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The real financial crisis: an individual households' crisis The case for index-linked government bonds for the Netherlands, the U.S. and the U.K.

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The real financial crisis: an individual households' crisis

**The case for index-linked government bonds
for the Netherlands, the U.S. and the U.K.**

By

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Introduction

The real financial crisis in the U.S. and in other countries did not take place in the banking or the wider financial sector -yes banks and others financial institutions were affected by their own induced excessive lending schemes- but no, it seriously affected the individual households. More than 40% of the 53 million home owners who had a mortgage in the U.S. were affected by foreclosure proceedings over the period 2004-2012. Out of those 21.4 million households 5.4 million had their homes repossessed. Between 2006 and 2010 an additional 7.8 million Americans lost their jobs. Mainly as a result of the economic slowdown, between 2006 and to-day the U.S. government doubled its debts from \$8.5 trillion till just below \$17 trillion to-day. On top of this individual households lost \$12.6 trillion in net worth in 2008, more than the total debt level on home mortgages in that year which stood at \$10.5 trillion.

The focus of many economists is to find a general economic equilibrium and to study the relationship between money supply, inflation and economic growth levels. From above headline figures one can conclude that the U.S. economy was as far from a general equilibrium as one could possibly imagine. One may also conclude that it was not the money supply¹ which changed dramatically (M2, seasonally adjusted, grew by 4.7% in 2003, 5.96% in 2004, 4.5% in 2005 and 5.76% in 2006), but rather the use of funds over the four years preceding 2008, which led to house price increases of over 30% in the three year period 2003-2005. It was the “abuse of funds” over the latter period which led to the subsequent losses in jobs, in incomes and net worth and in a reduction in economic growth rates which has lasted up till to-day. It was also one of the main causes of the growth in U.S. government debt over the last 7 years.

In this paper a “use of funds” theory will be developed, which will be based on actual economic developments, rather than on hypothetical links between money supply, inflation, and economic growth.

Emphasis will be placed on the two main long term borrowing levels which affect individual households: home mortgages and government debt levels. The borrowing behaviour of the company sector will not be a subject of discussion as a misallocation of funds to these companies will usually lead to bankruptcy, which means the company ceases to exist. Neither individual households nor a government disappear in the same manner.

Emphasis will also be placed on the costs of debt and the accumulation of savings in pension funds in this use of funds theory. It will be demonstrated that issuing (part of) government debt in an index linked manner is an ideal tool to lower the costs of funding for the three countries under consideration: the Netherlands, the U.S. and the U.K. Such funding will also act as an anti-cyclical instrument in times of slow or negative economic growth. The negative interest rate effects on fixed rate bond portfolios as a consequence of discontinuing quantitative easing can be counteracted by temporarily increasing the volume of index linked bonds.

The aim of this paper is to provide an insight into the links between lending activities, inflation, interest rates, economic growth and the ambition to provide for future incomes out of individual households own savings, rather than relying on a transfer system from those in work to those in retirement.

¹ <http://research.stlouisfed.org/fred2/data/M2SL.txt>

1. The macro-economic setting

For many years economists have been searching for the links between the money supply, inflation levels and economic growth. In his book: *Monetary Theory and Policy*², Prof Carl E. Walsh provides an extensive overview of the many efforts of economists to search for a general economic equilibrium and to quantify the relationships between money supply, inflation and economic growth.

General equilibrium theory studies supply and demand fundamentals in an economy with multiple markets, with the objective of proving that all prices are at equilibrium. The theory analyzes the mechanism by which the choices of economic agents are coordinated across all markets.

The problem with such supply and demand approach is that it automatically implies that the price set at the level where supply meets demand is a correct one. Human intervention through creating monopolies in certain markets and human errors in assessing correctly the “costs” of credits to a government or to individual households, turn the assumption that the price is always right upside down.

What economists have also generally assumed is that inflation is measured through the price changes in the costs of goods and services, the CPI or RPI price indices. Inflation does not only appear in the price for goods and services. Inflation -price changes- can occur in fixed assets, especially homes and in financial assets for instance in share prices, but also in the values of derivatives. The latter price changes have generally not been taken into account in the models provided.

There are other factors of major importance which distort the relationships between money supply, inflation and economic growth. The first factor to be mentioned is the development of wages and salaries. Do they grow faster than inflation or slower and what are the causes of such speeding up or slowing down? The second major change, especially for the three countries under review, is the growth in savings in pension funds. Money gets locked up in financial assets and the return of such monies to the pension savers is no longer one of free choice, but one based on a set of government rules. Finally money in circulation is closely linked to the levels of credits granted to individual households, the company sector and a government. Losses - a destruction of savings- have a major effect on the behaviour of individual households and on governments when doubts arise about the repayment capacity over their outstanding debt. The timing when such losses appear can be years from the moment of granting the loans. A money loss, especially a write off of outstanding debt, represents a use of funds loss. The ultimate bearers of such losses are always the individual households. It may be banks or pension funds which may have to write down the values of outstanding claims, but the ultimate owners of all assets of these organisations are the individual households. A use of funds theory recognises the importance of such losses occurring and the effects it has on lending levels, inflation and economic growth. Money supply theories do not show such losses.

It is symptomatic that in the excellent overview of current economic thinking the concepts of loan losses and credit risk management were not mentioned once in the book written by Prof Walsh. It is also symptomatic that when it comes to interest rates there seems to have been few efforts to diversify such rates according to the assumed maturity periods of government debt, individual household debt and corporate debt. In the real world such maturities matter and they (should) change the interest rates applicable to each type of debt.

² http://people.ucsc.edu/~walshc/mtp3e/MTP_e3_toc.pdf

The approach used in this paper does not start with the money supply but with the “use of funds” by individual households and by a government. It represents an effort to define a “use of funds theory”. The company sector has been excluded for this purpose, not because this sector is not important, rather the opposite, but its actions are profit oriented. The ultimate penalty for a misallocation of financial resources by companies is usually bankruptcy, the disappearance of the company. Individual households and a government will not disappear in the same manner. Neither, it appears, will some banks.

What is important in this “use of funds” theory is to set out the factors which influence the collective borrowing behaviour of individual households, especially the long term borrowing actions. Secondly the “use of funds” theory will also study the relationship between the income levels of individual households and their debt obligations. This can be done on a macro scale as statistics to this effect are available in the U.S. and in the U.K. Last but not least it will study the debt accumulation of the three governments and the manner in which individual households have to pay for it and benefit from it.

The Federal Reserve Bank in St. Louis produces on a quarterly basis a Balance Sheet of Households and Nonprofit Organizations³. These statistics have been produced over many years and provide a very valuable tool in analysing the collective behaviour of individual households.

2 The principal causes of the 2008 financial crisis

2.1 The use of funds approach to home mortgages

Making money available to individual households, especially of the long term variety of home mortgages, requires a judgement on the future repayment capabilities of each individual household. There are three aspects to such lending: the first one is that the judgement represents a risk assessment. A risk assessment is different from a price in that the applied price includes the risk premium over costs of funds over a long period. Only future developments will show whether the accepted price was the correct one. The 2008 financial crisis showed that in many cases the price was wrong or even more importantly that based on the income levels of some borrowers no price would have ever matched their ability to repay their home loans. For some 5.4 million U.S. borrowers there was no equilibrium price. The second aspect is that the demand for homes is a finite one based on population growth and on the changes in the average household. The third aspect is that making money available for home mortgages can have two effects: the first one is that money enables families to acquire a home, but the second one is that if supply is not forthcoming in the short run in the places where families want to live, it drives up house prices. To lend money which is converted into increased house prices has less impact on economic growth than new construction; not only that, but one may question the economic value of rapid rises in house prices. The gain can have two potential causes: one it reflects the scarcity value, but two it represents a misallocation of funds as no economic gain -a gain in output in an economy- is made from the rise in house prices. The latter reflects closely the “black tulip” mania in Holland in the 17th century, where speculation drove up the black tulip price to 3000 to 4150 guilders, when a skilled craftsman earned 300 guilders a year.

³ <http://www.federalreserve.gov/releases/z1/current/z1r-5.pdf>

2.2 The U.S. experience

Over the period 2000-2006 in the United States the combined mortgage debt of individual households increased from \$4.814 trillion as per the year-end 2000 till \$9.874 trillion as per the end of 2006, an increase of 105.1%. Over the same period the median income level of individual households moved up in nominal terms from \$41,186 in 2000 till \$47,262 in 2006, an increase of 14.75%. If one takes into account the increase in the number of individual households from 104.705 million in the year 2000 till 114.384 million in 2006 than the average amount of outstanding mortgage debt moved up from \$45,977 in 2000 till \$86,323 in 2006; an increase of 87.75%. The conclusion can be drawn that mortgage debt expanded by a factor practically six times faster than medium income levels. This excessive speed of lending for home buying purposes plus the packaging of such home loans into daily trade-able mortgage backed securities lies at the heart of the causes for the 2008 financial crisis.

- The national home mortgage portfolio

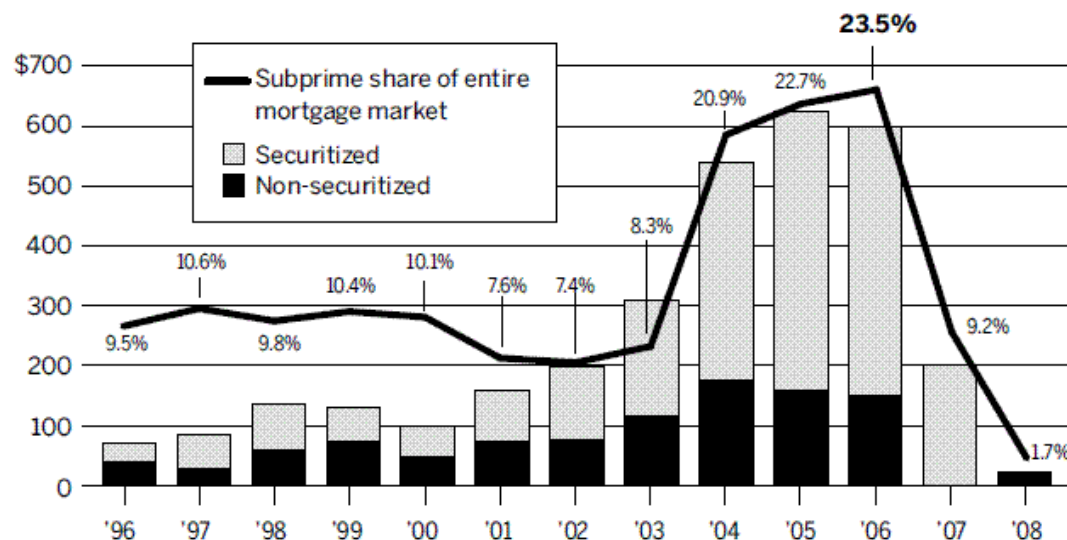
The amounts of \$4.8 trillion in 2000 and \$9.9 trillion in 2006 represent the national home mortgage portfolio of the U.S. in these years. The quality of the national home mortgage portfolio is strongly influenced by the quality of the borrowers. The graph below⁴ shows the rapid growth of the sub prime share in new mortgage originations in the years 2004-2006.

Table 1: Sub prime mortgage originations

Subprime Mortgage Originations

In 2006, \$600 billion of subprime loans were originated, most of which were securitized. That year, subprime lending accounted for 23.5% of all mortgage originations.

IN BILLIONS OF DOLLARS



NOTE: Percent securitized is defined as subprime securities issued divided by originations in a given year. In 2007, securities issued exceeded originations.

SOURCE: Inside Mortgage Finance

⁴ https://en.wikipedia.org/wiki/Subprime_mortgage_crisis

In table 2 the annual outstanding mortgage amounts are reflected over the period 1996-2008 as well as the annual increase in outstanding mortgage amounts. Also included in the table are the house price inflation levels on a year over year base and the consumer price inflation levels⁵ over same period. Finally the excess of house price inflation over CPI has been displayed.

Table 2: Mortgages outstanding 1996-2008, annual increments in mortgage amounts, house price changes and consumer price inflation levels.

Year	'96	'97	'98	'99	2000	'01	'02	'03	'04	'05	'06	07	'08
Amount x US \$ trillion	3.54	3.75	4.05	4.43	4.81	5.30	6.26	6.91	7.81	8.91	9.90	10.58	10.5
Year on Year increase x US\$ billion	218	216	301	377	383	507	705	882	944	1099	990	683	-57
House Price Inflation % y.o.y	2.24	5.10	4.61	5.81	7.67	6.04	6.48	7.29	11.08	10.44	3.33	-1.95	-13.3
CPI Inflation % y.o.y	2.95	2.29	1.53	2.16	3.25	2.77	1.56	2.23	2.59	3.28	3.12	2.77	3.70
Excess HPI over CPI	-0.7	2.81	3.08	3.65	4.42	3.27	4.92	5.06	8.49	7.16	0.21	-4.72	-17

- Credit judgement errors.

When individual households get into payment difficulties on their home mortgages, the first action by the lenders is foreclosure, followed by a foreclosure filing and subsequently home repossessions. U.S. statistics on all three can be found on the website of Statistic Brain⁶. The credit judgement problems took off in 2005 with the level of foreclosures increasing by 25% over 2004. In 2006 they

⁵ http://www.bls.gov/data/inflation_calculator.htm

⁶ <http://www.statisticbrain.com/home-foreclosure-statistics/>

were 90% higher than 2004 and in 2007 nearly 3.5 times the 640 000 level of 2004. The peak was reached in 2011 at 3,920,418 which stood at over 6 times the 2004 level. All this led to home repossessions which numbered 269,000 in 2006, 489,000 in 2007, 679,000 in 2008, 945,000 in 2009, 1,125,000 in 2010, 1,147,000 in 2011 and over 700,000 in 2012. All in all nearly 5.4 million credit judgement errors led to the ultimate repossession of homes. The number of households who had to deal with foreclosure proceedings amounted to 21.4 million households over the period 2004-2012. The Milken Institute⁷ estimated that in June 2008 there were 53 million households having a mortgage and 27 million were outright owners without any mortgage. Of the 53 million just over 40% had to deal with foreclosure proceedings during the 2004-2012 period; a staggering percentage, which really showed the extent of the financial crisis for individual households.

The credit judgement errors were compounded by the securitization process, which, as table 1 showed, really took off in 2003 when nearly two thirds of new home mortgage originations were farmed out to the financial markets. This meant that American financial institutions were able to generate mortgage sales, but did not need the financial reserves as the transactions were packaged and sold off to, among others, overseas banks and pension funds. It is noteworthy in this respect to note that the Bank of Spain, Spain's central bank, did not allow Spanish banks to buy such U.S. mortgage backed bonds. Regretfully, it did not stop its own country's mortgage disaster. The securitization method also made it very difficult to deal with individual clients as whole portfolios of clients were simultaneously declared insolvent; hence the enormous numbers of foreclosure procedures compared to the number of households having a mortgage.

- Demand for homes

The key determinant in the demand for homes is not the price but the growth in the number of individual households. In the period 2000-2010 the number of households grew in the U.S. from 105.5 million to 116.7 million according to the Census Bureau⁸. On average the U.S. increased the number of individual households by 1.12 million per annum over the period 2000-2010. Of the around 80 million homes used all year around in the U.S., the average lifespan can only be estimated but is probably around 130 years, which means that the total finite demand for homes is somewhere around 1.7 million new housing starts per annum. Table 3 gives an overview of realised annual new housing starts, seasonally adjusted for the period 2000-2013

Table 3: U.S. annual new housing starts⁹ per 1 July, seasonally adjusted over the period 2000-2013

Year	Housing starts x 1,000	Year	Housing starts x 1,000
2000	1463	2007	1354
2001	1670	2008	923
2002	1655	2009	594
2003	1897	2010	546
2004	2002	2011	623
2005	2054	2012	741
2006	1737	2013 (1June)	836

Elements, which "helped" individual households to acquire homes, were the applicable interest rates and other loan conditions attached to the mortgages. Low starts up interest rates were used to

⁷ <http://www.milkeninstitute.org/pdf/riseandfallexcerpt.pdf>

⁸ <http://www.census.gov/prod/cen2010/briefs/c2010br-14.pdf>

⁹ <http://research.stlouisfed.org/fred2/data/HOUST.txt>

entice individual households to sign up to mortgages. Such mortgages had their rates steeply increased after a two year period. 100% mortgages were also used with no repayment obligations. In many cases short term funding rates were applied rather than a 30 year fixed rate. All these elements shifted the credit risks to the individual households. The latter only hoped that house price increases and incomes would grow faster than their payment obligations. When the lending excess came to the boil in 2008, such hopes were shattered and not only did house prices drop rapidly, also income growth stayed behind CPI inflation levels and, of course, the outstanding payment obligations remained the same as before the crisis. Individual households reacted in a way they could. They reduced the total volume of the outstanding national home mortgage portfolio from \$10.5 trillion in 2008 till \$ 9.38 trillion as per the end of the first quarter of 2013. During the latter period an increased share of households' incomes was diverted to paying off home mortgages as compared to the allocations before the 2008 crisis. This change in income allocation through paying off mortgage debt and acquiring new homes from own income or savings reduced the spending power available for buying other goods and services. This had the effect that demand levels were reduced. The company sector reacted in slowing down employment growth and investments as well as generally following a wages and salary policy of keeping wage increases below price rises. Reduced growth rates in companies' turnover levels and a slower growth in households' incomes led to a rapidly increasing government debt level in all three countries involved.

- Conclusions

The conclusions, which can be drawn, are that excessive increases in home mortgage funding in 2003-2005 led to excessive new housing starts, which was simultaneously accompanied by the highest house price inflation seen for several decades. Income growth did not keep up with the excessive debt increases. When the home price levels started to get close to CPI levels, as they did in 2006 and when at the same time more households got into financial difficulties as shown by the increased level in foreclosures, the market turned around, banks became more reluctant to lend themselves as shown by the very high level of securitisation in 2004-2007. The (international) financial markets absorbed the U.S. home mortgage risks. In August 2008 some banks went bankrupt and others had to be rescued, including Fannie Mae and Freddy Mac as well as AIG Holdings. The latter had provided a huge volume of credit default swaps on mortgage backed securities to the (international) financial markets.

Was the U.S. national home mortgage portfolio managed, so that these excesses could not have occurred? The answer is no. Could it have been managed, the answer is, of course, yes. There was and still is no single authority in the U.S., the U.K. or the Netherlands which manages the national home mortgage portfolio. A penalty system for lenders and intermediaries in the lending and securitisation process does not exist, at times when such lenders and intermediaries caused excessive lending levels; excessive as compared to income developments of individual households. The current lack of a national home mortgage portfolio management system led to individual households being penalised either from foreclosures, from home repossessions or from drops in house prices after excessive gains as well as from an excessive increase in government debts as a consequence of negative or slow growth economies. Individual households are also penalised by average wage and salary increases below inflation levels. On top of all this they are also the ones who suffered the additional 7.8 million job losses and are responsible for paying back the \$5.3 trillion increase in U.S. government debt since the 2009 fiscal year.

A "use of funds" theory rather than a money supply theory has the benefit that it is able to explain why and how individual households' incomes are affected by long term borrowing levels and what

it does to CPI inflation and economic growth rates. This leads to the largest borrowers of all: governments.

3. Government debt of the Netherlands, the U.S. and the U.K.

3.1 Volume factors

In a purely cash based society individual households could only buy those items which their income or cash based savings could afford. Governments could not incur any debt and neither could individual households or companies. Banks would not be needed. If an individual could not create an income through getting a job or being self employed, he or she would have no means to buy any goods or services and would have to depend on charity from others.

Developed economies have moved a long way away from this simple concept, especially through government and central bank actions. For instance in 1993 the U.S. government debt level stood at \$4.35 trillion per end of June 1993 and increased to \$16.74 trillion per end of June 2013. In the U.K. the government debt level was £202 billion in 1993 and had increased to £1.04 trillion per end of March 2013. In the Netherlands the government's debt stood at Euro 83 billion in 1993 and is expected to reach Euro 451 billion in 2013.

Such an explosion of government debt raises a series of questions. The first one is one of debt maturity; the second one of applied interest rates and the third one is one about the individual households who have to carry the weight of government debt in the future.

3.2 Government debt maturity levels

A subject which is rarely discussed in Parliaments is the maturity level of government debt. With the four to fivefold increase in government debt over the last 20 years, one can conclude that no progress has been made to reduce the debt level in any serious manner over this period. It will also be clear that continuing the trend line of the growth pattern in government debt levels over the next twenty years would lead to a debt volume which would seriously disrupt the functioning of economies. Funds which could otherwise have been used for increasing production and improving efficiency levels in the production sector would be diverted to fund past expenditure levels of governments, which did not take the difficult steps to bring tax income levels in line with their expenditure levels. Taking the current levels of government debt of the three countries as a starting point, it would require maturity periods of some 70 to 80 years before all debt could be cleared without putting an unduly and unreasonable burden on the taxpayers and thereby on economic growth. The individual households' debt freedom day from government debt: the day that individual households no longer have to pay to cover the expenses of a government over previous periods, is many years away.

With such lengthy maturity periods the funding of government debt should be put in focus. Two of the three governments mentioned: the U.K. and the U.S. have opted for issuing some index-linked government bonds.

3.2.1 Issuance of index linked bonds U.K. and U.S.

The U.K. was the first country among the 12 major countries which issue index linked bonds. It started issuing such bonds: index linked gilts in 1981. In the U.K. such gilts are linked to the RPI index. Initially such link had an 8 months delay before inflation adjustments took place, but more recently this period has been shortened to 3 months. The aim of issuing such index linked gilts was to assist especially institutional investors like pension funds to manage their assets in line with their long term liabilities. The total outstanding volume of such gilts is around £380 billion out of the total government debt level of just over £1 trillion.

The U.S. introduced Treasury Inflation Protected Securities (TIPS) in 1997. The U.S. Treasury¹⁰ indicated that its intention is to maintain the portfolio of TIPS at around 10% of all U.S. government debt outstanding to the public. The maturities of its TIPS are 5, 10 and 30 year bonds. They can be bought by institutional investors as well as by individuals. The current level of outstanding TIPS is just over \$1.1 trillion.

The question may be raised why countries practice such different approaches to issuing index linked bonds compared to total government debt outstanding with the public? The U.K. maintains a level of around 38%, the U.S. of 10% and the Netherlands of 0%. In the next three tables it will be illustrated that over long periods of time issuing a much larger proportion of government debt in index linked bonds would have been cheaper for the countries and its taxpayers concerned. Secondly, at times of economic hardship, it would equally have been effective as an anti-cyclical instrument. Thirdly it may solve the dilemma of rising interest rates after quantitative easing will be stopped.

3.2.2 Historical overview of long term fixed rate bond yields with CPI and index linked bonds for the Netherlands, the U.K. and the U.S.

Table 4: the Netherlands

Year	5 longest Dutch Govt. bond Yields %	CPI %	Effective Yield %	Index Linked Yield %	Year	5 longest Dutch Govt. bond Yields %	CPI %	Effective Yield %	Index Linked Yield %
1993	6.69	2.61	4.08	3.61	2004	4.14	1.12	3.02	2.12
1994	7.20	2.64	4.56	3.64	2005	3.44	2.04	1.40	3.04
1995	7.19	1.68	5.51	2.68	2006	3.86	1.00	2.86	2.00
1996	6.49	2.29	4.20	3.29	2007	4.33	1.87	2.46	2.87
1997	5.80	2.32	3.48	3.32	2008	4.36	1.94	2.42	2.94
1998	4.87	1.78	3.09	2.78	2009	4.03	1.11	2.92	2.11
1999	4.92	2.15	2.77	3.15	2010	3.79	1.93	1.86	2.93
2000	5.51	2.60	2.91	3.60	2011	4.31	2.38	1.93	3.38
2001	5.17	4.15	1.02	5.15	2012	3.06	2.90	0.16	3.90
2002	4.99	2.75	2.24	3.75	2013		2.00 (est.)		
2003	4.27	1.70	2.57	2.70					

¹⁰http://www.treasurydirect.gov/indiv/products/prod_tips_glance.htm

For all three countries an index linked yield of 1% over CPI (or in the U.K case RPI) inflation level was chosen for bonds maturing in 30 years. For the Netherlands it was, of course, a theoretical yield as no index linked bonds have been issued by the Dutch government. There is a second caveat and that is that the index linked yield reflects the yield that both new bond issues and existing ones receive. As index linked bonds can be regarded as the best hedge against the risks of CPI inflation, the assumption was made that they are kept to maturity rather than being subject to a daily mark to market practice. The latter practice is only useful for short term fixed rate bond traders as their objective is to make gains (or losses) in trading such bonds. The average index linked bonds would have yielded 3.5% over the period 1993-2002. Over the period 2003-2012 the average yield would have been 2.8%. From all the years, only in 2012 was the index linked yield above the long term government bond yield. In 9 years was the index linked yield even below the effective yield. If one considers that institutional investors would have been very satisfied with a guaranteed yield of 1% over inflation, than the Dutch government would have been much better off if it had issued a sizeable proportion of its debt in index linked yields and so would have been the Dutch taxpayers. Long term debt would not require the premiums covering the risks of inflation, which the effective yields show. The elimination of such risks by issuing index linked bonds would have brought the overall costs of funds to the Dutch government down by a very sizeable percentage. The exception year would have been 2012, but with a negative growth rate of minus 3/4%, such a positive contribution to the savers could be regarded as an anti cyclical cash injection into the economy. Many pension funds would not have had to cut their pension payments, which in themselves constitute a drain on the purchasing power for the retired and thereby for an economy.

Table 5: The United Kingdom experience, average 10 year gilt yield, Retail Price Index (RPI), the effective yield after inflation and new issues of 30 year index linked gilts.

Year	10 year Average Gilt yield %	R.P.I.	Effective Yield %	Index Linked Gilts %	Year	10 year Average Gilt yield %	R.P.I.	Effective Yield %	Index Linked Gilts %
1993	7.69	1.9	5.79	2.1	2004	4.79	3.5	1.29	4.5
1994	8.18	2.9	5.28	3.9	2005	4.45	2.2	2.25	3.2
1995	8.24	3.2	5.04	4.2	2006	4.24	4.4	- 0.16	5.4
1996	8.03	2.5	5.53	3.5	2007	4.62	4.0	0.62	5.0
1997	7.15	3.6	3.55	4.6	2008	4.60	0.9	3.70	1.9
1998	5.59	2.8	2.79	3.6	2009	4.54	2.4	2.14	3.4
1999	4.87	1.8	3.07	2.8	2010	4.66	4.8	- 0.12	5.8
2000	4.93	2.9	2.03	3.9	2011	4.38	4.8	- 0.42	5.8
2001	4.99	0.9	4.09	1.9	2012	3.77	3.1	0.67	4.1
2002	5.04	2.9	2.14	3.9	2013		2.9(est.)		
2003	4.87	2.8	2.07	3.9					

The experience of the U.K. is different from the Netherlands in that in 2006 and 2007 and in 2010 and 2011 it had very high RPI inflation levels, far above the remainder years. The index linked gilts yield is based on new and existing gilts issued of this type with a margin of 1% over R.P.I. The average yield over index linked gilts over the period 1993 till 2002 would have been 3.44% and assuming that such gilts are being held to maturity, the costs to the Treasury and therefore the

British Taxpayer would have been substantially lower than the 10 year average gilt yield. Even over the period 2003-2012 the 10 year average gilt yield would have been more expensive at 4.5% than the index-linked average yield of 4.3%. When a government is able to keep inflation levels low, it works to the advantage of issuing index-linked gilts. In section 4.2 the case study of the Bank of England's own pension fund will be raised. One policy action -quantitative easing- by both the Bank of England and the U.S. Federal Reserve was to buy up mainly fixed rate government bonds over the period 2009-2012. This influenced the price of such bonds, the interest yields over the outstanding bonds, plus the CPI or RPI inflation levels.

Table 6: The U.S. experience

Year	10 year Average Bond yield %	C.P.I.	Effective Yield %	30 Year Tips yield %	Year	10 year Average Bond yield %	C.P.I.	Effective Yield %	30 year Tips yield %
1993	6.26	2.99	3.27	3.99	2004	4.30	2.59	1.77	3.59
1994	6.90	2.56	4.34	3.56	2005	4.13	3.28	0.85	4.28
1995	6.74	2.83	3.91	3.83	2006	4.52	3.12	1.40	4.12
1996	6.07	2.95	3.12	3.95	2007	4.30	2.77	1.53	3.77
1997	6.10	2.29	3.81	3.29	2008	3.18	3.70	-0.52	4.70
1998	5.18	1.53	3.65	2.53	2009	3.16	-0.36	3.52	0.64
1999	5.64	2.16	3.48	3.16	2010	3.60	1.61	1.99	2.61
2000	5.75	3.25	2.50	4.25	2011	2.67	3.06	- 0.39	4.06
2001	5.06	2.77	2.29	3.77	2012	1.92	2.03	-0.11	3.03
2002	4.64	1.56	3.08	2.56	2013	2.50 1 July	1.67	0.83	2.67
2003	4.23	2.23	2.00	3.23					

The U.S. case is quite similar to the two other countries in that if a larger proportion of its government debt would have been issued in TIPS, especially of the 30 year variety, it would have saved the government and thereby the taxpayers a substantial amount of US dollars. With pension reserves at over \$16 trillion as per the end of March 2013, the \$1.1 trillion in TIPS seems a very low percentage of total debt. Also in the U.S. in the period 2008 till to-day the 30 year TIPS rate would have acted as an economic stabiliser as it would not have been affected by quantitative easing, but only by CPI inflation levels.

3.2.3 Conclusions

The case for index-linked bonds seems very clear. By transferring the inflation risk back to the taxpayers, the respective government on behalf of its tax payers in all three countries will save itself substantial amounts if it chooses for a higher the percentage of its debt to be issued in index linked bonds. The 20 year experience as set in tables 4-6 for the Netherlands, the U.K. and the U.S. shows how expensive it has been to use fixed rate bonds, which do not protect against the inflation risks. The financial markets require a compensation for such risks. Their risk price has historically been much higher than in case the government would take over such risks as can be seen in the differences between the 10 year fixed rate bond yields and the 30 years TIPS yield or the equivalent in other countries. Quantitative easing has exacerbated the price setting in especially fixed rate

government bonds by changing the supply-demand relationship and thereby lowering the yields. Once the reverse process gets started, the U.K. and the U.S. governments will find that the yield will go up and many fixed rate bond holders will experience substantial losses on their portfolios. An alternative way to get out of the foreseeable loss situation for many fixed rate bondholders once interest rates will start to go up is for governments to temporarily increase the percentage of government bonds issued as index linked. The key conclusion out of the above is that fixed yields are variable due to the interest rate and inflation expectations and the variable index linked bonds are fixed with their yield fixed to a variable -inflation level- which turns the total result into a foreseeable fix at 1% over inflation. The conclusion which can be drawn from the 20 year overview is that index linked bonds lower the costs of government borrowings substantially, but help long term investors at times of economic hardship, which in itself helps economic growth. The readjustment to more normal interest rates once quantitative easing is reversed will cause serious losses over existing fixed rate bond portfolios. A solution would be to temporarily increase the issuance of more index linked government bonds rather than relying on more fixed rate ones.

4 Pension funds: the Netherlands, the U.K. and the U.S

4.1 The growth in pension funds assets

In a book by Clark and Munnell: *The Handbook of Pensions*¹¹, Chapter 23 written by Ian Tonks, it was stated that as of 1996 the total pension assets in the Netherlands were \$349 billion or 89% of GDP, for the U.K \$966 billion which represented 76% of GDP and for the United States \$4.763 trillion which was 62% of GDP. According to Towers Watson pensions study 2013¹² the Dutch pension savings have reached \$1.199 trillion or 156% of GDP, the U.K. pension savings \$2.736 trillion or 112% of GDP and in the U.S. 16.851 trillion or 108% of GDP. Such assets are a major change in the savings landscape as individual savers have no say over the use of funds as the rules of use is controlled by government regulations. The growth in such assets needs a rethink by economists about the economic effects of delegating the decisions over the adequacy of assets versus liabilities to people who do not own the financial resources. The easiest manner to demonstrate such effects is by using an extreme example: the Bank of England's pension fund.

4.2 The Bank of England's pension fund

The Bank of England defined benefit pension fund¹³ stands out from all pension funds in that in 2012 94.7% of its pension reserves of just over £ 3 billion were invested in index linked bonds; £2.459 billion in government bonds (gilts) and £ 400.1 million in corporate index linked bonds. Such asset allocation raises a series of interesting issues.

The future income of this pension fund is uncertain, but the certainty is that its income will always be in excess of RPI inflation levels. The current value of the future pension liabilities is also uncertain as it depends on the life expectancy of the pension fund participants, but also on inflation levels. The changes in life expectancy for the Bank of England's pension fund population can be properly assessed by an actuary. What actuaries cannot know and neither can any other person is how future inflation levels will develop. What the actuaries and the pension trustees of this pension fund will know though is that their future liabilities can be met from current assets in as far as the

¹¹ <http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199272464.001.0001/oxfordhb-9780199272464>

¹² <http://www.towerswatson.com/en/Insights/IC-Types/Survey-Research-Results/2013/01/Global-Pensions-Asset-Study-2013>

¹³ <http://www.bankofengland.co.uk/about/Documents/humanresources/pensionreport.pdf>

inflation effect is concerned. For a defined benefit promise, which is increasing the pay-out at least in line with the RPI index, to have financial assets which perform such function is invaluable. What actuaries and the pension trustees cannot do is to put an uncertain inflation development into a fixed discount percentage. In the case of the Bank of England's pension fund 3% was used as the discount rate. In financial terms, history is no guide to uncertain future developments and one may put great question marks over the 3% used if it was only to cover future inflation levels.

The Bank of England's pension fund is a great exception to the many pension funds in the world due to their financial asset base. However this pension fund -as well as all others including the pension supervisors- grapples with the problem of how to find the correct manner to discount future liabilities into a current liability figure and compare this to the asset base of a pension fund. It is especially the development of inflation rates which makes all the difference for defined benefit schemes. Many companies have closed their defined benefit schemes as they became unwilling to bear the risks of inflation out of corporate profits. In the case of defined contribution schemes the pension pot saver carries the full impact and risks of inflation. In all schemes the monthly coverage ratio is used as the guideline to decide on any changes in the pay-out figures. In my view and only considering it from an inflation perspective, there is and can be no accurate prediction of inflation rates over a 30 or more year period. A natural hedge has been applied by the Bank of England's pension fund, but this fund is lucky to have found such a hedge.

5 An overall balance: conclusions

The real reason that the U.S., the U.K. and the Netherlands are out of balance is that managing debt levels to individual households was never seen as a policy objective. Most economists started from the money supply data, rather than from a use of funds philosophy. The latter incorporates income level developments and compares it to the volume of lending to individual households, especially of the long term variety of home mortgages. The use of funds philosophy also incorporates the many errors which were made by financial institutions in granting loans to individual households who could not afford to pay back such loans. Such loan losses had a cumulative effect far greater than the amounts lost as it changed individual households' behaviour in their spending patterns. Subsequently it changed the corporate behaviour due to reduced demand levels as well as government behaviour due to the escalating government debts.

There are other reasons as well. Central banks are supposed to maintain the value of the currency, which means to keep inflation levels low. Currently inflation levels are only based on current prices for goods and services: the real sector. They are not based on price developments of fixed and financial assets and liabilities, notwithstanding that there are strong links between the value of a currency and the latter price developments. Inflation does not restrict itself to goods and services. With a great ambition to save for future incomes through individual pension savings, the current and the future have become closely interlinked. This ambition has changed the character of the balance between the real sector and the financial sector, whereby the rapid growth in government debt has added to the weight of the financial sector.

An overall balance in an economy cannot be reached on basis of the markets functioning perfectly. Human intervention and human errors make this impossible. Therefore human understanding is needed, initially to comprehend which are the key drivers of human behaviour, especially of individual households and of a government and subsequently what can be done to restore the balance. My conclusion based on the data provided in this paper is that individual households are the key decision makers in an economy, rather than companies or the government. However collectively, individual households can make mistakes about their collective borrowing levels. The

two most important borrowing exposures are: mortgage debt and government debt levels. For individual households in the countries in the Euro zone, these are not cross-border exposures but purely domestic debt servicing obligations. The most serious mistake is to over estimate the ability to take on debt faster than the income growth of individual households. Therefore economies need a sensible national home mortgage portfolio management system, which avoids lending excesses. The first requirement for all three countries is to put one entity in overall control. As it involves lending, the most likely candidate would be the national central banks. The second requirement is not to punish the individual borrowers (and the rest of the economy) by raising their costs of funds through an interest rate increase but by penalising the lenders' and intermediaries' profit levels. In the Netherlands the DNB could not raise interest rates anyway as the ECB takes the interest rate decisions on the Euro. Home mortgages and government debt levels are the most domestic of all financial products as they are nearly totally restricted to citizens of the country concerned. Therefore the DNB, the Bank of England and the Federal Reserve could be given the powers to install a traffic light system for managing the national home mortgage portfolio: green for continue what banks and intermediaries are doing on the home mortgage front; amber for slow down and finally red for an imposition of a fines system for those institutions exceeding the speed limit. By increasing the costs of lending at the point of origin, it will affect the availability level of mortgages without seriously affecting the price.

The second element of managing an economy is managing the government debt portfolio. Both the Federal Reserve and the Bank of England have been influencing the price of fixed rate bonds by buying up substantial quantities of outstanding government debt and especially in the Fed's case other bonds as well. The Bank of England has bought up £ 375 billion of mainly fixed rate bonds and the Fed about \$2 trillion of various bonds, but mainly fixed rate government bonds. Again the way back is not to punish those who still hold fixed rate bonds, but to temporarily increase the level of index linked bonds in the new issues. Another option is to swap the fixed rate bonds in the central bank's coffers and replace them by index linked bonds. The latter bonds could be gradually sold back to the financial markets.

Finally the third main question of managing an economy is to wonder how the adjustment period could be speeded up. In a number of previous papers I have suggested to start "economic easing" for a short period of time; a period of one to two years. In the above the rapid growth in pension fund reserves was mentioned. Such pension savings represent the savings of individual households for future consumption. Individual households have no longer a say over when to use such savings. However the effectiveness of these savings is closely related to the performance - the economic growth rates- of an economy. Share prices, bond yields, commodity prices and for whole economies the exchange rates depend on the success to create full employment and stable long term economic growth rates. What pension funds are currently unable to do collectively is to speed up income transfers on a temporary basis when collectively individual households have over estimated their long term borrowing capacity. Rather than waiting for an adjustment period to sort itself out and see simultaneously government debt increase rapidly, it makes sense to shorten the adjustment period drastically. The main limitation is that individual households cannot do it on their own as they no longer have control over their own main savings instrument: the pension savings. It is however in everyone's interest that the reductions in demand as a consequence of this over borrowing process are neutralised. This can be done by giving all pension savers a short term cash injection out of their own pension pots. The amounts needed are relatively small as compared to the total size of the accumulated pension savings. For the Netherlands it would be about 2/3 of 1%, for the U.K. about 7/8 of 1% and for the U.S. about 1%. Such cash injections can be spread out over four quarterly instalments and can be equally distributed over the young and old pension savers. The young will have to save for the longest periods and run the highest investment risks. If all receivers of such

funds are encouraged to spend these funds not on reducing debt but on spending on goods and services, than companies will start employing new staff and investing more. If companies have the certainty that such cash injections will be repeated till countries have reduced their unemployment levels to pre-crisis levels, then the company sector will start planning long term expansions. The pension funds will experience an improvement in their exposure to the company sector as profits will increase. Individual households will not see their debt levels increase and a government benefits from the higher level of economic activity through increased tax income and reduced social security payments. This leaves the question what do pension funds get out of it. They firstly benefit from the economic upturn through company profits and share prices, including those of banks who see their doubtful debtors level reduced. Secondly to have a chance to a future pay-out, many more individuals will likely join pension funds as only those in the schemes will benefit. Thirdly there is the uncertainty whether economic easing will fully repay itself, in other words whether pension funds will not be worth off after the cash outlay. The governments of the three countries concerned could provide a top up guarantee in case, say after 3 years, the original amount plus the reward based on the return of index linked bonds has not been fully recuperated.

Economic easing will turn out to work much faster and cheaper than executing an infrastructure plan. For infrastructure, which is really needed, the plans and their execution should always take place irrespective of the state of the economy. However the planning stages and subsequent implementation often takes many years which make such plans not very suitable for relatively short term economic interventions. A reality check for these plans will show that governments (i.e. the taxpayers) will need to borrow substantial amounts to implement such plans. This adds more debt to the already overburdened individual households.

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