Helicopter money or a risk sharing approach?

De Koning, Kees

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By

Drs Kees De Koning

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Introduction

The U.S. financial crisis of 2007-2008 clearly illustrated that some mortgage borrowings became not only a curse for investors, but equally for individual households with a mortgage and for all home owners; for the employed who lost their jobs, for pension funds and last but not least for the U.S. government which saw its debt levels skyrocket.

The fund providers were not only local U.S. banks, but also pension funds, investors in mortgage-backed securities and other fund providers. These providers did not just originate from within the United States, but also from many overseas countries. Money invested in U.S. mortgage-backed securities came from around the world and this resulted in a crisis in the U.S. becoming an international financial pandemic.

Why did the crisis occur, how did it happen and what could have been done to avoid it happening?

The prevailing wisdom in the years 1997-2007 was that house price rises in the U.S. were the result of supply and demand factors and therefore should not be the subject of government intervention. The 2007-2008 financial crisis disabused the world of that notion in a dramatic fashion.

The main driver of the crisis was the use of borrowed funds to acquire homes, rather than personal savings. Buyers' (and bankers' funding) sentiment was to buy with (mostly) borrowed funds, relying on a predicted rise in house prices to compensate for the interest costs. The prevailing interest rates mattered less than the potential gains.

Over the period 1997-2005 the net annual increase in outstanding mortgage amounts rose from $216 billion in 1997 to $1.054 trillion in 2005. During the same period the net annual increase in household real estate values rose from $210 billion in 1997 to $3.014 trillion in 2005. Homebuyers seemed to have made a wise decision during these years.

What was overlooked, however, was what the economy could bear in terms of borrowed funds as compared to its National Income (or its near equivalent of GDP). In 1997 outstanding mortgage levels were $3.75 trillion and nominal GDP $8.6 trillion. In 2006 mortgage levels reached $9.9 trillion and nominal GDP $13.9 trillion. The macro-economic ratio of debt to income had risen from 43.6% in 1997 to 71.2% in 2006.

A dynamic yet stable debt-to-income level offers the best prospects for economic growth, not just in one year, but also over the long run.

No effective action was taken to stop the excessive mortgage lending growth over the period 1997-2006; no effective action was taken to stop the deterioration in the quality of mortgage products on offer, especially from 2004 onwards; no effective action was taken to stop or diminish the risks from the securitization and internationalization of mortgages.

Various policy options could have been explored and implemented such as a "traffic light system" for banks to slow down lending, when needed, combined with a series of "quality control measures". When, as in 2005-2006, mortgage-lending levels were threatening future economic growth levels, a Macro Economic Reserve Policy could have been applied. It would have involved a transfer of some bank lending reserves from a number of banks to the Fed as a method of economic risk sharing between Wall Street and Main Street. Another policy option could have been to establish a lender of last resort for individual households. Such organization could, on a temporary basis, have combined a type of 'helicopter money' with a lengthening of the mortgage period, so that the pressure on households would have been eased in the short term. A Macro Economic Reserve Policy is needed before a financial crisis erupts. The use of helicopter money, provided it is part of a well-designed program, is part of the corrective options after a financial crisis has occurred. Lower income groups should benefit most.

None of these would have required a change in interest rate policy, which in any event had not been effective as households (and banks) had decided that the increase in house prices would outweigh the interest charges on a mortgage.

The "fixes' adopted after the crisis had occurred: liquidity support for the banking sector and quantitative easing (QE) did little to help individual households. With the lowest interest rates on record, households reduced their total volume of mortgage loans by about $1 trillion over the period 2007-2015. Mortgage borrowers also profited very little from QE as they owned very few of the government bonds and mortgage-backed securities. Lenders were the main beneficiaries.

The conclusion must be that prevention rather than attempting to cure the effects of the financial crisis would have been the best strategy. Being ready for the next potential crisis will necessitate having such preventive measures to be in place.

1. Financial risk accumulation in the U.S. over the period 1997-2007

1.1 The risk accumulation process

It is important to make a distinction between short and long term household debt. Short term is usually meant to be shorter than a year, but in terms of household debt, the definition should be slightly lengthened to stretch over a period of two to three years. In such case all debt incurred to acquire consumer goods, like cars and white goods, fall into this category. Credit card debt may also be regarded as short-term household debt.

Long-term household debt is incurred through taking up home mortgages and student loans. In the case of homes there is an underlying asset, but for student loans the source of repayment is the intellectual capacity (to be) employed in the workplace.

For the purpose of this paper the main focus is on home mortgages and on household real estate values.

Table 1 gives an overview of the collective level of outstanding mortgages in the U.S. over the period 1997-2015. Secondly the changes in the outstanding volume of home mortgages have been registered. Thirdly the effective Fed Funds rates have been included and finally the changes in the annual household real estate values have been documented.

Any outstanding loan or any asset owned by households constitutes a potential risk not only to the mortgagor and/or the owner of the asset but equally to an economy. When financial claims turn into doubtful debts, the matter is not only one of concern to the borrower, but equally to the fund providers. When an increasing scale of doubtful debtors sets off a self-fulfilling cycle of sales of assets, the risks to an economy multiply.

The real question is when do household risks start to pose a threat to economic growth, to employment levels and to government funding? Of course the last turning point in the U.S. economy is well known: August 2007. But knowing the turning point does not provide an answer to the question: at which point in time could the recession of 2007-2008 still have been avoided and what measures would have been necessary to do so.

Risk accumulation is the easy process; risk avoidance requires a full understanding of potential triggers in the first place upon which countermeasures can be enacted. Table 1 may provide some guidance as to what happened in the U.S. over the period 1997-2015.

Table 1: Overview of the U.S. outstanding mortgage levels over the period 1997-2015, the annual change in mortgage volumes, the effective Fed Funds Rate and the change in the Households' Real Estate values

Year	Outstanding Mortgage levels X $trillion	Annual increase In Mortgage Volume X$billion	Effective Fed Funds Rate %	Increase in Annual Household Real estate Values X$billion
1997	3.753	216	5.25-5.50	210
1998	4.055	302	5.56-4.68	836
1999	4.431	376	4.63-5.30	946
2000	4.814	383	5.45-6.40	1572
2001	5.322	508	5.98-1.82	1354
2002	6.028	706	1.73-1.24	1298
2003	6.910	882	1.24-0.98	1618
2004	7.859	949	1.00-2.16	2511
2005	8.913	1054	2.28-4.16	3014
2006	9.910	997	4.29-5.24	509
2007	10.613	703	5.25-4.24	- 1813
2008	10.580	- 33	3.94-0.16	- 3197
2009	10.419	- 161	0.15-0.12	- 454
2010	9.921	- 498	0.11-0.18	- 555
2011	9.702	- 219	0.17-0.07	- 293
2012	9.491	- 211	0.08-0.16	1412
2013	9.401	- 90	0.14-0.09	2102
2014	9.400	- 1	0.07-0.12	1096
2015	9.491	91	0.11-0.24	1255

1.2 The risk assessment process

As mentioned above, the growth in the collective U.S. mortgage portfolio was extremely fast over the period 1997-2007. The collective level increased from $3.75 trillion in 1997[1] to $10.61 trillion in 2007. By 2007 the level of outstanding mortgage loans had overtaken the U.S. government debt level, the latter being $9.00 trillion by 30 September 2007. Long-term household debt had become larger than government debt.

What was striking was the assessment of the collective value of all homes over the same period. The Federal Reserve publishes data on owner's equity[2] in homes. In Q1 1997 the equity level amounted to $4.925 trillion, while by Q1 2006 the equity level had increased to $13.267 trillion.

[1] https://research.stlouisfed.org/fred2/series/HMLBSHNO
[2] https://research.stlouisfed.org/fred2/series/HMLBSHNO

Compare these figures to U.S. GDP in nominal terms. At year-end 1997, home equity valuation was $5.105 trillion compared to nominal U.S. GDP of $8.6 trillion. In 2006 home equity valuation had shot up to $13.267 trillion while U.S nominal GDP had grown to $13.9 trillion. The home asset values as compared to U.S. output had increased from 57.3% in 1997 to 95.4% in 2006.

Nominal GDP (=National Income) did grow by 54.3% over the period 1997-2006, but home asset values increased by 159.9% over the same period; nearly three times the speed of income growth. On an individual basis, no household can afford to increase long-term borrowings by 264% (from $3.753 trillion in 1997 to $9.910 trillion in 2006) when total income grows by only 54.3%. However, this is exactly what happened in macro-economic terms in the U.S. over the period 1997-2006.

It is instructive to pause and consider what home asset values reflect. A realized price for a particular sale of a home is just one transaction. However not all existing homes are sold in a single year and new homes are added to the stock of homes. For the U.S., rough estimates indicate that perhaps between 7 and 10% of the total housing stock comes on the market in a single year. From a macro-economic perspective, multiplying the total housing stock with the prices achieved for selling a small number of homes can be very be misleading.

The values of the total housing stock are not wrong, but are not right either. The values do not reflect the income earning levels, which lie at the heart of the repayment risk relating to mortgage loans. When National Income grows by 54.3% over the period 1997-2006 and the housing stock values grow by 159.9% over the same period, it is not that the National Income has been assessed wrongly, but that the link between income and home value levels has broken down.

If each buyer would have had to use his/hers own savings to buy a home, there could not have been a break in the link between income and values. It is with the help of outside funds -home mortgages- that this link can break. Such a scenario becomes accepted reality when the speed of mortgage lending growth outstrips the macro-economic income growth. Money, as in personal savings, does in itself not provide any danger to the housing market. However borrowed money can make the difference between steady economic growth and boom-bust scenarios.

Financial risks on home mortgages were accumulated too rapidly over the period 1997-2006 relative to income growth. The shift away from a direct lender-borrower relationship through securitization of assets held by groups of borrowers and remote lenders further complicated the picture and from 2004 securitization efforts were ramped up. Another complicating factor was the acceleration in selling sub-prime mortgages from 2004 onwards. However the amounts involved were never more than $1.3 trillion out of a total mortgage portfolio of just over $10 trillion. The spark that set off the financial crisis in

August 2007 may have been BNP Paribas' action to bar investors from withdrawing money from three of its investment funds that held securities backed by U.S. subprime mortgages, but this was just a symptom and not the cause of the crisis. The real cause was that the accumulation of mortgage lending over the period 1997-2006 which caused house prices to increase at a speed that far outpaced the growth in the National Income in the U.S. and the increase in income levels was far outpaced by house price increases.

1.3 Why did the interest instrument not achieve its goals?

The Federal Reserve's interest rate policy was not aimed at containing the increase in households' real estate values. It was aimed at keeping output prices at a growth level no greater than 2% annually. It was also aimed at creating the right environment for the U.S. economy to grow and keep unemployment levels as low as possible.

Why did the interest rate policies applied by the Fed not prevent the 2007-2008 financial crisis?

The main reason was that individual households behaved in a manner, just like companies do frequently. If the costs of borrowing are compared to the potential gains to be made by investing in a home –or in the case of companies in an activity- than it matters less what the price of borrowing is –the interest rate applicable- but what gains may be expected from the borrowed amount. For many homebuyers a current known cost element –the interest rate payable- was set off against a potential future gain. Some people may call this speculation; others will argue that it is a well-considered choice based on market history.

As Table 1 shows, in each year from 1998-2005 the annual increase in mortgage borrowing was much lower than the increase in annual household real estate values. In 2005 the $1.054 trillion in net new borrowings led to an increase in household real estate values of $3.014 trillion. Little wonder that many households were enticed to invest in property, notwithstanding the increase in effective Fed funds rate from 2.28% to 4.16% in 2005.

In Ben S. Bernanke's book[3]: 'The courage to act' the Fed's considerations about the causes of the financial crisis are exhaustively spelt out. Mr. Bernanke acknowledges that high mortgage-lending levels might have resulted in homeowners' real estate values to growing at an even faster speed. The latter values exceeded National Income growth by three times over the period 1998-2005. The macro-economic source of repayments for all debts is the National Income level. When income levels fell materially behind the home value growth

[3] http://books.wwnorton.com/books/detail.aspx?ID=4294989041

levels during 2002-2004, alarm bells should have started ringing. The Fed and others failed to act on these warning signs.

Is the interest rate tool the most suitable tool to bridge the gap between income growth levels and house values? Lowering interest rates is likely to encourage economic growth levels. It is likely that incomes will pick up. Rapidly rising house prices might require higher interest rates to slow down such rise.

There are two considerations that make the actual level of interest rates less relevant. The first one was the mentioned household sentiment factor: expecting house prices to go up faster than the costs of borrowing. The second one is that the volume of mortgage lending is not build up in a year or so, but over many years and under many different short-term interest rates. Any change in short-term interest rates will not affect the mortgage obligations of many borrowers, who took out their mortgages in previous years.

This begs the question: why chose the National Income growth level as the benchmark for comparing it with the household real estate values rather than the growth level of the outstanding mortgages?

As Table 1 shows, there has not been a fixed multiplier between the annual incremental amount in mortgage lending and the annual increase in house price values. The volumes of newly build homes may play a role, population growth could play a role, average family size changes could change the picture and there may be more factors involved.

What is certain is that the mutations in National Income levels determine the general ability of an economy to repay outstanding debt levels, including home mortgage debt. On the other hand changes in house price valuations determine the attraction for households to ramp up or slow down their borrowing behavior.

Therefore, policy makers need to follow and compare the trends in National Income levels and in annual household real estate values. These trends combine the two most relevant factors in determining whether home mortgage lending levels grow too fast. Action may be needed, but changing the interest rate levels is likely to have a minor impact only. With the lowest Fed funds rates on record for some eight years since 2008, households reduced their home mortgages level by some $1 trillion or just over 10%.

2 The role of the banking and financial sector in the financial crisis

With hindsight some relatively easy observations are possible. Was it the role of an individual bank to curtail its mortgage-lending book, when the competition was expanding their mortgage book? Of course, every institution had an obligation to its shareholders to maximize profits within specified risk limits. The point is that the collective of banks created the outstanding mortgage lending levels, not just one or another bank. If the rise in the U.S. mortgage loan book was too rapid over the period 1997-2005 –which it was- then it would have been logical that the regulators would have invented solutions to curb such lending rather than punish individual banks. As explained in the previous section just moving the Fed funds rate up and down would have been rather ineffective because of the popular sentiment toward the housing market.

The volume growth in outstanding mortgage loans over the period 1997-2006 may have been the logical consequence of banking competition since no single bank was responsible for the collective growth. The growth level was too fast with the value of household real estate holdings far outstripping National Income growth. Only the banking supervisory authorities could have taken measures to slow down such lending patterns, but with the ineffectual exception of adjusting Fed funds rates occasionally, they failed to act.

Some banks in their hunger for profits resorted to more dubious practices, which significantly increased the severity of the crisis. From 2004, banks in their drive for short term profits increasingly started to sell sub-prime mortgages, not on the basis of their client's creditworthiness, but pinned on the hope that the rise in house prices would cover their risks. If a client defaulted under a mortgage loan agreement, a sale of the house would return the loan proceeds. In effect banks started to act like a large number of their customers. They focused on future asset values rather than on income affordability by the borrower. Among others 'interest only' mortgages were offered, 'teaser rates' were offered with a below market starting up interest rate for some two years followed by a big hike in rates thereafter.

The volume growth of the collective home mortgage book is a logical consequence of having banks compete with one another. Banks cannot and should not be blamed for responding to a competitive environment. However, it became a different matter when banks no longer based their creditworthiness assessment on the income level of the borrower but on potential future house prices. The widespread use of subprime mortgages from 2004 onwards was a classical example of banks moving the goal posts.

With the effect of amplifying the effects of the crisis, banks also engaged in securitization of mortgage portfolios. Securitization severs the link between lender and borrower. It combines and repackages pools of underlying mortgages, which is then offered to investors. It is widely accepted that credit

rating agencies did a pretty poor job in assessing the risks of such securities. The global distribution of these securities by the banks, internationalized the funding element of the U.S. mortgage portfolio. Group risks on mortgagors, poor work by the credit rating agencies and overseas involvement in the funding element all constituted factors that made the financial crisis more difficult to contain than it would otherwise have been. Again the U.S. banking supervisors did not act against the face of these emerging risks.

3 The actual and potential policy responses to the 2007-2008 financial crisis

In addition to lowering the Fed funds rate in 2008 to its lowest level ever, the Fed reacted to the crisis by supporting many banks and some other specialized financial institutions by providing liquidity to these financial sector companies. Some were beyond salvation, such as Lehman Brothers; others like nearly all the big banks needed this support to survive. In 2007-2008 banks did not trust other banks and therefore hoarded liquidity instead of smoothing out daily liquidity ups and downs between themselves. The downward spiral of increasing mortgage loan defaults combined with falling house prices put a great strain on bank equity levels.

Providing liquidity to financial market participants became a major objective for the Fed during the initial crisis period. In this effort the Fed did have the courage to act and did it under great stress. Every day during this period brought new challenges.

In 2009 and following years, the Fed launched a series of purchases of U.S. government and mortgage bonds, ultimately to the extent of some $4.3 trillion; Quantitative Easing. The aim was to inject funds into these markets, so that the banking sector was enabled to lend more to their customers. As Table 1 illustrates this injection of funds bypassed the individual households altogether as household's aim was to restore each individual own balance sheet before taking on new loans. What the purchases also brought about was to lower long-term interest rates to the lowest interest rates on record. According to the most recent Fed Balance sheet[4], it still holds some $4.245 trillion in securities on its books. The Fed neutralizes this liquidity provision by offering banks the opportunity to deposit surplus funds with the Fed. It pays a positive spread to the banks over short-term U.S. government securities. With any increase in the Fed funds rate these payments will increase and affect negatively the profits the Fed will transfer to the U.S. Treasury.

In connection with individual households, what the Fed and others regulators seem to have missed was to study and subsequently act upon the link between the National Income developments and the Household Real Estate values.

[4] http://www.federalreserve.gov/releases/h41/current/h41.htm#h41tab1

What could have been done differently? A number of tools could have been used and they can still have a place when the next gyration in the housing market occurs.

3.1. Set up an early warning system

An 'early warning' system could be installed which sounds an alarm once it becomes clear that house price increases are running much faster than the National Income growth. Such a system could use 'traffic lights' to warn banks that caution is required.

Green would indicate that the mortgage markets are not growing too fast and may continue to grow until further notice. Amber for when the speed of mortgage lending growth is becoming excessive and signaling that lenders should slow down their lending volumes with red reserved for when mortgage volumes are growing too fast. The Fed could indicate the rate at which the mortgage market may safely grow. Any institution exceeding such speed of growth might be penalized as it risks undermining the volume targets needed to avoid a boom-bust situation.

Banks cannot be expected to stop mortgage lending volumes to grow voluntarily, hence a simple but effective traffic management system helps to avoid that the U.S. economy will not return to the 2007-2008 financial crisis situation again.

A structural weakness in banking supervision would have to be overcome as regulatory oversight was and to some extent still is divided over the 12 Federal Reserve banks and various State organizations. The Federal Reserve could be put in charge operating such warning and traffic management system.

3.2. Set up a home mortgage quality control system

Banks and other financial institutions are very adept in developing products that help their profits rise in the short term. Subprime mortgages and 'teaser' rates are just a few of the examples that come to mind. Mortgage backed securitization is another example. There is nothing wrong with the principle of finding investors other than banks to fund mortgage portfolios. However the practice as executed in the U.S. from 2004-2007 left much to be desired.

Banks may prefer their freedom of the markets, but market freedoms should not come with a price tag for society as a whole, which is at odds with the benefit of the entrepreneurial freedoms acquired. For instance it cannot be right that over the period 2006-2013 as a result of bad bank practices 21.3 million U.S. households were confronted with foreclosure proceedings or nearly 45% of all

mortgagors. It can also not be right that 1 out of every 8 households with a mortgage lost their home over the same period. It cannot be right that 7.8 million workers lost their jobs between 2007 and 2010[5] as a consequence of the financial crisis. Finally it cannot be right that as a consequence of the financial crisis U.S. government debt more than doubled from $9.22 trillion by the end of 2007 to $18.922 trillion by the end of 2015[6].

For these reasons a mortgage quality control system could be put in place. In 1994 Congress with the support of the Fed passed the Home Ownership and Equity Protection Act (HOEPA), to outlaw abusive mortgage lending practices. However this Act concentrated on predatory lending practices and it did not intend to impede 'legitimate' access to the subprime mortgage markets. When the Act was drafted no one had foreseen the volume-lending boom of the early 2000s. Furthermore implementation of the Act was not helped by the fact that implementation was executed by many regulatory bodies, without anyone of them having full management control.

A major flaw of the Act is that it dealt only with individual household cases and not with the macro economic impact of a mortgage lending boom supported by banking practices often no longer based on the ability of households to repay outstanding mortgages out of current income, but out of future expected values of the home being financed. The 'crime', which the Act failed to cover, is an 'economic crime', committed by wantonly placing customers in a 'loss' situation when it was known or could be expected that house prices were no longer rising.

3.3 Marry the early warning system with the quality control one

Mortgage lending was at the amber level in 2002-2003. The policy measures needed at that point would have been twofold: to introduce a product liability system for banks and introduce a macro-economic reserve policy (MERP).

Most companies, when they sell a product, provide a guarantee that the product will operate satisfactorily during the lifetime of the product. Banks cannot guarantee that the home mortgage client will not default on home mortgage payments. However the amber stage in home mortgage lending indicates that the net volume growth in new lending is reaching a dangerous pitch. The Fed and with it all other bank and financial sector regulators could stipulate that any new home mortgage requires a financial reserve set aside within the originating institution at a higher level than the previous one. For instance, if 3% was the expectation of the annual level of doubtful debtors before the amber stage, the

[5] http://fpc.state.gov/documents/organization/203740.pdf

[6] http://www.treasurydirect.gov/NP/debt/search?startMonth=12&startDay=31&startYear=2007&endMonth=12&endDay=31&endYear=2015

Fed could dictate that 5% is added to the reserves for any new home mortgage. The second stipulation could be that such reserves have to be kept in place until the home mortgage has been fully repaid. Selling the funding side of the mortgage to third parties should not be a factor in releasing such reserves. They should stay in place until the end of the mortgage period.

The 'red' stage requires a more drastic approach, as this stage reflects the fact that the macro-economic development of the relevant country is at serious risk. This happened during 2004-2006 in the U.S. A material macro-economic risk necessitates a quite different counter-measure.

Jobs are at risks. 7.8 million people lost their jobs as a consequence of the financial crisis. Government funding is at risk as demonstrated by the doubling of government debt from $9 trillion to nearly $19 trillion over the period 2007-2015. The financial stability of 25 million households was at risk as foreclosure proceedings were started against them. Building enough new homes was put at risk. If annually 1.8 million new homes were needed, the cumulative shortfall over the period 2008-2015 reached 7.830 million.

The macro-economic risks caused by an excessive speed of lending put not only banks at risk, but also jobs, incomes, pension savings, government expenditure, home building and of course companies due to a reduced demand for goods and services.

A well considered response would be to ensure that at the red stage the new reserves built up for doubtful debtors on home mortgages are available not just to the banks and their shareholders, but to the population at large: from Wall Street to Main Street. Such a MERP would consist of two elements: firstly, it would increase the reserve ratio to some 8% for all new home mortgage lending and secondly, the reserves should be placed away from the lender and at the Fed in the form of U.S. government securities. It could be decided that such reserves have to stay at the Fed until the mortgage loans have been repaid. Furthermore as the threat is one to the macro-economy of the U.S., such reserves should be pledged to the Fed and the U.S. government in case of bank failure. In effect the transfer of reserves to the Fed would constitute a provisional penalty for the financial institution involved in order to get the micro and the macro policies in line. Rather than issuing penalties after the recession period as is being done currently, a preventive method would be the up-front transfer of reserve amounts based on net new home mortgage lending. The return of such reserve funds to the financial institution involved should only take place once the performance of the underlying mortgages can be assessed as satisfactory with 'satisfactory' denoting a portfolio performance in line with that of the best lending years.

3.4 Helicopter money - set up a National Mortgage Bank (NMB)

One of the aims of economic policy should be to avoid an economy going into a recession. The tools as set out above were not used before the financial crisis erupted, but could be used in future.

The establishment of an additional tool to counteract the excessive lending patterns may need to be considered. In a paper: "Are countries prepared for the next recession"[7] by this author, it was suggested to set up a National Mortgage Bank.

The main aim of an NMB is to act as lender of last resort for individual households.

A National Mortgage Bank would not be a mortgage lender or originator in the normal sense. One could not visit its office to obtain a mortgage. It is also not a Fannie Mae or Freddy Mac, organizations that facilitate long-term fixed rate mortgages. What it would be, is an instrument of economic policy, only to be called into action as and when the number of foreclosure proceedings start to grow substantially.

Under the guidance of the U.S. Treasury and the Fed, the NMB could help households threatened with foreclosure proceedings with monetary assistance for a limited period of time. Such assistance may be varied according to the income group, to which the householder belongs, with the lowest income group receiving more help than the higher ones. The assistance can be a combination of 'helicopter' money –an outright grant element- and a mortgage loan element. The financial support should not eliminate the obligation of the mortgagor to share in the monthly payments. For the mortgage loan element a subordinated mortgage claim could be established.

From a macro-economic perspective an NMB set-up helps to prevent forced sales of homes in a downward house price market. It helps households to continue spending on other goods and services, rather than being involved in an accelerated repayment schedule of the outstanding mortgage amounts. It helps to keep employment levels up. It helps to keep tax revenues up. It lowers the risk profile on home mortgages for all banks, financial institutions and the fund providers through mortgage-backed securities; all of whom should pay a risk premium to the NMB.

What an NMB needs is a U.S. government decision on establishing such a bank at an early stage in order to be ready when the next recession strikes.

[7] https://ideas.repec.org/p/pra/mprapa/70209.html

4. Some conclusions

- The philosophy that house price rises in the U.S. were the result of supply and demand factors and therefore should not be the subject of government intervention turned out to be an erroneous one as the 2007-2008 financial crisis testified.

- The main reason was that borrowed funds were used to acquire homes, rather than personal savings.

- Over the period 1997-2005 the net annual volume increase in borrowed funds for home acquisitions multiplied from $216 billion in 1997 to $1.054 trillion in 2005; a nearly fivefold increase in borrowed funds.

- The net annual increase in household real estate values rose over the period 1997-2005 from $210 billion in 1997 to $3.014 trillion in 2005; an increase of over 14 times.

- Between 2001 and 2006 many households in taking out mortgages based their decisions on the known interest rate charges and compared these with the potential price increases of their acquired home: the household sentiment factor. Not the income level but the potential opportunity of a substantial value gain drove the house market.

- Banks helped to perpetuate these sentiments. The strong push of subprime mortgages from 2004 onwards –interest only and teaser rates mortgages for instance- were the wrong products at the wrong time. The securitization of such mortgages increased the macro-economic risks further, by turning long-term risks into a daily tradable risk. Securitization also caused the internationalization of the risks.

- Subprime mortgages were not stopped by the regulators nor were the securitization of these products; the legislation in place did not deal with macro-economic disturbances, but only with misselling of mortgages to individual households.

- In macro-economic terms if the growth in National Income is far lower than the growth in long-term borrowings, the level of doubtful debtors is bound to increase dramatically.

- The Fed and other regulators could have acted differently. Their conventional tool base comprised mainly of the Fed funds rate, which was not meant to deal with house price increases. Even if it had done so, moving interest rates would not have been effective as the household sentiment factor was strong and based on future gains in house prices.

- More effective tools that could have been deployed include the "early warning or traffic light system", a "home mortgage quality control system", and a "Macro-economic reserve policy system". The latter system would move new reserves away from the banking system into a protected account with the Fed, so as to protect the public at large from the costs of recessions caused by the lending excess.

- Finally a "National Mortgage Bank" could be set up to help households as a lender of last resort in order to stretch out mortgage payments over a longer period of time and overcome the threat of a forced sale of homes. An element of "helicopter money" could be combined with a subordinated claim on the property.

- The use of helicopter money in a targeted approach such as via a National Mortgage Bank should be the preferred approach rather than helping all households indiscriminately. A shared risk approach between a government, the banks and the household sector provides the best strategy for averting another financial crisis.

- The preventive measures discussed herein would have helped the economy to stay on a steady growth path; it would have avoided the situation where many mortgagors lost their homes or were forced to allocate a large share of incomes to the (p)repayment of their outstanding loans; it would have avoided the large number of jobs being lost and it would have avoided the doubling in U.S. government debt levels from $9 trillion in 2007 to nearly $19 trillion in 2015. It would also have meant that rather than not building the 7.8 million homes; more homes would have been built.

Drs Kees De Koning
Chorleywood, U.K.
8th June 2016

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