GLOBAL SAVING GLUT AND MONETARY POLICY: CAUSE-AND-EFFECT RELATIONS

 $^{\odot\,2017}$ amalyan N. D.

UDC 338.23:336.74

Amalyan N. D. Global Saving Glut and Monetary Policy: Cause-and-Effect Relations

The global financial crisis became a landmark both in everyday life of the population of all developed countries, engendering the Great Recession, and in the economic theory, demonstrating the maladjustment of traditional tools of monetary policy. Causes of financial crisis, measures for its mitigation, actual and forthcoming aftermaths of the crisis became the most discussed issues in problem-oriented literature as well as in consumer magazines. Federal Reserve System Chairman Ben Bernanke put the blame for the crisis on external factors, namely global saving glut, while other researchers pointed out internal factors. The article presents an analysis of both approaches and put in doubt the validity of Ben Bernanke's interpretation of the causes and effects of global saving glut, affords proofs that it is the monetary policy of FRS, ECB and Bank of England that is inflating global saving glut and detects risks of the expansive unorthodox monetary policy in Eurozone and in the USA.

Keywords: global saving glut, unorthodox monetary policy, quantitative easing, negative interest rate, secular stagnation.

Amalyan Nataliia D. – PhD (Economics), Associate Professor, Associate Professor of the Department of Banking, Kyiv National University of Trade and Economics (19 Kioto Str., Kyiv, 02156, Ukraine)

E-mail: namalyan@gmail.com

УДК 338.23:336.74

Амалян Н. Д. Глобальний надлишок заощаджень і грошово-кредитна політика: причинно-наслідкові зв'язки

Глобальна фінансова криза стала знаковою як у повсякденному житті населення всіх розвинених країн, спричинивши Велику рецесію, так і в економічній теорії, демонструючи недієвість традиційних інструментів грошово-кредитної політики. Причини фінансової кризи, заходи щодо її пом'якшення, фактичні та майбутні наслідки кризи стали найбільш обговорюваними темами серед фахівців. Голова ФРС Бен Бернанке поклав провину за кризу на зовнішні чинники, а саме: на глобальний надлишок заощаджень, у той час, як інші дослідження вказують на внутрішні чинники. У статті представлено аналіз обох підходів і ставиться під сумнів обґрунтованість інтерпретації Бена Бернанке щодо причин і наслідків глобального надлишку заощаджень. Надаються докази того, що саме грошово-кредитна політика ФРС, ЄЦБ і Банку Англії роздуває глобальний надлишок заощаджень. Також перераховано ризики експансивної неортодоксальної грошово-кредитної політики в Єврозоні та у США.

Ключові слова: глобальний надлишок заощаджень, нетрадиційна грошово-кредитна політика, кількісне пом'якшення, негативна процентна ставка, постійна стагнація.

Бібл.: 20

Амалян Наталія Дмитрівна— кандидат економічних наук, доцент, доцент кафедри банківської справи, Київський національний торговельноекономічний університет (вул. Кіото, 19, Київ, 02156, Україна) **E-mail:** namalyan@gmail.com УДК 338.23:336.74

Амалян Н. Д. Глобальный избыток сбережений и денежно-кредитная политика: причинно-следственные связи

Глобальный финансовый кризис стал знаковым как в повседневной жизни населения всех развитых стран, породив Великую рецессию, так и в экономической теории, демонстрируя безрезультативность традиционных инструментов денежно-кредитной политики. Причины финансового кризиса, меры по его смягчению, фактические и будущие последствия кризиса стали наиболее обсуждаемыми темами среди специалистов. Председатель ФРС Бен Бернанке возложил вину за кризис на внешние факторы, а именно: на глобальный избыток сбережений, в то время как другие исследования указывают на внутренние причины. В статье представлен анализ обоих подходов и поставлена под сомнение обоснованность интерпретации Бена Бернанке относительно причин и последствий глобального избытка сбережений. Представлены доказательства того, что именно денежнокредитная политика ФРС, ЕЦБ и Банка Англии раздувает глобальный избыток сбережений. Перечислены риски экспансивной неортодок-

Ключевые слова: глобальный избыток сбережений, неортодоксальная денежно-кредитная политика, количественное смягчение, отрицательная процентная ставка, постоянная стагнация.

сальной денежно-кредитной политики в Еврозоне и в США.

Амалян Наталия Дмитриевна — кандидат экономических наук, доцент, доцент кафедры банковского дела, Киевский национальный торгово-экономический университет (ул. Киото, 19, Киев, 02156, Украина) E-mail: namalyan@gmail.com

lobal saving glut (GSG) is a term coined by a former Chairman of the Federal Reserve System Ben S. Bernanke (at that time a member of the FRS Board of Governors): for the first time he used it in his speech in 2005 in Richmond, Virginia [1]. It is, in brief, a short code for a situation in which the volume of world's desired savings exceeds desired investments.

In Ben Bernanke's opinion, GSG, being caused mainly by external factors, became one of the main sources of global financial crisis of 2007-2008. To manage fallout of the crisis, FRS, accompanied by ECB and major national central banks, after extensive application of all available classical tools proceeded to unorthodox policies, including originally subprime lending, and later – quantitative easing and zero/negative interest rates.

The *aim* of the article is to examine cause-and-effect relations between monetary policy (especially in the USA) and global saving glut, concurrent with the analysis of the possible consequences of GSG itself and phenomenon engendering it.

The emergence of global saving glut was dated by Ben Bernanke "past 8 to 10 years", meaning 1995-1998. The main cause of the new phenomena, in the opinion of FRS Chairman, was a combination of diverse forces/developments that had created a significant increase in the global supply of savings; these developments included the following:

 strong saving motives of rich countries with aging populations, which caused mature industrial economies as a group seek to run current account surpluses and thus to lend abroad;

- a series of financial crises experienced by developing countries in the past decade or so, which transformed the developing world from a net user to a net supplier of funds to international capital markets;
- the demand for "war chests" of the most prosperous developing countries that had escaped the worst effects of the crisis but remained concerned about future crises, notably China;
- the sharp rise in oil prices that resulted in current account surpluses of oil exporters;
- development and adoption of new technologies and rise of the productivity in the United States (together with the country's long-standing advantages, such as low political risk, strong property rights, and a good regulatory environment) that made the U.S. economy exceptionally attractive to international investors during that period, etc.

The consequences of these developments, as Ben Bernanke stated, was huge inflow of capital (\$530 billion) to the US debt market buying American Treasury securities and other assets (as an interim result) and GSG (as a net result) [1].

With a helping hand of FRS Chairman, the term 'global saving glut' became a set phrase widely discussed in modern problem-oriented literature. Ten years later Ben Bernanke himself reiterated his theses, taking a global perspective and listing external factors as main causes of Great Recession [2].

According to FRS Chairman, it were strong inflows of capital that gave birth to subprime crisis (housing bubble) in the USA, while "the link between the monetary policy in the early part of the past decade and the rapid rise in house prices that occurred at roughly the same time" is "at least, weak" [3].

Bernanke's hypothesis strongly influenced economists' analysis; in many cases it was fully accepted (for example, the one carried out by J. Tatom, N. Ferguson, P. Krugman and R. Wells, A. Belke and D. Gros), while in other cases the authors (J. Taylor, F. Mishkin, W. Seyfried and R. College, P. Mizen, T. Bracke and M. Fidora, D. Mayer-Foulkes, D. Diamond and R. Rajan, F. Sà, P. Towbin and N. Wieladek and B. Giancarlo, C. Borio and P. Disyatat, M. Bordo and J. Landon-Lane) pointed to the monetary policy of the Federal Reserve as a cause of the crisis.

Por the last decade the term "GSG" became one of the hottest issues. The whole legion of politicians and economists took up the idea, simultaneously presenting their own interpretation of the causes and effects of GSG.

The whys and wherefores of GSG. The most comprehensible explanation of the invalidity of Ben Bernanke's statement was presented by Bertocco Giancarlo: "If we consider a world composed of two geographical areas, one being an economically advanced country, the U.S., and the other being an emerging economy, we can assume that the trade between the two areas would be carried out in the currency of the more developed country, i.e. the U.S. dollar. In this case, the money accumulation process by the ... producers in the emerging economies cannot only be the result of their decision to produce more ..., but it is the con-

sequence of the sale ... to U.S. consumers or entrepreneurs". Again, "the purchase ... by the U.S. is only possible thanks to the availability of dollars". Therefore, "the availability of money to U.S. consumers or entrepreneurs does constitute the necessary origin of the process that determines the symmetrical imbalances in the trade balances of the U.S. and of the emerging economies... The accumulation of money by emerging countries and the consequent trade balance surplus are not the cause of the housing bubble, but rather the result of the decision of the U.S. financial system to expand credit to households and firms; the phenomenon of speculation is linked to the presence of a bank money that permits to underline the concepts of wealth, investments, innovations and uncertainty. These elements, which lead to recognize the endogenous nature of crises, are neglected by the mainstream theory" [4].

n a more sophisticated manner John B. Taylor, basing on the statistical analysis, argued that excessively low policy rates led to the housing bubble: "government actions and interventions caused, prolonged, and worsened the financial crisis. They caused it by deviating from historical precedents and principles for setting interest rates, which had worked well for 20 years" [5]. W. Seyfried and R. College [6] demonstrated that the loose monetary policy significantly affected housing price rise in Ireland, Spain and the USA in the recent years. Frederic Mishkin [7] commended that "although it is far from clear that the Federal Reserve is to blame for the housing bubble, the explosion of microeconomic research, both theoretical and empirical, suggests that there is a case for monetary policy to play a role in creating credit bubbles". F. Sá, P. Towbin and T. Wieladek [8] used a panel data of the OECD countries to prove that the monetary policy and capital inflows shocks had a significant and positive effect on the real house prices, real credit to the private sector and real residential investment. Claudio Borio and Piti Disyatat [9] indicated that it was not the global saving glut but credit creation, that became a defining feature of the monetary economy, which played a key role as a main contributor to the financial crisis.

Statistics apparently verifies their point of view. *Quantifying the volume of the global saving glut.*

Solving the problem of cause-and-effect relations between the GSG and FRS monetary policy may be facilitated by statistics:

- → in 2005 Ben Bernanke, defining the causes of GSG, indicated the \$530 billion deficit of the US current account, which in his opinion was the main reason of GSG;
- ★ between February 1, 2006 and February 3, 2014 (period of FRS under Ben Bernanke's guidance) the monetary base in the USA was increased from \$836 billion to \$3.88 trillion [10] – that is by more than \$3 trillion.
- similar policy of quantitative easing (still in process) in Europe has already resulted in increase of the monetary base in Eurozone by €1.1 trillion and in the United Kingdom by £375 bn.

The emission of such a huge amount of new money was accompanied by the lowering of corresponding prime

rates: dealing with woes of Great Recession, Chairman of FRS let effective federal fund rate fall from 5.25 % to 0.07% [11] while Governors of Bank of England decreased the official bank rate from 5.75% to 0.25% [12].

The most drastic arrangements were made by Mario Draghi, who let the ECB's fixed rate fall from 3.25% to -0.40% [13]. Similar negative interest rates were set in 2009 in Sweden, in 2016 – in Denmark and Switzerland (not direct participants in the Euro currency zone) and in Japan.

In an interview in December 2015, a former Federal Reserve Chairman Ben Bernanke said that FRS was likely to add negative interest rates as a policy tool. And in February 2016 a testimony before the US House of Representatives, FRS Chairwoman Janet Yellen stated that negatives were still on the policy table.

Such policy, according to the theory, was supposed to stimulate economy – vast amount of cheap money had to raise both consumption and investments. But in reality at the moment of Ben Bernanke's discharge from the duties of FRS Chairman we were witnessing a down-drift of the multiplier in the USA below one – to 0.7 [14] – the figure theoretically invalid.

In light of this several actual topics for discussion sprang up.

ne of them is a 'liquidity trap'. This trap, according to the definition in Business dictionary, refers to the situation where bank cash-holdings are rising and banks cannot find sufficient number of qualified borrowers even at extraordinary low rates of interest. It usually happens where people are not buying and firms are not borrowing (for inventory or plant and equipment) because the economic prospects look dim, investors are not investing because expected returns from investments are low, and/or a recession is beginning. People and businesses hold on to their cash and thus get trapped in a self-fulfilling prophecy.

Before the Great Recession all of us were adhering to traditional Hicks-Krugman interpretation of the liquidity trap. In conformity with it, when an economic shock knocks an economy into a bad equilibrium and the rates fall to zero (at this point the monetary policy loses its punch and the economy remains sank into a shortage of demand), the government either needs to borrow gravely and spend to boost demand, or the central bank needs to promise to tolerate high inflation at some point in the distant future.

An alternative view emerged over the course of the recession, which Ryan Avent calls the Friedman-Schwartz-Bernanke story [15]: Ben Bernanke's Federal Reserve System adopted a version of Milton Friedman and Anna Schwartz view: that liquidity trap is only a trap for an insufficiently aggressive central bank. Use an enough unconventional monetary policy, and the trap can be overcome.

And so the Federal Reserve System never attempted to gin up any sort of regime change, or to dramatically increase the market's expectations for future inflation. Instead, it used in turns QE1, QE2, QE3 and promised to keep rates low for as long as necessary to support demand; Ben Bernanke himself [2] listed prerequisites for success: "1) China continues to move away from export dependence toward greater reliance on domestic demand; 2) the buildup of fore-

ign reserves among emerging markets, especially in Asia, continues to slow, and (3) oil prices remain low.... If global imbalances in trade and financial flows do moderate over time, there should be some tendency for global real interest rates to rise, and for US growth to look more sustainable"; all of them are evidently exogenous.

Contrary to Ben Bernanke's approach teeming economists adhere to the Hansen-Summer's concept of "secular stagnation".

Alvin Hansen, who is best known for his introduction of Keynesian economics in the United States in the 1930s, all his professional life, was a diligent researcher of business cycles; in the late 30s analysis of the aftermath of Great Depression led him to the detection of a secular stagnation as a possibility for the United States economy [16].

In the wake of Great Recession 71st Secretary of the Treasury and a former Chief Economist of the World Bank Lawrence H. Summers justified the application of Hansen's term to the current US economy stating that "macroeconomics, just 6 or 7 years ago, was a very different subject than it is today". And "it is fair to say that 6 years ago, macroeconomics was primarily about the use of monetary policy to reduce the already small amplitude of fluctuations about a given trend, while maintaining price stability... Today, we wish for the problem of minimizing fluctuations around a satisfactory trend... Today, it is increasingly clear that the trend in growth can be adversely affected over the longer term by what happens in the business cycle. And today, there are real questions about the efficacy of monetary policy, given the zero lower bound on interest rates" [17]. As L. Summers declared, one of the most relevant issues at present is a prospect of secular stagnation.

ccording to modern definition, secular¹ stagnation is a condition of negligible or no economic growth in a market-based economy, when the percentage of savings is likely to start exceeding that of longer-term investments in, for example, infrastructure and education, that are necessary to sustain future economic growth. The absence of such investments (and, consequently, of the economic growth) leads to declining levels of per capita income (and, consequently, of per capita savings). With the reduced percentage savings rate converging with the reduced investment rate, economic growth comes to a standstill – i.e., it stagnates [18]. In his keynote address at the NABE Policy Conference in 2014, Larry Summers proved the presence of all the main features of the secular stagnation in the American economy on the basis of comprehensive statistical data. And his statement is receiving more and more powerful backing from an increasing number of economists.

Another topic for consideration is an economic essence of the 'negative interest rate'.

From university textbooks we remember Zero Lower Bound Problem (ZLBP): a situation in which the central bank of a country wants to lower the short-term nominal

¹ The term *secular* in this context is used in contrast to *cyclical or short-term*, and suggests a change of fundamental macroeconomic dynamics.

interest rates but faces a hindrance when the interest rate reaches or nears zero and cannot lower it further. But at present we witness rates going below zero in all major European countries.

sually central banks pay interest on the excess reserves – those above the minimum level required – of commercial banks. As a rule, banks prefer not to hold excess reserves because the interest rates offered by central banks are much lower than the market ones. However, when financial risks rise some commercial banks choose to hold higher reserves with the central banks. On a large scale this is leading to a credit freeze.

In order to avoid such a situation some central banks and ECB started to charge money for excess reserves instead of paying for them. They do it in an attempt to prod commercial banks to lend more money to businesses and consumers rather than maintain large balances with the central bank. As a matter of fact, they are forcing commercial banks to leverage their balance sheet to a higher level, to cut down on excess reserves and lend — or the central bank is going penalize the banks by charging interest on their deposits.

In *practice* such policy is fraught with serious risks:

(i) If commercial banks decide to pass on the cost of the negative rates to their customers (i. e. to charge customers for keeping their savings in the bank), the customers might simply withdraw their savings. In a worst-case scenario, this could create a run on the banks. Net result – inhibition of free flow of funds through the financial system (i.e. effect reverse to required).

The likelihood of such result can be demonstrated by the rising visibility of the term "disintermediation risk" (reduction in the use of banks and savings institutions as intermediaries in the borrowing and investment of money, in favor of direct involvement in the securities market) in economic literature.

- (ii) Visa versa, if the banks continue to absorb the costs, it would shrink their profits. As of today net interest income as a share of banks' total income has already fallen by 13%: from 67.6 percent in 2008 to 58.7 percent in 2014 [19]. As a result bank valuations have already suffered.
- (iii) Drop in the interest income spurs banks to increase their exposure to lower quality operations and assets: either by means of speculations in more risky derivatives or lending to unreliable borrowers (i.e. back to sub-prime). With yields on safe assets growing short the chances of portfolio rebalancing towards riskier assets are rising.
- (iv) Negative interest rates also have a profound impact on foreign exchange markets. Interest rate differentials from one currency to another drive the future value of currencies: any central bank implementing Quantitative Easing and/or lowering rates into more negative levels is putting downward the pressure on its currency. The end result is currency dumping and currency wars.

In *theory* negative interest rates (and the notion of negative time preference) come laden with the sign of the end of classical theories of money and monetary policy as money cease to be a scarce resource.

CONCLUSIONS

Today global gross savings are about 24% of global GDP [20] and, in analysts' judgments, global savings glut is more likely to swell than ebb. Whether it is the cause of the expansive unorthodox monetary policy in Eurozone and in the USA, or its consequence, the time is ripe for revision of the economic essence of abundant fiduciary money and onset of devising new instruments of post-crisis remedial actions. An optimal scenario would be design of effective crisis avoidance tools.

LITERATURE

- **1.** Remarks by Governor Ben S. Bernanke At the Sandridge Lecture, Virginia Association of Economists, March 10, 2005. URL: https://www.federalreserve.gov/boarddocs/speeches/2005/200503102/
- **2. Bernanke Ben.** Why are interest rates so low, part 3: The Global Savings Glut. April 1, 2015. URL: https://www.brookings.edu/blog/ben-bernanke/2015/04/01/why-are-interest-rates-so-low-part-3-the-global-savings-glut/
- **3. Chairman Ben S.** Bernanke Monetary Policy and the Housing Bubble. Speech at the Annual Meeting of the American Economic Association. Atlanta, Georgia, January 3, 2010. URL: https://www.federalreserve.gov/newsevents/speech/bernanke20100103a.htm
- **4. Giancarlo B.** Global Saving Glut and Housing Bubble: A Critical Analysis. Economia Politica. January 2011. P. 8, 23. URL: http://eco.uninsubria.it/dipeco/quaderni/files/QF2011_12.pdf
- **5. Taylor J. B.** The Financial Crises and the Policy Responses: An Empirical Analysis of What Went Wrong. *NBER Working Paper*. 2009. No. 14631. URL: http://www.nber.org/papers/w14631.pdf
- **6. Seyfried W., Rollins C.** Monetary policy and housing bubbles: a multinational perspective. *Research in Business and Economics Journal*. 2010. URL: www.aabri.com/manuscripts/09351.pdf
- **7. Mishkin F. S.** Monetary Policy Strategy: Lessons from the Crisis. *NBER Working Paper*. 2011. No. 16755. URL: http://www.nber.org/papers/w16755
- **8. Sà F., Towbin P., Wieladek T.** Low Interest Rates and Housing Booms: The Role of Capital Inflows, Monetary Policy and Financial Innovation. *Bank of England Working Paper*. February, 2011. No. 411. URL: http://voxeu.org/article/housing-booms-capital-inflows-and-low-interest-rates
- **9. Borio C., Piti D.** Global imbalances and the financial crisis: Link or no link?" *BIS Working Paper*. May 2011. No 346. URL: http://www.bis.org/publ/work346.pdf
- **10.** St. Louis Adjusted Monetary Base. URL: https://fred.stlouisfed.org/series/BASE
- **11.** Effective Federal Funds Rate. URL: https://fred.stlouisfed.org/series/FEDFUNDS
- **12.** Statistical Interactive Database Official Bank Rate History. URL: http://www.bankofengland.co.uk/boeapps/iadb/Repo.asp
- 13. Key ECB interest rates. URL: https://www.ecb.europa.eu/stats/monetary/rates/html/index.en.html
- **14.** M1 Money Multiplier. URL: https://fred.stlouisfed.org/series/MULT
- **15. Avent R.** Economists' evolving understanding of the zero-rate liquidity trap. URL: http://www.economist.com/blogs/freeexchange/2015/12/zero-one-then-back-zero
- **16. Hansen A.** Full Recovery or Stagnation. URL: https://books.google.com/books/about/Full_recovery_or_stagnation. html?id=15scAAAAIAAJ&redir_esc=y&hl=ru
- **17. Summers L. H.** U. S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound. *Business Economics*.

2014. Vol. 49, No. 2. P. 1–2. URL: http://larrysummers.com/wp-content/uploads/2014/06/NABE-speech-Lawrence-H.-Summers1.pdf

- **18.** Definition of secular stagnation. Financial times/Lexicon. URL: http://lexicon.ft.com/Term?term=secular-stagnation
- **19. Barua A.** Impact of negative interest rates: Living in the unknown. URL: https://dupress.deloitte.com/dup-us-en/economy/global-economic-outlook/2016/q2-impact-of-negative-interest-rates-controlling-inflation.html#endnote-3
- **20. Rossi D.** The global savings glut. URL: http://www.fidelity.com.au/insights-centre/investment-articles/the-global-savings-glut/

REFERENCES

Avent, R. "Economists' evolving understanding of the zerorate liquidity trap". http://www.economist.com/blogs/freeexchange/ 2015/12/zero-one-then-back-zero

Bernanke, Ben. "Why are interest rates so low, part 3: The Global Savings Glut". https://www.brookings.edu/blog/benbernanke/2015/04/01/why-are-interest-rates-so-low-part-3-the-global-savings-glut/

Borio, C., and Piti, D. "Global imbalances and the financial crisis: Link or no link?". http://www.bis.org/publ/work346.pdf

Barua, A. "Impact of negative interest rates: Living in the unknown". https://dupress.deloitte.com/dup-us-en/economy/global-economic-outlook/2016/q2-impact-of-negative-interest-rates-controlling-inflation.html#endnote-3

Chairman, Ben S. "Bernanke Monetary Policy and the Housing Bubble". https://www.federalreserve.gov/newsevents/speech/bernanke20100103a.htm

"Definition of secular stagnation. Financial times". http://lexicon.ft.com/Term?term=secular-stagnation

"Effective Federal Funds Rate". https://fred.stlouisfed.org/series/FEDFUNDS

Giancarlo, B. "Global Saving Glut and Housing Bubble: A Critical Analysis". http://eco.uninsubria.it/dipeco/quaderni/files/QF2011_12.pdf

Hansen, A. "Full Recovery or Stagnation". https://books.google.com/books/about/Full_recovery_or_stagnation.html?id=15scAAAAIAAJ&redir_esc=y&hl=ru

"Key ECB interest rates". https://www.ecb.europa.eu/stats/monetary/rates/html/index.en.html

Mishkin, F. S. "Monetary Policy Strategy: Lessons from the Crisis". http://www.nber.org/papers/w16755

"M1 Money Multiplier". https://fred.stlouisfed.org/series/MULT

"Remarks by Governor Ben S. Bernanke At the Sandridge Lecture, Virginia Association of Economists". https://www.federal-reserve.gov/boarddocs/speeches/2005/200503102/

Rossi, D. "The global savings glut". http://www.fidelity.com. au/insights-centre/investment-articles/the-global-savings-glut/

"St. Louis Adjusted Monetary Base". https://fred.stlouisfed.org/series/BASE

Summers, L. H. "U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound". http://larrysummers.com/wp-content/uploads/2014/06/NABE-speech-Lawrence-H.-Summers1.pdf

Seyfried, W., and Rollins, C. "Monetary policy and housing bubbles: a multinational perspective". http://www.aabri.com/manuscripts/09351.pdf

Sa, F., Towbin, P., and Wieladek, T. "Low Interest Rates and Housing Booms: The Role of Capital Inflows, Monetary Policy and Financial Innovation". http://voxeu.org/article/housing-booms-capital-inflows-and-low-interest-rates

"Statistical Interactive Database – Official Bank Rate History". http://www.bankofengland.co.uk/boeapps/iadb/Repo.asp

Taylor, J. B. "The Financial Crises and the Policy Responses: An Empirical Analysis of What Went Wrong". http://www.nber.org/papers/w14631.pdf