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### **The impact of Great Recession on central bank balance sheet**

#### **Abstract**

The financial crisis that began on the real estate market in the USA resulted in relevant changes in the theory and practice of monetary policies. It led to an appraisal of unconventional monetary policies, in which a special place is held by balance-sheet policy. These types of actions were taken by significant numbers of central banks. A direct result of the balance-sheet policy conducted by the central bank is an increase and change to the structure of its balance sheet. This also indicates how difficult in implementation so-called exit strategies are going to be. The aim of the article is to present the impact of the Great Recession on the central bank's balance sheet to the Gross Domestic Product ratio. This relation is important because it unveils the scale of the central bank's intervention into the economy during the subprime crisis. This paper contains an analysis of the balance sheet/GDP ratio in the USA, the Eurozone, the UK and Japan.

**Keywords:** monetary policy, balance sheet policy, financial crisis, quantitative easing, lender of last resort.

**JEL CODE:** E58, G01.

### **Kryzys finansowy a udział bilansów banków centralnych w gospodarce**

#### **Abstrakt**

Kryzys finansowy, zapoczątkowany na amerykańskim rynku nieruchomości, skutkowało znaczącymi zmianami w sposobie prowadzenia polityki pieniężnej. W teorii i praktyce zaczęto mówić o tzw. niekonwencjonalnej polityce pieniężnej. W jej ramach szczególne miejsce zajmuje polityka bilansu banku centralnego. Na jej zastosowanie zdecydowało się liczne grono kierujących polityką pieniężną. Bezpośrednim rezultatem polityki bilansu banku centralnego jest zwiększenie sumy bilansowej oraz zmiana kompozycji aktywów i pasywów instytucji kierującej polityką pieniężną. Celem artykułu jest przedstawienie wpływu kryzysu finansowego (tzw. *Great Recession*) na relację sumy bilansowej wybranych banków centralnych do produktu krajowego brutto. Zobrazowanie kształtowania się wymienionej relacji jest istotne, gdyż pokazuje skalę ingerencji banku centralnego w gospodarkę, która nastąpiła w rezultacie kryzysu finansowego. Ukazuje ona również skalę trudności przed jaką staną prowadzący politykę

pieniężną przy wdrażaniu tzw. strategii wyjścia. W opracowaniu dokonano analizy ewolucji sumy bilansowej banku centralnego w relacji do produktu krajowego brutto w USA, strefie Euro, Anglii oraz Japonii.

**Słowa kluczowe:** polityka pieniężna, polityka bilansu banku centralnego, kryzys finansowy, luzowanie ilościowe, pożyczkodawca ostatniej instancji.

## **Introduction**

The theory and practice of monetary policy in recent years has undergone significant evolution. To describe this situation, some economists use a metaphor in which they represent central banks as ships that sailed into unknown waters (Borio 2011, p. 5). Moreover, in the ongoing debate on the future of monetary policy, more and more voices indicate the need to redefine the goals set for it. Among a position worth mentioning is that of Ben Bernanke, former President of the Fed, who stated the need to increase the importance of activities aimed at ensuring the stability of the financial system (Zumbrun, Kruger 2012). In this context, Jeffrey Frankel's statements (2012) deserve a mention, who had announced "the death of the direct inflation targeting strategy (DIT)". He claimed that it did not succeed in preventing asset bubbles<sup>69</sup>. Despite such declarations in recent years, the US Fed and the Bank of Japan have likened their monetary policy to the DIT strategy (Gorstal et al., 2015, p. 14).

In addition to the problem of choosing the right strategy, recent years, and in particular the period of the subprime financial crisis, were characterized by a change in the tools used by central banks. The balance sheet policy has become a new instrument used to counteract the effects of the global crisis. It adopted various formulas but their common features are changes in the structure or size of the central bank's balance sheet. This study analyzes the change in the size of balance sheet totals that took place in recent years at selected central banks. These banks are: the US Federal Reserve System, the European Central Bank, the Bank of England and the Bank of Japan. In order to illustrate the scale of this phenomenon, a comparison of their balance sheet totals with gross domestic product was also made.

## **The central bank balance sheet policy - characteristics**

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<sup>69</sup> As an alternative to DIT, he pointed to a nominal anchor in the form of nominal GDP

In 2004, B. Bernanke, looking for the reasons for significant stabilization in terms of economic growth dynamics and inflation in the 1990s (the so-called Great Moderation)<sup>70</sup> had underlined achievements in the field of macroeconomic policy, and in particular monetary policy, as one of the reasons. Within the then existing consensus, "the monetary policy stance was determined only with the use of a short-term interest rate" (Borio, Disyatat 2009, p. 9). Hence, it is referred to as the interest rate policy. It is characteristic of announcing the desired interest rate and using liquidity operations only to ensure its functioning on the market. Thus, these operations performed only a technical function and did not convey any information (Borio, Disyatat 2009, p. 10).

B. Bernanke, V. Reinhart and B. Sack (2004, p. 4) note that under "normal circumstances" the central bank may influence the long-term interest rate as part of the interest rate policy by shaping the expectations of market participants through communication regarding the planned future policy of the interest rate.

This way, it determines the level of the interest rate that is crucial for the economic decisions made. In a crisis situation, this type of monetary impulse channel is becoming ineffective. This problem was shown by the economic slump that started in the US real estate market in 2007. This forced significant changes in the style of conducting monetary policy.

An alternative to the interest rate policy is the central bank balance sheet policy. According to the systematics presented by C. Borio and P. Disyatat (2009, p. 1), "it involves the active use of the central bank balance sheet item in order to directly affect market prices, as well as the long-term interest rate". The aforementioned authors also distinguished four of its types, which are (Borio, Disyatat 2009, p. 9):

- the exchange rate policy - it involves the central bank intervening on the currency market,
- the quasi-debt management policy - consists of buying public sector debt securities from the private sector,
- the credit policy - under which the central bank attempts to change the conditions on the loan market for the private sector. For this purpose, it may: increase the scope of accepted collateral for the loans it offers, extend the period of the loan offered, expand the list of partners in offered credit programs and purchase securities issued by the private sector,
- the bank reserve policy - it is distinguished from the policies above by the direct objective of increasing the size of reserves of commercial banks maintained in the central bank.

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<sup>70</sup> The stabilization of the economic situation that lasted from the mid-1980s has been pointed out by Fr. Blanchard and J. Simon (2001).

The direct results of the central bank balance sheet policy, regardless of its type, are the increase in the balance sheet sum of the central bank and its composition. Such a situation carries various types of risk, including the loss of independence and credibility, credit and interest rate risks, the scale of which cannot currently be estimated. Therefore, the answer to the question about the scale of using the policy of the central bank balance is important.

### **The dynamics of balance sheet totals of selected central banks in 1980-2016**

Several criteria determined the selection of central banks for the analysis of the dynamics of balance sheet totals. First of all, the significance of the given entity for situations on international financial markets was decisive. Secondly, the scale of unconventional measures applied was considered. It should be emphasized here that the effects of the exchange rate policy have not been taken into account, as, as Borio and P. Disyatat note (2009, p. 9), this type of bank balance policy constitutes a conventional activity<sup>71</sup>. Therefore, the situation of the following four central banks is presented below: the Federal Reserve System, the European Central Bank, the Bank of England and the Bank of Japan. In order to present the scale of the growth of central banks' balance sheets and their exceptional nature, the data relate to a period of over 30 years.

#### **The US Federal Reserve System**

The financial crisis initiated within the American economy resulted in a significant reduction in economic activity and an increase in unemployment. There was also a threat of the emergence of deflation processes. It should be mentioned that in 2002, in a speech with a loud title - Deflation: Making sure "It" does not happen here - B. Bernanke (2002) presented a list of central bank activities, the implementation of which was to protect against deflationary spiral. Among the announced steps, the importance of the central bank balance sheet policy was underlined. By taking actions to stabilize the situation on the financial markets and in the real economy, the Fed President was already carrying out those recommendations.

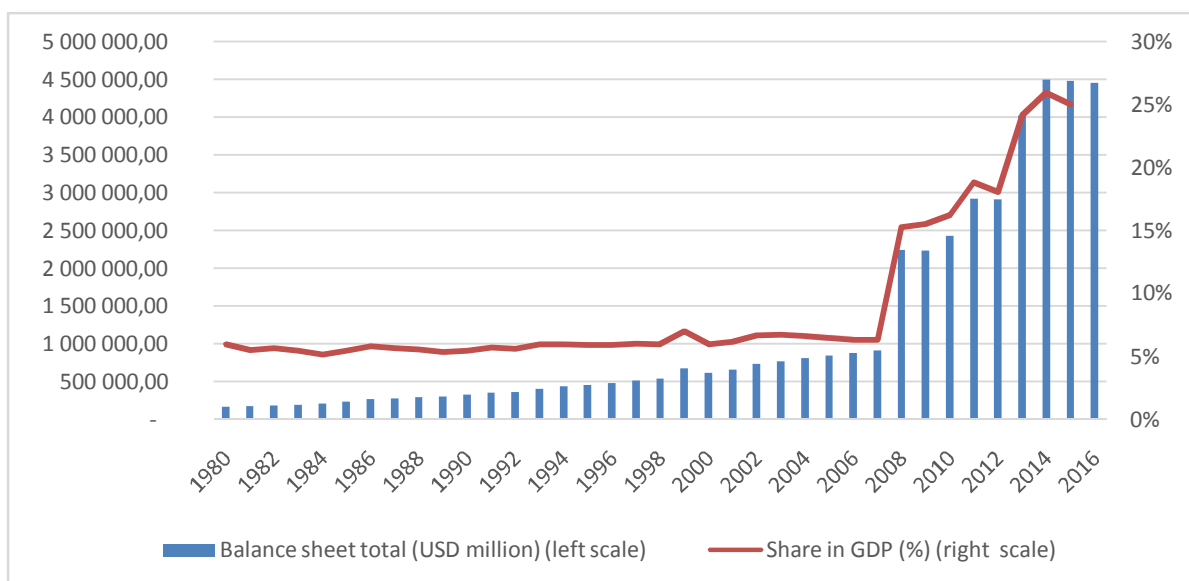
Between 2008 and 2016, The Federal Reserve system implemented numerous programs characteristic to a central bank balance policy. They included: Money Market Investor Funding Facility (MMIFF), the Asset-Backed Commercial Paper Money Market Mutual Fund

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<sup>71</sup> This is obviously a contractual matter. However, it is worth noting that when considering the actions of some central banks on this issue (eg Swiss National Bank) and record levels of foreign exchange reserves (in August 2014 they reached USD 12.03 billion (Xie, Wong 2015) their "conventionality" raises doubts. Due to the scope of this study, they had to be omitted.

Liquidity Facility (AMLF), the Commercial Paper Funding Facility (CPFF), the Primary Dealer Credit Facility (PDCF), the Term Securities Lending Facility (TSLF) and the Term Auction Facility (TAF) (see Bernanke 2009). However, due to its scale and the long-term impact it had on the Fed balance, the most significant was the Large Scale Assets Purchases (LSAP) program<sup>72</sup>. It was implemented in three rounds, which took place in 2008-2009, 2010-2011 and 2012-2014 respectively. The financial assets purchased under this program included federal government bonds, agency bonds<sup>73</sup>, and mortgage-backed securities (MBS) guaranteed by the federal government.

**Chart 1. Balance sheet sum of the Federal Reserve System and its relation to GDP in the years 1980-2016**



Note: data for the end of the period; for 2016, data from October were used

Source: own study based on (Annual Report, Board of Governors of Federal Reserve System, 1980-2015 and World Bank Data).

Upon analyzing Chart 1, it becomes apparent that the result of the policy of central bank balance applied by the Federal Reserve System in the years 2008-2016 was a significant increase in the size of its balance sheet. Since the onset of the crisis, it has more than quadrupled. Furthermore, the Fed's balance sheet total is the largest it's been in over 30 years. The continuous line marked on graph 1 corresponds to the question about the balance of the central bank to GDP. As in the case of nominal values, the central bank / GDP balance relation as a result of anti-crisis measures in recent years has reached its historic peaks. In addition, in the last 36 years, it has never approached these values. Moreover, it should be noted that compared to 2007, it is currently close to 20 pp. higher.

<sup>72</sup> Colloquially referred to as *quantitative easing* (QE).

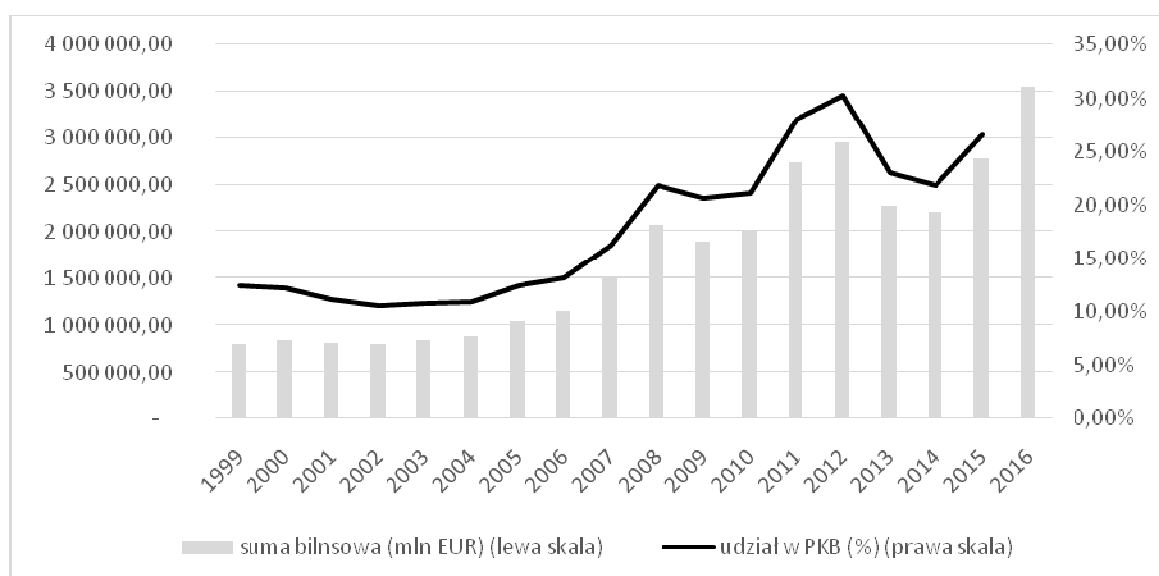
<sup>73</sup> Fannie Mae, Freddie Mac and Ginnie Mae

## The European Central Bank

Similarly to the Federal Reserve System, the European Central Bank (ECB) decided to apply extraordinary solutions to its monetary policy in face of the crisis situation. It should however be noted that its institutional determinants were much more complicated. Hence, these activities gradually evolved and only after a few years reached the formula corresponding to a policy of quasi-management of public debt<sup>74</sup>. The most important programs shaping the size of the Eurosystem balance sheet total were or are: the Covered Bond Purchase Program (three rounds), the Securities Market Program, the Long-term Refinancing Operations, the Targeted Long-term Refinancing Operations, the Asset-Backed Securities Purchase Program, the Public Sector Purchase Program and the Corporate Sector Purchase Program. Of note is also the Outright Monetary Transactions (OMT) program, which, although it did not affect the size of the Eurosystem's balance sheet<sup>75</sup>, undoubtedly contributed to easing the costs of financing the debt of the peripheral Eurozone countries.

Although the time series available to the Eurosystem is significantly shorter than in the case of other central banks, the increase in the balance sheet total resulting from anti-crisis measures is clearly visible. Between 2007 and 2016, it has more than doubled. The relation to GDP has also significantly increased. While in the year when the Eurozone began operating it was around 12.5%, in 2012 it exceeded 30%.

**Chart 2. Eurosystem balance sheet total and its relation to eurozone GDP in the years 1999-2016**



Note: data for the end of the period; for 2016, data from October were used

<sup>74</sup> Currently, some programs implemented by the ECB are even "more unconventional" than the anti-crisis measures of the Federal Reserve System.

<sup>75</sup> Up until now, no Member State has decided to use OMTs.

Source: own study based on: (*Annual Report*, European Central Bank, 1980-2015 and Eurostat data)

### **The Bank of England**

The negative consequences of the collapse of Lehman Brothers in September 2008, through the contagion effect, also affected the British economy. In response, the Bank of England decided on an unprecedented reduction of the basic interest rate to the level of 0.5%, in March 2009<sup>76</sup>. In the opinion of the Monetary Policy Committee, these activities were insufficient, hence the next steps taken by the Bank of England were the policies of the central balance sheet carried out as part of the Asset Purchase Facility program.

The APF program launched in January 2009 was initially financed with funds from the issue of Treasury securities and debt management operations, so it did not constitute quantitative easing (Joyce et al. 2011, p. 203). It was not until three months later that the MPC decided to use the money creation of the central bank to finance the program. Under the APF, the Bank of England acquired mainly Treasury debt securities. In addition, it became involved in the corporate bond market, if only slightly.

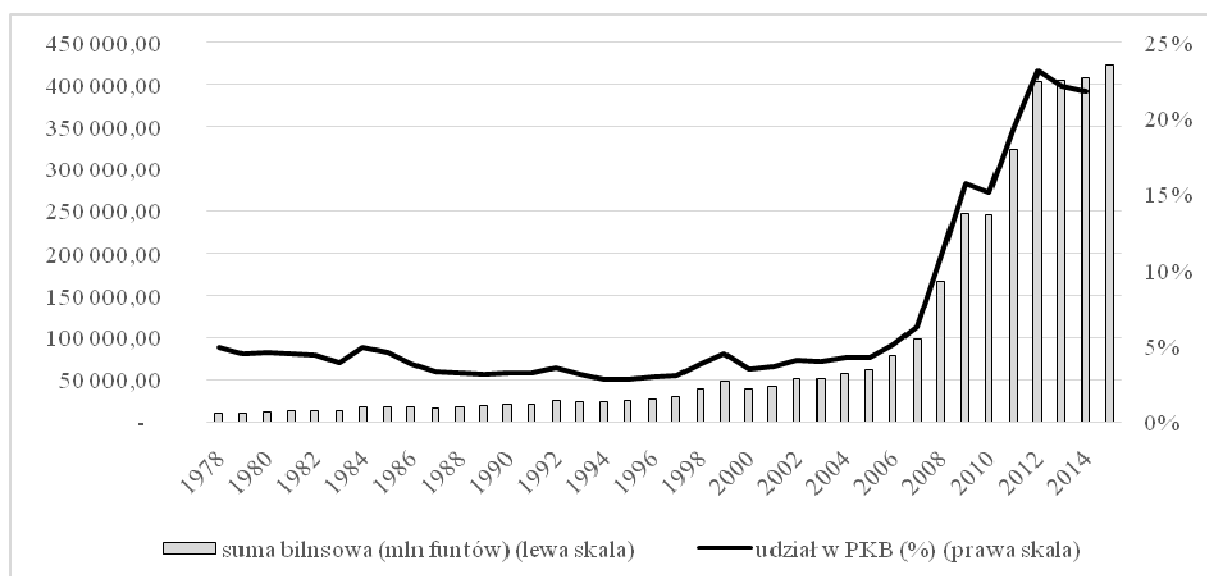
The Bank of England also used the central bank balance sheet policy to limit the negative consequences of Brexit<sup>77</sup>. In August 2016, the MPC decided to increase the level of government bonds maintained within the APF up to GBP 435 billion. Furthermore, a decision was made to acquire corporate bonds worth GBP 10 billion over the next 18 months. Chart 3 shows how, as a result of the Bank of England's activities, the size and relation of its balance sheet to its GDP shaped.

#### **Chart 3. Balance sheet sum of the Bank of England and its relation to GDP in 1980-2016**

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<sup>76</sup> In 2016, as a result of the announcement of Brexit, this rate was reduced to 0.25% (Bank of England 2016).

<sup>77</sup> <http://www.bankofengland.co.uk/markets/Pages/apf/default.aspx>



Note: data for the end of the period; for 2016, data from October were used

Source: own study based on: (*Annual Report*, Bank of England, 1980-2015 and Eurostat data).

Chart 3 shows that the balance sheet policy of the Bank of England resulted in a significant increase in its balance sheet total. It reached its peak in the analyzed period, i.e. over 30 years. Furthermore, its relation to GDP also reached its historical maximum. Its average value in the period from 1980 to 2007 was 4%, while in recent years it has been at the level of over 20%. It should however be noted that this value is smaller than those in the case of the Federal Reserve System and the European Central Bank.

### The Bank of Japan

Among the central banks mentioned above, the Bank of Japan has the most historical experience in conducting central bank balance sheet policy. At the beginning of the 21st century, in order to combat deflation, he decided to apply the policy of bank reserves (see Kimura, Small 2004). This policy is apparent on chart 4 in the form of an increased amount of the balance sheet total in 2001-2005.

The subprime crisis has had negative consequences for the Japanese economy as well. Previously unresolved problems and the global economic downturn have forced the monetary and fiscal authorities to take decisive reform measures. The result was the concept of "three arrows" of Prime Minister Shinzo Abe (often also referred to as Abenomics). One of them is to be an expansive monetary policy, which is to limit deflationary phenomena in the economy. In April 2013, the Bank of Japan chaired by its new president - Haruhiko Kuroda - decided to implement the Quantitative and Qualitative Monetary Easing program. According to it, Japan in the next two years was to reach the inflation level of 2% y / y by doubling the

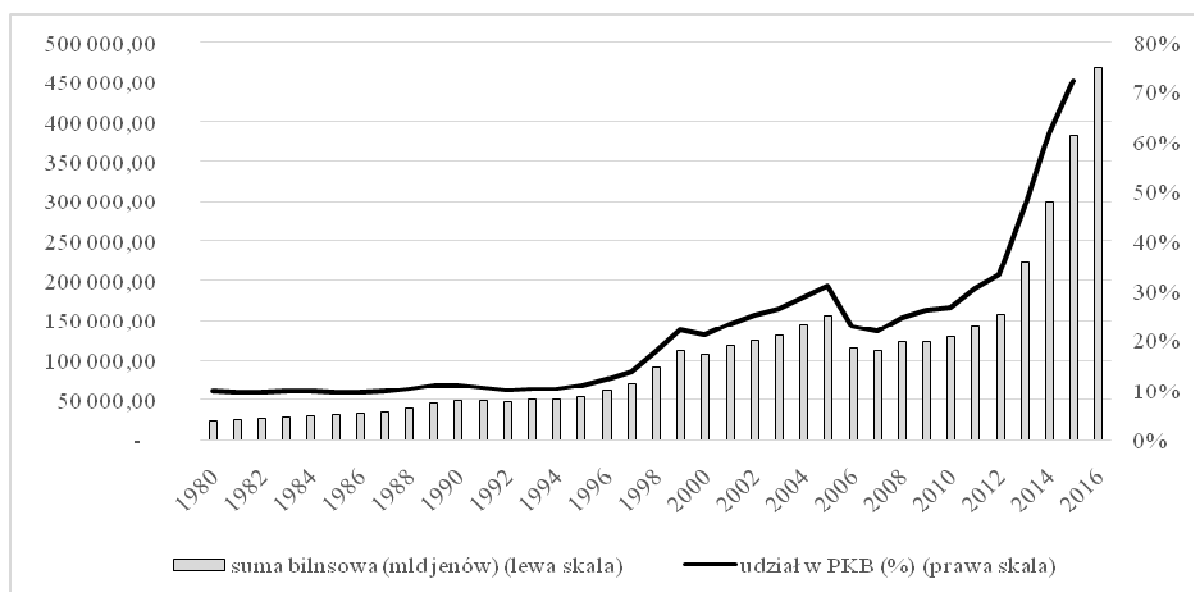


monetary base (Bank of Japan 2013), which is why the head of the IMF - C. Lagarde - described it as the “triple 2”. Moreover, the new program implied the suspension of the banknote principle, which was in force in the case of quantitative easing from 2001-2006. According to said principle, the value of government bonds held by the Bank of Japan could not exceed the amount of cash (Bank of Japan 2013, p. 2). The securities purchased by the Bank of Japan within this program include: government bonds, EFTs (exchange-traded funds) and J-REIT, (Japan Real Estate Investment Trusts). The last change in the policy of the Bank of Japan is the introduction of "Quantitative and Qualitative Monetary Easing (QQE) with Yield Curve Control". The decision to introduce said change was taken in September 2016. According to this program, the central bank is to control the slope of the yield curve using its balance sheet. Earlier attempts to influence the forward interest rate structure took place as part of the interest rate control strategy.

Chart 4 shows that the Bank of Japan policy resulted in an unprecedented increase in the balance sheet total. Thus, it definitely exceeded the levels recorded in the quantitative easing period from 2001-2006. Moreover, compared to 1980, BoJ's balance increased nearly 20 times. This historical comparison shows the scale of expansion of its activities.

Similar conclusions can be drawn from the analysis of the change in the relation of the balance sheet in relation to the GDP of Japan. In comparison with 2007, it increased by as much as 50 pp. It also stands out significantly when compared with that of the other central banks. The analyzed relation is more than 40 pp higher for the BoJ than for the other central banks indicated in the study. Its magnitude raises a question about its consequences in the future.

**Graph 4. Balance sheet total of the Bank of Japan in 1980-2016 (in billion yen)**



Note: data for the end of the period; for 2016, data from October were used

Source: own study based on (*Annual Report*, Bank of Japan, 1980-2015 and World Bank Data).

## Conclusions

The analysis indicates that the balance sheets of central banks, as a result of their anti-crisis measures, reached their historical levels. Moreover, none of the banks surveyed in the last 30 years (the exception here is the ECB, as it was created only in 1999) has never come close to the current values. The same statement is also true when analyzing the contribution of the central bank's balance sheet to the GDP of a given country (currency area). Therefore, in spite of the words of C. Borio and P. Disyatat (Borio, Disyatat 2009, p. 10) that the balance sheet policy in the past was a "canon" of monetary policy, the current activities of central banks, even from a historical perspective, are exceptionally "unconventional".

Furthermore, the current levels of central banks' balance sheets to GDP (for the US - 25%, the ECB - 27%, the Bank of England - 22%, Bank of Japan - 72%) should raise questions about the connected risk and consequences. The situation may lead to the emergence of such problems as, inter alia: bubbles in asset markets, zombie banks and currency wars. Moreover, based on historical experience, it should be stated that these levels are impossible to maintain for a longer period, hence an important question as to how central banks will limit them (exit strategies) and what the economic consequences will be. These problems will have to be tackled by future monetary policy makers.

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