Balance Sheet of a Central Bank – A Source of Information about the Economic Position of a Country. A Comparative Study of USA and China

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Abstract

The objective of the paper is to present the results of a comparative analysis of the balance sheets of the central banks of USA and China in order to investigate how they reflect the changes in the international positions of these countries on the world economic scene after 2000.

The growth of a country's GDP is usually accompanied by an increase in the monetary base (and consequently the monetary aggregates), but there are also other factors determining the changes in a central bank's balance sheet.

The study presented in the paper contains two steps. First, the collateral of money issue in USA and China during the period 2000-2012 is compared. The main collateral of money issue in USA are U.S. Treasury securities, but after 2008 also mortgage-backed securities. The main collateral of money issue in China are foreign assets. Second step of the study is a comparison of the international position of these countries.

The presented analysis confirms that the collateral of money issue in USA is debt, which reflects the position of USA as a world debtor. The collateral of money issue in China are foreign assets, mainly foreign currencies, which reflects the role of China as a world exporter and creditor.

Keywords: *central bank's balance sheet, net export, international investment position, fiat money*

JEL Classification: F42, F43, E52, E58

Introduction

In 1971 the gold standard (a monetary system in which a unit of currency is based on a fixed quantity of gold) was abandoned and this was the beginning of the fiat money system. Nowadays no country uses a gold standard as the basis of its monetary system, although some hold substantial gold reserves. The fiat money used nowadays is based on treasury and other debt securities, foreign currencies, liquidity and credit facilities for commercial banks etc. This allows central banks to expand the monetary base (high powered money) by purchasing debt securities or foreign exchange from commercial banks in order to meet the liquidity needs of the financial system of the country.

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Recent studies on the central banks' balance sheets are focused on two main topics.

The first is related to the changes of central banks' balance sheets in response to the financial crisis which started in 2007. In this context, quantitative and qualitative changes of balance sheets are investigated. Quantitative easing for commercial banks causes an expansion of the balance sheet total. Reducing the requirements for collateral leads to the qualitative deterioration of balance sheets. An overview of the monetary policy of the Federal Reserve, the European Central Bank and the Bank of England after the crisis began in 2007 is provided by Nagel (2012). Central banks started to offer loans with longer maturities and a broader spectrum of collateral in order to ensure liquidity for commercial banks. The substantial deterioration of the balance sheets of the Fed and ECB and growing exposure to risk is identified by Bagus & Howden (2009) and Bagus & Schiml (2009). These studies reveal that during the crisis period changes in central banks' balance sheets impacted the quality of money.

The second topic is related to the changes of central banks' balance sheets in countries with surplus on their balance of payments. Oil or consumer goods producing countries with strong net export positions experience permanent foreign exchange inflows. The monetary policy of their central banks is addressed to neutralize the foreign exchange inflows and to maintain financial stability. The sterilization effects of central banks' actions in China are examined by Tan & Yang (2012). Schnabl & Schobert (2009) provide detailed analysis of the monetary policies of oil-exporting countries.
McKinnon & Schnabl (2004) distinguish liquidity-providing central banks of large industrialized countries (creditor central banks) and liquidity-absorbing central banks of oil and goods exporting countries (debtor central banks).

The aim of this article is to present the results of a comparative analysis of the balance sheets of the central banks of USA and China – the Federal Reserve (Fed) and the People's Bank of China (PBC) – in order to investigate how they reflect the changes in the international positions of these countries after 2000.

For this purpose, firstly, a stylised version of the central bank's balance sheet is presented, followed by an overview of assets and liabilities of the central banks of USA and China. The main factors reflecting the changes in the total and structure of the balance sheets are analysed. Secondly, the international economic position of the countries measured by their trade balances and net international investment positions are presented. The article ends with conclusions. The significance of the central banks' balance sheets as a source of information about growing world imbalances is emphasized.

1. Central bank's balance sheet

A central bank's balance sheet comprises assets and liabilities of the monetary authority of a country. The structure of a central bank's balance sheet is provided in table 1.

Table 1. A central bank's balance sheet

Assets	Liabilities and Capital

• Domestic assets
• Foreign assets
• Other assets
	• Monetary liabilities (monetary base)
	  ▪ Currency in circulation
	  ▪ Banks' reserves (deposits in central bank)
	• Non-monetary liabilities
	  ▪ Central bank securities
	  ▪ Government deposits
	• Other liabilities
	• Capital

Total Assets	**Total Liabilities and Capital**

The asset side of a balance sheet includes domestic and foreign assets. Domestic assets are treasury securities or other debt securities with a different spectrum of maturities and risk. Foreign assets include foreign exchange or foreign debt securities. The assets are the collateral of the country's issue of currency. In situations of speculative attacks, the central bank uses its assets to protect the currency. The analysis of the asset side of a balance sheet is important for the evaluation of the quality of the currency.

The liability side of a central bank's balance sheet reflects the banking system's structural needs for central bank money. The most important items of liabilities are monetary liabilities, which form the monetary base. This contains currency in circulation and bank reserves (deposits of commercial banks in the central bank). The non-monetary liabilities include securities issued by the central bank and government deposits in the central bank.

The development of a central bank's balance sheet refers to the expansion of the total (both the assets and the liabilities) or to changes in the composition of assets or liabilities without changing the total.

An expansion of the total of the balance sheet is most often caused by increasing the monetary base accompanied by increasing the domestic assets and/or foreign assets:

$$\Delta M = \Delta D + \Delta F, \qquad (1)$$

where:

ΔM – change in monetary base,

ΔD – change in domestic assets,

ΔF – change in foreign assets.

The monetary base increases when in order to provide liquidity the monetary authority purchases domestic debt securities from banks. The monetary base also increases due to the central bank purchasing foreign exchange. This situation often takes place in countries with surplus on their balance of payments. In order to avoid expanding the monetary base, which could cause financial instability, central banks carry out sterilization operations. Purchases of foreign exchange are accompanied by simultaneous sales of domestic assets, so the overall effect on the monetary base is zero. In other words, if

$$\Delta F = -\Delta D, \text{ then } \Delta M = 0.$$

In this case, the composition of assets changes without expanding the balance sheet total.

In order to avoid expanding the domestic monetary base due to foreign exchange purchases, the central bank could also increase non-monetary liabilities, (ΔN), issuing its own securities or accepting government deposits:

$$\Delta F = \Delta N. \qquad (2)$$

In this case the purchase of foreign currency is accompanied by the expansion of the balance sheet total, without changing the monetary base.

Finally, qualitative changes of balance sheets take place when the central bank changes its collateral requirements.

2. An overview of assets and liabilities of the Federal Reserve and the People's Bank of China

The evolution of a central bank's balance sheet reflects the decisions of the monetary authority of the country. A comparative study of the Fed's and PBC's balance sheets reveals marked differences both on the side of assets and the side of liabilities.

2.1 Balance sheet of the Federal Reserve

The structure and development of the Fed's balance sheet during the period 2002-2012 is provided in figure 1. Until the crisis began in 2007 the assets of the Fed's balance sheet comprised about 90% of U.S. Treasury securities (the debt of U.S. government). After the subprime mortgage crisis, the U.S. financial system needed an urgent bailout. The Emergency Economic Stabilization Act, known as Paulson's plan, enacted on October 3rd, 2008, authorized the United States Secretary of the Treasury to spend up to $700 billion to purchase distressed assets from commercial banks, mainly mortgage-backed securities. The total of the Fed's balance sheet doubled and the quality of assets used as collateral for the issue of the U.S. dollar declined substantially. At that period the central bank of USA started to use other instruments providing liquidity such as liquidity swaps and credit facilities for banks. Although the Fed continued to provide liquidity through the outright purchases of government debt, the share of U.S. Treasury securities in total assets declined and varied between 30% and 60% after 2007.

Figure 1 shows the most important items of liabilities on the Fed's balance sheet. Fed notes present the U.S. currency in circulation. The monetary base (Fed notes and bank deposits) rose more than 3 times after 2007 due to the expansion of bank deposits. Before the crisis, banknotes in circulation comprised more than 90% of the Fed's balance sheet total, whereas after 2007 they made up only around half or even less of the total.

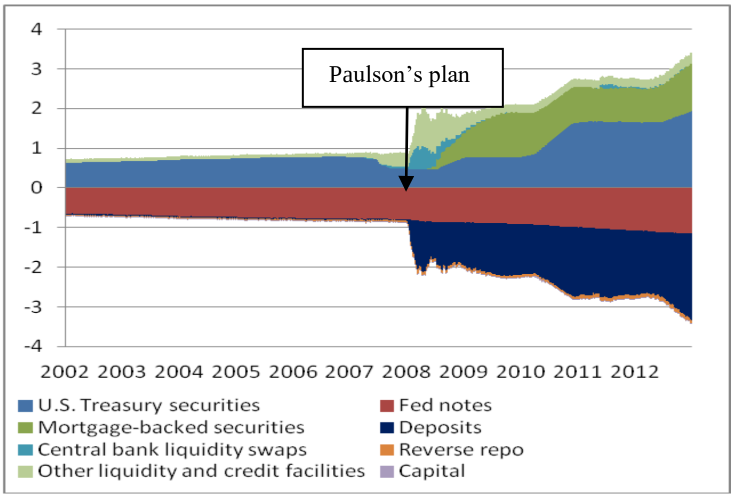

Figure 1. Assets and liabilities of the Federal Reserve, 2002-2012 (billion USD)
(Source: Fed (2014))

To sum up, the main factor affecting the development of the Fed's balance sheet was the financial crisis. In 2007 the central bank of USA started to make its balance sheet deteriorate – substantially expanding the total by purchasing low quality assets and thus changing the composition of assets. As a consequence the quality of the U.S. dollar declined and the risk rose significantly.

2.2 Balance sheet of the People's Bank of China

A look inside the PBC's balance sheet reveals a different picture. The development and structure of its assets and liabilities in 2000-2012 are presented in figure 2. The total of its balance sheet continuously expanded during this period - more than 5 times. As the PBC has the responsibility of managing foreign reserve assets, it passively purchases foreign exchange. Consequently, the PBC's holding of net foreign assets increased more than 11 times and the share of foreign exchange in total assets rose from 40% to 80% during the period.

The most important items of liabilities of the PBC are currency in circulation, deposits of financial institutions and other liabilities (government deposits, issued bonds, foreign liabilities, etc.). The currency in circulation declined from about 40% of the total in 2000 to 20% at the end of the period. The increase of bank deposits and non-monetary liabilities reflects the PBC's actions to neutralize the foreign asset purchases. The biggest influence on the changes in the PBC's balance sheet is passive purchases of foreign exchange from enterprises and financial entities.

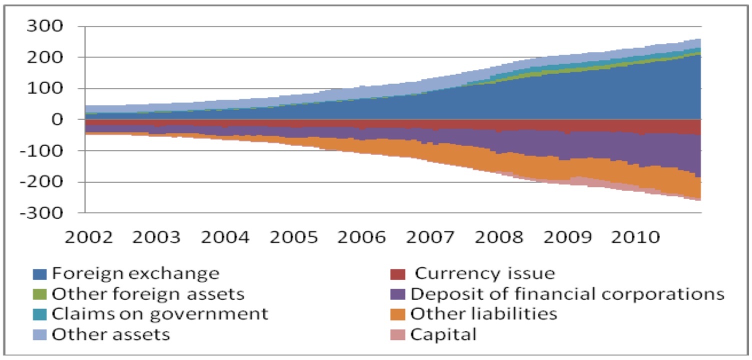

Figure 2. Assets and liabilities of the People's Bank of China, 2002-2012 (100 million CNY)
(Source: PBC (2014))

The comparison of the balance sheet of two central banks reveals, that the Fed is a liquidity-providing central bank, while the PBC is a liquidity-absorbing central bank.

3. International economic position of USA and China

In this section, the evolution of the international economic position of USA and China during the period 2000-2012 is compared. In order to examine the trade position of the countries, their current accounts are investigated. Furthermore, a comparison of the net international investment positions of the countries is presented.

3.1 Trade balance

The current accounts of USA and China are shown in figure 3. The trade balance of USA is negative due to the permanent prevailing volume of import over export.

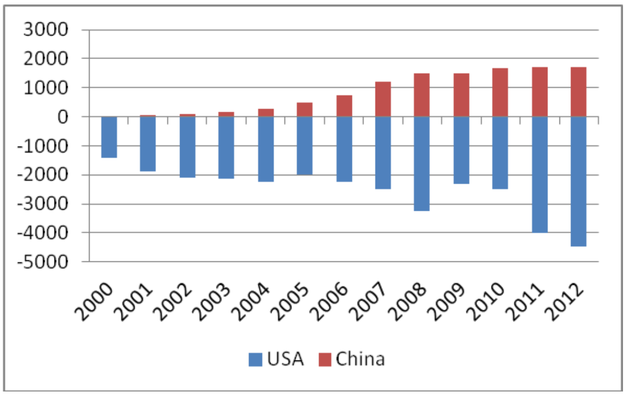

Figure 3. Current accounts of USA and China, 2000-2012 (billion USD)
(Source: Data World Bank (2014))

Since 2000 China has registered surplus on its current account due to strong net export.

3.2 Net international investment position

The net international investment positions of USA and China are provided in figure 4. While USA experienced net capital outflow and has developed as a net debtor nation, net capital inflows to China have affirmed its creditor position with rising external wealth.

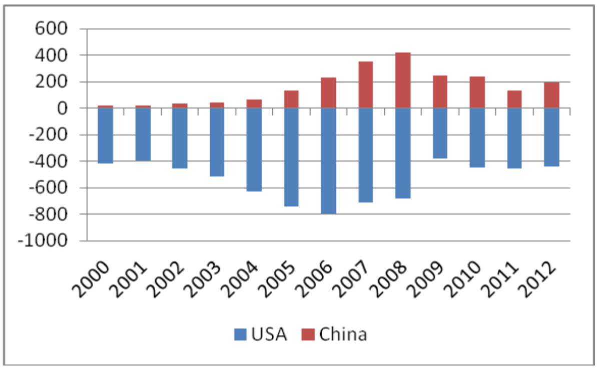

Figure 4. Net international investment positions of USA and China, 2000-2012 (billion USD)
(Source: U.S. Bureau of Economic Analysis, PBC)

Summarizing, USA have negative net export and negative net international investment position. China, on the contrary, has strong positive net export and positive net international investment position.

Conclusions

The main collateral of the issue of the U.S. dollar until 2007 was U.S. Treasury bonds and after the financial crisis began, mortgage-backed securities as well. Consumer life style, negative net export and the negative net international investment position of USA have caused growing external and internal debt. The quantitative expansion and qualitative deterioration of the Fed's balance sheet went hand in hand with the deepening debtor position of USA on the international scene.

On the other hand, the PBC's holdings of foreign exchange have increased continually since 2000. Due to its strong export, China has accumulated substantial savings and become the net creditor of the world.

Considerable differences in the asset side of the balance sheets of the central banks of USA and China reflect the international position of these countries.

The Fed is a liquidity-providing central bank, while the PBC is a liquidity-absorbing central bank. The increase of debt in USA and accumulation of savings in China are part of circular and cumulative processes enabled by contemporary fiat money system. The presented analysis confirms the asymmetric nature of the world currency system which could be the source of growing imbalances.

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