



WHAT GOOD IS HIGHER INFLATION? TO AVOID OR ESCAPE THE LIQUIDITY TRAP¹

Lucian CROITORU²

Abstract

When governments are over-indebted, it is mainly the role of monetary policy to focus on reflating the economy in order to release it from the liquidity trap. We show that the following problems may arise in this context: linking inflation expectations to base money developments; increased uncertainty on the possible reversal of quantitative easing by central banks in close correlation with banks' lower liquidity preference after escaping the liquidity trap; higher inflation when central banks fail to reverse the quantitative easing at an adequate pace for a long period; losses reported by central banks once economies exit the liquidity trap and yields go up. Given the recurrence of the instability cycle and the higher probability of the economy to avoid falling into the liquidity trap if inflation is relatively high when a bubble bursts, then such inflation is preferable to a relatively low one. This paper proposes an enhancement of the monetary policy objective by shifting from explicit or implicit targeting of low and stable inflation to targeting moderate and stable inflation.

Keywords: macroeconomics, Liquidity Trap, monetary policy, inflation

JEL Classification: E52, E58

Introduction

Several years have already passed since monetary policy rates have neared zero in many advanced countries, namely since these economies fell into the liquidity trap. In order to help them exit this trap, central banks have increased the base money several times since the crisis outbreak, without however solving the problem. This rekindles the practical and academic interest in two important issues. The first one refers to the relation between money and inflation, as well as between money and asset prices. The second one concerns monetary policy effectiveness when the policy rate equals zero.

¹ *The opinions expressed herein are those of the author and do not, in any way, reflect the official position or policies of the National Bank of Romania. The reproduction of this paper without the author's consent is forbidden. Data may be used only by indicating the source.*

² *The author would like to thank his NBR colleagues, Elena Iorga, Florian Neagu and Adriana Aloman, for their support in preparing this paper. Additional thanks for their valuable insight go to the participants in the symposium on "Broad Money and Inflation. Theory and Practice" hosted by the National Bank of Romania on 6 March 2012.*

In the past, there was a strong positive correlation between the average long-term growth of base money and inflation. This correlation, along with the liquidity trap, poses difficult questions for both the public and central banks in advanced countries as well as in some emerging economies that depend on the former in various ways, including in Romania.

On the one hand, the delay in the economy's firm response to the quantitative easing laid down in theory raises the question whether monetary policy can actually generate, within a predictable time frame, the inflation necessary for the economies to exit the liquidity trap.

On the other hand, the strong relation between money and inflation raises the question whether monetary easing has not already gone too far in practice and could lead, in time, to hard-to-control inflation levels, which could also affect other countries, not only those where base money has increased dramatically.

Finally, should the central bank not counter the surges in asset prices given that they may lead to financial crises so severe that they can push the economy into the liquidity trap, thus putting high pressure on monetary policy to act *ex post*? Or, perhaps, would it be better to target moderate and stable inflation rather than low and stable inflation?

Some clarifications

All schools of thought agree that, when the short-term interest rate is equal or close to zero, central banks cannot further fully accommodate large deflationary shocks by reducing their policy interest rates. In contrast, the effects of money growth on output and inflation depend on aggregate demand factors taken into account by different approaches.

Where aggregate demand depends solely on current interest rate and incomes, as the Keynesian thought, the growth of money in circulation has no effect on output and inflation whatsoever. When prices go down, money injections in commercial banks cannot push the nominal rate below zero, and the real interest rate goes up. For this reason, monetary policy cannot foster economic growth.

The neo-classicists, such as Pigou, Patinkin and Metzler, argued that real money supply rises if prices fall (the Pigou effect), which would entail the rise in consumption and aggregate demand, thus helping the economy exit the liquidity trap. However, in the case of Japan, the drop in prices concurrently with the flat consumption indicates that the Pigou effect lacks impetus³. On the contrary, the decline in prices pushes real

³ Another reason why the real balance effect (also known as the Pigou effect) would lack impetus is the Ricardo-Barro equivalence. When the government allows budget deficit to widen, the aggregate demand remains unchanged if the private sector responds by increasing its level of savings. The dispute over the effects of the Ricardian equivalence is still ongoing and produces mixed results. One of the recent approaches to this equivalence and its related effects on the liquidity trap is that of Eggertsson and Krugman (2011). They derived a theoretical conclusion based on their New-Keynesian model involving debtors and creditors stating that the Ricardian equivalence "breaks down" because some agents are debt-constrained, and that "Keynesian-type multipliers, in which current consumption depends on current income, re-emerge".

debt higher, as Fisher (1932, 1933) suggested, which becomes “the root of all the evils” (Fisher, 1933, p. 39), causing the economy to plunge even more deeply into recession.

Nowadays it is widely acknowledged that aggregate demand depends not only on the current interest rate set by the central bank, but also on the anticipated paths of inflation and interest rates, as implied by dynamic stochastic general equilibrium (DSGE) models. Thus, aggregate demand depends, in the end, on long-term interest rates too. Given this dependence (causal linking), money supply growth could be effective in helping the economy exit the liquidity trap.

In DSGE models, where the utility function is assumed separable⁴, real money is absent both on the demand and on the supply side of the economy. Monetary policy affects the economy via the real interest rate. The central bank controls the real interest rate by controlling the short-term nominal interest rate. Hence, the central bank can affect real output. In these models, the interest rate is the primary channel whereby output is affected through both investment and consumption.

However, if utility is not separable, the real quantity of money affects demand and supply alike. In this case, changes in the real quantity of money alter the marginal utility of consumption, so that the absence of money constitutes a special case of New Keynesian general equilibrium models (Walsh, 2003, p. 250). Separable utility models are easier to construct and hence more frequently employed. The conclusions based on these models remain however valid since, as McCallum and Nelson (1999) and Woodford (2001) pointed out, the effects that arise from assuming separability do not differ much from the effects obtained with non-separability loss. In addition, in the New-Keynesian models with separable utility, the quantity of money appears in the intra-temporal optimality condition⁵. This means that even in these models there is a clear relation between money and the interest rate, if the latter is seen as a proxy for the opportunity cost of holding money.

Thus, based on DSGE models with separable utility, it is equally possible for the central bank to set the nominal interest rate and derive the nominal quantity of money or, the other way round, to start by setting the nominal quantity of money and to derive the nominal rate of interest, output gap and obviously inflation. Consequently, when the economy is in a liquidity trap, monetary policy will foster aggregate demand if it succeeds in altering the anticipations on the path of future short-term interest rates or on future money supply.

In his cash-in-advance model, Krugman (1998) chose to underline directly the role of money supply in formulating the necessary condition for inflation expectations to emerge when the economy is in a liquidity trap. The condition is that the central bank should convincingly commit itself to increasing money supply in the future so as to enable a production boom and accommodate moderate inflation once the deflationary shock has faded away. In Krugman’s words (1998, p. 139), “monetary policy will in

⁴ See Chapter 5 in Walsh (2003) for a more in-depth approach to the standard framework of dynamic stochastic general equilibrium models.

⁵ This condition requires that the “marginal rate of substitution between money and consumption be equal to the opportunity cost of holding money” (Walsh, p. 234).

fact be effective if the central bank can credibly promise to be irresponsible, to seek a higher future price level”.

Eggertsson and Woodford (2003) chose to highlight directly the interest rate role and came to a similar conclusion: policy success depends on the central bank's credible commitment to maintain the nominal interest rates at low levels (zero) for a certain period after the deflationary shock has faded away, irrespective of the future price level. To a similar conclusion came Werning (2012). Using a continuous-time version of the New-Keynesian model, he concluded that, “surprisingly”, both deflation and recession “are exacerbated with greater price flexibility”.

When an economy falls into a liquidity trap, a central bank commitment seems to have two stages. In the first one, the central bank has to be credible with respect to its commitment to transforming deflationary expectations in inflationary expectations. This will cause the drop in real rates even though nominal interest rates can no longer decrease. Then, following the dissipation of deflationary pressures, the commitment to cut nominal interest rates translates into lower real interest rates, which foster demand. The clearer is a central bank in communicating this to the general public, the more efficient are its actions towards the end of reflating the economy.

While the theoretical solution of reflating the economy by shifting from deflation to inflation expectations is elegant, its putting into practice may prove difficult. Factors like the frequency of deflationary shocks, past practices of central banks, and the lack of incentives for keeping promises could possibly render inflationary commitments problematic (Eggertsson, 2008). Regarding the first factor, it is clear that the frequency of deflationary shocks decreased over time. For instance, in the US, the period from 1921 to 1955, i.e. spanning 35 years, saw 13 years when prices dropped or remained unchanged. By contrast, during 1956-2011, in 56 years' time, prices fell only once, namely in 2009. The credibility of reflationary commitments is hard to build as deflationary shocks are seldom manifested.

Second, even the practice of central banks in developed countries to observe a Taylor rule in normal times might be a problem, making the quantitative easing ineffective (Eggertsson and Woodford, 2003). The problem emerges when, after a period of a successful reflating policy, the general public anticipates an interest rate rise, that is “as soon as inflationary pressures in excess of an implicit inflation target emerge” (Eggertsson, 2008). The same ineffectiveness emerges if the public expects money supply to stabilise at a quasi-constant level as soon as deflationary pressures dissipate (Krugman, 1998).

Third, it is widely known that the most credible reflating policies rely on incentives. For instance, issuing public debt is such a policy, as it creates incentives for governments to increase inflation (Calvo, 1991). In Calvo's words, “a larger nominal debt requires, other things being equal, raising more distorting taxes. This gives the future government greater incentives to use inflation instead of distorting taxes, which explains the ex post positive association between nominal public debt and inflation”. The incentive argument works both for indebtedness in national currency and in foreign currency (Eggertsson, 2008). Where public debt is issued in the national currency, failure to reflate the economy calls for higher taxes (which may prove costly in both political and public terms) in order to cover the additional real debt generated

What good is higher inflation?

by deflation. Moreover, incentives emerge if, as Jeanne and Svensson (2004) pointed out, the government accumulates nominal debt (or the central bank prints money) to purchase foreign currency. In this case, if the inflation objective is missed, the currency appreciation in real terms will lead to balance sheet losses.

Monetary policy has remained the only hope

The advanced economies currently facing the deflation spectrum have resorted to both quantitative easing and public debt rise. In order to resume economic growth, the government strategy has two major objectives: (i) the alleviation of the effects generated by lower private cash flows via public deficit widening and (ii) the substitution of public credit for private deleveraging until the stabilisation of the credit system. Japan has embarked upon this process more than a decade and a half ago and has not completed it yet.

The question is: will the US, the UK and the euro area be more successful after increasing the base money several times since the financial crisis outbreak? Certain advanced countries under the threat of deflation have little or no room for increasing public debt. Moreover, some countries decided to reduce their debts. As a result, the ongoing deleveraging gains new meanings.

In its traditional meaning, the paradox of deleveraging is the following: a prudent stance of households and companies, which is essential for the economy to recover, amplifies the overall economic stress. Hence, both governments and central banks can intervene in order to diminish overall stress. At present, however, not only the private sector, but also governments resort to deleveraging (even in concert in Europe), so that lowering overall stress is more and more becoming a responsibility of central banks.

It is uncertain whether the quantitative easing implemented until recently is sufficient to generate the inflation necessary for the economies to exit the liquidity trap. Nevertheless, the paradox of combined deleveraging of households, companies and governments could call for additional liquidity injections to levels that could hardly be imagined two or three years ago. Paradoxically, only monetary policy can really help advanced economies escape the liquidity trap. This was inconceivable before 1998.

Quantitative easing and delayed inflation

A central bank pursues quantitative easing by purchasing financial assets from both the government and the private sector, whereby it aims to increase available funds in banks' current accounts beyond the level required for bringing the overnight rate to zero (Isărescu, 2012)⁶.

⁶ *There are two major differences as regards normal monetary policy operations. One is that the central bank purchases not only government bonds, but also other financial assets from banks and other private entities. The other difference pertains to the maturity of purchased assets. In conventional operations, the central bank buys securities at the shorter end of the maturity spectrum in order to influence short-term interest rates. In quantitative easing operations, the*

Repeated under the commitment to increase money supply (in the sense described by Bernanke and Reinhart, 2004), these asset swaps could exert inflationary pressures via three channels. The first one is the expected tax reduction resulting from the decline in the anticipated value of public debt costs following the steady rise in money supply. This cut in anticipated taxes would foster aggregate demand (Auerbach and Obstfeld, 2003). The second channel consists in investors' shift towards certain financial assets, whose value would rise, thus stimulating aggregate demand (Goodfriend, 2000). In other words, lowering yields following the purchase of bonds should lead to a pick-up in the aggregate demand of the economy. Finally, some analysts might expect banks to resort to additional liquidity temporarily placed with the central bank in order to extend loans to households and companies. Lending would entail the rise in broad money and, thus, foster economic growth.

So far, none of the three channels has delivered the expected results. Many countries are over-indebted, which is unlikely to generate expectations of a tax cut in the foreseeable future, the decline in sovereign bond yields due to quantitative easing notwithstanding. Lower long-term interest rates fostered demand, yet output – despite muted growth – remained well below potential and was thus unable to generate enough inflation. The flattening of the yield curve at extremely low levels fails to provide sufficient room for yields to go down in the future and to create opportunities for investors to obtain capital gains. Hence, the incentives granted to financiers for lending over the medium and long term have almost vanished, while longer maturities have become riskier, putting a damper on investment.

Finally, lending has either increased marginally or not at all due not only to banks' indifference between loans and cash, but also to expectations on increased regulatory capital requirements and increased capital levels requested by markets. For both reasons, banks preferred to hold additional liquidity with the central bank. As for central banks, their holdings of public or private financial assets saw a substantial rise.

Therefore, most advanced economies reported surges in base money, along with slow rises in broad money, without any pick-up in inflation. The Figures below show the base money and M2 developments in Japan, the UK, the US and the euro area.

These are not unexpected results. In the case of a liquidity trap, the rise in base money triggers small increases in M2, as the general public is encouraged to hold more cash (base money component) in the context of short-term interest rates close to zero. Bank deposits (M2 component) are seen to decline or, at best, grow at a very slow pace, as cash is almost a substitute for deposits. Banks increase their reserves (base money component) due to their increased liquidity preference.

monetary authority buys securities with longer maturities. The purchase of assets sends their price higher and their interest lower. The central bank's purchases of long-term financial assets mark an attempt at lowering long-term interest rates so as to foster investment, which is an unconventional approach.

Figure 1. Japan

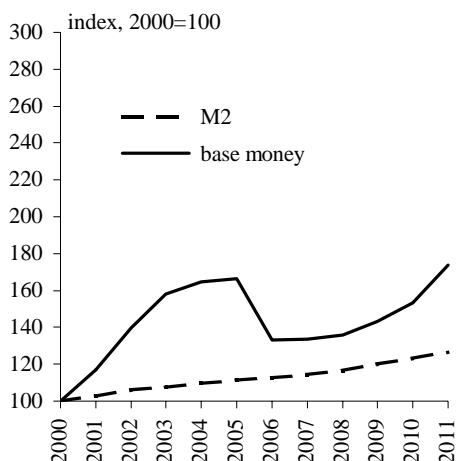
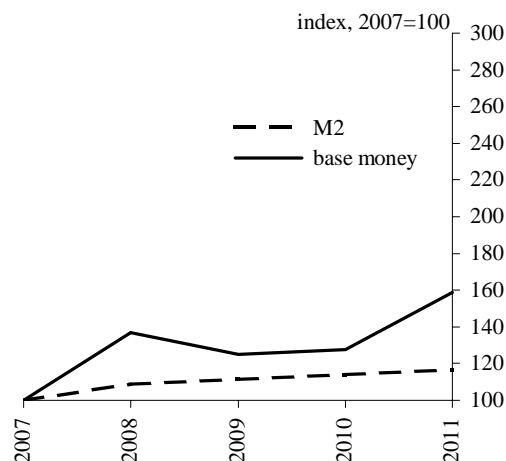


Figure 2. Eurozone (ECB)



Source: Author's calculations based on the data provided by Reuters.

In theory, the exit from the liquidity trap is to occur sooner or later, once the commitment to increasing the money supply has gained credibility. However, there is no precedent to confirm the theory. Given the short-term interest rates close to zero, the low yields and the negative output gap, it is safe to assume that Japan is probably still mired in the liquidity trap⁷ after almost 18-20 years.

Figure 3. United Kingdom

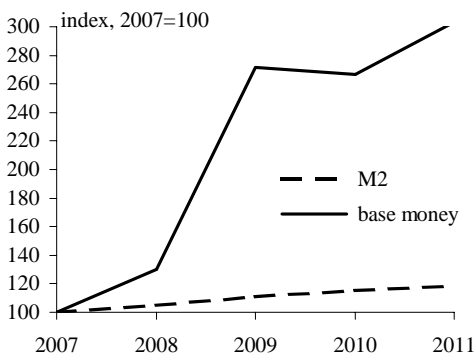
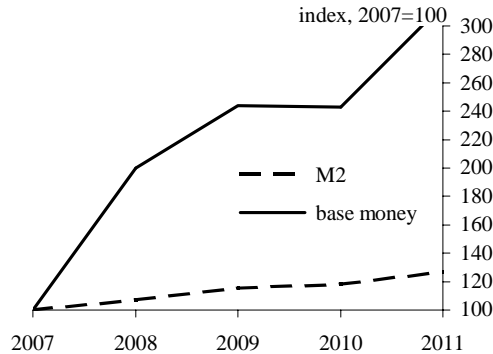


Figure 4. US



Source: Author's calculations based on the data provided by Reuters.

⁷ An economy can be caught in the liquidity trap even without falling prices. Werning (2012) showed that "the optimal interest rate is set to zero past the liquidity trap and jumps discretely up upon exit. Inflation may be positive throughout, so the absence of deflation is not evidence against a liquidity trap. Output, on the other hand, always starts below its efficient level and rises above it".

The US and the advanced countries in Europe (the Euro Zone) appear to fall deeper and deeper into the liquidity trap. Short-term interest rates are very low, yields are very small, and the economic growth is below potential, while prices have changed marginally despite the two to three time increases in base money in several years.

The negative impact of these developments would be aggravated and protracted if the public anticipated the situation to last for an indefinite time period. This would render more difficult the central banks' mission to build the credibility necessary for generating a high-enough inflation to help the economy escape the liquidity trap. The persistence of such a situation would also affect other economies that are not caught in the liquidity trap, Romania included.

Data confirm the relation between money and inflation

Upon the economies' exiting the liquidity trap, base money will record a significantly higher level than before the crisis outbreak. One of the underlying principles of monetary policy postulates that, in the long run, money is neutral to real variables. This implies that the rise in money supply translates into price hikes in the long run, which raises concerns with respect to longer-term inflation and the ways of keeping it at bay.

This statement could seem contradictory to that according to which the relation between money and inflation was discontinued due to technology and financial innovations. However, this is not a contradiction, but one of the frequent confusions that fuel public debates.

In defining his approach to the liquidity trap, Krugman referred to three such confusions. One of them concerns the definition of money. The statement that the increase in money is proportionally reflected by price hikes refers to base money, namely to "outside money". The relation between money and inflation is actually the relation between base money and inflation. For this reason, during a certain period in the past, the central banks' strategy on inflation control used to rely on base money control.

A second clarification refers to the relation between short run and long run. The standard reasoning for money neutrality with respect to real variables is formulated for the long term: a rise in base money in the current period and in the periods ahead will entail proportional price hikes. In fact, Krugman (1998, p. 142) took precisely this latter observation as a starting point to make the connection between monetary policy credibility and the liquidity trap.

Hence, the implication on the monetary policy regime is that base money can no longer be controlled in the short run once capital and the exchange rate move freely. For this reason, certain targeted levels of inflation cannot be guaranteed in the future. The rise in base money does not necessarily entail an increase in inflation in the short run. As a result, the targeting of base money (which could no longer be kept under control) was abandoned and the explicit or implicit inflation targeting was adopted. But it generates inflation in the long run.

What good is higher inflation?

Finally, the third clarification concerns the relation between money, inflation and financial intermediation. Krugman (1998) showed that the structural features of the financial system cannot affect the long-term relation between base money and inflation. Base money neutrality is not conditional on the soundness of banks' balance sheets, financial system competitiveness or corporate indebtedness. Base money is simply neutral in the long run.

The relation between base money and inflation in the 19 countries for which data were available over the long term, i.e. 20 years, is very strong (Figure 5). The long-term correlation between base money and broad money (M2) is also very good (Figure 6). In retrospect, it is safe to assume that the latter correlation remaining strong is an indication that the economy did not fall into the liquidity trap.

Figure 5. Correlation between base money and inflation in 19 countries in 1991-2010

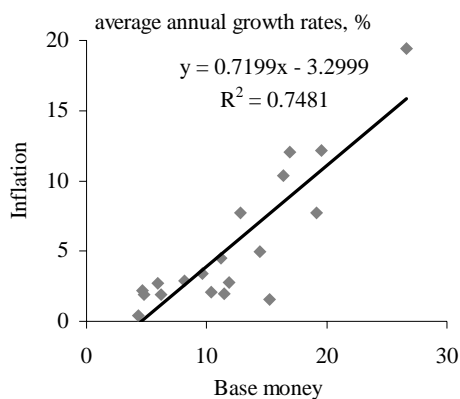
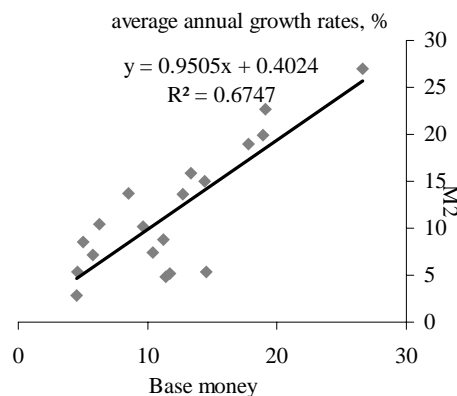


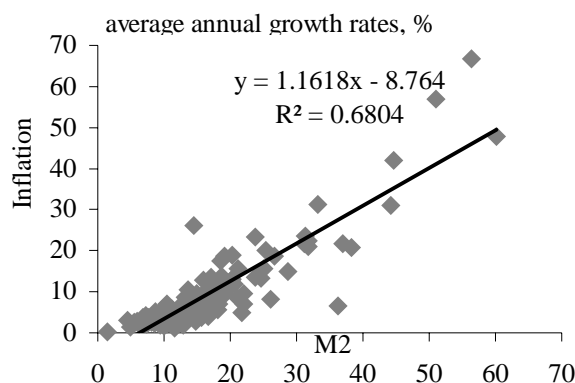
Figure 6. Correlation between base money and M2 in 19 countries in 1991-2010



Source: Author's calculations based on the data provided by Reuters.

As long as economies have not been caught in the liquidity trap, the good correlation between base money and M2 allows us to assume that the relation between M2 and inflation also reflects well the relation between base money and inflation. Indeed, the relation between broad money and inflation is very good in the case of 117 countries for 20 years (Figure 7).

Figure 7. Correlation between M2 and inflation in 117 countries in 1991-2010



Source: Author's calculations based on the data provided by Reuters.

Inflation after escaping the liquidity trap

Should we, therefore, worry about future inflation given the quantitative easing rounds required for taking economies out of the liquidity trap? Could massive quantitative easing lead to a persistent link between inflation expectations and base money? It depends.

Those who still believe that money supply can be adequately measured via a monetary aggregate, such as M2, as suggested by Friedman and Schwartz should be worried. Once economies escape the liquidity trap, i.e. when nominal interest rates return to relevant positive levels, money supply (broad money) will witness a fast-paced increase.

By contrast, most central bankers are confident that liquidity injections performed over the recent years can be reversed before causing any trouble. However, such a wide-scale unwinding has yet to be tested. Several issues may arise in connection to it, the most important being the actual timing and the pace of the reversal.

The timing of the reversal is a matter of "risk management policy", as Greenspan (2003) called it, and it can have far-reaching consequences. In order to highlight the magnitude of the risk materialising, I will give two examples, one from the run-up to the financial crisis that started to wreak havoc in 2007 and the other dating back to the aftermath of the 1929-1933 crisis.

Yellen (2009), Vice Chair of the Board of Governors of the Fed starting 2010, showed that "the Fed took a calculated risk" from 2002 to 2004, resorting to quantitative easing as an insurance policy against "a potentially devastating deflationary episode". The policy rate "was held below the level that would otherwise have been chosen to promote a return to full employment". Yellen added that "the cost of that insurance

was an increased possibility of overheating the economy". The risk materialised and the policy actions eventually contributed to the house price bubble.

The other example is among the few, if not the only one, clearly pinpointing the potential effects of a premature unwinding of liquidity injections after the abatement of deflationary pressures. A W-shaped recession may emerge if quantitative easing measures are reversed too early. And here is the example: output in the United States expanded by 39 percent in 1933-37, ignited by Franklin Delano Roosevelt's announcement of a plan to reflate the economy (Eggertsson and Pugsley, 2006, p. 152 and p. 172). The FDR administration prematurely claimed its victory over the depression in 1937 and abandoned the inflation policies. Industrial output shed 30 percent in 1938, and the recovery started once the authorities had resumed the inflationary policies (Eggertsson, 2008).

But the reverse can be equally hazardous. If quantitative easing schemes are kept in place for too long, a strong relation between inflation expectations and base money cannot be ruled out. There exists a premise for this relation to emerge, since base money growth via quantitative easing is largely the monetization of very large budget deficits, which will translate into swelling debt and eventually inflation. In this latter case, the strong association between money and inflation in the past could turn the expectations on price developments into an enemy of inflation for some time after escaping the liquidity trap.

The other issue related to the unwinding of quantitative easing schemes, i.e. the pace of the reversal, could prove even thornier than that of timing. Assuming that, as many suggested, inflation expectations were already linked to base money upon escaping the liquidity trap, a rapid decline in banks' preference for liquidity from the peaks seen these days would call for a relatively fast-paced reversal of quantitative easing measures. Otherwise, inflation expectations linked to the base money level could entail higher wages, higher budget deficits, a weaker domestic currency or spikes in asset prices. All of these would feed-back inflation expectations and so on and so forth.

Finally, once economies escape the liquidity trap, yields are expected to embark on an upward path towards historically normal levels, meaning that central banks could incur very high capital losses. Along with other factors, this explains the opposition voiced by Germany, the largest contributor to the ECB capital, with regard to the European Central Bank engaging in quantitative easing.

In order to trim down the base money, central banks will have to sell quite fast the huge volumes of bonds and other financial assets purchased from the private sector, which would entail much lower prices of these securities and hence major capital losses. At the end of the day, large capital losses turn into inflation if they end up eroding central banks' credibility. Such erosion would occur if over-indebted governments were short on cash to recapitalise the respective central banks.

The correlations between base money and inflation and between the former and broad money respectively might witness some changes for the period spanning the years spent in the liquidity trap and for several years following the escape. In the case of advanced economies facing a liquidity trap, the correlations will probably no longer be

depicted as in Figures 5 and 6 respectively, but rather as a more or less horizontal line.

However, the link between broad money and inflation will continue to resemble the depiction in Figure 7. Many will interpret these developments during the liquidity trap as validating their credo that a broader monetary aggregate, such as M2, is the adequate measure of money supply and the variable that inflation is best linked to. They will also derive satisfaction from the exit from the liquidity trap, once the strength of the correlation between base money and broad money has been restored, with both aggregates linking well with inflation over the long term.

Low inflation has fostered the fall into the liquidity trap

Many advanced economies have fallen into the liquidity trap as a consequence of bursting house and bond price bubbles, thus validating the “financial meltdown” mechanism described by Minsky⁸. His theory conceals an important lesson which, to my knowledge, has yet to be brought to the fore. And I would phrase this lesson as follows: it is better to have relatively high inflation when a credit-fuelled bubble bursts.

Minsky’s theory essentially claims that advanced capitalist economies with well-developed financial institutions are fundamentally unstable and prone to depressions once the economic entities pile up debt in order to finance, based on euphoric expectations of future cash flows, the purchase of assets whose prices are on the rise⁹.

More precisely, in Minsky’s view (1993), “over periods of prolonged prosperity”, euphoric expectations shift the economy “from financial relations that make for a stable system to financial relations that make for an unstable system”. Specifically, the economy moves from a financial structure dominated by hedge borrowers¹⁰ to a

⁸ Other instances that substantiate Minsky’s theory, but have seldom been recalled as validation examples, include the Latin American inflation and debt crisis of the 1970s, the Wall Street crash of 1987, as well as the “dotcom” boom.

⁹ His theory rests on three pillars of Keynesian origin, elegantly described by Keen (1995): (i) while consumer prices are determined by adding up a margin to primary costs, asset prices are not formed based on their cost, but rather on the expected net present value of the relevant cash flow; (ii) the latter depends on the overall condition of expectations, which take shape on a volatile basis: they lag behind prices during times of downturn and lead prices during a recovery or boom; (iii) finally, money supply “is essentially endogenously determined” by the financial system, and regulatory controls are unable to render it strictly exogenous (i.e. supplied by the central bank). See Minsky (1993) for a distinction between the Keynesian vision of money and the quantity theory of money (the third pillar).

¹⁰ Borrowers that are hedged against risks thanks to their cash flows (Minsky, 1993).

structure in which there are large shares of speculative borrowers¹¹ or Ponzi borrowers¹². This journey leads to skyrocketing asset prices.

Rising interest rates and large debts gradually hurt the viability of many activities and, at a certain point in time, the reverse journey starts, with sales of now illiquid assets, whose prices dive, turning euphoria into panic and leaving behind a major discrepancy between the accumulated debt and the cash flow generated by it¹³.

In Minsky's view, the economy returns to the stability of the hedged segment and from there it expands again relatively fast. This occurs because the state increases its expenditures¹⁴ in order to make up, at least in part, for the drop in private cash flows, while the central bank contains or even reverses the credit slump via swift liquidity-providing operations.

The ongoing crisis, which Minsky foreshadowed when referring to the journey from stability to instability and backwards, made his theory regain its well-deserved recognition and exposure. Hence, Minsky's theory has been extensively used these past few years to outline and better fathom the stages conducive to the current crisis (McCulley, 2009), while also serving as a basis for a higher degree of regulation¹⁵ and intervention on the part of governments and central banks.

In theory, Minsky's vision fostered models that are explicit about the distinction between debtors and creditors (Eggertsson and Krugman, 2008), as opposed to one representative agent models in which everyone is alike, meaning that the preference for liquidity rises or declines equally for everybody. The model in which "impatient" agents borrow from "patient" agents provides a better understanding of why more debt is a solution to the debt-induced economic downturn.

But Minsky's theory (1986) also incorporates another element, seldom brought to the fore, which helps the economy avoid the fall into depression or at least shorten the unavoidable downturn in the aftermath of a bubble burst. It is the level of inflation at

¹¹ *Borrowers only able to cover the interest due, but having to roll over the principal (Minsky, 1993).*

¹² *Borrowers who believe that the appreciation of the value of their assets will suffice to refinance their debt, but cannot fully cover interest payments or principal repayments with the cash flows from investments (Minsky, 1993).*

¹³ *In a recent paper I have shown the implications of euphoria on companies' employment policy and the possible consequences on the wage-setting mechanism. I have pointed out that, during good times, companies tend to establish laxer norms regarding the employment of auxiliary staff, leading to relatively marked declines in unemployment. These norms are eliminated during recessions, entailing somewhat more visible rises in unemployment in times of economic downturn. This mechanism partly explains why the unemployment rate stays high for some time after economic growth is back on track (Croitoru, 2011).*

¹⁴ *"[...] the much greater participation of national governments in assuring that finance does not degenerate as in the 1929-1933 period means that the downside vulnerability of aggregate profit flows has been much diminished" (Minsky, 1993). This shows Minsky did not imagine that the secular debt-swelling trend would apply to governments as well, rendering it impossible (as was the case with the crisis that broke out in 2007) for the latter to intervene.*

¹⁵ *Too few have noticed that Minsky dwelt on the idea that money remains essentially endogenous to the economy, even when controls related to banking system regulation are tightened.*

the time the bubble bursts. Cash flows depend both on investments and on inflation. Investments dwindle during a crisis, leaving the balance between debt and the cash flow generated by it dependant solely on asset price drop (debt deflation) and on inflation.

The mechanism whereby inflation acts in Minsky's theory is synthetically described by Keen (1995). High inflation at the outbreak of the crisis helps cash flows go up in order to pay off the debt accumulated in times of exuberance, even without requiring larger government spending to support the rebound in investment. This is a self-correcting mechanism, which helps the economy recover by going through stagflation, i.e. starting from initially low growth and relatively high inflation, but avoiding a prolonged slump. The self-correcting mechanism, whose consequences over the relatively short term are reinstating the conditions for repeating the cycle and avoiding serious falls, "is likely to lead to a secular decrease in liquidity preference" (Keen, p. 613).

By contrast, low inflation at the outbreak of the crisis is of no help to cash flows. Given the debt level, *caeteris paribus*, the lower the inflation rate, the larger the debt-cash flow imbalance. The larger this imbalance, the more companies whose interest payments exceed corporate cash flows will have to sell assets, accept lower margins than those of their competitors or else go bankrupt. These decisions will tend to reduce inflation, worsening the initial imbalance, which will call for a new set of similar decisions. Thus, unlike relatively high inflation, relatively low inflation at the time of the bubble burst cannot prevent asset price deflation (which is "not self-correcting, but rather self-reinforcing"), pushing the economy deeper into depression (Keen, p. 613).

To make a long story short, when very large bubbles burst, the economy either falls into the liquidity trap and dives into a prolonged recession or it avoids the liquidity trap and emerges relatively fast from the unavoidable doldrums of such a burst. It is as if the economy was at a crossroads and it depends on the magnitude of inflation whether economic growth or protracted recession will follow. The only thing is that inflation at the time of the bubble burst is the result of past decisions. Our conclusion is that the path the economy will follow after the burst is largely predetermined by the path it followed up to the bubble burst from the point of view of inflation.

This means the economy faced an "inflation bifurcation" at a given point in the past as well, after the end of a crisis, when it "chose" between relatively high and relatively low inflation. There is increased likelihood of highly persistent inflation¹⁶ if relatively high inflation had already been recorded for a sufficiently long period at the time the bubble burst. The economy will avoid the liquidity trap and depression because inflation, albeit on the wane, will stick to somewhat high readings and will bolster cash flows, thus shunning severe asset price deflation. On the other hand, if the bubble burst was preceded by a sufficiently long period of low and stable inflation, deep recession can no longer be avoided. Inflation will drop to readings from which inflation expectations can quickly turn into deflation expectations and hence the economy might fall into the liquidity trap due to the self-reinforcing mechanism of asset price deflation, as Minsky predicted.

¹⁶ Meaning that at least some inflation expectations are backward-looking.

What good is higher inflation?

Bond and house price bubbles, which burst in July 2007, emerged amid relatively low inflation, fuelled by euphoric expectations or irrational exuberance. As Yellen (2009) put it, “the incaution that reigned by the middle of this decade had been fed by roughly twenty years of the so-called ‘great moderation’, when most industrialised economies experienced steady growth and low and stable inflation”. When the bubble burst, inflation expectations switched to deflation expectations in no time. Low inflation must have played an instrumental role in this conversion, to which added the delays in credibly promoting genuine reflationary policies.

Our conclusion is that, taken together, the over-indebted governments’ crippled ability to increase public spending to adequate levels, along with the low inflation prevailing at the bursting of the house price bubble in 2007 explain the fall of advanced economies into the liquidity trap. Had governments recorded a lower degree of indebtedness, they could have contributed more to the rise in cash flows in the economy by fostering investment. Higher inflation would have made a similar contribution.

Since the instability cycle is recurrent in nature, capping the share of public debt in GDP at relatively low levels is a prerequisite for avoiding any future fall into the liquidity trap or prolonged slumps. This conclusion has already been captured as an underlying principle guiding from now on both fiscal and public debt policies.

Monetary policy, inflation level and asset prices

What conclusion could be drawn concerning the use of the monetary policy in the future? Should it be employed directly to moderate asset price bubbles, particularly credit-fuelled bubbles, before they swell too much and eventually push the economy into a liquidity trap? Or should we revisit the theory saying that inflation ought to be low and stable?

It is obvious that falling into the liquidity trap comes at a big price. It diminishes the appetite for taking risks, while modern capitalism depends exactly on risk-taking. The severity of financial and economic problems associated with the liquidity trap called for massive intervention by governments and the central bank. This seems to warrant the attempts to deflate asset price bubbles, without, however, striking a new balance between the pros and the cons.

This balance points to the conventional view that inflation and output are the appropriate objectives of monetary policy. Many authors agree that under the implicit or explicit inflation targeting regime, monetary policy should respond to an asset price change only to the extent that the latter affects the future path of inflation and output. Whenever they may want to use “monetary policy to deflate bubbles”, policymakers “will face the difficulty of identifying bubbles”, dealing as well with “uncertainties in the relationship between monetary policy and financial stability” (Yellen, 2009).

Minsky stated that “[...] if an economy with a sizeable body of speculative financial units is in an inflationary state, and the authorities attempt to exorcise inflation by monetary constraint, then speculative units will become Ponzi units and the net worth

of previously Ponzi units will quickly evaporate"¹⁷. Nevertheless, it is important to emphasise that the same effect emerges in an economy with a considerable number of speculative financial units that records low and stable inflation. Such was the case when the Fed started to raise the interest rate in the US as of 2005.

Monetary policy cannot be used directly to moderate a bubble, which sheds special light on the level of inflation at the moment a credit-fuelled bubble bursts. In the previous section we have shown how, based on Minsky's analysis, one can infer that, given a state's possibility to raise expenditures, higher inflation is preferable when a bubble bursts. Therefore, both theory and practice must focus on identifying the desirable level of inflation and the ways the central bank may reach it so that the benefits should exceed the related costs at the time of the bubble burst.

Some might think that easing monetary policy during a bubble could bring about higher inflation when the bubble bursts. However, such a policy is surrounded by the same uncertainties as the strengthening of monetary policy aimed at deflating the bubble. Moreover, it would speed up the increase in asset prices, which could lead to the bubble burst before generating higher inflation. Looking back, this happened in the US during 2002-2004, when monetary policy easing inflated the real-estate and bond bubbles further without pushing inflation up.

Monetary policy should thus consider the option of an increase in the desirable level of inflation, either explicitly or implicitly targeted. This means a profound change in the conventional philosophy stating that monetary policy should target low and stable inflation. Debating over a change in this philosophy and the desirable level of inflation is reasonable, given that the advanced economies depending on large financial institutions inevitably come to face a bubble burst.

Actually, nowadays, the developed economies deal with an "inflation bifurcation". The monetary policy strategy could be improved by shifting from targeting low and stable inflation to targeting moderate and stable inflation. The moderate level of inflation should be checked from the standpoint of costs and benefits accompanying such a change. The new higher inflation target should come together with a series of reforms¹⁸ in order to counter at least partly the negative effects that might arise.

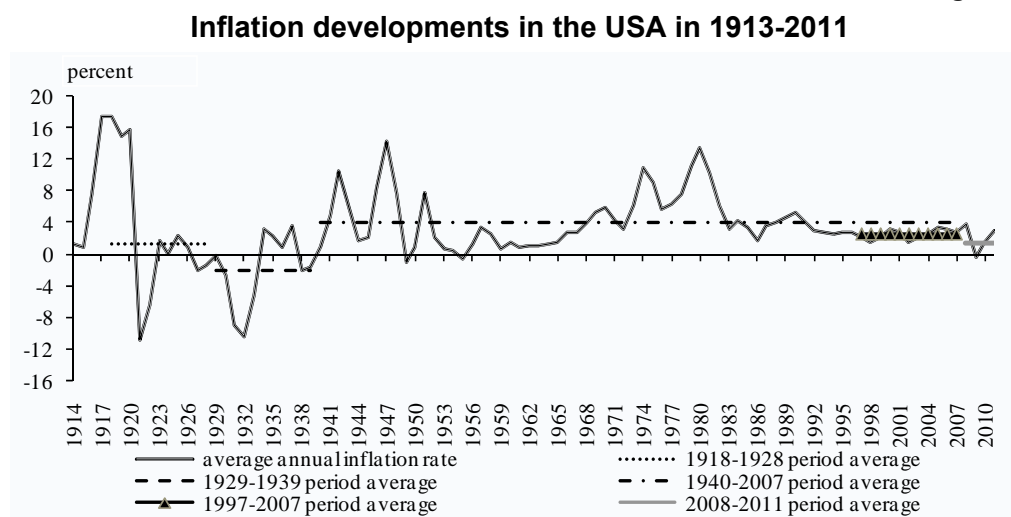
¹⁷ *When expectations are exuberant, raising the policy rate could not deflate bubbles. We reached this conclusion following the logic of Minsky's theory. In this logic, three trends emerge during a period of euphoric expectations: (i) financial institutions accept to finance riskier projects, which would have been rejected in times of sober expectations; (ii) companies' debt-to-capital ratio gradually goes up; these two trends jointly lead to higher interest rates on the credit market; the higher rates should cool down the boom, but this does not happen because, given the euphoria, (iii) the expected yields on speculative investments constantly outpace the increased interest rates. This means that, in euphoric times, the higher credit-related costs imposed by the market cannot deflate a credit-fuelled bubble. Similarly, in my opinion, neither could a rise in the policy rate.*

¹⁸ *Some of these reforms are referred to in the paper by Blanchard, Dell'Ariccia and Mauro (2010). The theoretical support of this proposal originates in the incorporation of the labour market into the standard New-Keynesian model, which features real wage rigidities (Blanchard and Gali, 2008). They discussed the possibility of increasing the desirable level of inflation in view of the need to provide the monetary policy with larger room for manoeuvre during deflationary recessions, a theory which differs from the cash flow perspective we*

What good is higher inflation?

Finally, the inflation target must ensure that those costs which could not be compensated through reforms will be lower than the benefits arising from preventing the economies from falling into the liquidity trap.

Figure 8



Source: Author's calculations based on the data provided by US Bureau of Labor Statistics.

Central banks maintaining a moderate inflation level together with an adequate regulatory process would fully create the favourable *ex ante* conditions for minimising the impact of a credit-fuelled bubble burst, whereas wider public deficits¹⁹ and quantitative easing will act *ex post* in the same direction.

The case of the US is taken in order to show how average inflation prior to a major financial crisis correlated with average inflation during the crisis and shortly after it. Figure 8 shows inflation developments in the US over 1913-2011. During this period spanning 99 years, average annual inflation stood at 3.24 percent, reflecting the influence of the Great Depression and the crisis of 2008-2011. If we leave aside these periods, focusing instead on a relatively normal period of time, such as the 1940-2007 period, average inflation came in at 4.1 percent.

discussed above. From the cash flow perspective, the monetary policy's room for manoeuvre would be larger not because of the interest rate falling from a higher level, thus dampening the decline in output and the deterioration of the fiscal position, as suggested by Blanchard, Dell'Ariccia, and Mauro, but because higher inflation would support cash flows, thereby contributing to the matching of cash flows with the companies' debt service. The discrepancy between cash flows and the debt service consists actually in the imbalance caused by the credit-fuelled bubble burst. Obviously, the two mechanisms can work simultaneously.

¹⁹ This does not necessarily imply an increase in public spending. "Demand stimulating policies become less effective in a liquidity trap than in normal circumstances. The key reason is that demand stimulus leads agents to believe that things are even worse than they thought. In contrast, supply side policies, such as cuts in labor income taxes, lead to relative optimism and become more powerful" (Mertens and Ravn, 2010).

By taking out the WW2 period as well, average inflation was 3.95 percent during 1946-2007. This inflation rate ranging between 3.95-4.1 percent is more relevant than the 99-year average, as it reflects relatively normal conditions, with no liquidity trap threatening the economy. This is probably the level that the Fed should implicitly target in order to maximise the benefits of inflation upon a bubble burst.

In the US, average annual inflation stood close to the mentioned level during 1983-1992, i.e. at 3.9 percent. However, during 1997-2007, in the decade before the burst of the real-estate and bond bubbles, average annual inflation was as low as 2.43 percent (2.62 percent during 1993-2007). In the early '90s, the American economy faced an "inflation bifurcation" and "chose" to keep in place a low and relatively stable inflation.

The low and relatively stable inflation (2.43 percent) reported in the decade preceding the bubble burst contributed to the emergence of the euphoric expectations underlying the two bubbles. Its level was high enough to prevent, alongside the macroeconomic policies implemented during the crisis, a broad-based decline in prices, with average annual inflation during 2008-2011 falling to merely 1.47 percent. However, this inflation level was not high enough to preclude the US economy from falling into the liquidity trap ever since 2009.

In comparative terms, during 1918-1928 (roughly one decade prior to the 1929-1933 crisis), inflation stood at 1.3 percent only. This low inflation level and the macroeconomic policies of the time could not prevent prices from falling by 2.07 percent, on average, per year during 1929-1939. On the one hand, inflation was much too low to avert the emergence of deflationary expectations. On the other hand, inflation policies were implemented with a time lag, starting with 1933, when Roosevelt came to power.

Conclusions

The present crisis has confirmed Minsky's theory on the economic journey from stability to instability, but has also unexpectedly brought about the liquidity trap. However, Minsky's vision that the economy can revert relatively quickly to stability is still to be proven right.

The economies which are now caught in the liquidity trap may head towards stability, but not the kind of stability seen in the two to three decades preceding the crisis that allows operating in an environment featuring moderate inflation and full employment, normal yield curves and interest rates hovering around normal historical levels. A new type of normalcy may emerge for advanced economies, in which stability might be for a long period of time similar to that seen in Japan over the last almost two decades, as suggested by many analysts. It is hard to say whether this kind of stability will continue to be characteristic of advanced economies only or it will extend to emerging economies as well.

As the states' indebtedness is already too high and regulatory adjustments have already been implemented, at present, the solution for countries to exit the liquidity trap lies with the central banks. Many economists agree that central banks should

What good is higher inflation?

produce more inflation. Yet, in order to do that, central banks need to credibly assume this task, which is obviously not an easy one.

The moderation of asset price bubbles cannot be included among the monetary policy objectives owing to the uncertainties surrounding the identification of bubbles and the relation between monetary policy and financial stability. However, we have argued that switching the monetary policy objective from targeting low and stable inflation to targeting moderate and stable inflation could help prevent the economies from entering depression or falling into the liquidity trap when credit-fuelled bubbles burst.

The exit from the liquidity trap will be accompanied by an increase in the yields on sovereign bonds purchased by central banks and by the relatively fast decline in banks' preference for liquidity. This will call for a relatively hasty sale of the bonds held by central banks.

On the one hand, a sluggish sale of bonds could spark inflation if a connection has been established between inflation expectations and the money base while in the expectations trap. On the other hand, selling bonds relatively rapidly might generate significant losses for the central banks. If the states are not prepared to cover potential losses incurred by central banks, the latter's credibility will decrease and losses might turn into inflation.

Part of the excess liquidity in advanced countries, which is temporarily parked with central banks, might go to the emerging economies when the preference for liquidity diminishes. This could lead to a widening of current account deficits in emerging countries, including in Romania. Both benefits and risks may arise. Benefits may come from faster economic expansion, while risks refer to currency appreciation and the accumulation of external imbalances, such as those underlying the crisis in 2007.

The experience with conducting macroeconomic policies, together with improved regulations, could help alleviate the adverse effects, without however fully countering them.

References

- Auerbach, Al. Obstfeld, M., 2003. *The Case for Open-Market Purchases in a Liquidity Trap*. Federal Reserve Bank of San Francisco (March).
- Bernanke, B.S. Reinhart, V.R., 2004. Conducting Monetary Policy at Very Low Short-Term Interest Rates. *American Economic Review*, 94(2).
- Blanchard, Olivier; Dell'Ariccia, Giovanni; Mauro, Paolo, 2010. Rethinking Macroeconomic Policy. *IMF Staff Position Note* 10/03.
- Blanchard, O. and Gali, J., 2008. Labour Markets and Monetary Policy: A New-Keynesian Model with Unemployment. *Working Paper* 13897, National Bureau of Economic Research, Cambridge (March).
- Calvo, A.G., 1991. The Perils of Sterilization. *IMF Staff Papers*, 38(4), pp.921-926.
- Croitoru, L. 2011. Three Unemployment Rates Relevant to Monetary Policy, *Romanian Journal of Economic Forecasting*, 14(3), pp.213-238.

- Eggertsson, B.G. and Pugsley, B., 2006. The Mistake of 1937: A General Equilibrium Analysis. *Monetary and Economic Studies*, (December).
- Eggertsson, B.G. and Woodford, M., 2003. The Zero Bound on Interest Rates and Optimal Monetary Policy. *Brookings Papers on Economic Activity*, (1), pp.212-219.
- Eggertsson, B.G., 2008. Liquidity trap. In Steven N. Durlauf and Lawrence E. Blume (Eds.) *The New Palgrave Dictionary of Economics*. Second Edition. Palgrave Macmillan, 2008. *The New Palgrave Dictionary of Economics Online*. Palgrave Macmillan. Available at: <http://www.dictionaryofeconomics.com/article?id=pde2008_L000237> [Accessed 25 May 2013].
- Eggertsson, B.G. and Krugman, P., 2010. *Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach*. Princeton, (November).
- Eggertsson, B.G. and Krugman, P. 2011. Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach. http://www.economicdynamics.org/meetpapers/2011/paper_1166.pdf
- Fisher, I., 1932. *Booms and Depressions – Some First Principles*. New York: Adelphy Company Publisher.
- Fisher, I., 1933. The Debt-deflation theory of Great Depressions. *Econometrica*, 1(4), pp.337-357.
- Goodfriend, M., 2000. Overcoming the Zero Bound on Interest Rate Policy. *Journal of Money, Credit and Banking*, 32.
- Greenspan, A., 2003. *Monetary Policy under Uncertainty*. Remarks at a symposium of the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 29.
- Isarescu, M., 2012. *Politica monetară postcriză: Reconfigurarea obiectivelor și a instrumentelor*. Dissertation delivered on the occasion of being awarded the degree of Doctor Honoris Causa by the “Andrei Șaguna” University (May).
- Jeanne, O. Svensson, E.O. Lars. 2004. Credible Commitment to Optimal Escape from a Liquidity Trap: The Role of the Balance Sheet of an Independent Central Bank, *Working Paper* 10679, National Bureau of Economic Research, Cambridge (August).
- Keen, S., 1995. Finance and Economic Breakdown: Modelling Minsky’s Financial Instability Hypothesis. *Journal of Post Keynesian Economics*, 17(4).
- Krugman, P., 1998. It’s Baaack! Japan’s Slump and the Return of the Liquidity Trap. *Brookings Papers on Economic Activity*, (2), pp.137-187.
- McCallum, T.B. Nelson, E., 1999. An Optimizing IS-LM Specification for Monetary Policy and Business Cycle Analysis. *Journal of Money, Credit and Banking*, 31(3), pp.296-316.
- McCulley, P., 2009. The Shadow Banking System and Hyman Minsky’s Economic Journey. CFA Institute: *Research Foundation Publications*, 5.

What good is higher inflation?

- Mertens, K. and Ravn, O.M., 2010. *Fiscal Policy in an Expectations Driven Liquidity Trap*. Paper delivered at the European Summer Symposium in International Macroeconomics (ESSIM) 2010, Banco de España, Tarragona, Spain, May 25-28.
- Minsky, P.H., 1986. *Stabilizing an Unstable Economy*. New Haven: Yale University Press.
- Minsky, P.H., 1993. The Financial Instability Hypothesis, Working Paper No. 74, May 1992. In Philip Arestis and Malcolm Sawyer, Edward Elgar, eds. *Handbook of Radical Political Economy*.
- Walsh, E.C., 2003. *Monetary Theory and Policy*. MIT Press, pp.230-237.
- Werning, I., 2012. *Managing a Liquidity Trap: Monetary and Fiscal Policy*. MIT (this version: January 2012).
- Woodford, M., 2001. Inflation Stabilization and Welfare. NBER *Working Paper*, no.8071.
- Yellen, L.J., 2009. *A Minsky Meltdown: Lessons for Central Bankers*. The 18th Annual Hyman P. Minsky Conference on the State of the U.S. and World Economies – “Meeting the Challenges of the Financial Crisis”, New York.