THE ZIRP TRAP- THE INSTITUTIONALIZATION OF NEGATIVE REAL INTEREST RATES

PHILIPP BAGUS*

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Resumen: Este artículo analiza las consecuencias de las políticas monetarias de los bancos centrales a partir de 2008 y la posibilidad de salir de estas políticas extraordinarias. ZIRP impidió la recuperación subvencionando una estructura productiva distorsionada. El sobreendeudamento de las economías occidentales se mantuvo artificialmente y se retrasó artificialmente. Mostramos también que ZIRP causa riesgo moral, el desarrollo de nuevas burbujas y consecuencias no intencionadas que desestabilizan el sistema financiero. ZIRP afecta negativamente a la función empresarial y a la cultura. Desincentiva el trabajo y la inversión prudente. En el mundo actual de bancos centrales, ZIRP implica la institucionalización de tipos de interés reales negativos. Daña las virtudes empresariales tradicionales, complica la planificación a largo plazo, politiza la sociedad y mina las bases del capitalismo.
La salida de ZIRP es políticamente costosa. Analizamos las opciones de salida que les quedan a los políticos incluyendo la represión financiera, una inflación elevada, el incumplimiento en los pagos, los impuestos sobre el capital, *bail-ins* y reformas monetarias que son evaluadas desde una perspectiva liberal.

Palabras clave: política de tipo de interés cero (ZIRP), política monetaria no convencional, sobreendeudamiento, opciones de salida, tipos de interés reales negativos.

Clasificación JEL: E14, E31, E32, E52.

Abstract: This paper analyzes the consequences of the monetary policies enacted by Western central banks from 2008 on and the possibilities to end these

* Profesor Contratado Doctor of the Applied Economics I Department, King Juan Carlos University.

policies. Zero interest rate policies (ZIRP) actually impaired the recovery that was underway by subsidizing a distorted structure of production. The over-indebtedness of Western economies was artificially propped up thus delaying recovery. We also show how ZIRP fosters moral hazard, the development of new bubbles and breed unintended consequences that destabilize the financial system. ZIRP adversely influences entrepreneurship and culture by discouraging hard work and prudent investment. In today´s central bank world, ZIRP implies the institutionalization of negative real interest rates. It harms traditional entrepreneurial virtues, complicates long-term planning, politicizes society and erodes the foundations of capitalism.
Exiting ZIRP is politically costly. We analyze the exit options that remain for policy makers, including financial repression, high inflation, default, capital levies, bail-ins and currency reforms, and evaluate them from a free-market perspective.

Keywords: ZIRP, unconventional monetary policy, overindebtedness, exit options, negative real interest rates.

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I
INTRODUCTION

Since 2008, western central banks have engaged in unconventional monetary policies. As former chief economist of the European Central Bank (ECB), Jürgen Stark, (2014) put it: «we are all parts of a monetary experiment with an unknown end. «Central banks had engaged in monetary easing prior to 2008, but this time was different as they were confronted with the zero lower bound of interest rates and responded with policies previously considered «unconventional», i.e. large-scale asset purchases (e.g., quantitative easing), negative interest rates, and forward guidance[1]. Zero interest rate policy (ZIRP) has been regarded as virtually unavoidable by policy makers to revive beleaguered economies. ZIRP is

[1] Forward guidance can be defined as the verbal assurance of market participants of future monetary policy.

usually regarded as being without an alternative. Their detrimental effects have not yet been fully scrutinized.

Due to this neglect, it is of vital importance to take a close and complete look at the consequences of ZIRP and measures such as quantitative and qualitative easing, negative interest rates and forward guidance. We are in some sense in uncharted territory. What are the consequences of the «monetary experiment» that Stark refers to? Do policy makers actually know what they are doing? Responsible action requires the knowledge of the costs. But what are the costs, both short and long-run, of ZIRP?

Most economists do worry that monetary policy may not be effective at the zero bound, but they neglect the possibility that ZIRP may actually impede recovery. Most importantly, the social, cultural and political implications of ZIRP remain largely unexplored. In this paper we close this theoretical gap by discussing the entrepreneurial and social consequences of ZIRP. We argue that ZIRP affect motivation, discourage prudent investment, harm traditional entrepreneurial virtues, complicate long-term planning, politicize society and erode the foundations of capitalism.

The potential long-run consequences of the monetary experiment are profound. What is most intriguing is that the dynamics of ZIRP make an exit from them complicated. We describe this phenomenon as the «ZIRP trap»: once you are in, it becomes more difficult to get out at later time. Over the long run, the social and cultural consequences of ZIRP become ever more pronounced.

In the light of our findings, a swift exit from ZIRP becomes crucial, but faces economic and political difficulties. We discuss the economic and political difficulties of an exit, analyze and compare the available exit options. The exit from ZIRP is likely the most difficult and important policy issue for Western economies today.

Our analysis of ZIRP would be not complete if we did not examine its redistributive effects that accumulate as an economy is held in the ZIRP trap. Indeed, the redistribution of wealth and income is an often omitted consequence of increases in the money supply. Yet, it may well be the most important consequence of monetary policy.

As early as 1755, Richard Cantillon showed that there is always a redistributive effect when the supply of money increases, since

new money does not reach all people at the same time or in the same proportion. The first receivers of the new money benefit because they can still transact at the old lower prices. As the early receivers spend their surplus cash balances, prices rise. Late receivers lose because their income rises at a slower pace than their expenditures.

It is difficult to pinpoint winners and losers of this process because it is not only difficult to determine who received the new money in the first place, but it is also difficult to follow the path of a fungible good (such as money) as it permeates throughout the economy. We will approach this difficult task in the following way: First, we will look at emergency lending and bailouts conducted by central banks or governments. We shall concentrate on the institutions in the United States and the Eurozone.

Second, we will look at the sectors of the economy in both the United States and the Eurozone that managed to increase their balance sheets during the period, and received funding in the form of loans. Sectors that were able to increase their balance sheets received new money relatively early and took on additional loans to the detriment of those sectors that did not receive such funding. Finally, we will ask from a theoretical point of view the counterfactual question of which groups would have benefitted if central banks had not enacted unconventional monetary policies.

Consequences of unconventional monetary policies[2].

II
REDISTRIBUTION OF WEALTH AND INCOME

1. **Liquidity lines and subsidies**

a) *Federal Reserve*

Even though the Federal Reserve System (Fed) tried to conceal information concerning its new loans programs, new transparency laws introduced in 2010 following pressure from the media com-

[2] For a short summary of the actions of the Fed and the ECB see appendix A.

pany Bloomberg led to public access of the list of recipients of emergency lending (Pittmann 2009).

In table 1 we can observe the Fed´s peak lending in 2008-2010 to selected financial institutions.

TABLE 1
RECIPIENTS OF FED LOANS

Morgan Stanley	$107.3 bn
Citigroup	$99.5 bn
Bank of America	$91.4 bn
Royal Bank of Scotland	$84.5 bn
State Street Corp.	$77.8 bn
UBS	$77.2 bn
Goldman Sachs	$69 bn
JPMorgan Chase	$68.6 bn
Deutsche Bank	$66 bn
Barclays	$64.9 bn
Merrill Lynch	$62.1 bn
Credit Suisse	$60.8 bn

Source: Bloomberg (2011).

Total emergency lending amounted to $1.2 trillion, disbursed from August 2007 through April 2010. The recipients were both US banks and foreign banks through their US subsidiaries. Almost half of the top 30 borrowers were actually foreign institutions, some of them government owned such as the German Bayerische Landesbank. Non-financial corporations that had obtained a banking license such as General Electric also benefitted from the Fed´s emergency lending[3].

If one adds up emergency lending, normal lending, lending limits and explicit guarantees, by March 2009 the Fed committed $7.77 trillion to support the financial system (Ivry et al. 2011). In addition to

[3] General Electric received also $30 bn. in loans from the government and public guarantees (Stockmann, 2013, p. 3).

the Fed´s assistance, the US government supported the financial system through deficit spending that was directly or indirectly financed through the Fed's loose monetary policy. For instance, the Treasury Department's Troubled Asset Relief Program (TARP) constituted a $700 billion bank-bailout fund and injected capital of $45 billion each to Citigroup and Bank of America, and $10 billion to Morgan Stanley. In total, the 10 biggest US banks and brokerage firms received $160 bn. in taxpayer-funded bailouts (Keoun and Kuntz 2011).

Ivry et al.(2011) estimate the profits out of the emergency lending taking advantage of the Fed´s below-market rates amounted to $13 billion between 2008 and 2010. However, this sum is only a small portion of the aid that companies supported by the emergency measures received. Benefits to the rescued companies included being the first receivers of new money as well as the possibility of avoiding illiquidity and bankruptcy. Moreover, they had the chance to acquire assets at depressed prices with the new money and to increase their market share. For instance, virtually all of Morgan Stanley´s liquidity at the end of September 2008 came from the Fed´s emergency programs[4].

As a consequence of the Fed's reaction to the crisis, financial markets quickly recovered, marking new highs as additional liquidity came in. The Dow Jones more than doubled from the March 2009 low of about 6,600 to around 18,000 by late 2014. The fall of housing prices stopped in 2011 and bond prices increased as interest rates fell (Dobbs et al. 2013).

b) *The European Central Bank*

Unfortunately, we do not have equivalent data concerning the recipients of central bank credit lines in the Eurozone. We only know that the European Central Bank (ECB) more than tripled its loans

[4] David Stockman (2013) argues that only investment banks were on the verge of bankruptcy and that the retail banking system was never in real danger. Stockman´s claim is, however, bold. A bankruptcy of investment banks would have led to a fire sale of assets, leading to losses also for retail banks and to a potential run of investors from the financial system.

outstanding to the banking system — from €423 bn. at the beginning of 2008 to a peak of €1,420 bn. by 2012. From the peak in 2012, outstanding lending fell back until January 2014 to €825 bn[5]. We do know that a large portion of the new funding ended up financing Eurozone governments which continued to engage in high deficit spending. The holdings of government securities by financial institutions including the ECB increased from €1.5 tr. in 2008 to €2.3 tr. in January 2014 (€0.2 tr. were central bank purchases and €0.6 tr. were purchases by the banking system).

Governments used the new money to finance their fiscal policies including the support of the banking system. The approved government aid packages in favor of the banking system including recapitalization, guarantees (mainly interbank loans), asset relief intervention and liquidity measures totaled €5 tr. (though only a portion of the approved aid was actually used). In total, European governments recapitalized their banks with injections totaling €300 bn[6]. Among the recipients of government aid were Spanish Cajas, Allied Irish Bank, Anglo Irish Bank, German Landesbanken, HypoRealEstate, Commerzbank, Fortis, Dexia, Royal Bank of Scotland and HBOs.

In addition to the aid in favor of the financial system, there was also a redistribution among the member states of the Eurozone as the bailouts of Greece (€245.6bn), Portugal (€79.4 bn.), Ireland (€68.2 bn.), Spain (€41.3 bn.) and Cyprus (€10 bn.) indicate. These bailouts were financed through the issuance of new sovereign debt. Defaults of member states were prevented and thereby also severe losses for the financial sector[7].

2. **Relative expansion of sectors**

We will now turn to the question of which sectors profited from the monetary expansion. While it is common knowledge that mostly banks and governments benefitted from unconventional

[5] These numbers do not include foreign currency lending to European banks.

[6] See Noonan and Flasseur (2013).

[7] For a detailed analysis of the European debt crisis, its winners and losers, see Bagus (2012).

monetary policies, we will try to quantify this and put their evolution in perspective. We will look at the balance sheet of households, non-financial and financial corporations, and governments. We will then analyze who was able to expand their balance sheet (i.e., increase leverage) by taking on new loans made possible by the central banks' newly created money.

Households in the US deleveraged slightly in the first years of the crisis. They reduced their loans from almost $14 tr. in July 2008 to $13 tr. in January 2013 mainly by paying down mortgages. Non-financial corporations began to deleverage in the early stages of the crisis and reduced their loans from $7.5 tr. in July 2008 to $7.3 tr. by October 2009. This trend reversed as the Fed's enacted stronger monetary policies, and by January 2014 loans to non-financial corporations had increased to $9.6 tr. Similarly, financial institutions reduced their liabilities in the early stages of the crisis from 69.5 tr. in July 2008 to $66.4 tr. by January 2009, and later increased their balance sheets rather aggressively (they were $84.2 tr. in January 2014). From July 2008 to January 2014, financial institutions increased their cash holdings from $1.1tr. to $3.7 tr., a period during which the US federal government almost doubled its debt outstanding from $8.8 tr. to $16.4 tr[8].

In other words, while households deleveraged slightly, non-financial corporations and financial institutions expanded their balance sheets, an outcome facilitated by unconventional monetary policies. Financial institutions managed to increase their cash positions[9]. In particular, the largest beneficiary of the Fed´s policies was the US government and the economic agents that received the new money from it.

In the Eurozone households in the aggregate did not deleverage with total household loans essentially remaining flat with €5.7 tr. in the second quarter of 2008 and €6.1 tr. at the end of 2013. Loans to non-financial corporations also remained mostly unchanged

[8] Charts of the credit instruments of the mentioned sectors may be found in Appendix 1.

[9] White (2012, p. 36) points out that the profit share of the financial sector in the US has been rising, now totaling 40 percent of all US corporate profits. As we will discuss below, the financial crisis would have corrected the overblown size of the financial sector if it would not have been for central bank and government intervention.

until 2009 when companies deleveraged to start paying down debt incurred to finance the malinvestments of the boom. From the second quarter of 2008 to the end of 2013 total loans outstanding fell from €4.7 tr. to €4.3 tr.

In contrast to the US, the size of financial institutions´ balance sheets in the Eurozone remained practically unchanged at €31 tr. during the same period[10]. Nevertheless, financial institutions benefitted from the ECB´s loose monetary policies as they changed the structure of their balance sheets´ to make them more robust. Thus, Eurozone banks reduced lending to companies and bolstered their cash positions from €2.2 tr. to €3.5 tr. over the same period as they received an inflow of new money from the ECB.

Similar to the US, Eurozone governments were a main beneficiary of the unconventional monetary policies. Total government debt of Eurozone countries rose from €6.5 tr. in 2008 to €9.1 tr. in 2013, facilitated by the ECB willingness to make debt and debt servicing sustainable.

In sum, Eurozone companies slightly deleveraged, and households increased their debts only insignificantly. Banks reduced their exposure to private debt, increased their liquidity position and also their exposure to public debt. The new money moved primarily from the ECB into the banking system, from where an important part ended up financing Eurozone governments.

In both the US and the Eurozone, financial institutions and governments were the main beneficiaries of easy monetary policies. Preventing sovereign and banking defaults, financial markets were consequently supported.

3. **Distributions between economic groups**

The benefits for governments and financial markets as first recipients of the new money during the last years are well known. In

[10] In both the US and the Eurozone there has been a contractionary effect on credits caused by the preparation for the implementation of Basel III regulation. The contractionary effect of Basel III compensated the expansionary effects exerted by central bank policies.

this section we will dig deeper to analyze distributional effects among economic groups from a theoretical point of view.

Zero interest rate policies in general cause a redistribution between creditors and debtors. Most individuals hold monetary savings, investments in savings accounts or bonds, and debt at the same time. Some of these will be net savers, while others are net debtors. Net monetary savers lose through ZIRP as the yield of their investments drops, while net debtors may profit if they are able to refinance their debt or have contracted variable rates. To the extent that young households are net debtors while older households are net savers, ZIRP implies a redistributive tendency from the old to the young.

Another redistribution occurs between the financial and non-financial sectors. As shown above, the financial sector was the first recipient of the new money. The stabilization and even extension of the financial sector that resulted is visible. Banks have increased their reserves, and improved their financial positions in relation to other economic agents that did not receive these reserves.

These outcomes are quite visible and discussed, but what of the unseen effects? If central banks had not intervened, financial companies would have become insolvent and the size of the financial sector would have been reduced with either lower profits or higher losses. Bonuses and wages in the financial sector would have been reduced. Resources absorbed by the financial sector, including human capital, would have become available for non-financial companies. Prices of some factors of production would have fallen, such as wages of workers formerly employed in the financial industry. The fall in factor prices would have made investment projects viable that were not so at higher prices. Entrepreneurs would have been directed toward non-financial ventures.

A similar redistribution occurred between the private and the public sector. Governments are one of the great beneficiaries of ZIRP as the stabilization of expansive and expensive welfare states and deficits resulted. What is unseen is that in the absence of ZIRP, governments would have been forced to reduce their expenditures. Wages of public employees, public pensions or general welfare spending would have been lower than they are today.

It would have become relatively more attractive to work and produce in the private sector. Entrepreneurial energies would have been directed more toward the satisfaction of consumer wants in the market place, and away from rent-seeking in the political arena. Economic agents employed in sustainable projects would have benefited, as well as consumers purchasing the produced goods that never came into being. These un-produced or unseen goods were victims of the prolonged misdirection of resources to political ends.

Finally, unconventional monetary policies cause(d) a tendency for a redistribution from the have-nots to the haves; from the poor to the rich. ZIRP has pushed up the prices of assets or stabilized them as the future income stream generated is discounted at a lower interest rate[11]. Thus, lower interest rates directed important parts of the new money supply toward the stock market. What is seen is that the fall in housing prices stopped and stock markets rose. People already owning such assets, i.e. the wealthy, benefitted.

The counterfactual, or unseen effect, is how low stocks prices and housing prices would have fallen without ZIRP. People that do not own such assets but would like to acquire them at lower prices are harmed. Moreover, lower-income individuals tend to save in cash or other low risk assets while higher-income savers invest in financial assets which have soared in value (Dobbs et al. 2013, p. 19)[12]. Furthermore, low-income people tend to benefit during a

[11] As mentioned above there is also the redistribution from the net monetary savers to the net debtors. This effect, however, is not necessarily compensating the distribution from the poor to the rich. Moreover, elderly people who are net monetary savers and invest in savings accounts, bonds, etc. do not necessarily own assets such as stocks or real estate. The redistribution from the poor (owning no assets) to the wealthy (owning assets) is a different and additional effect.

[12] One could respond that in 2008 low-income people owning savings accounts beneffitted from the bailout of banks, which is true. Yet, a (partial) loss of a saving accounts would only have made visible the losses in real wealth that had occurred during the previous artificial boom. Bailing out banks only hides these losses by way of a wealth transfer toward the first recipients of the new money, who normally are relatively wealthy as they own assets that can be pledged as collateral for new loans. In any case, long run ZIRP policies tend to hurt lower-income individuals vis-a-vis higher-income savers.

credit contraction and price deflation due to a fall in the cost of living as their wages tend to be more rigid. As Rothbard (1976) points out, the average consumer benefited from lower costs of living during the Great Depression, while wealthy individuals saw their fortunes collapse with the stock market. Such a development was prevented by recent central bank actions[13].

In a similar vein, the stabilization of asset prices benefited established entrepreneurs whose companies avoided bankruptcy. What is unseen are the new or potential entrepreneurs that could not start their investment projects or are experiencing difficulties with their new projects due to ZIRP, which prevents the liberation of resources from some of the old projects and a substantial fall in factor prices. As long as factors of productions are occupied longer than necessary within projects that would have failed without ZIRP, entrepreneurship is stifled[14], and new entrants must pay higher prices for factors, if compared that would have prevailed if the incumbents had not been bailed out.

Supporting this argument, Steve Hanke (2013) has argued that the Fed´s bailout policy harmed small companies relative to established ones. The Fed kept wholesale markets liquid, for instance with repurchase agreements, the issue of bonds or commercial paper. Yet, small companies do not usually have access to these markets but finance themselves through commercial loans, which had become more risky due to the reduction in interbank lending and the increase in uncertainty. Big companies could issue commercial paper that banks were willing to buy and use as collateral at the Fed, while small companies were confronted with frozen loan markets.

In sum, the ramifications of the monetary redistribution are manifold. They involve earlier and later receivers, public and private borrowers, financial and non-financial sectors, old and young individuals, savers and debtors, rich and poor, and established and new entrepreneurs.

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[13] Price deflation is not a problema for an economy as a whole but rather leads to a redistribution. For a detailled discussion of deflation see Bagus (2015).

[14] In addition, labor market interventions — especially subsidies to the unemployed and other factor market regulation — prevent the use of liberated resources and a fall in costs.

III
DELAY OF RECOVERY

1. **Requirements for recovery**

In face of the sluggish recovery, Joyce et al. (2012) wonder whether QE is ineffectual, or too light, and whether it needs to be complemented with other measures[15]. There is, however, a fourth option, namely that QE and extra easy monetary policies themselves are responsible for the sluggish recovery.

In 2008, several sectors were overextended, while bottlenecks developed in others. A healthy economic environment requires that distortions are fixed as soon as possible. For example, the prices of houses and wages in the construction industry must fall in order to arrest further building and induce people to move to other activities. Only when housing prices fall will the housing market clear and (empty) houses will be put to use. This is so because at the high bubble housing prices there is no demand to buy them. In other words, housing prices and rents fall until they can be bought or rented at prices which make their use attractive in new business projects or for living. Malinvestments have to be liquidated as quickly as possible to release resources for more urgent projects.

Furthermore, savings are needed to aid the recovery. The recessions was inevitable, because more investment projects had been started than could successfully be completed with the available savings. In other words, the crisis set in due to a lack of real savings. An increase in savings releases factors of production and reduces their prices[16]. These factors may then be used in the too ambitious projects that were started during the boom and are lingering. In other words, any increase in savings reduces the

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[15] For instance, curiously some authors worry about QE not raising inflationary expectations sufficiently. For the case of Japan see Svensson (2006). Others such as Woodford (2012) seek to make QE or monetary policy at the zero bound more effective in causing price inflation. These authors worry that price inflation may be too low. See also Reifschneider, Wascher and Wilcox (2013) who defend a highly expansionary monetary policy.

[16] Savings releases factors of production in the stages closest to consumption. For Austrian capital theory and business cycle theory see Huerta de Soto (2009).

needed adjustment[17]. More and freely available savings are also needed to smooth the adjustment itself and finance the expansion of neglected or new sectors[18]. Thus, these sectors can expand quickly and absorb the resources set free in the sectors that over-expanded during the boom[19].

A requirement for a quick recovery is flexible factor markets making the shift of factors of production from the malinvestment to new sectors easy and swift. For instance, workers must end building ever more houses and start to produce other more urgently demanded goods. Prices must be flexible to hasten this process[20]. When the unemployment of resources is stimulated by gov-

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[17] As Murray Rothbard (2000, p. 17) puts it: «In short, what can help a depression is not more consumption, but, on the contrary, less consumption and more *savings* (and, concomitantly, more investment)»

[18] It is true that there has been cash balance building in both the US and Europe. Cash building normally leads to falling prices, lowering costs and making investment projects viable that would not have been profitable without the fall in costs. Cash building may also imply to an increase in real savings if the it stems from a reduction in consumption. Yet, the crucial point is that the savings must be freely available for the private sector. In both the US and Europe important portions of the available savings were absorbed by the public sector and not available to finance new investment projects. As economic agents built up their bank accounts, the money was not invested into the private sector, but banks invested in government bonds. Governments in turn used the funds, partially, to prop up malinvestments, subsidies, unemployment, thus making labor markets rigid. A price deflation was prevented and there was a lack of real savings available to the private sector.

[19] It may be added that the liquidation process normally involves credit contraction and falling prices which might actually speed up the recovery. There may be a negative wealth effect and an accounting illusion. As asset prices fall, people may consider themselves poorer, thus increasing their savings. Moreover, businessmen might fall prey to an accounting illusion opposite to the one that occurs during an inflationary boom. During the boom costs lag behind selling prices as selling receipts increase partially due to the increase in the money supply. However, the purchasing power of money has decreased in the mean time. Since only part of accounting profit is nominal, the decrease in the purchasing power of money reduces real profit rates. During a credit contraction when prices fall the mechanism may work the opposite way. Buying costs are still at higher prices while the selling costs are lower. Accounting profits are reduced. Yet, real profits have not necessarily fallen as the purchasing power of money has increased. An accounting illusion occurs if business men start to save more as they think their real income has fallen. The increase in savings due to the accounting illusion and the wealth effect help to speed up the recovery.

[20] Bankruptcies are an important institution to speed up the adjustment of relative prices. A bankruptcy through the sale of assets and liberation of factors of production leads to a quick reduction in their prices making them attractive to use in

ernment subsidies (e.g. unemployment benefits), or the resources are reemployed by public works, a fall in factor costs and a shifting toward a more sustainable structure of production is delayed. Government spending sponsored the inflexibility of factor markets, especially labor markets. This government spending was financed, partially, by deficit spending monetized by monetary policies. ZIRP, thereby, indirectly helped to delay the recovery.

While price and factor market flexibility are important to smooth the recovery, they cannot undo the prior investment errors. Not only has time been lost, but some capital goods have been lost forever. It is too expensive to tear down housing blocks in the periphery of the metropolis to use the bricks for a new factory that produces other goods[21]. A steel mill cannot be easily converted into a retail shop. Likewise, human capital invested in bubble sectors may be lost. Bankers may perhaps be hired as farmers but their knowledge will not serve them well in their new job.

2. The counter-argument: the possible collapse of financial markets

A widespread response to our argument consists in saying that if central banks had not intervened, a crash would have occurred, and banks, overindebted companies and governments would have collapsed. There are several points to make regarding this argument.

First, the crisis is the period during which malinvestments are eliminated or reduced. This step is necessary, and the free-market recipes ensures it is relatively quick[22]. The alternative is to consol-

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other projects. In this way, a bankruptcy enables the liberation and transfer of savings into new projects. No more savings are absorbed to uphold and finance malinvestments. Savings can now finance and flow into new projects.

[21] Examples of more urgently demanded goods in 2008 were gasoline and other commodities that increased in prices.

[22] For a comparison of the rather harsh and short recession in Iceland where more liquidation was allowed and the long drawn out recession in Ireland see Howden (2014). Another empirical example are the Baltic states that suffered stronger declines in GDP in the beginning of the crisis as they allowed for more readjustment but recovered much faster than the states of the periphery of the Eurozone. See Bandow (2013) and Rallo (2014).

idate the structure of production distorted by credit expansion. As central banks chose the latter alternative, we are still sustaining investments that could not survive in a more «normal» interest rate environment.

Second, it is not obvious that all the companies that have been bailed out would have sunk otherwise. Indeed, David Stockman (2013) argues that the bailout of retail banks was unnecessary. Many among these banks had valuable assets to sell or were capable of raising capital to cover potential losses. Stockman argues that the rescue funds were mainly used to maintain high profits and bonuses. Similarly, countries like Greece had assets to sell but did not because they were bailed out, which allowed them to pay higher public salaries and subsidies than otherwise would be the case.

Third, even if unemployment surges temporarily, it is not clear that the failure of banks substantially affects output or production negatively. Indeed, the shrinkage of an overextended sector such as the banking sector liberates resources for sustainable economic growth. In an empirical study, Miron and Rigol (2013) find little evidence that during the Great Depression bank failures affected output substantially or for long periods.

Fourth, even assuming that the financial sector would have collapsed due to the inherent illiquidity of fractional-reserve banks and a downward spiral of fire-sales and bankruptcies, a bail-in strategy would have been a viable alternative to ZIRP. In a bail-in, debt is converted into equity thereby recapitalizing the company. Bail-ins are often implemented in the non-financial sector, when the business model of over-indebted companies is regarded as viable in the long term. If the business model is not viable, the company is liquidated. The same principle could have been employed in the financial sector (Bagus et al. 2014a)[23].

The advantages of a bail-in vis-à-vis a bail-out are the following: In a bail-in there are no indiscriminate bailouts of all entities

[23] For an application to the case of Spain see Bagus et al. (2014b). It may be objected that a bail-in triggers CDS payments while a bail-out does not. Yet, this does not affect the advantages of a bail-in vis-à-vis a bail-out. It just requires additional payments. Moreover, holders of CDS may be treated as another type of creditor.

but only of those that the parties involved consider viable. In a bail-in there is no crowding out of private savings, as occurs in publicly financed bailouts. A bail-in actually reduces the overall amount of debt in the economy while a bail-out financed through money creation increases debt. Finally, a bail-in does not involve problems such as moral hazard, the subordination of decision making of bailed out companies, the need for an exit strategy or increased regime uncertainty.

Fifth, even if we assume for that sake of argument that the collapse of credit and financial markets *had* to be prevented, and that emergency lending was the appropriate way of proceeding in 2008, it is dubious that the financing of government deficits in the following years through unconventional policies was necessary to prevent a collapse. In other words, one may argue that central banks could have compensated for the credit contraction of 2008 by monetary expansion, but they were wrong in persisting in an expansionary monetary policy in the subsequent years.

To summarize, unconventional monetary policies inhibited the adjustment process and thereby the recovery. They prevented adjustment by refinancing the financial sector which itself allowed for further public debt accumulation at low interest rates[24].

Low interest rate policies brought relief to debtors and struggling companies and malinvestments were kept alive artificially (White 2012). In short, resources were not released. These resources could have been put to use by new investment projects. Instead, savings were discouraged by the low rates and channeled through financial markets to governments to finance their deficit spending. Oversized financial markets were stabilized as the newly injected money flowed into them (Chodorow-Reich 2014).

3. **The stabilization of overindebtedness through ZIRP**

A debt-ridden economy is fragile. A bankruptcy of one debtor may well lead to the collapse of another and so on. Due to the recession

[24] For the connection of housing crisis, banking crisis, sovereign debt crisis and austerity crisis see Borooah (2014).

many economic agents, companies and households, were over-indebted in relation to the collapsing value of their assets and their shrinking income[25]. When economic agents become aware of their overindebtedness, they usually strive to improve their liquidity position[26] by reducing consumption or investment, selling assets or paying down debts. Once they attain their desired liquidity position, agents start to increase investment and consumption again.

When overindebted agents save and pay down their debts, lenders receive the funds, which they may reinvest in new projects. By saving and paying down debts that had been incurred to finance previous malinvestments, agents liberate funds for new and sustainable projects. Thus, the reduction of debt helps not only to strengthen the liquidity position of economic agents but it also helps to finance a sustainable restructuring as funds flow from malinvestments towards new projects.

The healthy debt-reduction process that started in 2008 was slowed down by the monetary policies enacted by Western central banks for two main reasons. First, when interest rates fall, the present value of existing debt increases. It becomes more expensive to retire debt early or buy it back. Moreover, ZIRP reduced the pressure to pay back debts for variable rate payments. Instead incentives were created to increase indebtedness even more at lower interest rates. Indeed, central banks wanted the private sector to start increasing its indebtedness. However, until now large amounts of the newly created liquidity did not reach the real economy but keep accumulating in the form of excess reserves on bank balance sheets. The unwillingness to incur more debt is not surprising given the existing desire to reduce overindebtedness and the lack of demand for additional loans. In short, lower interest rates do not alleviate the problem of overindebtedness; rather ZIRP worsens the problem.

Second, while the private economy managed to reduce indebtedness against these odds, in the Western economies rising public

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[25] In Spain, for instance, there are still almost 600,000 borrowers trapped in underwater mortgages (The Corner 2014).

[26] The liquidity position may be defined as the subjectively perceived ability of an individual to serve his debts. It is influenced by the liquidity of his assets, his debts, as well as his future income and expenditures.

debts made possible by ZIRP counteracted the private debt reduction. This debt reduction alleviates the lack of solvent demand for investable funds. Yet, while private agents deleveraged, the public sector increased its leverage. Overall debts were not reduced. The increasing level of public debt, which private agents will sooner or later have to pay in some form or another, has become a greater burden on the recovery.

Private savings urgently needed for the restructuring of the economy were sucked up by the public sector and used via subsidies and other measures to prop up the existing structure of production, stabilize asset prices and increase the price rigidity of factor markets. An illustration of this misuse of private savings is a household that saves in the form of a bank time deposit and the bank uses the money to acquire government bonds. The government spends the money on public works, thereby preventing the contraction of the construction sector and maintaining wages of construction workers. Thereby, the stabilization of the overall overindebtedness corresponds with the stabilization of the distortions of the structure of production. Overindebtedness reflects the problems of the real economy upon economic agents´ balance sheets.

IV
ZIRP, LEVERAGE AND MORAL HAZARD

Whenever the rate of return on the investment is higher than the interest rate paid to incur in more debts, leverage, i.e. the substitution of equity capital by debt, leads to an increase in the return on equity. The lower the interest rate the more effective leverage becomes. Thus, with ZIRP leverage becomes extremely attractive, and companies that keep financing themselves with equity are at a disadvantage. Lower interest rate spreads also pressure banks to increase their leverage. The structure of the financial sector is weakened as the banks´ equity ratio falls (Adrian and Shin 2008).

Another effect of interest rates close to zero is the incentive for governments to delay structural reforms that could imply the loss of public support. High interest rates make debt servicing

expensive and force governments to restrain public spending. Yet, these pressures have been alleviated by central bank policies, most notably in the Eurozone. Governments are not motivated to reduce spending when interest payments on sovereign debt fall. Rather, the government may actually argue that the fall in the cost of debt servicing has been caused by its reforms and the reform agenda has been successfully completed. The government may even gain leeway for additional spending and higher deficits.

In fact, when yields on government bonds in the Eurozone came down in the wake of the ECB´s interest rate cuts and promise to buy government bonds through its outright money transactions (OMT) in 2012, structural reforms slowed in the Eurozone.

ZIRP not only caused moral hazard by governments in the economies where they were enacted, but the effect was exported to emerging markets. Thanks to increased international liquidity, governments in emerging economies could also sell their bonds at lower yields (Dobbs et al. 2013). Indirectly, ZIRP of the main central banks financed the expansion of the public sector through deficit spending in emerging countries.

As an additional distortive effect of a zero interest rate environment, there develops a certain «reaching for yield» attitude, as investors try to maintain former returns on their investments[27]. For instance, defined benefit pension funds become troubled as they fail to earn sufficient returns with ZIRP (McKinnon 2012)[28]. Similarly, life insurance companies that also invest in safe financial titles such as bonds incur difficulties to earn sufficient returns on their investments[29]. In such a situation, we can expect insurance companies as well as money market funds to «reach for yield,» i.e. assume more risk in order to obtain higher yields[30].

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[27] Chodorow-Reich (2014) finds empirical evidence for additional risk taking.

[28] In a defined benefit pension plan, an employer or sponsor promises a specified money payment on retirement.

[29] Dobbs et al. (2013) point to the problems that Japanese insurance companies have experienced in a ZIRP world.

[30] Several commercial banks in the Eurozone started applying negative interest rates on deposits from institutional investors in 2014. Banks wanted to discourage deposits because they implied higher capital requirements.

Higher risk taking may come in several forms. One form is through the carry trade, e.g., funds are exchanged into currencies where higher yields prevail. This explains why there has been considerable upward pressure on emerging market currencies in the first years of the crisis. Lachman (2013) argues that capital inflows caused an «overvaluation» of these currencies, particularly the currencies of South Africa, Brazil, India and Indonesia. In order to maintain export-driven growth, emerging market economies inflated their own currencies to compensate for the appreciations these carry trades entail. Thereby the monetary expansion of developed economies is exported to emerging markets where credit expansion may have produced new malinvestments and «serial bubbles» (White 2012), which later cause a downward pressure of emerging market currencies[31].

Other forms of «reaching for yield» induced by ZIRP are risky investments in commodities and derivatives that evade Basel regulations. Derivatives as contingent liabilities are off-balance sheet instruments that can be used to increase returns. An illustration of such activities are banks that swap junk bonds against government bonds with an institutional investor and then use the government bond as collateral for an off-balance sheet derivative (Rickards 2014, 80 and 188)[32].

Central banks have also promoted risky behavior by resorting to forward guidance. Forward guidance, for instance the guarantee that short-term interest rates will remain near zero for years to come, reduces the risk of maturity transformation. Borrowing short and lending long is more attractive if the central bank guarantees a roll-over at low rates. Thus, collateral and maturity transformation schemes are instruments to make up for low yields in a ZIRP world. These risky investments hamper the stability and health of financial markets as new bubbles may have occurred.

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[31] Dobbs et al. (2013) point to agricultural land prices in the US as a possible new bubble. Lachman (2013) claims that unintended consequences of the unconventional monetary policies are bubbles in junk bonds, equity and sovereign debt (in the south of the EU). Rickards (2014) claims that currently the US is experiencing another stock and housing bubble.

[32] For the sizeable role that rehypothecation of collateral may play in strategies to boost returns see Singh and Aitken (2010).

As a consequence, investors may be adding new malinvestments to the old ones whose liquidation is hampered by ZIRP. New malinvestments may be concentrated especially in capital-intensive sectors that become relatively more attractive in a low interest rate environment. Investing becomes not only more risky but also more difficult in a ZIRP world, since the interest rate functions to distinguish profitable from unprofitable investment projects. Most importantly, with interest rates near zero, the interest rate loses this allocational function. Ever more investment projects seem realizable even though there may not be a sufficient amount of real savings[33].

V
EFFECTS ON ENTREPRENEURSHIP AND CULTURE

1. **Effects on entrepreneurship and business**

ZIRP makes early debt repayment less attractive and encourages companies to borrow even more[34]. This reliance on debt affects business culture, especially if ZIRP prevails for a sustained period of time[35]. Highly indebted or leveraged companies tend to behave differently than companies that have no or few debts.

Highly leveraged companies are under pressure to generate cash flow quickly, in order to service their debt, and have fewer resources with which to experiment in projects that would generate substantial profits, but only in a long-term perspective.

Owners of leveraged companies themselves lose independence in their decision-making. They increasingly need the approval of

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[33] The ECB even started to apply negative interest rates to its deposit facility. Indeed, if interest rates are sufficiently negative, almost any investment project becomes viable.

[34] On fiat money and indebtedness see Hülsmann (2013). The competitive benefits of the loans at very low interest rates are considerable and hard to resist in a competitive environment. Being among the first to receive the new loans represents an important advantage.

[35] ZIRP has a tendency to last for a long time, since it is politically difficult to exit once the zero bound is reached. We will turn to this point in more detail later.

their creditors for their actions. And creditors' interests often diverge from the owners'. Hence, highly leveraged companies are inclined to be more short-term oriented than equity financed companies (Hülsmann 2008). For instance, in equity financed companies such as traditional family businesses, employees and owners may grow into a long-term mutually beneficial relationship in which values such as reliability, trust and responsibility flourish.

Managers themselves will seek other values in a ZIRP world, since managers that are highly indebted privately are more eager to earn money quickly. The managers need to serve their own debts reflects also on their business's culture. Long-term planning for the long-term success of the company becomes less important when managers start to focus on making money quickly to service their private debts or acquire assets that keep increasing in value due to ZIRP that subsidizes financial markets. Values such as responsibility to employees or a reliable adherence to the long-term interest of the owners becomes less important.

The suitable form of entrepreneurship changes if leverage becomes essential for success. In a ZIRP world, mostly equity financed companies, especially if not listed on stock exchanges, such as family businesses with a long-term orientation have problems remaining competitive. Not all small companies will face difficulties to find financing in a ZIRP world when investors are searching for yield. Today, investors are trying to secure expected yields by investing in equity of fast growing technological companies. The run for high yields drives equity toward high-risk business. Thus, investors even invest in equity of small startups, getting involved in very new and highly unprofitable companies through equity stakes for a potential gain in the future. ZIRP may be funding a new technology bubble similar to the last one in the 1990s[36].

Yet, small companies of the mundane, non-digital world (non high-technology) still rely on loan funding and may find themselves in a disadvantage in relation to established, large companies, especially when the recession still continues. In general, a ZIRP environment makes an economy more rigid and less dynam-

[36] For the surge in IPOs of technological companies see Roof (2015).

ic because low interest rates favor large established companies versus small, newer ones and shield them from their competition. Established companies have a better connection to financial markets in general and to the banking system and newly created loans in particular[37]. Established companies can pledge their capital or financial titles as collateral for loans. Therefore, they can expect to get a larger share of credit from the banking system at the very low interest rates than newly established companies. When interest rates are at 10 percent, it is not such a great advantage to get fast access to the money created by the banking system. When interest rates are near zero percent it becomes important to leverage and get access to loans. It becomes more difficult to start a new business in a ZIRP world where established companies have easy access to cheap loans than it otherwise would have been[38].

In addition, ZIRP make take-overs with newly created money easier and more frequent[39]. Therefore, the ownership structure of companies may change more quickly. In a family controlled business with long-term, i.e. inter-generational, planning, owners, managers and workers may develop a personal relationship that can last their whole working lives, fostering trust and productivity. Yet, ZIRP facilitates an artificial high number of leveraged buyouts. Ownership structure changes more frequently, so that a more shortsighted and self-serving business culture tends to develop.

Lastly, under ZIRP entrepreneurship becomes more difficult[40]. First, more and more prices are influenced by policy making and

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[37] A good connection to financial markets is always important. It becomes more important in a world where investments are not financed by genuine savings alone but through newly created money. The lower the interest rate at which newly created money can be borrowed, the more important becomes the connection to financial markets.

[38] This does not exclude that high tech start ups can thrive in a ZIRP world. These start ups, once they got famous, are already established companies in comparison to companies yet to be founded. They may flourish especially in areas where the new money flows and create new bubbles.

[39] Especially, when the emergency uncertainty of the beginning of a recession vanishes and ZIRP continues.

[40] In one sense it seems that zero interest rates make it easier to invest as costs of financing fall. It is true that loans become cheaper. Yet, there is no increase in real savings. The real resource constraint has not changed. It only appears easier to complete investment projects successfully.

dependent on the whims of monetary policy, especially assets prices. Stock prices no longer reflect the future expected profitability of a company, but instead reflect expectations on the course of ZIRP. News about a rise in unemployment may then cause a rally in stock markets, as it increases the likelihood that ZIRP will continue. Moreover, as central banks also attempt to direct credit, e.g., into the real estate market, the relative prices between sectors no longer follow consumers' valuations.

Second, in spite of forward guidance, the long-term monetary future has become more uncertain under ZIRP. As we will see below, there is no exit strategy that promises clear success. The overindebtedness of governments that is sustained and exacerbated by ZIRP makes long-term planning more complicated. Will there be government regulation, high inflation, a bail-in, haircuts, defaults or even currency reform? Long-term planning is more difficult in a world of potential inflation in which banks have accumulated vast excess reserves. ZIRP increases regime uncertainty (Higgs 1997, 2010). Together with other unconventional policies it makes it more uncertain how the monetary order will look in the future and how property rights of money holders will be defended. This is so because ZIRP does not reduce overindebtedness, liquidate malinvestments or remedy the fragility of the financial system.

As long-term planning becomes more difficult, entrepreneurs will engage in shorter-term investment projects.

2. **Effects on entrepreneurship and culture**

ZIRP may also have an impact on culture and values in society in the long run[41]. And the chance that ZIRP lasts for a long time is not low, since exit is complicated (as is discussed in the next section). Indeed, we may speak of a «ZIRP trap.» Moreover, central banks

[41] The long-term consequences of ZIRP are in some sense similar albeit not identical with the consequences hyperinflation exerts on traditional virtues and values. For the cultural effects of inflation see Salerno (2013), Ferguson (2010), Hülsmann (2008) and (2013), and Marquart and Bagus (2014).

abhor price deflation and have the means to prevent it[42]. ZIRP combined with a central bank that aims at and achieves positive price inflation implies negative real interest rates. In other words, the ZIRP trap means in today´s central bank world the institutionalization of negative real interest rates.

First, ZIRP consolidates the extended dimension of welfare states or even allows for their expansion. The expansion of the welfare state substitutes and erodes traditional private institutions aimed at reducing harm in times of emergency. In particular, the welfare state substitutes some functions of the family, and thereby weakens this institution[43].

Second, in a recession central banks attempt to stimulate the economy. Via monetary policy economic agents are pushed to take on debts to invest and consume. Yet, in an economic recession economic agents usually do not want to spend but to increase their cash balances. They do so because uncertainty has increased and the structure of production produces goods and services not in line with consumer preferences. Thus, cash building can be a protest against the distortion of the existing structure of production. This option is attacked by ZIRP[44]. In a sense, the aim of ZIRP is to induce people to buy what they otherwise would not buy and to invest more riskily than they would like to invest. Consumer sovereignty is reduced. This strategy to trick people into spending may have adverse psychological consequences.

Cash accumulation normally occurs when the structure of production is distorted and unusual high uncertainty prevails. Currently, we are probably still in an early phase of ZIRP, in which people reduce their leverage and increase their cash balances despite the monetary policy aimed at the contrary. When ZIRP continues, this cautious and prudent behavior becomes more costly and we enter a second phase. In this second phase the uncertainty stemming from the recession falls. Some adjustments of the structure of production have occurred, asset prices recover, and eco-

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[42] See Bernanke (2002).

[43] See Horwitz (2007) and Rothbard (1996).

[44] For cash building or hoarding as a protest against the existing structure of production see Rallo (2012).

nomic agents have attained their desired cash balance and start to leverage again or even to reduce their cash balances. In the following, we concentrate on these longer-term consequences of ZIRP.

Third, ZIRP fosters a debt culture as it encourages the accumulation of additional debt. If economic agents remain indebted for a sustained period, their personality will be affected. Individuals that are highly indebted lose independence. They are increasingly dependent on the good will of their creditors; on credit conditions and the possibility of rolling-over their debts. There is a constant threat that credit conditions will worsen or a roll-over will not be possible on favorable terms. Therefore, money will become more important for people in a highly indebted economy than otherwise as there is continual pressure to service their debts. Consequently, people will tend to work longer hours or try to raise income by non-traditional means. They are more willing to give up leisure or moral principles for extra income[45].

Fourth, as argued before, ZIRP makes very low real interest rates or even negative real interest rates likely as central banks try their best to prevent price deflation[46]. Given that central banks aim at a price inflation rate above zero, zero interest rates institutionalize a tendency toward negative real interest rates[47]. By institutionalizing negative real interest rates, ZIRP changes the rules of the game of the market economy.

In a market economy, savers transfer their savings indirectly or directly to investors who employ them in a competitive process in

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[45] One might think that creditors experience somewhat the opposite effect. Yet, the management of credit relationships is also vital and take time; and even more so in a highly indebted economy. Moreover, most people are creditors and debtors at the same time. A highly indebted individual may own a pension fund that has invested in bank shares. Even though the individual owns assets, there remains the pressure to service and renegotiate his own debt. If the individual must sell his assets at a bad moment to service the debt, he may suffer losses. In any case, when assets (also those representing credit contracts) are purchased through debts, people tend to be less independent and more focused on money than if they are purchased through equity.

[46] See Bagus (2015) on the misplaced fear of price deflation by central banks.

[47] Our following analyses holds true for negative real interest rates in general. Again, the cultural consequences develop strongly only, if ZIRP is maintained for a sustained period of time. Indeed, one may argue that it is one of the aims of monetary policy today to implement negative real interest rates for a sustained period of time in order to reduce the public debt burden.

order to satisfy consumer demands. Savers transfer their savings through institutions such as savings accounts, life insurance policies or investment funds in order to have a positive return on their investment. ZIRP-induced negative real interest rates frustrate the purpose of these institutions, namely to accumulate or safeguard wealth. ZIRP practically eliminates compound interest as a way to accumulate wealth. Thereby, ZIRP eliminates the cautious, prudent saver that uses traditional low risk forms of savings. One such traditional way of saving is through life insurance companies, which in normal circumstances are excellent vehicles for long-term savings (Huerta de Soto 2009).

Traditional values and life plans praise savings, discipline and hard work — the traditional middle class values. One of the main attractions of a capitalist way of life is the promise that people who work hard, save and invest prudently, conservatively and cautiously will be able to accumulate wealth and become independent. A ZIRP world frustrates such life plans.

Moreover, ZIRP helps to finance government deficits. Today many people may still believe that their accumulated wealth — much of which is invested directly or indirectly in government debts — will enable them to live a comfortable and independent life after retirement. When retirees have to reduce their expected standards of living due to low yields and losses in indirect government debt holdings, discontent, disillusionment and widespread pessimism may set in. The depression of an important stratum of the population may result. One of the most troubling effects of ZIRP could then be a general distrust into the capitalist system itself. As hard work, discipline, savings and conservative investments cannot guarantee a comfortable life after retirement, insecurity and fear may spread and lead to a general discontent with the economic system. When the discontent grows, people may fall for socialist demagogues.

If people find it difficult to plan their future, they might end up losing self-confidence. They become less self-reliant, more present oriented, less self-assured and self-confident. Wealth and energy are directed to more immediate gratification. Not the virtuous savers but the shrewd financial market experts will be able to save for old age. Those who reduce their consumption and invest in con-

servative financial instruments such as life insurance may face poverty at old age, while gambling and swindling become relatively more attractive. What Erna Pustau, a contemporary of the German hyperinflation recollects may become also true in a ZIRP world of prolonged negative real interest rates (quoted in Buck 1969, p. 146):

> [People] had lost their self assurance; their feeling that they themselves could be the masters of their own lives if only they worked hard enough; and lost, too, were the old values of morals, of ethics, of decency.

In a ZIRP world (that stays for a long time), it becomes difficult to catch up through the traditional middle class life model. As hard work and steady savings conservatively invested pay off less than otherwise and independence through the accumulation of wealth becomes more difficult (except for lucky risk takers), the enthusiasm of a whole generation may vanish. Followers of the traditional life model get frustrated and a widespread pessimism may set in[48]. Cautious behavior pays off less than otherwise, while risky behavior, the use of leverage and financial markets facilitates upward mobility and independence. The moral and social values of society may tip towards more risky behaviors and life styles when ZIRP continues for a sustained period of time. There is not sufficient pay off for the traditional life model anymore. Steady advancement through frugality and hard work becomes ever more difficult, stagnation becomes the rule except for highly risky or even criminal behavior. Therefore, ZIRP depresses traditional entrepreneurial values in the long run. If self-control and self-restraint do not pay off in regard to the use of monetary income, why adhere to these principles when it comes to lifestyle or moral values?

As another consequence of a ZIRP world, not only companies but also individuals face increasing difficulties with long-term

[48] To have lasting social effects ZIRP must be in play for a sustained period of time. Therefore, the exit question becomes essential. Japan may already show the first symptoms of a ZIRP society. Generalized frustration and a more pessimistic outlook of the future could have widespread cultural consequences ranging from suicide to low birth rates.

planning. The future becomes more uncertain. The prices of assets such as stocks or real estate become more politicized. They depend more and more on the continuation of ZIRP. As prudent investments and accumulation of wealth for the future become more difficult, economic agents depend more on the state´s support. Economic agents feel more insecure regarding their future as they are driven into risky investments. They are pushed to become investors versed in the financial markets in lieu of other productive fields.

In sum, a stagnant, highly indebted ZIRP world discourages hard work, prudent investment and traditional entrepreneurial virtues. ZIRP increases uncertainty, complicates long-term planning and ultimately erodes the foundations of capitalism.

3. **Future scenarios, the exit problem and the ZIRP trap**

There are basically four scenarios for the future. (Huerta de Soto 2011).

First, ZIRP causes another artificial boom, when banks start to invest their excess reserves. Banks start expanding credit again at next to zero interest rates to finance additional investment projects unbacked by real savings. New malinvestments are added to old ones.

Second, ZIRP causes a stagnation of the economy, similar to the situation that Japan has been suffering since the early 1990s. Due to ZIRP, a restructuring of the distortions of the boom is inhibited, and malinvestments are kept alive indefinitely. Aggregate debt levels are maintained. Uncertainty remains high and savings rates lower than they otherwise would have been. The economy lingers in a recession-like, anemic state. Currently, we still seem to be within this scenario even though some readjustments have occurred. It is in this scenario that the social and cultural consequences outlined in the last chapter come to their full potential.

Third, the collapse of the financial system caused by the default of large debtors such as governments leading to the downfall of fractional-reserve banks is another possibility. In this case, the development that started in 2008 finally runs its course.

Fourth, despite all counterproductive actions by central banks and governments (monetary and fiscally) to prevent a recovery, entrepreneurs attempting to struggle along and improve their situation day by day finally readjust the structure of production and generate growth against all odds. Governments may support these developments with structural reforms reducing their interventions, for instance in the labor market. Yet, even in the last scenario where investment errors of the boom are finally corrected, there remains the exit problem, especially if one wants to prevent the consequences that ZIRP has on entrepreneurship in the long run.

Technically, there is no problem to reverse ZIRP and reduce central bank balance sheets[49]. Can they do so without endangering the stabilization of the economy?[50] Central banks have accumulated assets on their balance sheets that could suffer severe losses during an exit[51]. For instance, when the ECB raises interest rates, the government of Greece may have to default leading to losses for the ECB´s holdings of Greek debt. Similarly, in the US when the Fed raises rates, variable rate mortgage holders may default, lead-

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[49] For an overview of the technical possibilities see Blinder (2010).

[50] Interestingly, the IMF (2013a) believes that the exit will happen seamlessly as markets normalize. The IMF (2014) expects debt to GDP ratios to decline in highly indebted advanced economies by 2015. Members of the Federal Reserve Board do not seem to consider an exit problematic either (English et al. 2013). A warning voice is William White (2012), former head of the Monetary and Economic Department at the Bank for International Settlements, who maintains that the exit will not be easy due to high levels of government debts and the possibility of rising long-term interest rates. Similarly, Greenlaw et al. (2013) point to the enormous losses central banks could suffer by an exit. Reinhart and Rogoff (2013) are skeptical on an easy exit and expect defaults, restructurings, financial repression, high inflation or a combination of these in advanced economies.

[51] Mauldin and Tepper (2014, p. 213) cite an estimate by Bloomberg News and MSCI of half a trillion dollars in losses for the Fed. Related to the exit problem, is the threat to the «independence» of central banks. An exit could reveal losses on the assets central banks acquired and putting in risk their solvency. Mauldin and Tepper (2014, 214) state that «[w]e can pretty much guarantee that the Fed will be technically insolvent as it starts to wind down its Code Red policies…» Central banks could then require a recapitalization by their respective governments which increases their dependence on the government. In order to prevent these losses, central banks must delay the exit. For instance, a tighter policy stance by the ECB may lead to the insolvency of the Spanish government which itself causes losses for the ECB that it may want to prevent in the first place. The ECB has become dependent on the fiscal policies of governments that it has supported through bond purchases.

ing to losses on the mortgage-backed securities that the Fed has bought.

Restrictive monetary policy and an exit from ZIRP may cause the collapse of the financial system. It could constitute an economic Armageddon for political and business elites, i.e. lead us back to the scenario that unconventional central bank policies prevented from 2008 onward[52]. Despite some deleveraging after 2008, individuals and companies are still highly indebted. Many business models and investment strategies hinge on the continuation of ZIRP and unconventional monetary policies. Maturity mismatching and carry trade schemes that were made possible by ZIRP would become unprofitable. Moreover, the end of purchases of assets such as government bonds implies that the repayment of these bonds reduces the base money supply, which may cause a credit contraction.

An end of ZIRP could lead to falling asset prices and the insolvency of companies and investors dependent on interest rates close to zero. The turmoil could bring the financial system to the verge of collapse just as in 2008. The difference is that today governments are much more indebted than in 2008. In fact, governments are so highly indebted that small increases in the interest they have to pay may strain their budgets, and could force them to apply haircuts[53]. Put differently, the high amount of government debt makes the exit from ZIRP difficult[54].

ZIRP does not make the exit easier, to the contrary it may foster indebtedness and fragility of the system as risk taking increases.

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[52] We set aside here the question whether such an Armageddon would not be the best option from an ethical perspective. It could quicken the recovery and lead to a more robust economic system.

[53] Mauldin and Tepper (2014, p. 211) calculate that by June 2013 the US government was paying $510 bn. less in interest than it would have paid with the average interest rate on its marketable debt in June 2007. In other words, if interest rates would return to precrisis levels, the US government would have to come up with a sizable amount of money to service its debts.

[54] The pressure for central banks to finance their governments has euphemistically been dubbed as "fiscal dominance", where fiscal policy dominates monetary policy. For a review on the literature on fiscal dominance see Greenlaw et al. (2013). The term is, however, misleading as it is based on the illusion that an independent monetary policy is possible.

We may therefore speak of a ZIRP trap, when the economy consolidates in overindebtedness and a fragility spiral. Once you are in a ZIRP trap, it become increasingly difficult to get out without causing bankruptcies and defaults, something which increases the perceived need to continue ZIRP to avoid further bankruptcies.

Politically, an exit is unpopular. The financial community will argue that a quick monetary tightening is too dangerous (White 2012). Negative effects on specific but politically sensitive companies, and an increase in unemployment makes the exit politically unattractive. Increases in interest rates would raise pressure for fiscal austerity, which is quite unpopular among governments.

Due to high debts (public and private), political elites will go for a slow and cautious exit from ZIRP. In any case, exit will only be successful if government debts can be reduced to a level sustainable with normal (higher) interest rates.

VI
EXIT OPTIONS

1. **Financial repression**

The debt to GDP ratio falls if nominal GDP growth is higher than the deficit, i.e. real growth plus price inflation is higher than the primary deficit and borrowing costs. It is in this relationship where the logic of financial repression sets in[55]. Financial repression aims at reducing the public-debt-to-GDP ratio by lowering the interest rate on government bonds below the rate of inflation. Financial repression may be regarded as a subtle form of debt restructuring (Reinhart 2012). Financial repression succeeded at reducing the US debt to GDP of over 100% in 1945 to less than 30% in the early 1970s. While financial repression worked for the US and other countries after WWII, chances are much lower today that financial repression would work and clear the way to exit for several reasons.

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[55] On financial repression see for instance, Reinhart and Sbrancia (2011), Reinhart (2012) or Zimmermann and Baier (2012). On sovereign debt crisis see Reinhart and Rogoff (2009).

a) After WWII, the US government combined financial repression with drastic spending cuts. From 1945 to 1948 government spending dropped by 50%, also thanks to drastic cuts in military spending, which fell from 37.5% of GDP in 1945 to 3.6% in 1948 (Daggett 2002). Today, most government spending is on welfare. The political resistance to social spending cuts is much higher and makes similar reduction in spending as in the US after WWII unlikely. Austerity measures are highly unpopular among voters, and may cause sustained unemployment in inflexible labor markets[56].
b) While demobilization in the relative free US economy set the stage for important real growth rates after WWII (Taylor and Vedder 2010), today growth is anemic because of overregulation and high government spending that hinders the private economy. Overindebtedness and structural problems created by ZIRP, inhibit growth and make the exit through financial repression more difficult. Indeed, financial repression may reduce savings rates (Zimmermann and Baier 2012) thereby delaying economic recovery.
c) In the 1950s and '60s, it was easier for governments to repress interest rates. In the 1950s there were no money-market accounts or 401(k)s (Rickards 2014, p. 184). Stock markets were regarded as highly speculative after the experience of the crash of 1929. Money was put mostly in simple bank accounts, while yields on bank savings were easily capped by government interventions. Today, people have more ample investment opportunities internationally through stock markets, money market funds etc. People can reach for yield much more easily and could cause bubbles on the way. If governments are unable to suppress the yields on alternative investments, it will be difficult to maintain the yields on government bonds low in the long run. There remains, of course, one way to hold down yields on governments, which is by central bank purchases. Further

[56] In fact, the IMF projects highly indebted Eurozone countries to run primary budget surpluses of 5 percent of GDP for 10 years. Eichengreen and Panizza (2014) show empirically that periods with similar surpluses have been very rare. The growth of the welfare state and attempts to benefit from Eurozone neighbor countries through ECB policies make such surpluses even less likely.

bond purchases is a self-defeating strategy in the long run as new money is produced to hold yields down which causes future price inflation and thereby higher yields.

2. **Inflation**

Another option consists in inflating the debt away. Until now there has been a lack of price inflation. Central banks have even invoked the specter of deflation to justify their inflationary policies. The absence of price inflation in spite of the unprecedented increase in base money is explained by several reasons.

First, there *has* been important price inflation. Asset prices, such as at stock markets, have soared.

Second, banks themselves have been in an illiquid position. Interbank lending froze in 2008. Banks, therefore, used the reserves received by the expansionary monetary policies to improve their liquidity position in times of increased uncertainty, not to extend credit to new borrowers.

Third, you can lead a horse to water, but you cannot make it drink. There has been a lack of demand for bank loans. In times of increased uncertainty, there is not much demand to take on loans and invest. As long as the restructuring is not completed, the increased uncertainty will not disappear. Moreover, demand for loans must be solvent. Banks become more cautious in a recession. Overindebted companies representing malinvestments will demand loans in a recession, but they do not represent solvent demand. Ironically, as long as ZIRP props up overindebtedness and malinvestments, there will be a lack of solvent demand for loans and reduced price inflation.

Banks have been unwilling to grant loans in general, especially when they are struggling for their own survival. Private individuals do not want to incur more debt and instead reduce their debts and increase their liquidity position[57]. The private demand for

[57] Arias and Wen (2014) argue that excessively low interest rates fostered money hoarding and reduced the "velocity of money" which prevented the increase in base money to cause substantial price inflation. Howden (2013) explains the corollary — that

loans is weak because many individuals became aware of their overindebtedness in 2008 when the price of their assets collapsed and their income stopped increasing or even fell. Consequently, individuals started paying back their debt. Similarly, some companies started to deleverage[58]. Without the unconventional monetary policies that compensated for the deleveraging, a strong credit contraction would have developed and prices would have fallen. Unconventional policies prevented consumer prices from falling. Price inflation from the counterfactual price level which would have been attained in the absence of unconventional monetary policies is most likely quite substantial.

While central banks have not yet caused price inflation, they could use inflation as an exit strategy. By using the printing press, central banks could inflate private and public debts away and raise interest rate afterwards. However, the situation could get out of control and the monetary system collapse in a hyperinflation.

When a monetary system breaks down, it becomes difficult to regain the confidence in a fiat money standard again. As governments do not want to lose the control on money, the high inflation option is a last resort measure that has been unattractive to governments until now.

3. **Explicit default or restructuring**

The amount of government debt can also be reduced by partial restructuring (haircuts) or complete default[59]. A default on or restructuring of public debt could, however, trigger major losses for financial institutions and shake confidence in the financial sys-

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a fall in velocity is really just illustrative of a drop in demand for goods and services, and the causal factor causing low inflation is better explained this way.

[58] For the amount of deleveraging see the above section "Relative expansion of sectors."

[59] As private debts are also excessive in some countries, Rhodes and Stelter (2011) have argued for a general debt restructuring including private debts because they do not see financial repression combined with austerity and higher growth as a viable exit option. Their plan includes general debt write-downs, a recapitalization and temporary nationalization of the banking system, government control of the growth of private debt and possibly wealth taxes.

tem. A downward spiral of defaults and bank insolvencies might take the financial system down. The Armageddon that was to be avoided in the first place by unconventional policies would eventually play out. Therefore, this third option has not been chosen so far, at least not extensively[60].

An alternative restructuring plan for the Eurozone (PADRE: Politically Acceptable Debt Restructuring in the Eurozone) was proposed by Paris and Wyplosz (2014). According to PADRE, an agency would borrow from financial markets and purchase public debt at face value, swapping them into zero-interest perpetuities, so that debts would de facto disappear. Since the agency (the ECB) pays interest on its obligations but does not receive interest on the perpetuities, it suffers losses. The agency must roll-over the obligations to «finance» the perpetuities, which means that the losses continue forever. The losses fall completely on the agency, while existing bondholders do not suffer losses. A banking crisis is avoided. The agency's losses would then be passed on to the Eurozone governments.

While this solution on first sight seems intriguing, there are some problems with the PADRE plan. First, the overall amount of debt is not reduced, it is just shifted around.

Second, the incentive to reduce expenditures and balance the budgets is reduced, since governments will be encouraged to ask for future similar bailouts.

Third, the quality of the balance sheet of the agency, assuming that it is the ECB, decreases substantially. Hence, the quality of the euro is reduced as the average quality of the ECB´s assets deteriorates[61]. The non-interest bearing perpetuities are an illiquid, actually worthless asset, which could not be used to defend the euro in times of emergency either internally or externally. The effects of PADRE on the value of the euro are completely unknown. As the value of a fiat currency such as the euro depends solely on confidence, the experiment of PADRE could have substantial devaluing effects.

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[60] There has been a default on Greek government bonds through two haircuts. Lowering interest rates or extending their term represent other forms of restructuring that have been applied already.

[61] On the quality of money see Bagus (2009) and on the quality of central banks´ balance sheets see Bagus and Howden (2009a).

Fourth, PADRE would meet political opposition from countries that fear its distributional effects. Fiscally more solvent countries with a population adverse to inflation, such as Germany, could resist such a plan.

Increase in taxes, especially a capital levy: Another option consists in reducing public debts to a sustainable level via tax increases. Regular tax increases, however, reduce the incentive to be productive and save when they are foreseeable and repetitive. A one-time capital levy may be more effective and attractive for governments[62]. A capital levy could be used to bring back government debts to a sustainable level and, thereby, reduce the pressure on central banks to continue with ZIRP.

Indeed, the IMF (2013b, p. 49) has already suggested a capital levy for the EU of 10% on net financial wealth to bring back public debt ratios to end-of 2007 levels for Eurozone countries. The ECB could then exit its emergency policies and raise interest rates. Bach and Wagner (2012) also make the case for a capital levy arguing that high public debts are counterbalanced with high private wealth that is increasingly concentrated.

Eichengreen (1989) points to the problem of capital flight in democracies when a capital levy is discussed. He argues that in peace times there was virtually no successful capital levy and the policy only worked in Japan without a democracy after World War II. A capital levy also worked in Germany after the war, for the same reason. Yet, in today´s globalized world, the parliamentary discussion of a capital levy in the Eurozone would lead to large-scale capital flights. Only an undemocratic surprise measure could prevent it. Otherwise the capital levy would mostly be a one-time tax on immobilized capital such as real estate. An additional practical problem of capital levies is the difficult and costly valuation of assets involved.

4. **Bail-in**

Bringing back government debts to a sustainable level is not enough to make exit viable. The end of ZIRP and unconventional poli-

[62] One the effects of wealth taxation in general see Bagus (2007).

cies could bring severe problems for private agents that depend on its continuation. The banking system could suffer losses if interest rates were to rise and threatened the viability of investing schemes depending on ZIRP.

An end of ZIRP and the insolvency of agents could make a substantial recapitalization of the banking system necessary. Yet, if governments recapitalize banks, they increase their debt levels again. An alternative way to recapitalize the banking system and release the strain on governments´ balance sheets is a bail-in[63]. In a bail-in, bank creditors are converted to shareholders. A bail-in reduces overall debts and prepares bank balance sheets for eventual losses resulting from the end of ZIRP.

A bail-in could make bank balance sheets so robust that they could even sustain a haircut on government bonds. Thus, a reduction of government debts through default and a bail-in reducing indebtedness of the economy may be combined. In 2013 in Cyprus we have already seen a bail-in and the Eurozone has regulated procedures for bail-ins as part of the banking union. Therefore, it is not unlikely that a bail-in will be part of an exit strategy from ZIRP.

5. **Currency Reform**

Another option to exit ZIRP reducing overindebtedness is a full-fledged currency reform introducing a new fiat money. A currency reform is more radical than the bail-in option mentioned in the last paragraph. A bail-in is, in a sense, a half-way currency reform, as banks´ debts and the money supply are reduced but not banks´ assets (which may be reduced in a monetary reform). A currency reform could bring down the level of government debt and the overindebtedness of the private economy. Furthermore, it could recapitalize the banking system. Such a reform was instituted successfully in Germany after WWII.

Without entering into details, the German reform after WWII redenominated monetary debts and assets by a factor of one-

[63] For the possibility of a bail-in in Spain see Bagus et al. (2014a). On the advantages of a bail-in see Bagus et al. (2014b).

tenth[64]. All government debts were eliminated. Only banks received compensating assets for their government debt holdings. As bank liabilities fell by one-tenth, but not all bank assets (government compensation assets or real estate) fell commensurately, banks were recapitalized. As prices remained the same (the hidden inflation from the war years was simply eliminated) debt ratios fell.

These measures were combined with a confiscatory tax on gains from the currency reform and a capital levy. Both the banks' and the government´s solvency were greatly improved, overindebtedness was reduced and wartime losses for the common population realized.

6. **Return to a sound economy and sound money**

A final policy, which will likely not be chosen for political reasons, consists in combining a profound adjustment recession with a thorough reform of the monetary system. If the government would announce the start of currency competition, the elimination of legal tender laws and the privatization of central banks´ assets, economic agents dependent on further monetary inflation might face insolvency or at least severe losses[65]. Bankruptcies and unemployment would increase, perhaps quickly. Bankruptcies would reduce overindebtedness and factors of production would be redirected quickly toward their most valuable uses in the eyes of consumers. The adjustment recession could be alleviated by introducing a fully-backed metallic monetary system. Introducing, for instance, a 100% gold or silver standard could restore confidence in the monetary unit and spur savings that could finance new investment projects.

Such a reform involves many frictions, especially if not introduced on a global scale. Yet, the return to a robust economy and sound money may be considered as more important than its short-term costs. From a libertarian natural law perspective á la Roth-

[64] See Homburg (2011) for details.

[65] See Bagus (2008) for a detailed monetary reform plan that restores private property rights in money.

bard (1982) this last policy option is the one to be chosen as it is in line with the defense of private property rights[66]. While such a policy option is not politically realistic today, all policies can be judged and compared in light of such a reform.

Defenders of private property rights and natural law ethics will prefer any policy step in that direction, i.e., any monetary policy that somewhat resembles a gold standard, to steps away from the ideal. For instance, they will prefer a restrictive monetary policy and raising interest rates to the continuation of ZIRP.

VII
CONCLUSION

The unconventional monetary policies started in 2008 to save the financial system continue unabated. Today these policies support financial markets and governments in the hope for an increase in aggregate spending through wealth effects[67]. These policies are not without costs. They contain important redistributive effects in favor of financial institutions and governments to the detriment of the rest of the population. The combination of our quantitative and counterfactual analysis shows a tendency that redistribution runs from the poor and middle classes to the rich, from the old to the young, and from the potential new businesses to established ones. This redistribution may not only be regarded as unjust, it may also cause social unrest in the future and reduce the support for the market economy within the population.

In contrast to intuition and official purposes, ZIRP has slowed down and inhibited an economic recovery by reducing savings, channeling resources into unproductive government spending, propped up malinvestments and prevented the adjustment of overindebted balance sheets and relative prices.

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[66] Here is not the place to open the debate between fractional and full-reserve free banking. Suffice it to say that the introduction of a fractional-reserve commodity standard would have similar effects.

[67] According to Hunt (2013) the Fed´s policy is based on the false assumption, empirically derived, that wealth fluctuations seem to have no or little effect on consumer spending.

An often-neglected effect of ZIRP regards culture, entrepreneurship and values. In a ZIRP world with an institutionalization of negative real interest rates, traditional life models consisting of hard work, thrift and prudent investment are made less attractive. In the face of increased monetary uncertainty and the politicization of prices, long-term planning is made more difficult. Economic agents become more short-term oriented. Economic growth becomes more difficult; the economy stagnates as it becomes more rigid. Frustration and disillusionment by a population that is faced with stagnation as well as difficulties to advance or maintain its standard of living after retirement causes severe damage to the entrepreneurial and social fabric. As ever more economic agents depend on the government and the continuation of ZIRP the politicization of society erodes the foundations of the market economy.

It is not easy to exit these policies, as there is no popular way out of the ZIRP trap. Yet a quick exit is vital to minimize the long-run adverse effects that ZIRP exerts on entrepreneurship and culture. A return to a robust economy and sound money is politically unfeasible, but may serve as a yardstick to evaluate policies. Financial repression is the politicians´ preferred solution, because it hides and spreads out losses more than other options. Yet, financial repression may not work out as is commonly believed, as it may be too late to be effective. If economic growth remains anemic or inflation finally picks up and endangers the stability of the monetary system, other options will become more attractive. Capital levies, bail-ins or a full-fledged currency reform may be combined to bring the system back to sustainable debt levels and make an exit from ZIRP possible without provoking a mass bankruptcy of overindebted agents.

BIBLIOGRAPHICAL REFERENCES

ADRIAN, T. and SHIN HS (2008): «Liquidity and Financial Cycles». BISWorkingPaper256, Basel, July.

AIZENMAN, J., MAHIR, B., and HUTCHISON M. (2014): «The Transmission of Federal Reserve Tapering News to Emerging Financial Markets«. NBER Working Paper 19980.

ARIAS, M. and WEN, Y. (2014): «The Liquidity Trap: An Alternative Explanation for Today´s Low Inflation.» *The Regional Economist*, Federal Reserve Bank of St. Louis.

BACH, S., and WAGNER, G. (2012): «Capital Levies for Debt Redemption.» Voxeu.org August 15th. http://www.voxeu.org/article/eurozone-crisis-time-tax-rich

BAGUS, P. (2007): «A Taxonomy of Wealth Taxation.» Institute de Recherches Economiques et Fiscales http://www.irefeurope.org/col_docs/doc_89_fr.pdf

— (2008): «Monetary Reform and Deflation — A Critique of Mises, Rothbard, Huerta de Soto and Sennholz» *New Perspectives on Political Economy*, Vol. 4 (2), pp. 131-157

— (2009a): «The Quality of Money». *Quarterly Journal of Austrian Economics*, Vol. 12 (4), pp. 41-64.

— (2009b): «Monetary Reform — The Case for Button-Pushing.» *New Perspectives on Political Economy*, Vol. 5 (2), pp. 111-128.

— (2010): «Austrian Business Cylce Theory: Are *100 percent Reserves* Sufficient to Prevent a Business Cycle». Libertarian Papers, Vol. 2 (2).

— (2012): *The Tragedy of the Euro.* 2nd ed. Auburn, Ala.: Ludwig von Mises Institute.

— (2015): *In Defense of Deflation*. London: Springer.

BAGUS, P. and HOWDEN, D. (2009a): «The Federal Reserve and Eurosystem´s Balance Sheet Policies During the Subprime Crisis: A Comparative Analysis». with David Howden, *Romanian Economic and Business Review*, Vol. 4 (3), pp. 165-85.

— (2009b.): «Qualitative Easing in Support of a Tumbling Financial System: A Look at the Eurosystem´s Recent Balance Sheet Policies». *Economic Affairs*, Vol. 21 (4), pp. 283-300.

BAGUS, P., RALLO, J. R., and ALONSO, M. A. (2014a): «*Bail-in or Bail-out: The Case of Spain*». *CESifo Economic Studies, Vol. 60 (1), pp. 89-106.*

— (2014b): «*A free market bailout alternative*». *European Journal of Law and Economics, Vol. 37, pp. 405-419.*

BANDOW, D. (2013): «The Triumph of Good Economics: ´Austere´ Baltic States Outgrow their European Neighbors». Forbes. April 15th http://www.forbes.com/sites/dougbandow/2013/04/15/the-triumph-of-good-economics-austere-baltic-states-outgrow-their-european-neighbors/

BERNANKE, B. (2002): «Deflation: Make Sure ´It´Does not Happen here «. Speech before the National Economists Club, Washington D.C. November 21st. http://www.federalreserve.gov/boarddocs/Speeches/2002/20021121/default.htm

BLINDER, A. (2010): «Quantitative Easing: Entrance and Exit Strategies». *Federal Reserve Bank of St. Louis Review*, Vol. 92 (6), pp. 465-79.

BLOOMBER (2011): *The Fed´s Secret Liquidity Lines*. <http://www.bloomberg.com/data-visualization/federal-reserve-emergency-lending/#/overview/?sort=nomPeakValue&group=none&view=peak&position=0&comparelist=&search=>

BOROOAH, V. (2014): *Europe in an Age of Austerity*. London: Palgrave McMillan.

BUCK, P. [1947] (1969): *How It Happens: Talk about the German People, 1914-1933, with Erna von Pustau*. New York: The John Day Company. Excerpted in Fritz Ringer, ed., *The German Inflation of 1923*. New York: Oxford University Press, pp. 120-146.

CHODOROW-REICH, G. (2014): *Effects of Unconventional Monetary Policy on Financial Institutions*. NBER Working Paper No. 20230.

DAGGET, S. (2002): Defense Budget FY 2003: Data Summary. CRS Report for Congress. http://fpc.state.gov/documents/organization/9665.pdf

DOBBS, R., LUND, S., KOLLER, T. and SHWAYDER, A. (2013): «QE and ultra-low interest rates: Distributional effects and risks». *McKinsey Discussion Paper*. November.

ENGLISH, W., LÓPEZ-SALIDO, D. and TETLOW, R. (2013): «The Federal Reserve´s Framework for Monetary Policy — Recent Changes and New Questions». Paper presented at the 14th Jacques Polak Annual Research Conference Hosted by the IMF in Washington DC, November 7-8.

EICHENGREEN, B. (1989): «The Capital Levy in Theory and Practice». *NBER Working Paper* No. 3096.

EICHENGREEN, B. and PANIZZA, U. (2014): «A Surplus of Ambition: Can Europe Really Rely on Large Primary Surpluses to Solve its Debt Problem? «. *NBER Working Paper,* No. 20316.

FERGUSON, A. (2010): *When Money Dies*. New York: Perseus.

GILCHRIST, S., LÓPEZ-SALIDO, D. and ZAKRAJSEK, E. (2014): «Monetary Policy and Real Borrowing Costs at the Zero Lower Bound». *NBER working paper* No. 20094.

GREENLAW, D., HAMILTON, J., HOOPER, P. and MISHKIN, F. (2013): «Crunch Time: Fiscal Crises and the Role of Monetary Policy». *NBER working paper*, No. 19297, http://papers.nber.org/tmp/89905-w19297.pdf

HAMILTON, J. (2011): «The Effectiveness of Alternative Monetary Policy Tools in a Zero Lower Bound Environment». *NBER working paper* no. 16956. April.

HANKE, S. (2013): «The Federal Reserve vs. Small Business». *Cato at Liberty*, http://www.cato.org/blog/federal-reserve-vs-small-business-0

HIGGS, R. (1997): «Regime Uncertainty: Why the Great Depression Lasted So Long and Why Prosperity Resumed After the War». *The Independent Review*, Vol. 1(4), pp. 561-590.

— (2010): «Recession and recovery: Six fundamental errors of the current orthodoxy». The *Independent Review*, Vol. 14(3), pp. 465-472.

HOMBURG, S. (2011): «Erinnerungen an deutsche Währungsreformen». *Ifo-Schnelldienst*, Vol. 64 (19), pp. 17-22.

HORWITZ, S. (2007): «Capitalism and the Family». Foundation for Economic Education. http://fee.org/freeman/capitalism-and-the-family/

HOWDEN, D. (2013): «The Quantity Theory of Money» *The Journal of Prices & Markets*, Vol. 1 (1): 17-30.

— (2014): «The Icelandic and the Irish Banking Crisis: Alternative Paths to a Credit Induced Collapse». *The Independent Review*, Vol. 18 (3), pp. 421-439.

HÜLSMANN, G. (2008): *The Ethics of Money Production*. Auburn, Ala.: Ludwig von Mises Institute.

— (2013): *Krise der Inflationskultur. Geld, Finanzen und Staat in Zeiten kollektiver Korruption*. München: FinanzBuchverlag.

HUERTA DE SOTO, J. (2009): *Money, Bank Credit, and Economic Cycles*, Ludwig von Mises Institute, Auburn (Alabama).

— (2011): «Economic Recessions, Banking Reform and the Future of Capitalism». *Economic Affairs*, Vol. 31(2), pp. 76-84.

HUNT, L. (2013): «The Fed´s Flawed Model». *Casey Research*, August 7, http://www.caseyresearch.com/articles/the-feds-flawed-model

IMF (2013a): «Global Impact and Challenges of Unconventional Monetary Policy» *IMF Policy Paper* October.

— (2013b): «Taxing Times». *Fiscal Monitor*, October.
— (2014): «Public Expenditure Reform — Making difficult Choices». Fiscal Monitor, April.
Ivry, B., Keoun, B. and Kuntz, P. (2011): «Secret Fed Loans Gave Banks $13 Billion Undisclosed to Congress» Bloomberg. November 28, http://www.bloomberg.com/news/2011-11-28/secret-fed-loans-undisclosed-to-congress-gave-banks-13-billion-in-income.html
Joyce, M., Miles, D., Scott, A. and Vayanos, D. (2012): «Quantitative Easing and Unconventional Monetary Policy — An Introduction». *The Economic Journal*, Vol. 122, F271-F288.
Keoun, B. and Kuntz, P. (2011): «Wall Street Aristocracy got $1.2 Trillion in Secret Loans». Bloomberg, August 22, http://www.bloomberg.com/news/2011-08-21/wall-street-aristocracy-got-1-2-trillion-in-fed-s-secret-loans.html
Kihara, L. (2012): «Japan´s Abe Heaps Pressure on BOJ to set 2 percent inflation target». *Reuters*. 24th December. http://www.reuters.com/article/2012/12/23/us-japan-economy-idUSBRE8BM00C20121223
Lachman, D. (2013): «Global Effects of Unconventional Monetary Policies». American Enterprise Institute, *Perspectives*, November.
Marquart, A. and Bagus, P. (2014): *Warum andere auf Ihre Kosten immer reicher werden. Und welche Rolle der Staat und unser Papiergeld dabei spielen*. München: FinanzbuchVerlag.
Mauldin, J. and Tepper, J. (2013): *Code Red: How to Protect Your Savings from the Coming Crisis*. New York: Wiley.
McKinnon, R. (2012): «Zero Interest Rates in the United States Provoke World Monetary INstability and Constrict the U.S. Economy». *SIEPR policy brief*. August 2012.
Miron, J. and Rigol, N. (2013): «Bank Failures and Output During the Great Depression». *NBER working papers*, no. 19418, September.
Mises, L. V. (1998): *Human Action. Scholar´s Edition*. Auburn, Ala.: Ludwig von Mises Institute.
Noonan, L. and Flasseur, V. (2013): «European Bank Bailouts by Numbers». *ThompsonReuters*. September 30. http://blog.thomsonreuters.com/index.php/european-bank-bailouts-graphic-of-the-day/

PARIS, P. and WYPLOSZ, C. (2014): «The PADRE Plan: Politically Acceptable Debt Restructuring in the Eurozone». Voxeu.org, http://www.voxeu.org/article/padre-plan-politically-acceptable-debt-restructuring-eurozonem, January 12th.

PITTMAN, M. (2009): «Court Orders Fed to Disclose Emergency Loans». Bloomberg. August 29, http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a7CC61ZsieV4

POLLEIT, T. (2011): «Fiat Money and Collective Corruption». *The Quarterly Journal of Austrian Economics*, 14 (4): 397-415.

RALLO, J. (2012): *Los errores de la vieja economía*. Madrid: Unión Editorial.

— (2014): «Los bálticos: el ejemplo de recuperación robusta». *VozPopuli*. January 16th. http://vozpopuli.com/blogs/3929-juan-r-rallo-los-balticos-el-ejemplo-de-recuperacion-robusta

REIFSCHNEIDER, D., WASCHER, W. and WILCOX, D. (2013): «Aggregate Supply in the United States: Recent Developments and Implications for the Conduct of Monetary Policy». Paper Presented at the 14th Jacques Polak Annual Research Conference Hosted by the IMF in Washington DC November 7-8.

REINHART, C. (2012): «The return of financial repression». *Financial Stability Review*, No. 15, Banque de France, April, pp. 37-48.

REINHART, C. and SBRANCIA, B. (2011): «The Liquidation of Government Debt». *NBER working paper*, No. 16893.

REINHART, C. and ROGOFF, K. (2009): *This Time is Different: Eight Centuries of Financial Folly*. Princeton: Princeton University Press.

— (2013): «Financial and Sovereign Debt Crisis: Some Lessons Learned and Those Forgotten». *IMF Working paper* 13/266.

RHODES, D. and STELTER, D. (2011): *Back to Mesopotamia? The Looming Threat of Debt Restructuring*. Boston Consulting Group.

RICKARDS, J. (2014): *The Death of Money. The Coming Collapse of the International Monetary System*. New York: Penguin.

ROFF, K. (2015): «2014 Saw a Sharp Increase in Tech M&A, IPOs». FoxBusiness. http://www.foxbusiness.com/technology/2015/01/28/2014-saw-sharp-increase-in-tech-ma-ipos/

ROTHBARD, M. (1976): «Deflation reconsidered». In *Geographical Aspects of Inflationary Processes*, Vol. I, eds. P. Corbin and M. Sabrin, 35-41. Pleasantville, NY: Redgrave Publishing.

— [1982] (1998): *The Ethics of Liberty*. New York: New York University Press.
— (1996): «Origins of the Welfare State in America». *Journal of Libertarian Studies* Vol. 12 (2), pp. 193-232.
— (2000): *America´s Great Depression*. Auburn, Ala.: Ludwig von Mises Institute.
SCHNABL, G. (2013): «The Global Move into the Zero Interest Rate and High Debt Trap». University of Leipzig, *Working Paper* No. 121. July.
SINGH, M. and AITKEN, J. (2010): «The (sizeable) Role of Rehypothecation in the Shadow Banking System». IMF *Working Paper*, No. 10/172, https://www.imf.org/external/pubs/ft/wp/2010/wp10172.pdf
STARK, J. (2014): «Wir sind Teilnehmer eines großen geldpolitischen Experiments- mit offenem Ausgang». *Hauptstadtbrief*, 122.
STOCKMAN, D. (2013): *The Great Deformation — The Corruption of Capitalism in America*. New York: PublicAffairs.
SVENSSON, L. (2006): «Monetary Policy and Japan´s Liquidity Trap». *CEPS Working Paper* No. 126.
TAYLOR, J. and VEDDER, R. (2010): «Stimulus by Spending Cuts: Lessons from 1946». *Cato Policy Report*, Vol. XXXII, No. 3.
THE CORNER (2014): «Thousands of Spaniards Trapped in Underwater Mortgages.» *The Corner*. http://www.thecorner.eu/spain-economy/thousands-spaniards-trapped-underwater-mortgages/35337/
UEDA, K. (2011): «Japan´s Deflation and the Bank of Japan´s Experience with Non-traditional Monetary Policy». *CIRJE Discussion Paper*. October.
WHITE, W. (2012): «Ultra Easy Monetary Policy and the Law of Unintended Consequences». *Federal Reserve Bank of Dallas*, working paper No. 126.
WOODFORD, M. (2012): «Methods of Policy Accommodation at the Interest-Rate Lower Bound». Paper Presented at Jackson Hole, Wyoming, August 31, 2012.
ZIMMERMANN, G. and BAIER, F. (2012): «Financial Repression — Ein neues Umfeld für die Finanzmärkte». *Wirtschaftsdienst*, Vol. 92 (9), pp. 599-604.

APPENDIX

1. **Reaction of central banks**

We will describe briefly the policies of major Western central banks in the wake of the crisis concentrating on the policies of the Fed and the ECB[68].

The Fed

The Fed started already in 2007 to change the composition of its balance sheet in order to support a financial system that showed increasing signs of stress[69]. The central bank sold Treasury bills to the banking system maintaining its balance sheet´s size more or less constant by granting more loans to banks. As such banks received high quality collateral, improved their balance sheets and refinanced themselves. However, this kind of «qualitative easing», i.e. the deterioration of the average quality of central banks´ assets, proved to be insufficient with the collapse of Lehman Brothers in September 2008 when the Fed doubled the size of its balance sheet within two months. As the credit market froze, private wholesale funding was replaced by Fed-issued credit. To this end, the Fed also introduced several new facilities to support specific market segments such as the asset backed commercial paper facility and the money market mutual fund commercial paper funding facility. The Fed balance sheet started to incorporate the rescue loans of

[68] In the literature, tremendous efforts have been spent to develop and analyze the effectiveness of the unconventional monetary policies. The main focus, however, has so far not been to analyze the potential adverse consequences of these policies but to assure the effectiveness of monetary policies at the zero bound. See for instance Hamilton (2011) who points to maturity swaps for an effective monetary policy. Gilchrist (2014) empirically asserts the efficacy of unconventional monetary policies through the influence of expectations.

[69] For a detailed analysis of the balance sheet policies in the first stages of the financial crisis see Bagus and Schiml (2010) and Hamilton (2011). For a comparison of the policies conducted by the Fed and the ECB see Bagus and Howden (2009a). See English et al. (2013, pp. 40) for a summary of unconventional policies of major Western central banks (without the Fed).

AIG, as well as debt of Fannie Mae and Freddie Mac. Furthermore, the Fed broadened its counterparties and increased the terms of its lending activities. In terms of interest-rate policy, the Fed had already lowered the federal funds target rate to the 0-0.25% range by autumn 2008.

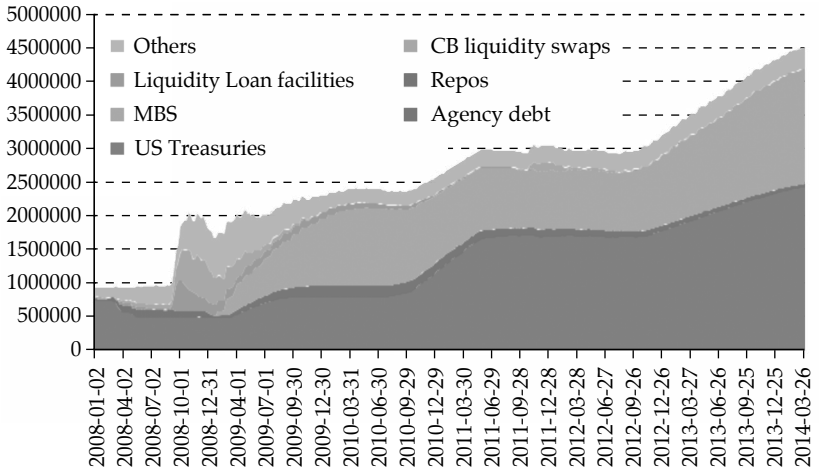
After reaching the zero bound, the Fed continued with its expansionary policy stand and started several rounds of what has been dubbed as quantitative easing (QE)[70]. During QE1 from March 2009 to March 2010, the Fed purchased $1 tr. of US government bonds and agency securities. QE2 lasting from November 2010 to the second quarter of 2011 comprised the purchase of $600 bn. treasury securities. In September 2012 $40 bn. of open ended monthly purchases of agency debt were announced. The purchases were increased by adding purchases of Treasury bonds totaling $85 bn. two months later. Starting in December 2013 the amounts of monthly purchases were reduced in steps of $10 bn. and were ultimately phased out.

Another unconventional policy employed by the Fed was Operation Twist announced in September 2011 by which the central bank tried to lower long-term rates on government bonds. During Operation Twist the Fed sold up to $400 bn. of short-term government securities (up to 3 years) in order to buy longer-term government securities. A final innovation introduced by the Fed was its «forward guidance» on future interest rates. In 2008, the Fed wanted to assure market participants that interest rates would remain low for an extended period of time. Later, the Fed introduced a 6.5% unemployment trigger for changing the course of monetary policy.

In graph 12, we see the expansion of the Fed´s balance sheet from 2008-2014.

[70] Forms of quantitative easing were also employed by the Bank of England between March 2009 and October 2011 and by the Bank of Japan between October 2010 to December 2012 and from April 2013 onward. For an analysis of the unconventional measures conducted by the Bank of Japan and a topology of QE see Ueda (2011).

GRAPH 1
ASSETS HELD BY THE FED IN MILLION DOLLARS



Source: Federal Reserve. H.4.1.

The ECB

The ECB also reacted with unconventional monetary policies to the crisis[71]. In 2007, the ECB started increasing its balance sheet steadily, mainly through its lending facilities. Later, the ECB used currency swaps to provide the European banking system with US dollars when international wholesale markets dried up. The ECB eased its collateral requirements from A- to BB-[72]. In addition, the ECB engaged in a form of qualitative easing by increasing successively the term of its lending operations. Between late 2009 and early 2012 it offered long-term refinancing operations (LTRO) of one-year term fixed rate and full allotment. In December 2011 and February 2012, it even offered three year LTROs allocating €489bn. and €530bn. respectively.

[71] For a detailed analysis see Bagus and Howden (2009b).

[72] In order to support the governments of Greece, Portugal and Ireland, the requirements for Greek, Portuguese and Irish governments bonds were further eased.

In terms of its interest rate policy the ECB started lowering its main refinancing rate standing at 3.75% in autumn 2008 to 1.00% in May 2009. The ECB then increased the rate up to 1.5% in July 2011 to cut it back later to 0.05% by autumn 2014. The marginal lending facility rate was also cut along the way, reaching 0.3% by autumn 2014. Until 2008, there had been a differential of 100 basis points between the main refinancing rate and the marginal lending facility. By June 2014, reducing the rate of distress lending had reduced this difference to 25 basis points constituting another measure to support the banking system.

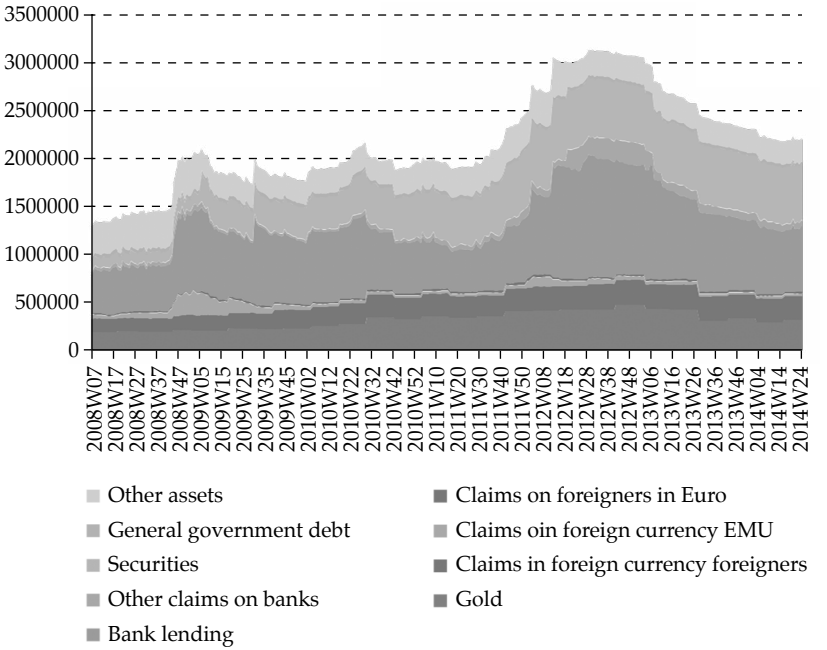
In terms of concrete asset purchases, the ECB bought bonds of peripheral Eurozone governments on the secondary market through its Securities Market Program in an amount of €208.7 bn. from May 2010 to August 2012. The Securities Market Program was substituted in August 2012 by the Outright Monetary Transaction (OMT), which has yet to be activated. In this program the ECB promises to purchase short-term sovereign debt of countries participating in an ESM-EFSF macroeconomic adjustment program. In addition to the purchase of government bonds, the ECB also bought covered bonds between mid 2009 and late 2012 totaling €76 bn. in order to support the covered bond market.

On June 5th 2014 the ECB went ahead with unconventional monetary policies at the zero interest bound by establishing a negative rate in its deposit facility of 0.1% in order to induce banks reducing their excess reserves. On that day, the ECB also announced it would stop «sterilizing» the Securities Markets Program. Sterilization had absorbed reserves from the banking system. The ECB also announced targeted LTROs (TLTRO) in which the collateral for the loans are private non-financial loans. These measures are intended to direct funds into the private non-financial sector. Previous LTROs had been mainly used to finance governments. By introducing a sort of forward guidance, ECB-President Draghi assured markets that interest would remain low as long as necessary[73].

[73] Other central banks started to use forward guidance. The Bank of England announced it would not raise the Bank Rate until reaching the unemployment threshold of 7%. The Bank of Japan announced in 2010 it would not raise interest rates until price stability was reached.

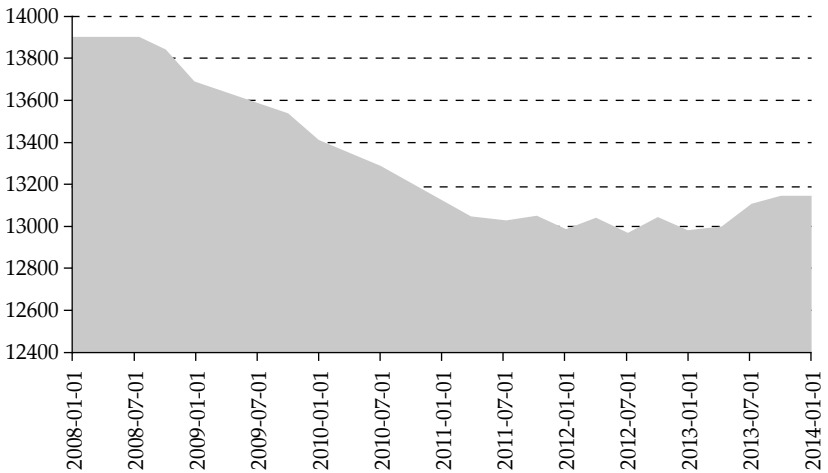
In graph 2, we can observe the expansion of the ECB´s balance sheet from 2008-2014. In comparison to the Fed, the ECB has been less expansionary and has reached the zero lower bound of interest rates much later than the Fed.

GRAPH 2
ASSETS HELD BY THE ECB IN MILLION EUROS



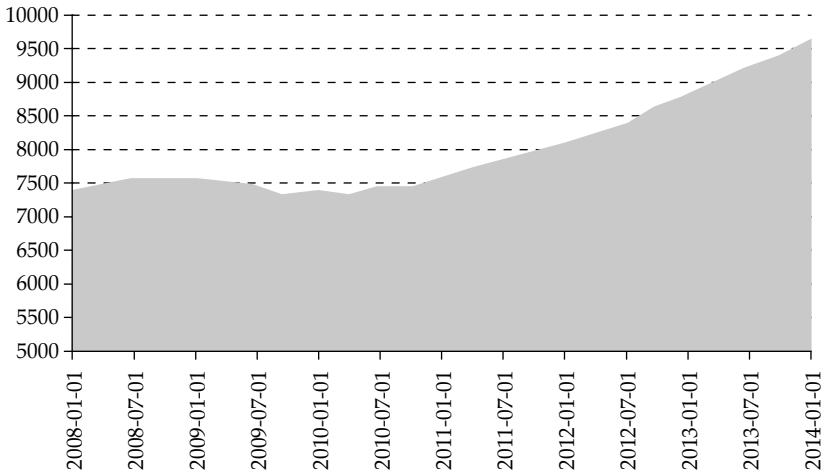
Source: ECB. Consolidated Financial Statement of the Eurosystem.

In graph 3 we can observe all credit market instruments of households in billion of dollars from 2008 to 2014.



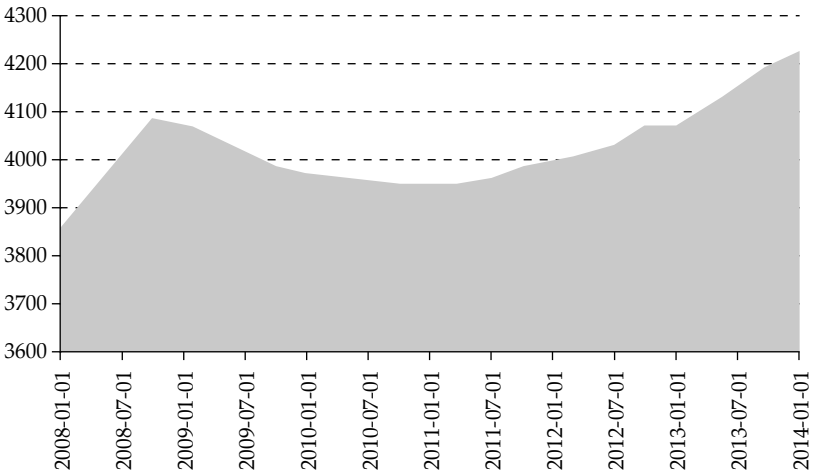
Source: Fred. Financial Accounts of the United States. 2014.

In graph 4 we can observe all credit market instruments of non financial corporate in billion of dollars from 2008 to 2014.



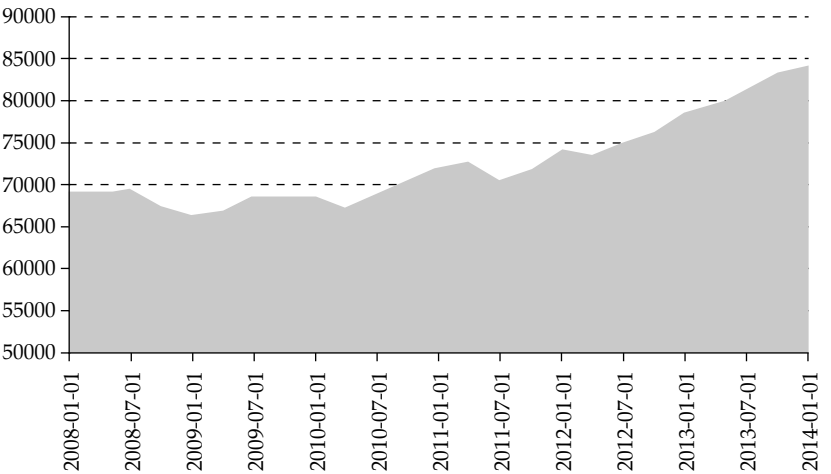
Source: Fred. Financial Accounts of the United States. 2014.

In graph 5 we can observe all credit market instruments by non financial non corporate in billion of dollars from 2008 to 2014.



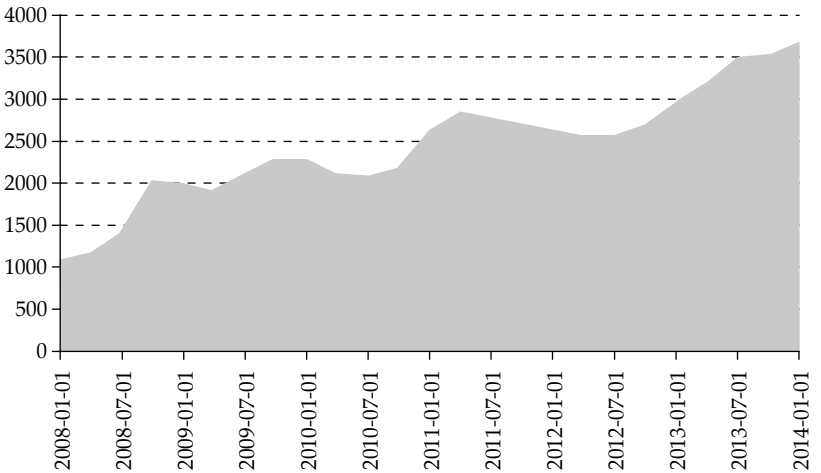
Source: Fred. Financial Accounts of the United States. 2014.

In graph 6 we see total liabilities of financial business in billion dollars from 2008 to 2014.



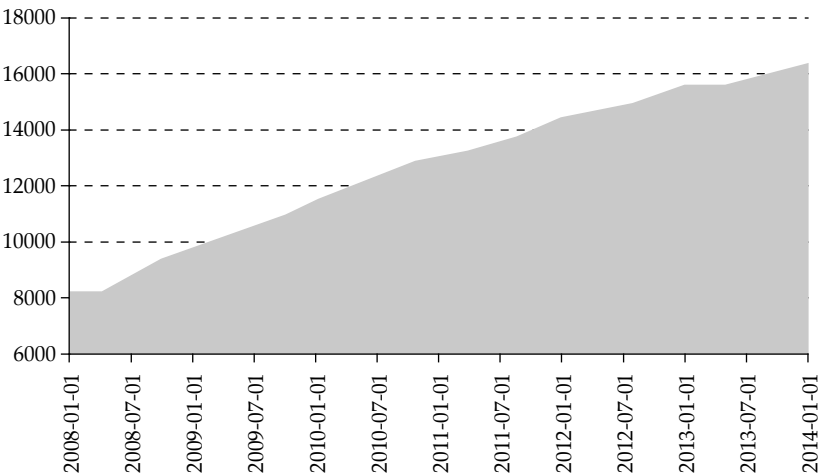
Source: Fred, Financial Accounts of the United States. 2014.

In graph 7 we see total currency of financial business in billion dollars from 2008 to 2014.



Source: FRED, Financial Accounts of the United States. 2014.

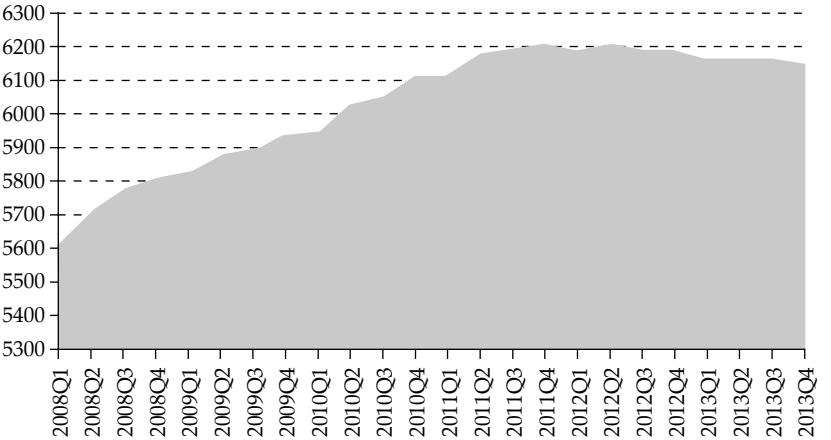
In graph 8 we can observe the total liabilities of the federal government in billion dollars from 2008 to 2014.



Source: FRED, Financial Accounts of the United States.

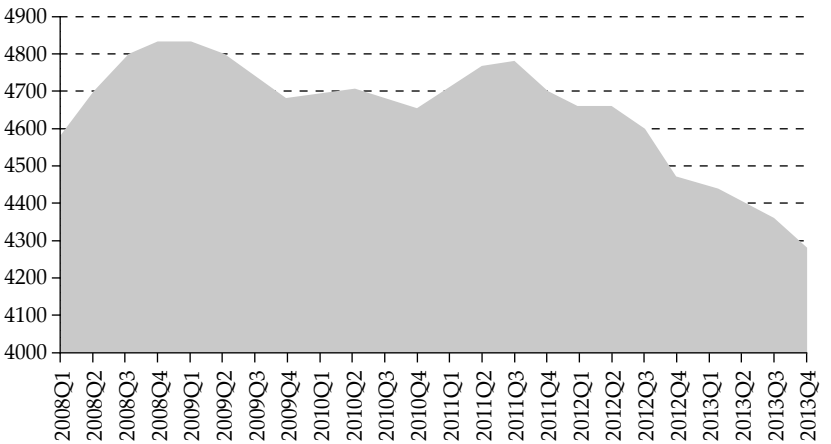
Euroarea sectors

In graph 9 we observe loans from Euroarea households in bn. Euros.



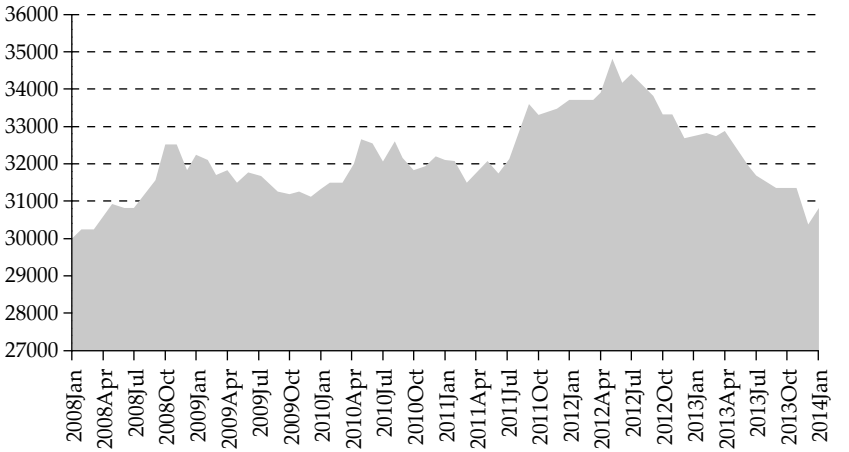
Source: ECB and Eurostat. Quarterly Euroarea accounts.

Graph 10 portrays loans of non financial corporations in billion euros from 2008-2014.



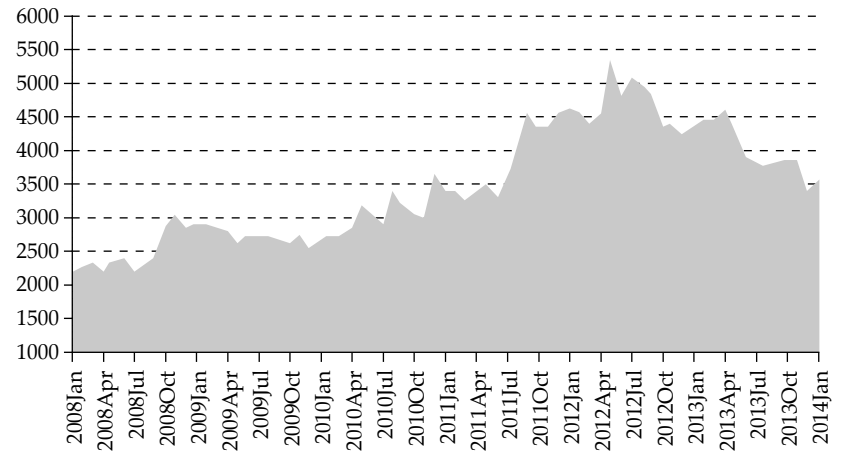
Source: ECB and Eurostat. Quarterly Euroarea accounts.

Graph 11 portrays total liabilities of monetary and financial institutions in billion euros from 2008 to 2014.



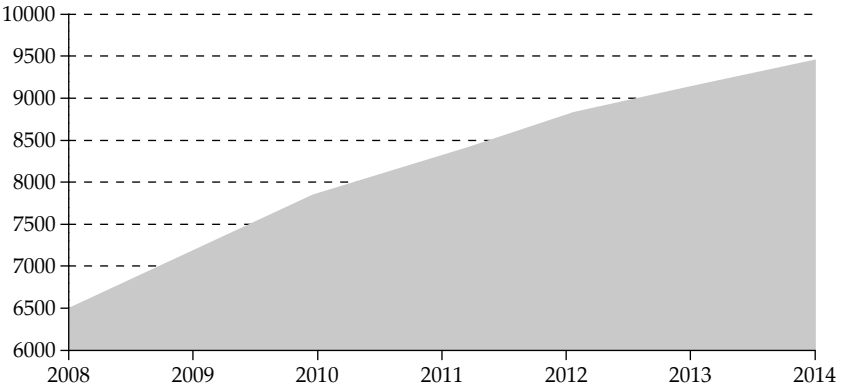
Source: ECB and Eurostat. Quarterly Euroarea accounts.

Graph 12 portrays remaining assets and cash in billion euros in the Eurozone from 2008 to 2014.



Source: ECB and Eurostat. Quarterly Euroarea accounts.

GRAPH 13
EUROAREA (18) GOVERNMENT DEBT
IN BILLION EUROS 2008-2014 (ESTIMATED)



Source: Ameco.