International Investment Positions, Gross Capital Flows, and Global Liquidity†

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Abstract

To begin with, we analyzed the contrasting structure of the US and Japan’s international investment positions (IIPs) and their asymmetric movements of “valuation effects” derived from different IIP structures (exorbitant privilege and duty) before and after the global financial crisis (GFC). Then, we realized that a significant impact on the GFC was not current account imbalances, which are equal to the net capital flows from Asian surplus countries to the US as a deficit country (global saving glut), but the gross capital flows between the US and Europe, both of which run current account deficits. Finally, we investigated the idea that the gross capital flows from the US to Europe represented the raising of wholesale funding through the US money market funds (MMFs) by European banks’ US branches and subsidiaries and then shipping it to their headquarters. From the viewpoint of the banking sector, these gross capital flows are in a large part regarded as global liquidity, especially non-core liabilities supplied by the US shadow banking system.

JEL Classification: F32, F33, G01

Key words: international investment positions, valuation effects, gross capital flows, global financial crisis, global liquidity, shadow banking system

1. Introduction

Over the past two 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 ballooned until the global financial crisis (GFC) of 2007-08. On the other hand, among emerging Asian economies, the 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.

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These experiences are reflected in the revised edition of the IMF’s Balance of Payment Manual (BPM). The official name of the 6th edition published in 2009 changed from “Balance of Payment Manual (BPM5)” to “Balance of Payment and International Investment Positions (BPM6).” This means that policy makers recognized not only the importance of the flow concept of balance of payments (BOP) but also the stock concept of international investment positions (IIPs).

At the same time, some academic scholars focus on the gross term of capital flows as well as the net term. A considerable number of studies have been conducted on such cross-border capital flows after financial globalization and their relation with the GFC. From our viewpoint, they can be categorized into three types.

The first and most accumulative studies focus on the ballooning of external balance sheets (e.g. Lane and Milesi-Ferretti, 2007, Obstfeld, 2010) and the accompanying “valuation effects”, which means capital gain and loss defined as the differences between current account balances and the change of net international investment positions (Gourinchas and Rey, 2007, 2014). Gourinchas and Rey (2007) called a sizeable excess return of gross assets over gross liabilities as the “exorbitant privilege”. This exorbitant privilege enjoyed by the US significantly alleviated its external constraints and achieved sustainability of its huge current account deficits before the GFC. After the GFC of 2007-08, however, payments from the US to the rest of the world (ROW) were much larger than the US receives from the ROW, and its international position as having “exorbitant privilege” drastically changed into the “exorbitant duty” (Gourinchas et al., 2010).

The second type of researches is the empirical studies on gross capital flows. The expanding external assets and liabilities defined by the gross and stock concepts were caused by the increasing capital outflows and inflows defined by the gross and flow concepts. Although it was quite natural that the study on IIPs had developed into a study on gross capital flows, only few attempts have so far been made from this point of view because there were statistical constraints and no theoretical background. Because BOP data obtained by the IMF are based on the residence principle but international banking statistics (consolidated banking statistics) obtained by the Bank for International Settlements (BIS) are dependent on the nationality principle, both sets of statistics are inconsistent and different from data coverage. Furthermore, capital flows modeled by present open economy macroeconomics are net capital flows equal to the balance on current account, but not gross capital flows. Regardless of these constraints, there are some empirical studies.

Forbes and Warnock (2012) classified the dimensions of gross capital flows into “surges” (sharp increases in gross inflows), “stops” (sharp decreases in gross inflows), “flights” (sharp increases in gross outflows), and “retrenchments” (sharp decreases in gross outflows). They clarified that during the GFC, the sudden inflow of capital caused by domestic investors selling foreign holdings and bringing the money home is classified as “retrenchment” in the definitions based on gross flows and that the retrenchment that outweighs the actions of foreign investors can show up as a “surge” using the older methodology based on net flows. Broner et al. (2013) show that gross capital flows are very large, volatile, and pro-cyclical, relative to net capital flows. During expansions, foreigners invest more domestically and domestic agents invest more abroad. During crises, total gross flows collapse, and this leads to a shrink in both inflows by foreigners and outflows by domestic agents.
The third and latest type of studies is the study from the unique viewpoint of “global liquidity”. Borio and Disyatat (2011) criticized that the “global saving glut” hypothesis by Bernanke (2005) was based on net capital flows and was inadequate to explain the expansion of gross capital flows before the GFC. As they accurately pointed out, global imbalances and the GFC have no link from the viewpoint of net capital flows from Asian countries to the US but have a link from the perspective of gross capital flows between the US and European countries. Following Borio and Disyatat (2011), Shin (2012) found that the gross capital flows between the United States and Europe from the viewpoint of the banking sector overlap with “global liquidity” supplied by the US shadow banking system.

The rest of the paper is organized as follows. Section 2 considers the differences of the IIP structure and the asymmetry of valuation effects between the US and Japan before and after the GFC. Section 3, to criticize the “global saving glut” hypothesis, analyzes the net capital flows between the United States and Asian-Pacific countries and the gross capital flows between the US and Europe. In section 4, these gross capital flows are examined from the viewpoint of global liquidity supplied by the US shadow banking system and intimately tied to the leveraging/deleveraging cycle of the global banks. Section 5 concludes the paper.

2. Exorbitant Privilege and Duty before and after Global Financial Crisis

2.1 Valuation Effects, Exorbitant Privilege and Duty

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 returns from 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 effects of asset price changes on net foreign assets. Recently, the meaning of “exorbitant privilege” has been expanded to the excess return from a country’s external assets over liabilities, that is, positive valuation effects (Gourinchas and Rey, 2007). On the other hand, “exorbitant duty” means negative valuation effects (Gourinchas et al., 2010).

In theory the changes in an economy’s net foreign assets ($\Delta NFA$) are equal to its balance on current account ($CA$), that is, $\Delta NFA = CA$ if there are no valuation effects. 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 the period, that is, $NFA_t = NFA_{t-1} + CA_t$. In reality, however, the significant size of capital gain arises from past gross foreign assets and liabilities due to changes in asset prices. Thus, the above equations should be

1) The concept of “exorbitant privilege” was used in the sense of the US’s seigniorage, which makes external settlements in US dollars possible, and was originally named by French politicians such as Charles de Gaulle, Jacques Rueff, and Giscard d’Estaing. Gourinchas and Rey (2007) used this concept in the sense that the center country (e.g. the US) of the International Monetary System enjoyed a sizeable excess return of gross assets over gross liabilities. It would be better to say that the “exorbitant privilege” means wealth transfers from the ROW to the US. On the hand, the “exorbitant duty” represents wealth transfers from the US to the ROW during a crisis. In other words, in times of global stress, the US provides insurance to the ROW (Gourinchas et al., 2010).
expressed as
\[ \Delta NFA = CA + VAL (NFA_t = NFA_{t-1} + CA_t + VAL_t), \]
where \( VAL \) is the valuation effects represented by capital gains or losses. The equation 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 gains or losses generated during the same period.

2.2 US vs. Japan Case before and after Global Financial Crisis

Figure 1 illustrates the development of US current account balance (\( CA \)) and its net foreign assets (\( NFA \)) over the past thirty years since 1995. The relation between \( CA \) and \( NFA \) in the 21st century can be divided into two stages: before and after the GFC of 2007–08.

In the first stage (before 2007), the \( CA \) deteriorated while the \( NFA \) improved. The US earned huge capital gain on its gross external asset holdings, which were sufficient to offset the continuing current account deficit during this first period. For example, even though the US current account deficit in 2005 reached $750 billion, its net foreign assets increased by $320 billion. This implies that the US capital gain 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.

On the other hand, in the second stage (after 2008), the \( CA \) improved while \( NFA \) deteriorated. The US current account deficit in 2014 was reported as $410 billion, and its net foreign assets decreased by no less than $1.5 trillion. This means that the US suffered a capital loss of more than $1 trillion in the same year.

Let us compare the valuation effects of the US with those of Japan. 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 due to enormous capital gain before the
GFC. On the other hand, as shown in Figure 2, 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 due to capital loss during same period. For example, even though Japan’s current account surplus in 2005 reached ¥18.5 trillion, its net foreign assets decreased by ¥5 trillion. This implies that Japan paid a capital loss of nearly ¥24 trillion (5.0 percent of GDP) in 2005.

On the other hand, after the GFC, Japan’s current account surplus sharply decreased while its net foreign assets continued increasing. Japan’s current account surplus in 2014 was reported as ¥2.6 trillion, and its net foreign assets decreased by ¥52 trillion. This means that Japan earned a capital gain of about ¥50 trillion (about 10 percent of GDP) in the same year.

Figure 3 compares the US capital gains and income gains (primary income balance) with those of Japan. Obviously, capital gains are volatile while income gains are stable in both countries. However, the US depends on capital gains although Japan is dependent on income gains. Furthermore, it is more important that the movements of valuation effects in both countries are sharply contrasting.

In the pre-GFC period (before 2007), the movements of capital gains and losses in both countries were completely asymmetric (asynchronized), and in many years the US earned huge capital gains while Japan paid huge capital losses. During the GFC period (from 2008 to 2012), the movements in both countries were symmetric (synchronized), that is, the valuation effects in both countries moved in the same direction. In the post-GFC period (after 2013), the movements of capital gains and losses in both countries are asymmetric (asynchronized) again, but the US paid huge capital losses while Japan earned huge capital gains (Rogoff and Tashiro, 2015).

In summary, the position of the US in the international monetary order changed from “exorbitant privilege” before the GFC to “exorbitant duty” after the GFC; on the other hand, the position of Japan changed from “exorbitant duty” before the GFC to “exorbitant privilege”
after the GFC.

The valuation effects were followed by the ballooning of gross international asset and liability positions, namely highly leveraged external balance sheets in some industrial countries. The GFC accelerated the deleveraging of their expanding balance sheets. These expanding external assets and liabilities defined by gross and stock concepts examined in this section were caused by the increasing capital inflows and outflows defined by gross and flow concepts considered in the next section.

3. Gross Capital Flows and Myth of Global Saving Glut

Immediately after the bankruptcy of Lehman Brothers, some studies argued that the GFC and global imbalances were “two sides of the same coin” (Bini Smaghi, L., 2008) or “products of common causes” (Obstfeld and Rogoff, 2009). Here, one side of this coin or one of the common causes is the “global saving glut”\(^2\). On the one hand, excess saving over investment in emerging countries such as China led to their current account surpluses and the US current account deficits, that is, global imbalances. On the other hand, the current account surpluses derived from excess saving in emerging countries led to net capital flows to the US, which caused the decrease in the US real interest rate. The low level of real interest contributed to the housing bubble in the US that was linked to the subprime loan crisis.

The first study to oppose the above scenario was by Borio and Disyatat (2011). They criticized that the global saving glut hypothesis was based on net capital flows and was inadequate to explain the expansion of gross capital flows before the GFC. As they accurately

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\(2\) In his speech on March 10, 2005, Bernanke, who was a member of the board of governors of the FRB at the time, 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” (Bernanke, 2005).
pointed out, global imbalances and the GFC have no link from the viewpoint of *net* capital flows from Asian countries to the US but have a link from the perspective of *gross* capital flows from European countries to the US.

### 3.1 Definition of Gross Capital Flows

Although *gross* and *net* capital flows are closely related, there are also confusing aspects, so first we will define these terms.

Gross capital inflows mean *net purchases of domestic assets by foreign investors*. In other words, they are purchases by foreign investors of domestic assets less their sales of such assets. On the other hand, gross capital outflows mean *net purchases of foreign assets by domestic investors*. In other words, they are purchases by domestic investors of foreign assets less their sales of such assets. Here, “net” means the long or short position upon subtracting “sales” from “purchases”.

Both gross capital inflows and outflows are usually positive. However, gross capital inflows may become negative when the home country is faced with an economic crisis and repatriation of their domestic assets by foreigners is larger than purchases of domestic assets. On the contrary, gross capital outflows may become negative when the foreign country is faced with an economic crisis and repatriation of their foreign assets by domestic investors is larger than purchases of foreign 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.

**Figure 4** shows recent developments in the US gross capital flows and current accounts

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**Figure 4**: US gross capital flows and current account

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Sources: Bureau of Economic Analysis; author’s calculations.
(relative to GDP) since 2003. The current account deficit in 2007 was $718.6 billion (4.96 percent of GDP) while the gross capital inflow was $2.2 trillion (15.08 percent) and capital outflow was $1.6 trillion (10.86 percent). Due to the Lehman Shock in 2008, the current account deficit decreased to $686.6 billion (4.68 percent) while gross capital flows shrank more significantly—capital inflow fell nearly 80 percent—to $454.1 billion, and capital outflow decreased by about 120 percent to $309.5 billion. The reason gross capital outflows in 2008 are negative is that the US residents who had been investing overseas pulled out of their foreign assets. Thus, gross capital flows are much more volatile and procyclical than net capital flows.

### 3.2 Gross Capital Flows between United States and Europe

Figure 5 and Figure 6 show the geographical breakdown of the US gross capital flows since 2003. In 2007 before the GFC, among the gross capital inflows of $2.2 trillion into the US, capital inflows from only Europe amount to $956.7 billion (Euro area : $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.

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 (Euro area : $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.

**Figure 5** : US gross capital outflows by regions

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Sources: Bureau of Economic Analysis; author’s calculations.
After the GFC, these capital flows among the US, Europe, and Asia-Pacific region sharply decreased. In 2012, the total gross capital inflows into the US and outflows from the US contracted to $98.8 billion and $280 billion, respectively. Among the total gross capital inflows of $602 billion, capital inflows from Europe and the Asia-Pacific region were $99 billion and $232 billion, respectively. Among the total gross capital outflows of $280 billion, capital outflows to Europe and the Asia-Pacific region were $136 billion and $125 billion, respectively.

These observations can be confirmed by referring to Figure 7. In 2007, the gross capital inflows from Europe to the US amounted to nearly $960 billion, and the gross capital outflows from the US to Europe amounted to about $1 trillion. As a result, the net capital flows from the US to Europe accounted for only $40 billion. On the other hand, the gross capital inflows from the Asia-Pacific region to the US accounted for about $430 billion, and the gross capital outflows from the US to the Asia-Pacific region accounted for a mere $31 billion. As a result, the net inflow from the Asia-Pacific region to the US amounted to as much as $400 billion.

In 2012, the gross capital inflows from Europe and outflows to Europe dramatically contracted to $99 billion (cf. 960 billion in 2007) and $136 billion (cf. $1.0 trillion in 2007), respectively, consequently the net capital outflows were $37 billion (cf. 40 billion in 2007). On the other hand, the gross capital inflows from the Asia-Pacific region and outflows to the Asia-Pacific region decreased to $232 billion (cf. $435 billion in 2007) and increased to $125 billion (cf. 31 billion in 2007), respectively, consequently the net capital inflows were $107 billion (cf. $404 billion in 2007).

In conclusion, it should be recognized that, as emphasized by Borio and Disyatat (2011), the global saving glut hypothesis, which focuses only on the net capital flows beyond the
Pacific from the Asian economies running current account surpluses to the US running a current account deficit, was merely a myth. The reality is the gross capital flows across the Atlantic between Europe and the US, both of which run current account deficits.
The next question is what types of money made up these gross capital flows between the US and Europe that vastly ballooned and sharply contracted before and after the GFC (from $960 billion to $99 billion in inflow and from $1.0 trillion to $136 billion in outflow, as shown in Figure 7).

4. Global Liquidity and Shadow Banking System

4.1 Gross capital flows and Global Liquidity

The gross capital flows between the United States and Europe from the viewpoint of the banking sector overlap with global liquidity supplied by the US shadow banking system. As shown in Figure 8, the gross capital outflows from the United States represent raising funds through the U.S. money market funds (MMFs) by European banks’ U.S. branches and subsidiaries and then shipping them to their headquarters. On the other hand, the gross capital inflows to the United States represent lending by European bank’s headquarters via the shadow banking system through the purchase of structured products generated by the securitization of claims on US borrowers such as mortgage-backed securities (MBS) (Shin, 2012).

After the introduction of the euro in 1999, European global banks not only increased the euro-denominated lending and borrowing within the eurozone but also expanded the cross-border dollar-denominated assets and liabilities. The US dollar assets and liabilities of banks outside the United States exceeded $10 trillion and $9.2 trillion, respectively, in 2008. Among these, the assets and liabilities owned by eurozone banks amount to approximately $5

Figure 8: Gross capital flows between United States and Europe via US shadow banking system

Source: Based on Figure 1 (Shin, 2012).
trillion each at their peak.

First, let us examine the asset side of European banks. The assets of U.S. counterparties owned by European banks amounted to $4.3 trillion in 2008. The US dollar-denominated assets owned by China, Japan, and other countries with current account surpluses were mainly purchased by Treasury and government-sponsored enterprise (GSE) securities. On the other hand, European banks were exposed mainly to the non-GSE, private-label securities, and structured products such as MBS.

Second, let us turn to the liability side of European banks. According to a BIS study, the US hosted 161 foreign bank branches in 2009 that raised over $1 trillion from the US money market funds (MMFs), of which $645 billion was channeled to their headquarters in Europe. European banks are heavily dependent on the wholesale funding market and among such banks eurozone banks rely strongly on MMFs. In addition, because many European banks raised dollar funds from MMFs when the interest rates were low, they exposed themselves to rollover risk. In fact, when the GFC 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). In that way, the eurozone crisis since 2009 was connected with the GFC of 2007–08.

Shin (2012) refers to the overcapacity in cross-border lending by global banks as “the global banking glut”. 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. In that way, global liquidity is intimately tied to the leveraging/deleveraging cycle of the global banks.

4.2 Global Liquidity Supplied by Shadow Banking System

Let us consider global liquidity through the shadow banking system in detail. Although global liquidity has become a popular term in policy and academic discussion, the definition of global liquidity is not yet settled. The expression “global liquidity” is broadly used to refer to the “ease of funding” in global financial markets (CGFS, 2011).

Previous studies may be divided into two approaches: price-based and quantity-based approaches of global liquidity (Chen et al., 2012, IMF, 2013). The former approach captures interest rates of secured and unsecured money markets or the spreads between rates in different market segments. Rey (2013) observed that implied market volatility measures (such as the VIX for the S&P 500) were seen as a prime proxy for investor risk appetite and a key indirect indicator of the willingness to provide funding\(^3\). When the increase/decrease of the VIX causes risk aversion/appetite of market participants, the gross capital flows (global liquidity) shrink/expand and leverage decreases/increases. Therefore, gross capital flows (except FDI) are negatively correlated with the VIX.

The latter approach has two measures: asset-based and liability-based indicators.

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3) The VIX is Volatility Index in Chicago Board Options Exchange Market (CBOE) and the implied volatility of S&P 500 index options. The VIX is regarded as a market proxy for risk aversion and uncertainty.
Asset-based indicators are official liquidity, which is created by central banks through both conventional and unconventional policies, and private liquidity, which is generated by financial institutions through credit creation (CGFS, 2011). Liability-based indicators show core liquidity, which reflects traditional deposit-based funding, and non-core liquidity, which captures wholesale funding, including securitization and collateral-based funding, which are usually associated with the shadow banking system (Shin, 2012).

Core global liquidity, measured as the sum of total resident deposits in commercial banks and other depositary corporations, corresponds roughly to the traditional monetary-aggregate approach. Non-core global liquidity, measured as the sum of a wide variety of debt securities and non-resident deposits, represents the liabilities that are not included in traditional monetary aggregates. Credit intermediation has increasingly moved away from deposit-based funding to other wholesale funding, including some types of securitization and collateral-based funding, namely, the shadow banking system. Figure 9 shows the total liabilities in three European global banks. These banks rapidly increased leverage after the 2000s in the sense that equity and traditional deposits (core liabilities) were almost constant and other liabilities (non-core liabilities) dramatically expanded.

The term “shadow banking system” was first coined by Paul McCulley, who was a managing director of Pacific Investment Management Company (PIMCO), in a 2007 speech at the annual financial symposium hosted by the Kansas City Federal Reserve Bank. It is a useful benchmark, and the Financial Stability Board (FSB, 2011) describes shadow banking as “credit intermediation involving entities and activities outside the regular banking system”.

As shown in Figure 10, the liabilities of the shadow banking system are much larger than the liabilities of the traditional banking system since the 1990s in the United States. In the traditional banking system, credit intermediation between savers and borrowers occurs in a single bank. Savers entrust their savings to banks in the form of deposits, which banks use to fund the extension of loans to borrowers. Unlike traditional financial intermediaries, the shadow banking system is interconnected along a long intermediation chain, which intermediates credit through securitization and secured funding techniques such as asset-backed commercial paper (ABCP), asset-backed securities (ABS), collateralized debt obligations (CDOs), and repurchase agreements (repos) (Pozsar et al., 2010, Claessens et al., 2012, Claessens and Ratnovski, 2014). In short, as shown in Figure 8, the shadow banking system has two functions: securitization and collateral intermediation. These functions are distinct but related as follows.

The largest liquidity suppliers to the shadow banking system are money market funds (MMFs). MMFs promise to preserve a fixed “net asset value” (NAV), which is the price at which MMF investors can redeem their shares usually at $1.00 per share. A substantial portion of funding supplied by MMFs to the shadow banking system is provided in the form of collateral-

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4) Both functions originated in the early 1970s. As for securitization, mortgage-backed security (MBS), which is a typical example of securitization and a type of asset-backed security (ABS), was first structured by some of the government-sponsored enterprises (GSEs), such as Ginnie Mae, Freddie Mac, and Fannie Mae, in the 1970s. Regarding collateral intermediation, money market funds (MMFs) in the wholesale funding market were first established and named “The Reserve Fund” in 1971. MMFs seek a fixed net asset value (NAV) per share (which is generally $1.00 in the United States). Creating MMFs would likely accelerate the disintermediation of bank deposits to MMFs.
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Figure 9: Total liabilities of European global banks

(a) Barclays

(b) BNP Paribas

(c) Société Générale

Source: Hyun Song Shin, “Global Banking Glut and Loan Risk Premium,” Mundell-Fleming Lecture, presented at IMF Annual Research Conference, November 10-11, 2011, conference slides, available via the Internet: http://www.princeton.edu/~hsshin/www/mundell_fleming_slides.pdf.
eral intermediation such as repurchase agreements (repos) or asset-backed commercial paper (ABCP).

A repo is a sale of securities collateralized for cash with a commitment to repurchase them at a specified price at a future date. The most commonly used type of collateral in the repo market is Treasury securities, and the rest are mostly mortgage-backed securities (MBS). Similarly, ABCP is a form of commercial paper that is also collateralized by other financial assets. ABCP is issued by a structured investment vehicle (SIV), of which the purpose is to purchase financial assets by selling ABCP to money market funds (MMFs). The collateral assets for ABCP are a mix of many different assets structured via securitization such as MBS and CDOs.

The following two features of the shadow banking system are important. First, the shadow banking system, like the traditional banking system, has a money multiplier. The shadow banking system deals with the scarcity of liquidity through the re-use of collateral multiple times, called “rehypothecation”, and the multiplier of the volume of transactions to the volume of collateral (the ‘velocity’ of collateral) was recently about 2.5 to 3 (Singh, 2011). Secondly, however, what distinguishes shadow banks from traditional banks is their lack of access to public sources of liquidity such as the Federal Reserve’s discount window or public sources of insurance such as Federal Deposit Insurance (Pozsar et al., 2010). Therefore, even though the economy as a whole would fall an acute shortage of liquidity, namely a liquidity crisis, the government cannot bail out the shadow banking system. Collateral fire sales are the only way to increase liquidity that participants of the shadow banking system have left.

Actually, the price-based and quantity-based approaches are closely related to each other. Growing supply of global liquidity (quantity) would result in falling interest rates (prices). By contrast, higher demand for global liquidity (quantity), which is driven by rising risk aversion
and collateral fire sales, would result in increasing interest rates (prices). The interest rates in collateral-based funding associated with the shadow banking system are the so-called “haircuts”. A haircut is the difference between the amount of funding and the market value of an asset used as funding collateral. Lower haircuts boost leverage, and higher haircuts reduce leverage. Therefore, global liquidity via the shadow banking system has a procyclical nature in which leverage builds up in booms and leverage reduces in busts. As shown in Figure 11, this procyclicality of leverage/deleverage is the mirror image of decreased/increased collateral requirements, that is decreased/increased “haircuts” during upturns/downturns (Bruno and Shin, 2013).

The GFC resulted in a dramatic collapse in non-core liquidity. As the mortgage situation in the United States became more serious, the collapse of assets used as funding collateral such as MBS and a sharp increase in haircuts contributed to the run on repo and ABCP and their collateral fire sales, which helped the contagion of the crisis (Gorton and Metrick, 2012, Krishnamurthy et al., 2013). The run on repo and ABCP caused the run on MMFs (demand for redemption) in September and October 2008. On September 16, 2008, immediately following the bankruptcy of Lehman Brothers, the Reserve Fund, which was established as the first MMF in 1971, announced that losses in its portfolio had caused the NAV to drop from $1.00 to $0.97. The news that an MMF was forced to “break the buck” spread panic quickly and led to a run on other MMFs by their investors and catastrophic outflows from MMFs. MMFs which fail into illiquid were coerced into a “fire sale” of assets to meet demand for redemptions.

4.3 Throwing Sand in Wheels

Most cross-border capital flows are intermediated through global banks and are heavily volatile and procyclical. The procyclical nature of cross-border capital flows has contributed to serious financial crises. The incremental liberalization of capital flows has not worked as traditional economic theory teaches. Financial regulations associated with macroprudential
policies, such as some methods of what James Tobin called “throwing sand in the wheels”, can play a key role in restricting global liquidity or cross-border capital flows by the activities of global banks. Macroprudential policies should operate on both the asset and liability side of a bank’s balance sheet (CIEPR, 2012).

The Banking Act of 1933, often referred to as the Glass–Steagall Act, erected a wall between commercial banks and securities firms. This separation of commercial and investment banking was repealed by the Gramm–Leach–Bliley Act in 1999. The Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd–Frank Act), signed by President Barack Obama on July 21, 2010, was based on the lesson that this repeal was one of the causes of the GFC of 2007–08. Furthermore, on July 21, 2015, the Volcker Rule, which refers to section 619 of the Dodd–Frank Act, took effect. To restrict US banks from making certain kinds of speculative investments that do not benefit their customers, the proposal prohibited insured depository institutions and companies affiliated with insured depository institutions (“banking entities”) from engaging in short-term proprietary trading of certain securities, derivatives, commodity futures, and options on these instruments for their own account. Such regulations prevent a bank’s asset side from contributing to a boom/bust cycle by prohibiting commercial banks from speculative investments for their own account.

As for MMFs, on July 23, 2014, the US Securities and Exchange Commission (SEC) adopted final rules governing the structure and operation of MMFs. The new rules will require institutional prime MMFs to price their shares using market-based values or “floating NAVs”. In addition, all MMFs will be able to impose liquidity fees and temporarily suspend redemptions (impose “gates”) during periods of illiquidity. Such regulations prevent a bank’s liability side from contributing to a leverage/deleverage cycle by imposing levies on the non-core liabilities by “throwing sand in the wheels”.

5. Concluding Remarks

Several important conclusions are derived from the findings in this study.

First, this paper analyzed the contrasting structure of the US and Japan IIPs before and after the GFC. In the US, even if a large current account deficit has been continuing and accumulating, net foreign debt stabilized or even improved due to enormous capital gain before the GFC, but net foreign debt sharply deteriorated due to capital loss after the GFC. 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 before the GFC. However, its current account surplus sharply decreased while its net foreign assets continued increasing after the GFC. Based on this analysis, we conclude that the position of the US in the international monetary order changed from “exorbitant privilege” before the GFC to “exorbitant duty” after the financial crisis. On the other hand, that of Japan changed from “exorbitant duty” before the GFC to “exorbitant privilege” after the financial crisis.

Second, this study investigated the contrasting capital flows between the US and Europe and between the US and Asian countries before and after the GFC. Before the crisis, even though Asian countries ran large current account surpluses, equal to the net capital flows to the US, the US gross capital inflows from Asian countries were much smaller than those from
European countries, and the US gross capital inflows to Asian countries were negligible. On the other hand, both the gross capital inflows and outflows between the US and Europe were huge, so net capital flows between the two regions were negligible. After the crisis, both the gross capital inflows and outflows between the two regions dramatically shrunk to nearly one-tenth. On the other hand, net capital flows from Asian countries to the US decreased only to one-quarter. Based on this analysis, we conclude that a significant impact on the GFC was not current account imbalances, equal to the net capital flows from Asian surplus countries to the US as a deficit country (global saving glut), but the gross capital flows between US and Europe, both of which run current account deficits.

Finally, in this paper, we realized that the gross capital flows from the US to Europe represented the raising of funds through the US MMFs by European banks’ US branches and subsidiaries and then shipping them to their headquarters. Therefore, these gross capital flows are to a large extent regarded as global liquidity, especially non-core liabilities, supplied by the US shadow banking system, which has two functions: securitization and collateral intermediation. The interest rates in collateral-based funding associated with the shadow banking system are the so-called haircuts. Global liquidity via the shadow banking system has a procyclical nature in which financial leverage builds up due to lower haircuts in booms and deleverage accelerates due to higher haircuts in busts. The GFC resulted in a dramatic collapse in non-core liquidity, and this collapse of assets used as collateral such as MBS contributed to the sharp increase in haircuts, the run on repo and ABCP, and their collateral fire sales, which helped the contagion of the crisis.

Financial regulations, such as some methods of what James Tobin called “throwing sand in the wheels”, can play a key role in restricting excess global liquidity or cross-border capital flows by the activities of global banks. The Volcker Rule, which refers to section 619 of the Dodd-Frank Act and took effect on July 21, 2015, prevent a bank’s asset side from contributing to a boom/bust cycle by prohibiting commercial banks from speculative investments for their own account. On the other hand, the new rules governing the structure and operation of MMFs, adopted by the SEC on July 23, 2014, prevent a bank’s liability side from contributing to a leverage/deleverage cycle by imposing levies on the non-core liabilities by “throwing sand in the wheels”.

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