooperation (2003-2015)”.

Table 5: China Outward FDI Flow
(Top 10 countries)

Rank	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong
2	S. Korea	Sudan	S. Korea	Russia	Canada	South Africa	Australia	Luxembourg	France	USA	USA	USA	Netherlands
3	Denmark	Australia	USA	USA	Pakistan	Australia	Luxembourg	Australia	Singapore	Kazakhstan	Australia	Luxembourg	Singapore
4	USA	USA	Russia	Singapore	UK	Singapore	Singapore	Sweden	Australia	UK	Singapore	Australia	USA
5	Macau	Russia	Australia	Saudi Arabia	Australia	Macau	USA	USA	USA	Australia	Indonesia	Singapore	Australia
6	Russia	Indonesia	Germany	Algeria	Russia	Kazakhstan	Canada	Canada	UK	Venezuela	UK	UK	Russia
7	Australia	Singapore	Kazakhstan	Australia	South Africa	USA	Macau	Singapore	Luxembourg	Singapore	Luxembourg	Germany	UK
8	Indonesia	Nigeria	Sudan	Zambia	Singapore	Russia	Myanmar	Myanmar	Sudan	Indonesia	Russia	Indonesia	Canada
9	Germany	Bahamas	Algeria	Mongolia	Nigeria	Pakistan	Russia	Russia	Russia	Luxembourg	Canada	Netherlands	Indonesia
10	Nigeria	S. Korea	Malaysia	Germany	Kazakhstan	Mongolia	Turkey	Iran	Iran	S. Korea	Germany	Laos	S. Korea

Source: Ministry of Commerce, “Annual Report on Outward Investment and Economic Cooperation (2003-2015)”.