Structural Changes of Global Economy Based on Gross Capital Flows and International Investment Positions†

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Abstract

Over the past decades two-way cross-border transactions in financial assets have increased among industrial countries. As a result, gross capital flows have expanded, and gross international asset and liability positions have ballooned. On the other hand, among emerging Asian economies, current account surplus has been continuing since the Asian crisis in 1997, and one-way asset transactions have become established. As a result, net capital flows and net international investment positions have increased.

The purpose of this paper is to analyze the structural change of the global economy from the aspects of gross capital flows and international investment position over the past two decades. In particular, it describes the following three problems: (i) the so-called global saving glut hypothesis, which tries to explain global current account imbalances with a focus on the behavior of net capital flows, cannot explain the expansion of gross capital flows before the financial crisis in 2008, (ii) the expanding of US capital inflows and outflows before the financial crisis reflected “borrowing short and lending long” between the US and Europe, which was caused by highly leveraged balance sheets of European global banks since the introduction of the euro and active adoption of Basel II, and (iii) one of the most important reasons the large US current account deficit had been sustainable before the financial crisis was the existence of significant valuation effects derived from the ballooning of gross external assets, but the vulnerability of these highly leveraged international positions were revealed in the financial crisis.

Keywords: capital flows, global imbalances, international investment position, valuation effects, financial crisis, euro

JEL classification: F32, F34, F36, F41

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1. Introduction

A widely held view of international capital flows over the past decades is that, on one hand, two-way cross-border transactions in financial assets have increased among industrial countries. As a result, both gross capital flows and gross international asset and liability positions have expanded (Obstfeld [2012]). On the other hand, among emerging Asian economies, current account surplus has been continuing since the Asian crisis in 1997, and one-way asset transactions have become predominant. As a result, net capital flows and net international investment position (NIIP) have increased.

It is difficult to explain both the patterns of capital flows with traditional theories. If interest-rate arbitrage works completely between two advanced countries, capital inflows and outflows cannot occur simultaneously in one country; therefore, the net capital flows should expand in that country. On the other hand, the fact that capital flows from developing counties with higher marginal productivity of capital to developed countries with lower marginal productivity of capital is known as the Lucas paradox (Lucas [1990]).

Although the importance of gross capital flows and international investment position has been accepted by a lot of researchers, it was not until recently that some theoretical and empirical studies were conducted on these new stylized facts. One of the empirical reasons is that it is difficult to find reliable and comparable statistics defined by gross and stock concepts1. One theoretical reason for this may be that economists in academia are accustomed to treat economic models in terms of net and flow concepts such as current accounts. For example, the global saving glut hypothesis, which tries to explain global current account imbalances, focuses on the behavior of net capital flows from countries with excess savings such as emerging Asian economies compared to countries with saving shortages such as the US (Bernanke [1995]). However, this hypothesis is inadequate to explain the expansion of gross capital flows before the financial crisis in 2008 (Borio and Disyatat [2011]).

This paper focuses on the gross capital flows and international investment position (IIP) over the past two decades and examines some comparisons of those patterns between different economies (especially the US, EU, and Japan). Section 2 begins with a general overview of the structural change in the global economy since 1995 and discusses the global saving glut hypothesis critically. Section 3 analyzes the differences in capital flows among developed countries and between developed and emerging economies and, relying on Shin [2012], examines the so-called “borrowing short and lending long” between the US and Europe before the financial crisis. Section 4 considers the difference between the IIP structure and the asymmetry of valuation effects between the US and Japan. Section 5 concludes this paper.

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1 The International Monetary Fund (IMF) has revised its Balance of Payments Manuals (BPMs) six times. In the sixth edition of the BPM (BPM6) released in 2009, the official name was changed from Balance of Payments Manual in BPM5 (since 1993) to Balance of Payments and International Investment Position Manual.
2 The End of Great Moderation

For approximately twenty years since the mid-1980s, the US economy had experienced decline in macroeconomic volatility and the inflation rate, and this period was called “great moderation.” For example, the standard deviation of the real GDP growth rate was 2.7 percent from 1960 to 1984 and fell to 1.6 percent from 1984 to 2011 (Stock and Watson [2004]).

However, during the last ten years of the age of great moderation (1995 to 2005), the US experienced a “decade of mania” when the dot-com bubble and its collapse were followed by the housing bubble and its collapse. During the same ten years, Japan underwent the so-called “lost decade” after the bubble economy burst.

Figure 1 shows the developments of three indicators in the US economy since 1995; the short-term interest rate (federal funds rate), long-term interest rate (yield on U.S. Treasury securities (ten-year), and real effective exchange rate. The US “decade of mania” can be observed.

Figure 1 Movements in the long-term and short-term interest rates and exchange rate in the US

Source: FRB

2.1 Reverse Plaza Accord and Yen Carry Trade (latter half of 1990s)

The starting point can be set as 1995, when there were strong-dollar policies also known as the “Reverse Plaza Accord” by Robert Rubin, who was Secretary of the Treasury at the time. The yen

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2 The following three factors existed behind this great moderation (Bernanke [2004]). The first is structural changes such as financial innovation and technology relating to inventory control. The second is improved performance of macroeconomic policies that were linked to stabilization of inflation. The third is good luck based on economic globalization, such as developed diversification and reduced variability of shocks.
appreciation, which started in January 1995, suddenly increased from March to April 1995 (the highest post-war value of 79.75 yen per dollar was recorded on April 19, 1995 in the Tokyo Foreign Exchange Market). In relation to this dollar depreciation, an agreement was made on an “orderly reversal” with respect to the falling of the dollar by the G7 on April 25, and coordinated intervention was implemented in the NY market on July 7. As a result, the dollar increased afterwards. The dollar appreciated to 127 yen in 1997 and to 147 yen in August 1998.

Another factor that caused such strengthening of the dollar and weakening of the yen during this period was the yen carry trade that started around the end of 1996. When yen carry trades are conducted, one trader borrows Japanese yen at low interest rates and invests in a different currency yielding a higher interest rate such as the US dollar; the Japanese yen depreciates in the process of selling the borrowed yen in foreign exchange markets. Thus, the yen depreciated since there was a great deal of yen selling although the yen is normally supposed to appreciate due to a current account surplus.

A major contributory factor behind the Asian currency crisis in 1997 was that the Thai baht, which had been pegged to the dollar, became overvalued in tandem with the dollar appreciation. The dollar appreciation and the currency crisis in emerging economies served as the trigger for the reversal of capital flows from poor to rich countries (Lucas [1990]).

Due to this dollar appreciation in the latter half of the 1990s, enormous amounts of capital from around the world flowed in to the US, and at the same time, the current account deficit suddenly expanded from $113.6 billion (1.5 percent of GDP) in 1995 to $417.4 billion (4.2 percent of GDP) in 2000. While the sustainability of the US current account deficit came to be viewed with suspicion (Mann [1999]), the seeds for global imbalance were planted.

2.2 Greenspan’s Conundrum and global saving glut (first half of the 2000s)

Excessive investments in internet-related companies in the latter half of the 1990s gave rise to the dot-com bubble from 1999 to 2000. The NASDAQ Composite index, which had hovered around $1,000 in 1996, broke $2,000 in 1999, and hit a high of $5,048 on March 10, 2000. However, the NASDAQ Composite index and Dow Jones industrial average decreased suddenly starting in April 2000, and the dot-com bubble burst. Because of this, the FRB lowered the target federal funds rate

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3 The causes behind this superstrong yen consisted of the capital that had flowed out being headed toward yen buying due to the Mexico currency crisis in December 1994 and the Tequila Effect, in which the currency turmoil had repercussions on various emerging countries, as well as the Great Hanshin-Awaji Earthquake that occurred in January 1995, which caused foreigners to increase yen purchasing in order to buy reconstruction-related stocks.

4 The conditions under which yen carry trade is carried out are such that there is anticipation for the state of low interest rates in Japan to continue for a long period of time, and that there is a large possibility of yen depreciation in the future. On the contrary, if interest rates in Japan increase and yen appreciation progresses, the risk of foreign currency gain or loss expanding increases if yen-borrowing transactions continue; in order to try to resolve this position, a movement of buying back yen early (rewinding) arises, and the yen appreciates. In the Russian currency crisis in September 1998, LTCM, a major hedge fund that was investing enormous amounts in emerging markets by utilizing yen carry trades, went bankrupt, and due to this, other hedge funds started moving towards dissolving yen carry trades (selling dollars, buying yen) at once, and thus the yen/dollar market jumped sharply to 111 yen in the beginning of October.
from 6.5 percent to 6.0 percent on January 3, 2001 and further lowered the target afterwards 13 times over a period of two years. On June 25, 2003, the target rate was lowered to 1 percent and remained at this level for approximately one year.

As is widely known, this aggressive monetary easing after the collapse of the dot-com bubble caused the housing bubble. The S&P/Case-Shiller Home Price Indices, which are calculated by setting 2000Q1 to 100, rose to 169.19 in 2005Q1. High economic growth was achieved based on an expansion of consumption, which was in turn supported by a rise in housing prices.

To deal with the housing bubble, the FRB raised the target rate from 1 percent to 1.25 percent on June 30 and continued to raise it 16 times. On June 29, 2006, it was raised to 5.25 percent, where it remained for a period of one year. On the other hand, the yield of long-term government bonds (ten-year bonds) decreased from 4.89 percent in June 2004, when the FRB raised the target rate to 3.90 percent in June 2005.

On February 16, 2005, the testimony known as Greenspan’s Conundrum was described in the senate by the then-chairman of the FRB (Greenspan [2004]). As is widely known, this conundrum means that long-term interest rates do not increase regardless of increases in the short-term interest rate. Although Greenspan acknowledged that the integration of emerging economies into the global market fell inflation expectations and decreased real interest rates (the Fisher effect), he testified that such globalization is not new and the decline in long-term interest rates remains a conundrum. In any case, this conundrum signifies that monetary policies to deal with the housing bubble had lost effect.

Furthermore, on March 10, 2005, the speech about the global saving glut was made by Bernanke who was a member of the board of governors of the FRB at the time (Bernanke [2005]). In his speech he stated, “over the past decade a combination of diverse forces has created a significant increase in the global supply of saving—a global saving glut—which helps to explain both the increase in the US current account deficit and the relatively low level of long-term real interest rates in the world today.” At one glance, this can be thought of as a response to Greenspan’s Conundrum. If the reason for global imbalances was the demand of financing its deficits in the greatest capital importing country, the US, real interest rates should have risen, but instead they were decreasing. Assuming that a global saving glut was behind this phenomenon, Bernanke examined its origins by analyzing the past ten years since 1996. Here, the hypothesis that global imbalances and financial crises are two sides of the same coin known as a global saving glut was established (Bini Smaghi [2008], Obstfeld and Rogoff [2009], Iwamoto [2009]).

Based on monetary policies losing effect, the housing bubble burst and the prices of securitized debt instruments incorporating subprime loans sharply decreased. Because financial institutions that had invested in such instruments by placing enormous amounts of leverage suffered excessive debt, they received capital injection through TARP (troubled asset relief program). As will be reviewed in the following section, European global banks also invested in these securitized debt instruments.
Therefore, the US financial crisis linked to the EU financial crisis.

2.3 Saving versus financing and net versus gross capital flows

Figure 2 shows a simple two-country model of the global saving glut hypothesis. The world is represented by Country A (for example, the US) and Country B (for example, China), and for both countries, savings ($S$) increases and investments ($I$) decreases, as real interest rate ($r$) increases. If there are no capital flows between the two countries, savings and investments reach equilibrium at Point 1 for Country A and Point 4 for Country B, and the real domestic interest rates become $r^A$ and $r^B$, respectively ($r^A > r^B$). If capital flows between the two countries are completely free, capital flows from Country B, where interest rates are low, to Country A, where interest rates are high. Thus, Country A runs a current account deficit for Country B ($CA^A$), Country B runs a current account surplus for Country A ($CA^B$), and the world’s real interest rate becomes $r$. At this time, the real interest rate in Country A (US), which has a current account deficit, falls from $r^A$ to $r$.

Figure 2  Global saving glut hypothesis

It is important to note that the money market does not appear at all in this hypothesis. Accordingly, the interest rate is a real interest rate, not a nominal interest rate. According to Borio and Disyatat [2011], the global saving glut hypothesis fails to distinguish between saving and financing. Financing, which is required for money as a settlement medium or for credit as IOUs, is a cash-flow concept whereas saving, which is defined as income (or output) not consumed, is a national accounts concept. Although savings and investments are mirror images of each other, investments require financing but do not require saving.

Referring again to Figure 2, ex ante savings in Country A (US) are too small as a result of over-consumption, and ex ante investments are too large ($I^A > S^A$). On the contrary, ex ante savings in
Country B (China) are too large as a result of under-consumption, and \textit{ex ante} investments are too small ($I^t < S^d$). Needless to say, \textit{ex ante} savings and investments are not at equilibrium because decision-making of consumption and savings by households differs from decision-making of investment by firms, while \textit{ex post} savings and investments are exactly in balance in accordance with bookkeeping. Since \textit{ex ante} savings and investments are not observable and it is hard to identify the \textit{ex ante} saving-investment disequilibrium, the global saving glut is simply a hypothesis.

In the case of a closed economy, \textit{ex post} savings and investments reach equilibrium as real interest rates increase in Country A (US) and decrease in Country B (China). In the case of an open economy, the difference between saving and investment in Country A (US) becomes a current account deficit, and this can be covered by the current account surplus represented by the difference between saving and investment in Country B (China). At this time the real interest rate in Country A (US) declines.

Here, the meaning of \textit{cover} is used in the sense of national accounts, that is to say, the overspending that exceeds the output in Country A (US) is \textit{covered} by \textit{net exports} of Country B (China). However, countries running current-account surpluses (so that savings exceeds investments) are not financing those running current-account deficits (so that investments exceeds savings).

Of course, the present current account deficit must be repaid by the future current account surplus, and for that purpose, Country A (US) sells the claims that promise future repayment and Country B (China) purchases these claims. The trade of such claims means the \textit{net} capital flows from Country B (China) to Country A (US) are equivalent to the current-account imbalances in both countries. This net capital flow is, in essence, barter trade if financial markets were complete in the sense that state-contingent securities could be traded. Unfortunately, to quote Gourinchas [2011], “while the notion of complete financial markets is a useful teaching and modeling concept, it is largely irrelevant when looking at the real world!”

The discussion here is important when examining \textit{gross} capital flow in the next section as well. The reason is the distinction between savings and financing is partly mirrored in the concepts of net versus gross capital flows at the international level.

### 3 Gross capital flows

The global saving glut as a hypothesis explaining global current-account imbalances focuses on the behavior of net capital flows from countries with excess savings such as Japan, Germany, China, Russia, and oil-producing countries to countries with deficit savings such as the US (See Figure 3(a)). However, focusing on the behavior of gross capital flows that largely exceed net capital flows, the persuasive power of this hypothesis becomes weak. As will be examined in the next section, by expanding gross capital flows, gross asset positions have ballooned (See Figure 3(b)).

Although there are close relations between gross and net capital flows and gross and net international investment positions, there are also confusing aspects, so these terms will be defined
3.1 Definitions

Let us define gross capital flows in accordance with the balance of payments based on the principle of residence (Turner [2009]).

Gross capital inflows mean net purchases of domestic assets by foreigners. In other words, they are purchases by foreigners of domestic assets less their sales of such assets. The net used here...
means the long or short position upon subtracting “sales” from “purchases”.

Gross capital inflow
  = net purchases of domestic assets by foreigners
  = purchases by foreigners of domestic assets less their sales of such assets

The gross capital inflows generally are positive. However, when the home country is faced with economic crisis and foreigners try to withdraw their assets, purchases by foreigners of domestic assets are smaller than their sales of such assets, so gross capital inflows may become negative. This situation is called capital flight because foreigners who had invested in the home country try to pull out their assets.

On the other hand, gross capital outflows mean net purchases of foreign assets by residents. In other words, they are purchases by residents of foreign assets less their sales of such assets.

Gross capital outflow
  = net purchases of foreign assets by domestic agents
  = purchases by residents of foreign assets less their sales of such assets

Gross capital outflows generally are negative. However, when the foreign country is faced with economic crisis and residents try to realize their assets, purchases by residents of foreign assets are smaller than their sales of such assets, so gross capital outflows may become positive. This situation results in liquidation of foreign assets because residents who had been investing overseas pull out their assets.

Gross capital outflows are equal to the change in gross external assets, and gross capital inflows are equal to the change in gross external liabilities. Needless to say, net capital flows are gross capital inflow less gross capital outflow and are equal to current accounts in accordance with the balance of payments. Thus, net capital flows equivalent to current accounts are equal to the change in net international investment positions. These relations between flow and stock terms would hold if there were no valuation effects as examined in the next section.

**Figure 4** shows recent developments in the US gross capital flows and current accounts (relative to GDP) since 1999. The current account deficit in 2007 was $710.3 billion (5.06 percent of GDP), while the gross capital inflow was $2.1 trillion (14.72 percent) and capital outflow was $1.5 trillion (10.36 percent). Due to the Lehman Shock in 2008, the current account deficit decreased to $680 billion (4.74 percent), while gross capital flows shrank more significantly—capital inflow fell nearly 80 percent—to $431.4 billion, and capital outflow decreased by more than 120 percent to $332.1 billion. The reason gross capital outflows in 2008 are positive is that the US residents who had been investing overseas pulled out their assets. Thus, the gross capital flows are much more volatile and pro-cyclical than net current flows.
3.2 Capital flows among US, Europe, and Asia-Pacific

Figure 5 indicates the US gross capital flows by category before the financial crisis. Among the gross capital inflows in 2007 of $2.1 trillion, a mere $481.0 billion originated in the public sector, and the bulk of the remaining $1.6 trillion originated in the private sector (direct investments: $221.7 billion, securities investments: $672.3 billion, banks and non-bank sectors: $700.8 billion) (See Figure 5(a)). In a similar way, among the gross capital outflows of $1.5 trillion, the public sector part accounts for a negligible $2.2 billion, and the remainder is accounted for by the private sector (direct investments: $414.0 billion, securities investments: $366.5 billion, banks and non-bank sectors: $650.7 billion) (See Figure 5(b)). In such a way, the majority of gross capital inflows and outflows in the US are accounted for by the private sector, especially by securities investments and banks and non-bank sectors.

Figure 6 shows the geographical breakdown of the US gross capital flows. Among the gross capital inflows of $2.1 trillion into the US, capital inflows from only Europe amount to $956.7 billion (eurozone: $308.5 billion, UK: $555.8 billion, other: $92.4 billion), making up 46 percent of the total. In contrast, capital inflows from the Asia-Pacific region amount to $434.5 billion (China: $260.1 billion; Japan: $60.2 billion, other: $114.2 billion), amounting to less than half of the capital inflow from Europe (See Figure 6(a)). In a similar way, among the gross capital outflow of $1.5 trillion from the US, capital outflow to Europe alone amounted to $1.0 trillion (eurozone: $472.4 billion, UK: $410.2 billion, other: $117.6 billion), accounting for 2/3 of the total. In contrast, capital outflows to the Asia-Pacific region amounted to only $31.2 billion (China: capital recovery of $2.1
billion, Japan: capital recovery of $51.4 billion, other: $84.7 billion), which is a negligible amount compared to the capital outflow to Europe (See Figure 6(a)).

Figure 5 US Gross Capital Flows by Category

Source: Bureau of Economic Analysis

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As defined in 3.1, generally, capital outflows are negative (increase in external asset in home country), and capital outflows are positive (decrease in external asset in home country). Here, in order to avoid the complication of sign, the minus sign for capital outflow is omitted.
Figure 6  US Gross Capital Flows by Region

Figure 7  US Gross Capital Flows before and after the Financial Crisis

Source: Bureau of Economic Analysis
These observations can be confirmed by referring to Figure 7. In 2007, the gross capital inflows from Europe to the US amounted to $960.0 billion, and gross capital outflows from the US to Europe amounted to $1 trillion. As a result, the net outflow from the US to Europe accounted for...
only $40.0 billion. There is no mistaking that the majority of gross capital flows of such an enormous amount are based on the private sector. On the other hand, the gross capital inflows from the Asia-Pacific region to the US accounted for $430.0 billion, and gross capital outflows from the US to Asia-Pacific accounted for a mere $31.0 billion. As a result net inflow from the Asia-Pacific region to the US amounted to $400.0 billion. There is no mistaking that the majority of net capital flows of such an enormous amount are based on the private sector (increase in foreign reserve of various East Asian countries). When seen in this way, as emphasized by Borio and Disyatat [2011], the recognition of the capital flows beyond the Pacific from the Asian economies running current account surpluses to the US running a current account deficit (which was stylized in the global glut saving hypothesis) is a myth only from the viewpoint of net capital flows. From the perspective of gross capital flows, the reality is the capital flows across the Atlantic between the EU countries and the US, both of which run current account deficits.

The questions then are what types of fund made up these enormous capital flows between the US and Europe and what kind of impacts did this have on the eurozone crisis following the Lehman Shock. Thus, it is necessary to focus on Europe now.

3.3 Short-term borrowings and long-term loans from Europe to US

After the introduction of the euro in 1999, eurozone banks rapidly expanded the cross-border euro-denominated lending and borrowing within the region. As shown in Figure 8, intraregional euro-denominated assets of eurozone banks in 2008 ballooned to 9.7 trillion euros, and liabilities amounted to 7.3 trillion euros. Such leverage increases by eurozone banks within the region greatly exceeded those by US banks inside the US. This expansion of euro-denominated assets included the increase of lending in loans to countries in Central and Eastern Europe that joined the EU after 2004 and fueled the real estate bubble in Spain and Ireland after 2002.

In addition, eurozone banks not only increased cross-border euro-denominated lending and borrowing but also expanded US dollar-denominated assets and liabilities. As shown in Figure 9, U.S. dollar assets and liabilities of banks outside the United States exceeded $10 trillion and $9.2 trillion, respectively, in 2008. As shown in Figure 10, among these, assets and liabilities owned by eurozone banks amount to approximately $5 trillion each at their peak. Furthermore, as shown in Figure 11, the assets of U.S. counterparties owned by European banks including the UK and Switzerland amounted to $4.3 trillion in 2008.

Figure 8 Domestic Currency Claims of BIS Reporting Banking by Currency

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6 With regard to the gap between the $10 trillion in bank assets on a dollar basis located outside the US and the $5 trillion in assets on a dollar basis owned by European banks where US residents are the trading partner, a large factor is that the former depends on Locational Banking Statistics based on the principle of nationality of banks, while the latter depends on Consolidated Banking Statistics based on the principle of residents.
Source: BIS, Locational Banking Statistics, Table 5A

Figure 9 Cross-Border Foreign Currency Claims of BIS Reporting Banking by Currency

Source: BIS, Locational Banking Statistics, Table 5A

Figure 10 US Dollar-denominated assets and liabilities of EZ banks
Incidentally, as Shin [2011, p.167] indicates, the US dollar-denominated assets owned by China, Japan, and other current account surpluses were mainly purchased by Treasury and government-sponsored enterprises (GSE) securities rather than the private label securities that provided financing for subprime mortgages. On the other hand, European banks were exposed
mainly to the private label (that is, non-GSE) securities and structured products associated with subprime lending. In other words, European banks expanded their U.S. dollar exposures to U.S. counterparties to purchase structured products such as mortgage-backed securities (MBS).

Next, let us turn to the liabilities side of European banks. According to a BIS study, the US at that time hosted the branches of 161 foreign banks that raised over $1 trillion from short-term money markets (wholesale funding markets), of which $645 billion was channeled to their headquarters in Europe. As indicated in Figure 12, even in net terms, foreign bank branches had a net positive interoffice position vis-à-vis their headquarters (“assets owned by branches against their head offices” minus “assets owned by head offices against their branches”) amounting to $468 billion. As long as the head offices provide funding to their branches, the net interoffice position should normally be negative, in fact, it was negative from the 1980s to the 1990s. However, after 1999, the net interoffice position of US branches turned positive, continued expanding rapidly afterwards, and then dropped suddenly in 2008.

*Figure 12 Interoffice assets of foreign banks in the United States*

![Graph showing interoffice assets of foreign banks in the United States](image)

*Source: Shin [2012]*

Furthermore, as shown in Figure 13, European banks are heavily dependent on the wholesale funding market compared to US and Japanese banks, and among such banks, eurozone banks rely strongly on this market compared to UK banks. In addition, because many European banks raised dollar funds from the US short-term money market when the interest rates were low, they exposed themselves to rollover risk. In fact, when the financial crisis occurred in the US, many of the banks that received enormous amounts of funding from the FRB based on the Term Auction Facility (TAF)
in December 2007 were European banks, rather than US banks. Furthermore, when the debt crisis in Europe occurred, eurozone banks had difficulty refinancing and experienced a “dollar shortage“ (McGuire and Peter [2009]).

**Figure 13 Banking System Capital and Reliance on Wholesale Funding**

![Diagram showing banking system capital and reliance on wholesale funding](image)

Note: Wholesale funding includes debt and interbank borrowing. Total funding is wholesale funding plus deposits.

*Source: IMF, Global Financial Stability Report, September, 2011, Figure 1.6.*

Based on this evidence, Shin [2012] concludes that the gross capital outflows from the US before 2008 were the funds that US branches and subsidiaries of European banks raised through money market funds (MMFs) that were then shipped to their European headquarters. These funds re-entered the US through the purchase of non-Treasury securities by European headquarters. That is, the gross capital inflows to the US represent lending by European banks via the shadow banking system through the purchase of private label mortgage-backed securities (MBS) and structured products generated by the securitization of claims on U.S. borrowers. We should note that European banks’ branches and subsidiaries in the United States are treated as U.S. banks in the balance of payments based on residency, not nationality. Thus, Europe was “borrowing short and lending long” in relation to the US.

Shin [2012] refers to the overcapacity in cross-border lending by global banks as “the global banking glut,” and, as seen in the previous section, Borio and Disyatat [2011] pointed out that investments require financing and financing requires money, but not savings. These two unique suggestions were based on the same evidence that the raising of funds of European banks from MMFs in the US (borrowing short) and investing or re-entering using these funds to purchase MBS through the US shadow banking system (lending long) caused expansion of their balance sheet size.
and a rise in leverage. If the global saving glut hypothesis relying only on net terms is correct, European banks seeking a high yield should only move away from Treasury securities into private label securities without a rise in leverage that is not associated with an expansion in balance sheets. In reality, however, they expanded their balance sheets with a rise of leverage in a gross sense and increased the holdings of risk assets. The backgrounds behind the expansion of balance sheets by European banks are as follows. First, European banks expanded their euro-denominated assets, especially by lending to GIIPS (Greece, Italy, Ireland, Portugal, and Spain) and Eastern European countries, by the elimination of currency risk after introducing the euro. Secondly, due to the active adoption of Basel II, they undervalued risk-weighted assets (Shin [2012]). As a result, regardless of the capital adequacy ratio (where risk-weighted assets are used as the denominator) or the Tier 1 ratio (where core equity as the numerator is maintained at a high level), the equity/total assets ratio (where only equity is used as the numerator and total assets as the denominator) was extremely low.

In such a way, after European banks expanded leverage and increased the overcapacity in cross-border lending, they entered into private sector lending markets not only in Europe but also in the US. This nurtured the housing bubble in the US that was linked to the subprime loan crisis. At the same time, based on deleveraging of European banks due to the euro crisis, borrowing of short-term capital from the US and lending of long-term capital shrank greatly, as seen in Figure 7(b). In this sense, the eurozone crisis had a serious impact on not only the European economy but also the US economy.

4. International investment position of advanced and emerging economies

As examined in 3.1, the large expansion of gross capital flows led to a significant ballooning of gross asset positions. In other words, as reviewed in 3.3, such countries' external balance sheets becoming highly leveraged resulted from two-way cross-border transactions in financial assets and the expansion of balance sheets in global financial institutions. This kind of phenomenon is particularly predominant in advanced countries rather than emerging economies.

4.1 Comparisons based on Grubel-Lloyd index

The following two types of indices are well-known as indices of financial integration. The first type was proposed by Obstfeld [2004] [2012] and is similar to the Grubel-Lloyd index as an intra-industry trade index. This GL index for a country with gross foreign assets $A$ and liabilities $L$ can be expressed as

$$GL = 1 - \frac{|A - L|}{A + L}, \quad 0 \leq GL \leq 1.$$  

This index equals 0 for a country with complete one-way asset transactions where $A = 0$ or $L = 0$. It
takes a value of 1 with a country with complete two-way asset transactions where \( A = L \) and then the net foreign asset (NFA), or the net international investment position (NIIP), equals 0. The more the value of the GL index is close to 1, the more the international investment position (IIP) becomes the advanced country type. Regardless of a net creditor country \( (A > L) \) or net debtor country \( (A < L) \), the more the degree of two-way asset transactions increases, the larger the value of this index becomes. On the other hand, the more this value moves away from 1, the more the IIP becomes the emerging economy type.\(^7\)

**Figure 14** shows the differences in GL indices between high-income and emerging economies. Graph (a) includes official exchange reserves in gross foreign assets, and graph (b) excludes them. The high-income countries have a GL index averaging around 0.9 in both cases. On the other hand, the emerging economies have an average GL index exceeding 0.7 in recent years in the case of including foreign exchange reserves, whereas only a little above 0.5 even in recent years in the case of excluding foreign exchange reserves. In other words, in advanced countries, two-way asset transactions are predominant, while emerging economies have a tendency to continue one-way asset transactions, especially in terms of excluding official exchange reserves.

**Figure 15** compares the GL indices (including foreign exchange reserves) of Japan and the US. According to this, the GL index for the US almost always exceeds 0.9, while Japan’s GL index is much lower, even falling below 0.7 in some years. This comparison shows that in the US, two-way asset transactions are dominant regardless of it being the largest debtor country in the world, while in Japan, one-way asset transactions have been continuing regardless of it being the world’s largest creditor nation. In this sense, the structure of the IIP in Japan is still the same as that of emerging economies.

\(^7\) However, this GL index is such that if \( A \approx L \), the country’s GL index is high even if the country has small absolute values for \( A \) and \( L \).
The second type of index was presented by Lane and Milesi-Ferretti [2007], and this index of financial globalization is expressed as
\[ FG = \frac{A + L}{GDP}. \]

**Figure 16** shows the FG indices of 145 advanced and emerging countries from 1970 to 2004. The FG indices of advanced countries rose above 200 percent in the 1990s and exceeded 300 percent in the 2000s. **Figure 17** compares the FG indices of Japan and the US. In 2008, the US index was 295 percent whereas that of Japan was only about half of that (161 percent). Regardless of the fact that the FG index of both countries was around 90 percent in 1995, that of the US increased three times in the fifteen years since then, whereas that of Japan only rose by less than two times during the same period. Based on these indices, it is clear that international financial integration in Japan is similar to that of emerging economies.

**Figure 16  FG Indices for Industrial and Emerging Economies**

Source: Lane and Milesi-Ferretti [2007]

**Figure 17  FG indices in the US and Japan**

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8 On Philip Lane's Web site (http://philiplane.org/), a database of original papers up until 2007 is provided. According to this data, countries with extremely large FG indices are Switzerland (almost 1400%) and the UK (almost 1000%), with values that clearly exceed that of the US (almost 300%). In addition, the mean of gross foreign assets and gross foreign debt (as a percentage of GDP) exceeds 600% for both the UK and Switzerland, and exceeds 1600% for Ireland (Obstfeld [2012]).
4.2 Asymmetry of valuation effects between US and Japan

The huge expansion of gross external assets and liabilities in advanced countries resulted in a significant increase in “valuation effects” through capital gains and losses derived from changes in asset prices caused by exchange rates and differential asset returns on the country’s external assets and liabilities. Thus, external adjustment can take place not only through the traditional “trade channel,” where exchange rates contribute to the current account imbalances, but also through the additional “valuation channel” (also called the “financial channel”), which means the asset prices affect net foreign assets. While a number of studies have recently emphasized the role of valuation effects (Gourinchas and Rey [2007], Gourinchas [2008], Ghironi, Lee, and Rebucci [2009], Curcuru, Dvorak, and Warnock [2010], and Devereux and Sutherland [2010]), next we compare the valuation effects between the US and Japan based on Iwamoto [2012a] and [2012b].

US’s Case

Figure 18 illustrates the development of U.S. gross foreign assets and liabilities over the past thirty years since 1980. During the first fifteen years of this period, US gross foreign assets and liabilities had risen only slightly from 32 percent and 21 percent of GDP in 1981 to 47 percent and 53 percent of GDP by the end of 1995, respectively. During the latter half of this period, however, they sharply increased to 136 percent and 159 percent respectively, which is an increase of nearly three times for both, by the end of 2009.

In this context, it was important that the US earned huge capital gain on its gross external asset holdings, which were sufficient to offset the continuing current account deficit over the past years. For example, even though the US current account deficit in 2005 was reported as being $750 billion, its net foreign assets increased by $320 billion (see Figure 19). This implies that US capital gain only reached more than $1 trillion (8.1 percent of GDP) in 2005, which considerably exceeded its current account deficit of $750.0 billion (5.9 percent of GDP) in the same year.

Figure 18  U.S. Foreign Assets and liabilities, 1980-2010
Furthermore, during the six years from 2002 to 2007, the current account deficit in the US accumulated to $3.9 trillion. As shown in Figure 20, if this cumulative current account deficit is added to the net external debt of $1.9 trillion at the end of 2001, the theoretical value of US net external debt at the end of 2007 amounts to $5.8 trillion (41 percent of GDP). In actuality, US net external debt at the end of 2007 did not exceed $1.8 trillion (15 percent of GDP), indicating an improvement of $100.0 billion for this six year period. The difference between the theoretical and actual value of net external positions means that the US earned a capital gain of $4.0 trillion during this period.

In accordance with open economy macroeconomics, the equation for the theoretical natural
The relation between an economy's net foreign assets \((NFA)\) and its balance on current account \((CA)\) is as follows.

\[
\Delta NFA = CA \quad (NFA_t = NFA_{t-1} + CA_t).
\]  

The relation defined by equation (1) shows that changes in an economy's net foreign assets are equal to its balance on current account. In other words, the net foreign assets at the end of period \(t\) are equivalent to the net foreign assets at the end of period \(t-1\) plus the current account accumulated during period \(t\). In reality, however, the significant size of capital gain arises from past gross foreign assets and liabilities due to changes in asset prices. Thus, equation (1) should be expressed as

\[
\Delta NFA = CA + KG \quad (NFA_t = NFA_{t-1} + CA_t + KG_t),
\]  

where \(KG\) is the valuation effects represented by capital gains. Equation (2) shows that changes in an economy's net foreign assets at the end of period \(t\) should be defined not only by the current account during period \(t\) but also by capital gain generated during the same period.

Furthermore, based on equation (1), which does not take valuation effects into consideration, equation (3) below holds between net foreign assets and cumulative current accounts (theoretical value for \(NFA\) is given in Figure 20).

\[
NFA_n = NFA_t + \sum_{i=1}^{t} CA_i.
\]  

However, based on equation (2), which does take valuation effects into consideration, equation (4) below should be describing the relationship between net foreign assets and cumulative current accounts (actual value for \(NFA\) in Figure 20).

\[
NFA_n = NFA_t + \sum_{i=1}^{t} (CA_i + KG_i)
\]  

One of the most important reasons for earning huge capital gain is that the US holds the majority of external assets in the form of equity instruments such as foreign direct investments and stock investments, and most foreign liabilities are debt instruments such as bonds and bank loans. In other words, the US as a whole raises the fund with a low interest rate and invests it at a high rate of return. “Exorbitant privilege”\(^9\), defined by Gourinchas and Rey [2007], means differential external asset returns, that is, the fact that the earnings gained from overseas through gross foreign assets are larger than the earnings paid to foreign countries through gross external liabilities despite the US being a net debtor nation. The rationale that makes the US’s current account deficit sustainable is this exorbitant privilege based on the positive valuation effect.

**Japan’s Case**

Let us compare the features of the US international investment position with those of Japan. First, as shown in Figure 21, the gross foreign assets and foreign liabilities (as a percentage of GDP) in

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\(^9\) The term "exorbitant privilege" was used in the sense of the US’s seigniorage, which makes external settlements possible in US dollars, originally named by French politicians such as Charles de Gaulle, Jacques Rueff, and Giscard d'Estaing.
Japan increased from 53 percent and 38 percent to 118 percent and 70 percent, respectively, between 1995 and 2010, which are much lower increases than those of the US. This contrast reflects that one-way asset transactions were continuing in Japan, although two-way asset transactions were dominating in the US.

Second, let us compare the valuation effects of both counties. In the US, as mentioned above, even if the large current account deficit had been continuing and been accumulated, net foreign debt stabilized or even improved since 2000 due to enormous capital gain. On the other hand, as shown in Figure 22, even if Japan has been running a current account surplus, its net foreign assets increased but not in proportion to the current account surplus or even decreased in some years due to capital loss.

Figure 21  Foreign Assets and liabilities in Japan, 1995-2010

Source : Ministry of Finance Japan

Figure 22 Current Account and Net Foreign Assets in Japan, 1995-2010
Third, comparing the structure of external asset returns, as shown in Figure 23, Japan is dependent on income gains (income balance), although the US depends on capital gains. When taking the average from 2002 to 2007, in the US case, capital gains reached to 4.67 percent of GDP, while income gains were only 0.46 percent of GDP. On the other hand, in Japan’s case, capital gains recorded a loss of -1.39 percent of GDP, while income gains amounted to 2.23 percent of GDP.

**Figure 23  Capital gains and income gains in the US and Japan**

**Figure 24 Net Total Returns in the US and Japan**
Fourth, it is important that the movement of capital gains and losses in the US and Japan has been completely asymmetric during the twelve years before the financial crisis in 2007. That is, when the valuation effects in the US moved in the positive (negative) direction, those in Japan moved in the negative (positive) direction. And during the three years after the financial crisis, the valuation effects moved in exactly the same direction. Needless to say, capital gains represent wealth transfer rather than the creation of value added. However, it is not possible to understand whether there was wealth transfer from one country to another (from Japan to the US) based only on the above comparison.

Finally, when comparing the average net total return (the sum of net capital gains and net income gains) between Japan and the US for the fifteen years from 1996 to 2010, as shown in Figure 24, that of the US was $349.5 billion (38.2 trillion yen when converted by using the average nominal exchange rate for each year), while that of Japan was 5.8 trillion yen, which is less than one-sixth of that of the US. Although the US as the world’s largest debtor nation is earning relatively well, Japan as the world’s largest creditor nation is earning relatively little.

Japan ran by far the largest deficit of trade balance in 2012, and even when combined with the surplus of income balance, the current account surplus significantly shrank. If such a tendency is to continue, the balance on current account in Japan would turn into a deficit. It may be supposed from the above analysis that the current account deficit in Japan is directly connected to a decrease in net foreign assets, and the speed at which it would run through its net foreign assets may be fast, in contrast to the US where net external liabilities have stabilized or improved even if the current account deficit has continued.

### 4.3 Financial soundness and vulnerability from perspective of IIP

So far we have examined the differences in IIP structures of advanced and emerging economies by comparing the US IIP as a typical case of the former with Japan’s IIP still being classified into the latter. Judging from only these stylized facts of financial globalization, we can only deduce that various East Asian economies including Japan have surely missed out on financial globalization. However, judging from another distinguishing fact of financial globalization that financial crises occur one after another, it is inevitable to conclude that financial globalization increases vulnerabilities in many respects.

As indicated in Figure 23, it is evident that the movements of capital gain are generally much more volatile than these of income gain in both countries and valuation effects in the US dramatically turned from a capital gain of $1.0 trillion in 2007 into a capital loss of $700 billion, namely a sharp decrease of valuation effects by only $1.7 trillion year-on-year before and after the financial crisis. This case definitely shows that the external positions dependent on valuation
effects are fairly vulnerable. In fact, one of the most important reasons that the US current account deficit made sustainable over past years can be found in the “exorbitant privilege” of the positive net total returns that the earnings gained from overseas, which were larger than the earnings paid to foreign countries, despite the US being a net debtor nation. However, the reason this “exorbitant privilege” immediately turned into “exorbitant duty” (Gourinchas, Rey, and Govillot [2010]) in the financial crisis is that the US’s extensively leveraged positions and expanding of its balance sheet were unsustainable and vulnerable.

The raising of leverage by global financial institutions caused a high degree of leverage on the country’s external balance sheets. Thus, let us regard the ratio of a country’s gross external debt (GED) to net international investment position (NIIP) as the country’s external leverage ratio.

**Figure 25 Net International Investment Position versus Gross External Debt, 2011 (Percent of GDP)**

![Graph showing net international investment position versus gross external debt in selected countries.](source)

*Source: Created by the author based on IMF, Global Financial Stability Report, October, 2012, Figure 2.47, p.57.*

**Figure 25** shows the combination of NIIP and GED in selected countries as plotted in a scatter diagram. Here, the countries that are located towards the bottom right have higher external leverage, and those that are plotted in the upper left have lower external leverage. From this figure, the GIIPS countries excluding Italy (that is, Greece, Ireland, Portugal, and Spain) and the US are externally vulnerable, and Japan and emerging markets such as China, Korea, Malaysia, and Russia are financially sound. Thus, there may be a positive correlation between the deepening of financial globalization and increase in external vulnerability.
5 Concluding remarks

The present study begins with a general overview of the structural change in the global economy since 1995 from the viewpoint of capital flows and critically analyzes the global saving glut as a hypothesis trying to explain global current account imbalances. Also, this paper has shown how the gross capital flows between the US and Europe affect the financial crisis and what kind of differences there are in the structure of the international investment position between the US and Japan.

First, in advanced countries, the increasing of two-way cross-border transactions in financial assets led to the expanding of gross capital flows and caused the ballooning of the international investment position. On the other hand, in emerging economies, the continuing of current account surpluses and accumulating of foreign reserves since the Asian crisis in 1997 led to a predominance of one-way asset transactions, and these were followed by an increase in net capital flows and net international investment position. Based on these two categories of international capital flows, Japan should still be classified as an emerging economy.

Second, by examining capital flows before the financial crisis, the following can be observed.

(i) In terms of gross concept, one of the most significant capital flows was between the US (a country with current account deficit) and Europe (a region with current account balance or deficit). However, in terms of net concept, it is evident that the largest capital flow was from the Asia-Pacific (a region with current account surplus) to the US (a country with current account deficit). The global saving glut hypothesis, which tries to explain global current account imbalances, focuses only on the side of net capital flows. But taking into account the growing importance of gross international asset position, it is necessary to analyze gross capital flows without net capital inflows and outflows.

(ii) Among gross capital flows between the US and Europe, capital outflows from the US before 2008 were the funds that US branches and subsidiaries of European banks raised through money market funds (MMFs) that were then shipped to their European headquarters (borrowing short from the viewpoint of Europe). By re-entering these funds into the US through the purchase of private label mortgage-backed securities (MBS) by European headquarters, the gross capital inflows to the US represent lending by European banks via the shadow banking system (lending long from the viewpoint of Europe). Since US branches and subsidiaries of European banks are categorized as US banks in balance of payments based on residency, the overall picture of such capital flows cannot be fully comprehended.

(iii) The overcapacity in cross-border lending by European banks, named the “global banking glut,” which resulted from the raising of funds from MMFs in the US by their US branches and subsidiaries, caused an expansion of their balance sheet size and a rise in leverage. There were the elimination of currency risk via the introduction of the euro in 1999 and underestimation of risk assets by active adoption of Basel II in the background of this global banking glut. The deleveraging
of European banks due to the eurozone crisis not only hit Europe but also the US economy because of the shrinking of long-term lending from Europe to the US.

Third, there are a lot of completely opposite characteristics between the US and Japan in the structure of international investment position (IIP) and the external returns derived from IIP, and the so-called “valuation effects” in both countries were completely asymmetric.

(i) In the US, gross IIP has been ballooning for both the asset and liability sides, resulting from an increase of two-way cross-border transactions in financial assets (for example between the US and Europe as mentioned above). In Japan, however, net IIP (NIIP) has sharply increased because of the continuing current account surplus and one-way cross-border financial transactions (for example from Japan to the US). In this sense, Japan’s IIP structure is still that of an emerging country.

(ii) In the US, even if a large current account deficit has been continuing and accumulated, net foreign debt stabilized or even improved since 2000 due to enormous capital gain. On the other hand, even if Japan has been running a current account surplus, its net foreign assets increased but not in proportion to the current account surplus or even deteriorated in some years due to capital loss.

(iii) Although the US depends on capital gains, Japan is dependent on income gains (income balance). This difference results from the fact that with the portfolio of IIP in the US, the majority of foreign assets are owned in the form of equity instruments and most of the foreign debt consists of debt instruments, while in Japan, most of the foreign assets and liabilities are debt instruments such as bond investments and bank loans.

(iv) Valuation effects in the US and Japan before the financial crisis are completely asymmetric. In other words, when valuation effects in the US moved in the positive (negative) direction, those in Japan always moved in the negative (positive) direction. However, it is uncertain whether the fact that valuation effects are asymmetric means “transfer of wealth” from one side to the other (from Japan to the US). One conjecture from the exchange rate fluctuation is a “valuation channel” where the depreciation of the dollar causes foreign exchange gain in US holdings of foreign assets denominated by local currency on one hand and foreign exchange loss in Japan holdings of foreign assets denominated in dollars on the other hand.

Finally, when the country’s financial vulnerability is analyzed from the correlation of gross external debt (GED) and net international investment position (NIIP), countries that have large GED and small NIIP are the GIIPS countries and the US; countries that have small GED and large NIIP are emerging countries and Japan. Thus, there may be a positive correlation between the deepening of financial globalization and an increase in external vulnerability. Although it may be true that East-Asian economies including Japan missed out on financial globalization, it can be said that financial sustainability can maintain these economies.
References
Bini Smaghi, L. [2008], “The Financial Crisis and Global Imbalances: Two Sides of the Same Coin.”
  BIS Review, 156.
Greenspan, A. [2005], Testimony of Chairman Alan Greenspan, Federal Reserve Board's semiannual Monetary Policy Report to the Congress, Before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, February 16.
Iwamoto, T. [2012a], “External Imbalances and the Wealth Transfers: Asymmetry of Valuation Effects between US and Japan”, in Keimei Kaizuka and Policy Research Institute, Ministry of


