

**War on Savings – Modern Monetary  
Policy Deficiencies Exposed.  
International Edition**

**Sarel Oberholster**  
10 December 2008

# Table of Contents

<b>1</b>	<b>Introduction</b> .....	<b>5</b>
1.1	Truths of Finite .....	6
<b>2</b>	<b>Evolving problems of Modern Monetary Policy</b> .....	<b>6</b>
<b>3</b>	<b>Monetary Policy and Credit in Macroeconomic Theory</b> .....	<b>9</b>
3.1	Definitions .....	9
3.1.1	Legal form and economic substance of a Central Bank .....	9
3.1.2	Monetary Base and Credit availability .....	10
3.1.3	Deflation and Inflation .....	11
3.1.4	The Price of Money .....	11
3.1.5	Savings .....	11
3.1.6	Systemic Banking Failure .....	11
3.2	The Keynesian Cross as prelude to the Hicks-Hansen IS-LM model and the Neoclassical Macroeconomic Model .....	12
3.3	The Savings (S) curve .....	13
3.4	Monetary Policy incorporated into Macroeconomics .....	14
<b>4</b>	<b>Credit (Debt) Theory</b> .....	<b>16</b>
4.1	Unfunded Monetary Credit .....	16
4.2	Time value of Credit .....	20
4.3	Supply and Demand for Credit without monetary intervention .....	22
4.4	Supply and Demand for Credit with a monetary intervention .....	22
4.5	Consumer and Asset Inflation – The effect of Unfunded Monetary Credit on Prices .....	25
4.6	The compounding effect of Unfunded Monetary Credit .....	30
4.7	Debt Saturation .....	34
4.8	Debt Formation Failure .....	36
4.9	The economy frozen in Stasis .....	40
<b>5</b>	<b>The expansive power of Unfunded Monetary Credit stimulation on Mortgage Debt Formation – a case study.</b> .....	<b>44</b>
<b>6</b>	<b>Conclusions</b> .....	<b>49</b>

<b>Bibliography of Research:</b> .....	51
<b>Annexure 1 - Copy of Monetary Stimulation Compounding Model.</b> .....	58
<b>Annexure 2 - Copy of Monetary Stimulation GDP Discounting Model with clearing.</b> .....	62
<b>Annexure 3 - Copy of Monetary Stimulation GDP Discounting Model with crash testing.</b> .....	67

## List of Exhibits

Exhibit 1: Sterilisation of money creation. ....	16
Exhibit 2: The Debt Channel for money creation.....	17
Exhibit 3: The Central Government Channel for money creation.....	20
Exhibit 4: Shows a base case of a GDP growing at a constant rate .....	30
Exhibit 5: A constant Monetary Stimulation of 4% of GDP is added to the Base Case .....	31
Exhibit 6: Cyclical monetary interventions.....	32
Exhibit 7: Targeted cyclical monetary interventions – crash scenarios .....	33
Exhibit 8 Effect of Monetary Stimulations on Mortgage Debt Formation .....	45
Exhibit 9 Relevance of Capital and Interest for Monetary Interventions.....	47
Exhibit 10 The Real Mortgage Rate .....	48

## List of Tables

Table 1: Capital Risk Weightings .....	18
Table 2: Leverage using Risk Weighted Capital .....	18
Table 3 Monetary Stimulation effect of changing Interest Rates for a Constant Repayment .....	44
Table 4 Relevance of Capital & Interest for Monetary Policy .....	46

## List of Figures

Figure 1 Equilibrium in the market for Savings and Debt.....	22
Figure 2 Temporary Monetary Stimulation.....	23
Figure 3 The interest rate effect of a Temporary Monetary Stimulation .....	23
Figure 4 The Monetary Intervention Spiral.....	24
Figure 5 Temporary Monetary Stimulation increases Aggregate Demand (Savings/Debt Market) .....	25
Figure 6 Temporary Monetary Stimulation increases Aggregate Demand (Macroeconomic Yd & Yi) .....	26
Figure 7 Removal of a Temporary Monetary Stimulation decreases Aggregate Demand (Macroeconomic Yd & Yi).....	28
Figure 8 Interest Rate implications of a removal of a Temporary Monetary Stimulation .....	29
Figure 9 Debt Saturation and the Debt (Sd) Curve .....	35
Figure 10 Compounded Monetary Interventions into the Zero Bound.....	36
Figure 11 Effects of compounded Monetary Interventions into the Zero Bound on the Macroeconomic environment.....	38
Figure 12 Economic collapse into Stasis (Savings/Debt Market).....	40
Figure 13 Economic collapse into Stasis (Macroeconomic Yd & Yi).....	42

# War on Savings – Modern Monetary Policy Deficiencies Exposed.

*“The great inflations of our age are not acts of God. They are man-made or, to say it bluntly, government-made. They are the offshoots of doctrines that ascribe to governments the magic power of creating wealth out of nothing and of making people happy by raising the “national income”.”*

Foreword by Murray N. Rothbard to The Theory of Money and Credit - **Mises, Ludwig von** (1881-1973).

## 1 Introduction

The war upon Savings is an ancient one. Even the alchemic desire of turning lead to gold was part of this war. Saving is a sacrifice. Savings can be stolen, plundered, but most of all, used to protect against the ravishes of fate. Savings and the vessels of Savings have been lusted after since the production of the very first economic surplus. The inventions of deceit to dispossess Savings have no match in any other human endeavour. Wars were fought with it and over it. Everybody wanted some but not all were prepared to gather it the hard way.

Japan was the focus of my research when I set out on this journey of discovery. The Japanese economic miracle turning into a disaster of systemic failure needed to be understood. The reason for the research became more compelling with the advent of the global financial crisis in 2007.

The Austrian School of economic thought was going to be important for my research but a rigorous drive into economic theorising took me to the heart of Austrian economics. My research will show that economic management in the invisible hands of the market is in much better hands than the hands of monetary interventionists. The destructive nature of monetary interventionism will be placed on display. Growth with monetary intervention and without will be tested with scenario analysis to find the better option, but first some ground rules on infinity.

Often in dealing with Macroeconomics we postulate variables into infinity. I wish to avoid this tendency for it leads to logical errors and will introduce “finite” as a structural framework. Also, the concept of “households” in macroeconomic theory institutionalises humans and tends to disguise the fact that our life spans are finite. The individual will be my decision making economic participant as part of a macroeconomic assessment.

## **1.1 Truths of Finite**

- 1.1.1 The economy exists for and by the grace of humanity.
- 1.1.2 The total value of an individual's income over his/her life span will be finite.
- 1.1.3 The realised value of an individual's past, present and future income will be that finite income.
- 1.1.4 The total value of an individual's consumption over his/her life span will be finite.
- 1.1.5 The value of an individual's Savings or Deficit is finite as the sum of the value of income less the sum of the value of consumption.
- 1.1.6 A human who owned Savings will leave a surplus in the economy.
- 1.1.7 A human who consumed more than his finite income will leave a deficit in the economy.
- 1.1.8 A growing economy will be one in which economic surpluses accumulate faster than economic deficits
- 1.1.9 A declining economy is one in which economic deficits accumulate faster than the economic surpluses.
- 1.1.10 The economy for any given period will be finite as the sum of economic production for that period.
- 1.1.11 A human may store past and present income for consumption in the future. Stored past and present income is Savings.
- 1.1.12 A human may exchange future income for consumption today. Discounted future income is debt.
- 1.1.13 The economy uses the institutions of inheritance, gifts, debt default and tax as a legitimate means of transferring Income, Savings or Deficits from one person to another.
- 1.1.14 A Market Equilibrium at any given point in time is not absolute but a behavioural tendency to balance a supply with a demand in a way that will cause the least economic structural stress.

## **2 Evolving problems of Modern Monetary Policy**

I have researched the working papers and utterances of serving Central Bankers of the Federal Reserve, the Central Bank of the United States of America (the FED) and of the Bank of Japan (BOJ) as being the leading representatives of Modern Monetary Policy. The pre- and post-bubble experiences of Japan in the implementation of a macroeconomic monetary policy stance was a prelude to the globalised credit turmoil which commenced with growing sub-prime mortgage concerns in the second half of 2007.

The first mortgage lender in this era to experience an age old run-on-the-bank was Northern Rock in the UK on 14 September 2007. Fourteen months later and the world economy is in the grips of a full blown financial crisis.

The Japanese crisis is normally timed at 29 December 1989 when the Nikkei had peaked. The first “run” on a significant financial institution was only in late July 1995 on Cosmo Credit Corporation with Japanese authorities providing a bailout on 2 August 1995.

I will use 14 September 2007 as the advent of the global economic crisis and 29 December 1989 as the advent of the Japanese financial crisis. The common denominator is the collapse of an inflated asset class. It is appropriate to identify common difficulties experienced by Central Bankers in the application of Modern Monetary Policy during the Japanese financial crisis and the global financial crises of 2007.

Understanding what went wrong and how things went wrong is the first step in finding informed solutions. Panic stricken ad hoc monetary and fiscal interventions based on dated Keynesian theory can certainly not be deemed a solution to unidentified problems.

A diagnostic list of monetary policy difficulties has been extracted from a large number of working papers, studies and speeches (see **Bibliography of Research**). I will formulate a Credit Theory to assess each of these problems.

The problems experienced by Modern Monetary Authorities are summarized hereunder:

- 2.1 Economic stagnation and economic indifference to monetary stimulation:** A general frustration when aggressive monetary interventions fail to generate an inflationary effect.
- 2.2 Disappearing Wealth Effects:** Previously celebrated wealth effects of asset inflations turned out to be less permanent than expected. This was further complicated by an expectation that the asset prices would soon recover and thereby eliminate the crisis. It did not happen.
- 2.3 Zero bound interest rates:** Experimental theories with regard to zero or near zero interest rates such as quantitative easing did not achieve the desired monetary stimulation outcomes.
- 2.4 Non Performing Loans:** Non Performing Loans became a persistent long term structural problem against an unrealised expectation of early recovery of collateral values.
- 2.5 Asset deflations:** Asset deflations persisted and all attempts to reflate asset classes failed. Central Bankers insist that they have an absolute power to inflate and the unresponsiveness of asset classes to their policies is perplexing to them.

- 2.6 Declining economic activity:** Economic activity declined generally and all monetary and even extensive fiscal stimulation could not generate growth at the potential GDP level.
- 2.7 Credit spending resistance:** Credit utilisation stagnated and monetary stimulations aimed at reviving credit spending failed.
- 2.8 “Losses” from unrealisable output gaps:** Failure to close the output gap is (incorrectly) described as a permanent loss to the economy.
- 2.9 Forbearance Lending:** This practice of banks to lend additional money to debtors with the objective of avoiding debtor default perpetuated stagnation by absorbing significant banking resources and bailout funding.
- 2.10 Insufficient Deposit Insurance reserves:** Deposit Insurance reserves were insufficient to protect depositors and required Central Bank and Central Government support to fulfil its objectives.
- 2.11 Balance Sheet Restoration:** Leverage combined with asset deflation caused excessive gearing and insufficient capital for households and enterprises alike. Income was and is directed at restoring distressed gearing ratios rather than being used for consumption or investment. I will show how perverse these attempts to substitute monetary stimulation for savings are.
- 2.12 Liquidity Trap:** Liquidity Trap theory has been revived. Monetary policy proposals and experimentation based on Liquidity Trap theory proved as inefficient as other Modern Monetary policy experiments.
- 2.13 Lack of Confidence:** A general lack of confidence is blamed for the failures of monetary interventions.
- 2.14 Banking Bankruptcies:** Undercapitalised banks are in need of recapitalisation to restore their ability to lend and to avoid bankruptcy. Recapitalisation of Private Banks became a structural ongoing problem due to the Capital Risk Weighting mechanism for debt formation inherent to the Basle Accords.
- 2.15 Moral Hazard:** Moral hazards of bailouts and interventions must be tolerated for the greater good.
- 2.16 Government Supported Entities (GSE's):** GSE's could not continue to function and implicit Central Government guarantees quickly became explicit Government guarantees.

This list will form the basis for discussions on monetary policy in a macroeconomic context. I will also evaluate why these problems surfaced and how to avoid them rather than to petrify them. It is more productive to move

on to positive alternatives than to dwell in the cul-de-sac of applied Modern Monetary Policy.

### **3 Monetary Policy and Credit in Macroeconomic Theory**

#### **3.1 Definitions**

##### **3.1.1 Legal form and economic substance of a Central Bank**

The relationship between Central Government and the Central Bank is important when working with macroeconomics. The legal independence of the Central Banks from Central Government is a contradiction of the economic interdependence of these two institutions. Consider the absolute reliance of Central Government on the Central Bank for managing all aspects of Government Debt financing. Consider the committed drive of Modern Monetary Policy towards monetary stimulation aimed at achieving long term objectives agreed with Central Government.

Ask for instance these questions:

- Who does the Central Bank ultimately report to?
- Who controls the appointment of the significant decision making officials of the Central Bank and what influence or control has Central Government over such decisions and individuals?
- Are the objectives of the Central Government and Central Bank mostly aligned or mostly independent?
- Who dictated the legal creation of the Central Bank and who maintains absolute control over that legal environment?
- What would the balance sheet of the Central Bank (FED) look like without Central Government Bonds and securities?
- Can a Central Bank perform any of its functions without an implicit guarantee of the Central Government to give it “standing”? The implicit guarantee becomes even more relevant when the Central Bank exchanges Central Government Debt on its balance sheet for private debt of dubious quality. The more risk taken on by the Central Bank the greater the reliance on the implicit Central Government guarantee.
- What are the nature and the power of the Central Bank’s banknote and money creation monopoly? Who grants and maintains this power for its wielding?
- Who is the owner of the residual economic income? It is a specific accounting rule that an orphan entity or Special Purpose Entity must be consolidated with a Principal as if a wholly owned subsidiary of that Principal in the event that the economic benefit is transferred to that Principal. The international standard arrangement is that the residual profits of the Central Bank belong to Central Government. It follows that the Central Bank

and Central Government Financial statements should be consolidated according to GAAP principles.

- Is the FED website at <http://www.federalreserve.gov/> a Freudian slip, an oversight, a convenience or perhaps more telling an accidental true reflection of the actual reality (with a .gov site reference)?

The argument of substance over form, an accounting concept, has limited legal standing but in macroeconomic analysis would better describe the symbiotic relationship between the Central Bank and Central Government. It remains a complication as the legal status has definite implications. Their overall economic behaviour is more in line with a relationship where the Central Bank is an extension of Central Government with Central Government exercising “management control” over the Central Bank irrespective of the legal form.

I will concentrate on the economic substance of a Central Bank as an extension of Central Government rather than the legal form of independence. Nobody who has observed the interplay between Central Governments and Central Banks over the past fourteen months could claim an economic independence of the Central Bank other than for political convenience and operational freedom from voter control.

### **3.1.2 Monetary Base and Credit availability**

The innovation of payment systems via electronic means have not been incorporated into monetary theory or the monetary base. The extensive use of credit limits and ready access to credit has no standing in monetary base calculations. For example, the banking products of credit access to revolving credit mortgage bonds have an available debt component which functions as near money for payment purposes. The result is that the monetary base actually fluctuated significantly more than the recorded numbers show. We have no data to make adjustments, not even proxy data and will have to rely on observation and interpretation. Contemplate adding to the monetary base all available but not yet utilised credit limits on all debt products where access to that credit is instantaneous or near instantaneous (such as an internet banking transfer from a credit available mortgage account into a current account). The payment systems of the globalised world today involve an exchange of account balances across banks and across currencies. More important the balances available for exchange compute as the sum of all credit balances and available debt.

This is of particular importance in assessing the monetary base growth during the pre-bubble years as compared to the post-bubble period. It is entirely logical to expect that the post-bubble shrinkage in available credit balances (money in accounts) have not been nearly as sensitive

to the change as the level of available credit (readily accessible debt) which was available to effect payments. We need to keep in mind that the invisibility of the debt amount available for payment before the advent of the financial crises and the debt amount available for payment after the advent of the financial crises may in fact have disguised a negative monetary base growth significantly more than the unprecedented monetary and fiscal stimulations since the advent of the financial crisis.

The increase and decrease in readily available debt for payment is an unrecorded volatile monetary base.

### **3.1.3 Deflation and Inflation**

Deflation and Inflation will be used with the implied monetary phenomenon definition and not the general price level definition.

### **3.1.4 The Price of Money**

The price of money as expressed in interest rates shall refer to the interest rate as the price paid for the use of money over time. It therefore follows logically that the price for one month money will differ from the price for one year money. It is consistent with the existence of a yield curve in the economy.

### **3.1.5 Savings**

Savings originates from not spending income and is spending deferred to the future. The income in turn originates as an un-coerced payment for the production of goods and services for the economy. Any type or form of increase in the monetary base originating from applied Monetary Policy can never be regarded as Savings. This definition will not tolerate the description of unlimited monetary stimulation as a "Savings Glut".

### **3.1.6 Systemic Banking Failure**

Systemic Banking Failure would refer to a macroeconomic event on a national or international scale where the banking sector fails as viable businesses and as such pose a risk to the economy's ability to settle transactions through money or credit in the present or on term. Thus the failure in the banking sector migrates to the whole system, laterally among banks and vertically to debtors and creditors of the banking sector.

### 3.2 The Keynesian Cross as prelude to the Hicks-Hansen IS-LM model and the Neoclassical Macroeconomic Model

Working towards a supply and demand curve for Savings requires a small detour into macroeconomic accounting. The Keynesian cross is often used for this purpose. Its use, however, is very relevant to modern applied monetary policy in the context of the derivative Hicks-Hansen IS-LM model. The Keynesian Cross is used to derive an equation stating that  $I=S$ , i.e. Investments equals Savings. The Neoclassical Macroeconomic model similarly depends on the precondition of  $I=S$ .

There is a major discrepancy here. The expansion of the monetary base through debt formation is not accounted for and must be corrected. First we need to take a new look at the Keynesian Cross.

(i) Total income in the economy ( $Y_i$ ) = Income used for Consumption (C) + Income used for Savings (S) + Income used for Taxes (T). In short:

$$Y_i = C + S + T$$

(ii) Total spending (or demand) in the economy ( $Y_d$ ) = Spending by the private sector (C) + Spending on Investment (I) + Spending by Government (G) + Exports (X) – Imports (Z). In short:

$$Y_d = C + I + G + X - Z$$

(iii) Total Spending will equal total demand provided that Government does not use a deficit. Thus:

$$Y_i = Y_d$$

**Here is the first logical error. The qualification of a Government deficit is incorrect. In fact it is not even a necessary precondition for  $Y_i = Y_d$ . The qualification of a Government Deficit is a special condition to force  $T = G$  and  $C_d$  (Consumption as part of  $Y_d$ ) =  $C_i$  (Consumption as part of  $Y_i$ ), which in turn would force  $I = S$ .  $Y_i$  and  $Y_d$  will be equal irrespective of Government Deficits or Surpluses provided that the use of debt does not exceed the available Savings (S).**

We can now proceed to the Keynesian Cross by substituting the components for the Y equations:

$$C + I + G = C + S + T + (X - Z)$$

Users of this model would proceed from this point to propose that  $C = C$ , and  $T = G$  which would lead to a conclusion that  $I = S$ . Remove the limitation of a balanced Central Government budget and it is no longer possible to proceed to the  $I = S$  conclusion. Government can borrow

Savings and run a deficit without disturbing the equation. Savings can equally be borrowed for Private Consumption (C) or Investment (I) purposes.

It now becomes problematic to proceed to the Hicks-Hansen IS-LM model which requires the  $I = S$  precondition, much in the way computer programmers describe such a process. Garbage in ► Garbage out. The Liquidity Trap theory which relies on the Hicks-Hansen IS-LM model is even further removed. These theories become irrelevant without the ability to force I to be equal to S.

### 3.3 The Savings (S) curve

Debt is the direct opposite of Savings. Savings is not the mirror image of Investment. The effect of Savings is to sacrifice spending of earned income in exchange for spending in the future. The effect of debt is to use Savings in the present in exchange for rent (interest) until such Savings is returned to the Saver. The process is neutral to the economy unless a Saver is unable to find a willing or able Borrower, which is untenable in the absence of monetary stimulation via Unfunded Monetary Credits. To call Savings “hoarding” and negative for the economy is a fallacy.

The borrower discounts his future income for the use of Savings in the present. Default by the Borrower will transfer ownership of the Savings from the Saver to the Borrower. Default is an institutionalised confiscatory tax on Savings between Savers and Borrowers and often encouraged by Central Government with special legislation to protect Borrowers. I will work on the premise that Savers must and will be repaid. Banks are the intermediaries between Savers and Borrowers.

Savings is a scarce resource, true to economic definition. The signals of interest rates will balance the needs of Savers and Borrowers if allowed to function under normal market price discovery conditions. The interest rate yield curve will prevent a bundling of available Savings at any one point in time. Interest rates will allocate Savings to the highest bidder. A debt market will not cause debt or asset bubbles when interest rates are established free from intervention.

The use of Savings is not restricted to Investment. All of the defined entities of the Income demand ( $Y_d$ ) side of the Keynesian Cross will compete for the use of the Savings. Therefore Savings Demand (demand for debt) will be equal to the sum of the demand from each as follows:

Savings Demand ( $S_d$ ) = Private Consumption demand for Savings ( $C_s$ ) + Investment demand for Savings ( $I_s$ ) + Government Demand for Savings ( $G_s$ ). In short:

$$(iv) S_d = C_s + I_s + G_s$$

The Savings Demand (Sd) curve will be downward sloping due to marginal utility of interest cost for each unit of additional Savings demanded. Savings Demand is finite at the point where the market can no longer supply a willing and able borrower from the Private Sector and where one more unit of borrowing from the Central Government will cause a taxpayer rebellion. I will expand on this concept in the discussion on Debt Saturation.

### 3.4 Monetary Policy incorporated into Macroeconomics

The next step is to bring the Central Bank into the macroeconomic model. The Central bank has only **one unique economic power**, that of money creation. The Target Interest Rate is a derivative of this money creation power. The power of money creation can be employed as a temporary monetary stimulation or as a permanent monetary stimulation. The Central Bank will use the power of money creation to alter the equilibrium state of interest rates.

A **permanent monetary stimulation** is a confiscatory power in the form of an inflation tax. This tax can be added to the  $Y_i$  equation as  $T_m$  and the Central Government Tax can be renamed as  $T_g$  for ease of reference.

International Savings Flows ( $S_i$ ) can be added.  $S_i$  may be positive or negative. The National Savings will be  $S_n$

$$(v) Y_i = C + (S_n + S_i) + (T_g + T_m) + (X - Z)$$

This is a conclusion of significance as it is clear that a permanent monetary stimulation is in fact no stimulation at all but a transfer of income away from  $C$  and  $S$  towards taxation. Calling a permanent monetary stimulation, a “monetary stimulation,” is off course an oxymoron.

A **temporary monetary stimulation** ( $M$ ) must have a finite term. I would argue that an extended term would by default become a permanent monetary stimulation. It follows that the stimulation would enter the economy in one term ( $t_1$ ) and exit the economy in another term ( $t_2$ ).

Monetary stimulations may flow freely as a portion of ( $M$ ) allocated internationally where the best risk-return conditions prevail. We can now add it to the macroeconomic model.

$$(vi) C + I + G + Mt_1 = C + (S_n + S_i) + (T_g + T_m) + Mt_2 + (X - Z) \text{ which can be rewritten as}$$

$$(vii) C + I + G + (Mt_1 - Mt_2) = C + (S_n + S_i) + (T_g + T_m) + (X - Z)$$

The presence of the Central Bank in the macroeconomic model gives rise to the following conclusions:

- Temporary monetary stimulation introduces cyclicity to the macroeconomic model. (Before t1, during t1-t2, and after t2).
- Monetary stimulation of aggregate demand (Yd) as Mt1 is discounted future income (Yi) on a macroeconomic scale not supported by Savings.
- Central Bank monetary stimulation will cause disequilibrium for the period t1 to t2. Repayment of Mt2 will restore equilibrium.
- The Central Bank will not pay rent on discounting future income in this manner. It is an interest free loan from future income (Yi).
- This equation does not deal with rent for the discounting action and as such it cannot be interpreted that no rent will become payable by anybody just because we know that the Central Bank can escape paying the rent. I will show later that borrowers will pay the rent in higher interest rates upon the removal of the monetary stimulation.
- The value of Mt1 will express itself as some combination of additional Private Consumption (C), additional Investment (I) or additional Government Consumption (G).
- Savings can be imported (for example current account deficit countries) or exported (for example current account surplus countries).
- Note that Savings flows and monetary stimulation flows will remain separated even in the event of international flows.
- Monetary stimulation may be exported as a stimulation in another country (for example the “Carry Trades”) via the Debt Channel.
- Mt1 and Mt2 will include international flows of monetary stimulation and when used to analyse National Accounts will be as follows:  
Mt = (Monetary Stimulation Nationally (Msn) + Monetary Stimulation Internationally (Msi)); where Msi may be positive or negative.
- The international flows of monetary stimulation will equal zero when consolidated for a Global analysis.
- The impact of international monetary stimulations on a national economy will be a function of the access which such a national economy has to international debt via the Debt Channel.
- Note that monetary policy in leading international economies could have dramatic consequences on follower economies. Monetary stimulation effects can be exacerbated in such smaller economies at Mt1 and at Mt2.
- Depressionary Deflations and Hyperinflationary events will become a greater risk in follower economies. See section 4.9.
- Sovereign debt defaults will have the same effect as private national defaults on monetary stimulated debt formation.
- Resolving international debt defaults are more complex than resolving national defaults and would require the use of the UNCITRAL Model Law on Cross-Border Insolvency. The Debtor nation will nevertheless always have the power to use default and permanently transfer Savings from the lending nation to itself. Sovereign Defaults or defaults across international borders have great disruptive potential for a global economy suffering from debt

distress. (For more information see the website of UNCITRAL at [www.uncitral.org](http://www.uncitral.org))

- Debt standstill arrangements on a Sovereign level would be similar to forced Forbearance Lending.

The “Central Bank” (vii) equation can now be used to develop Credit Theory.

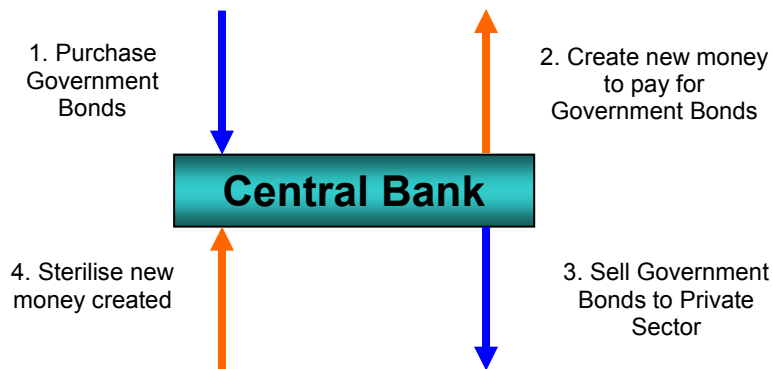
## 4 Credit (Debt) Theory

### 4.1 Unfunded Monetary Credit

How does the monetary stimulation enter the economy? We know it is not part of Savings. There are two channels, the Debt Channel and the Central Government Channel. The money created by the Central Bank for distribution via these two channels involves no implicit or explicit sacrifice of production to fund its creation and is therefore defined as Unfunded Monetary Credit. I will discuss both channels and a base case.

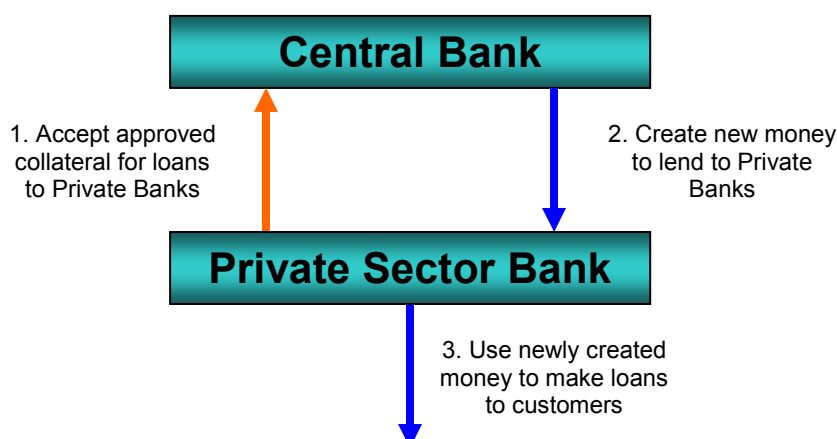
The first step is to take a closer look at the Central Bank in action.

#### Exhibit 1: Sterilisation of money creation.



The process is numbered clockwise from 1 to 4. 1) The Central Government issues a Government Bond and sells it to the Central Bank. 2) The Central Bank does not actually have money to pay for the bond and will simply credit the Central Government’s account with the amount due for the Government Bonds. 3) The Central bank then sells the Government Bonds to the private sector. 4) The Central Bank receives actual payment for the Government Bonds and uses the money to eliminate the money created under 2. The monetary action has been sterilised.

## Exhibit 2: The Debt Channel for money creation.



The Central Bank does not have money to lend to Private Sector Banks. Yet, the Central Bank lends money to Private Banks all the time. The overriding requirement is that the Private Banks must have approved collateral to pledge for such loans from the Central Bank. The process is usually structured as a repurchase agreement with specific legal and accounting implications but the economic effect is as shown in Exhibit 2.

This is how monetary stimulation enters the economy via the Debt Channel. 1) Private Banks offer security for loans from the Central Bank. 2) The Central Bank creates new money to lend to Private Banks against the collateral offered. 3) Private Banks can now distribute the newly created money as loans into the economy.

Clearly this new money did not originate from Savings and clearly this new money cannot be called Savings. The Central Bank can provide any quantity of this newly created money to banks up to the quantity of collateral that the banks can offer to the Central Bank. The Central Bank makes the rules about the quality of asset which they will accept from the Private Banks. Reserving no longer has any significant impact on this process.

All Central Banks are subscribers to the Basle II Accord. The ability of banks to leverage their balance sheets is controlled via Capital rules. Fractional reserving is no longer in use and will give incorrect results when applied in macroeconomic analysis and monetary policy analysis. Anybody with an interest in economics or markets should familiarise themselves with the Basle II Accord at the website of the Bank for International Settlements at <http://www.bis.org/>.

I provide Table 2 as a sample of the ability of Private Banks to leverage their capital. There are very specific rules for qualifying capital but Unimpaired Shareholders Equity would normally make up 50% of

qualifying Capital (tier 1) while forms of long term debt or debt-equity hybrid instruments can be used as the remainder (tiers 2 and 3).

The leverage in Table 2 is calculated as if a Private Bank holds 100% of its loans (loans are assets for banks) in a given class of asset.

The first principle is that all loans must be “backed” by a minimum Capital Risk Weighting which is set at 8% in the Basle I Accord. The minimum tier 1 Capital Risk Weighting requirement is set at 4% in Basle II. I will apply the 4% benchmark in Table 2 as I am interested in shareholders equity and not in hybrids or debt. Note that the “backing” is an indexing method and not an actual cash method, i.e. a Bank can leverage for as long as its Balance Sheet shows that it has qualifying capital. A relaxation of accounting principles applicable to the composition of Capital could have significant debt formation potential.

The second variable is a loan specific risk weighting allocation based on Credit Ratings of international rating agencies (applicable internationally).

**Table 1: Capital Risk weightings**

<b>Credit Rating</b>	<b>AAA to AA</b>	<b>A+ to A-</b>	<b>BBB+ to BBB</b>	<b>BB+ to B-</b>	<b>Below B-</b>	<b>Unrated</b>
<b>Risk Weighting</b>	0%	20%	50%	100%	150%	100%

Data Source: Bank of International Settlements.

Specific Capital requirements for a \$100,000 loan in the different categories are calculated as follows (example 8% \* 20% = 1.6% tier 1 is 50% of 1.6% at 0.8%. \$100,000 \* 0.8% = \$800. 1 / 0.8% = 125 times):

**Table 2: Leverage using Risk Weighted Capital**

<b>Minimum 8% at risk weighting</b>	0%	1.6%	4%	8%	12%	8%
<b>Tier 1 Equity Capital Requirement</b>	Nil	\$800	\$2000	\$4000	\$6000	\$4000
<b>Leverage of tier 1 Capital (Times)</b>	Unlimited	125 times	50 times	25 times	16.7 times	25 times

There is one other special case which must be mentioned. The risk weighting on residential mortgage debt is set at 35% provided that the value of the real estate is equal to or more than the value of the outstanding loan. Using the same calculation gives a Private Bank an

ability to leverage tier 1 equity capital 71.4 times on mortgage debt. It is a double edged sword when asset inflations reverse.

The three top categories for capital utilisation are AAA to AA, A+ to A- and qualifying Residential Mortgage Debt.

Each Private Bank will have a unique mix of loan asset portfolios which dictates its level of Tier 1 Risk Weighted Capital. Securitisations of asset portfolios will allow a Private Bank to maximise the use of its capital. It's a rolling process. Build up a debt portfolio, securitize and sell it off. The freed-up capital can be used to repeat the process. Residential Mortgage Debt portfolios are ideal for this process.

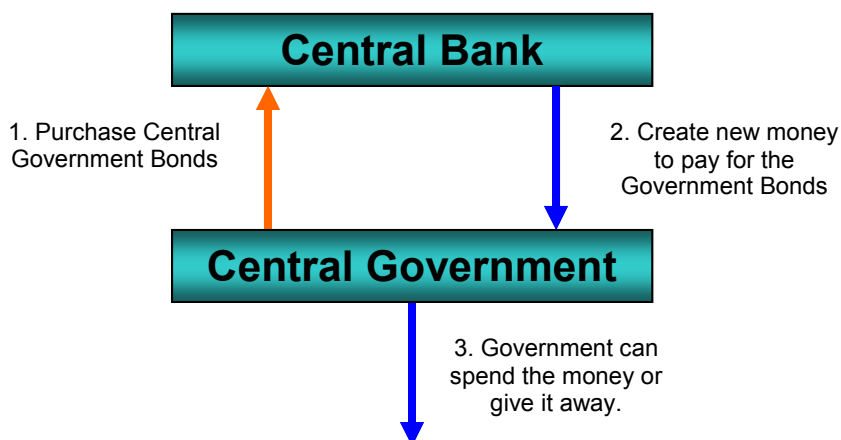
It should be clear at this point that the Debt Channel for distributing the money created by Central Banks is highly efficient and basically capable of distributing unlimited amounts of newly created money. Private Banks need to actively manage their debt portfolios, their capital and their holdings of qualifying collateral for access to Central Bank to maximise their leverage. The process of capital leverage as a debt distribution channel is vastly superior to the old money multiplier theory and fractional banking.

This distribution channel can be expanded beyond Private Banks right into a direct channel between the Central Bank and end users of debt. The outright purchases of Commercial Paper or Private Sector Securities by the Central Bank are an example of such an expansion. It surely gives the illusion of an ability to infinitely expand the monetary base but that is not the case as I shall show later.

The allocation of the newly created funds is controlled indirectly by authorities and more directly by the choices of Private Bankers for lending portfolios. Here the role of capital allocations in terms of the Basle Accords becomes apparent. With unlimited supply of new money, Banks would have a preference for the lowest rated risk weighted assets of equal potential income. The return on capital for a zero rated asset would be infinite and can be leveraged without any drain on capital, i.e. for an unlimited amount. Distribution would naturally flow according to perceived risk, risk weighting and rewards (interest income or capital appreciation) of each asset class but the banking sector as a collective would not be constrained by liquidity concerns in their quest to acquire assets. This is the modern banking way of debt formation.

The additional and alternative distribution channel for Unfunded Monetary Credit is the Central Government Channel.

### Exhibit 3: The Central Government Channel for money creation.



1) This distribution option starts with a purchase of Government Bonds by the Central Bank. 2) The Central Bank has no money to pay for the Government Bonds and creates new money for the purchase. 3) Central Government can do with the money as it pleases. Spending Options for Central Government would be to reduce taxes, fund infrastructure, issue tax rebates, gifts or grants, current expenditure uses, buy financial assets or buy non-financial assets. The important point is Central Government decides the ultimate application.

This application of Unfunded Monetary Credit is an indiscriminate confiscating tax. The reality of employing this distribution channel is the usual absence of a specific enforceable reversal requirement. The temptation inherent to this form of hidden taxation makes it highly probable that use of this channel will be a permanent rather than a temporary monetary stimulation.

The use of the Central Government Channel for money creation always poses an excessive Hyperinflationary risk as it will destroy confidence in the currency.

#### 4.2 Time value of Credit

Saving takes place for a reason, a savings preference. Savers do not have to lend out their savings and will not relinquish their savings in the presence of default risk – this is an absolute precondition. Marginal default risk will be tolerated at a premium to rent (interest and default risk). Other considerations such as a store of value, the time preference and rent (interest) then become important. Risk is also time specific, where a debtor may qualify for a short term loan but not for a long term loan.

Cash preferences have almost no application in the modern world of electronic banking, internet payments and ready access to credit. The dated Keynesian theory of cash preferences simply no longer applies. It follows that the price for use of Savings (Credit) would be a function of marginal credit risk expressed as a premium to rent for the use of the savings, for a specific time preference.

(viii) Savings Supply (Ss) = Savings Preference + Encouragement from interest rates + Encouragement from risk premiums (all risks = Credit Risk + Sovereign Risk + Settlement Risk + Currency Risk).

(ix) Savings Preference in Money (Mp) = Any desire for a Future Consumption (Cf) + Store of value concerns (Ms). Where:  
 $Mp = Cf * (1 + Ms)$ . [Cf is a constant. Ms may be positive or negative and is expressed as a percentage.][For example a 20% loss of confidence on a Cf of \$5000 will give  $Mp = (5000 * (1 + (20/100))) = 4000$ .]

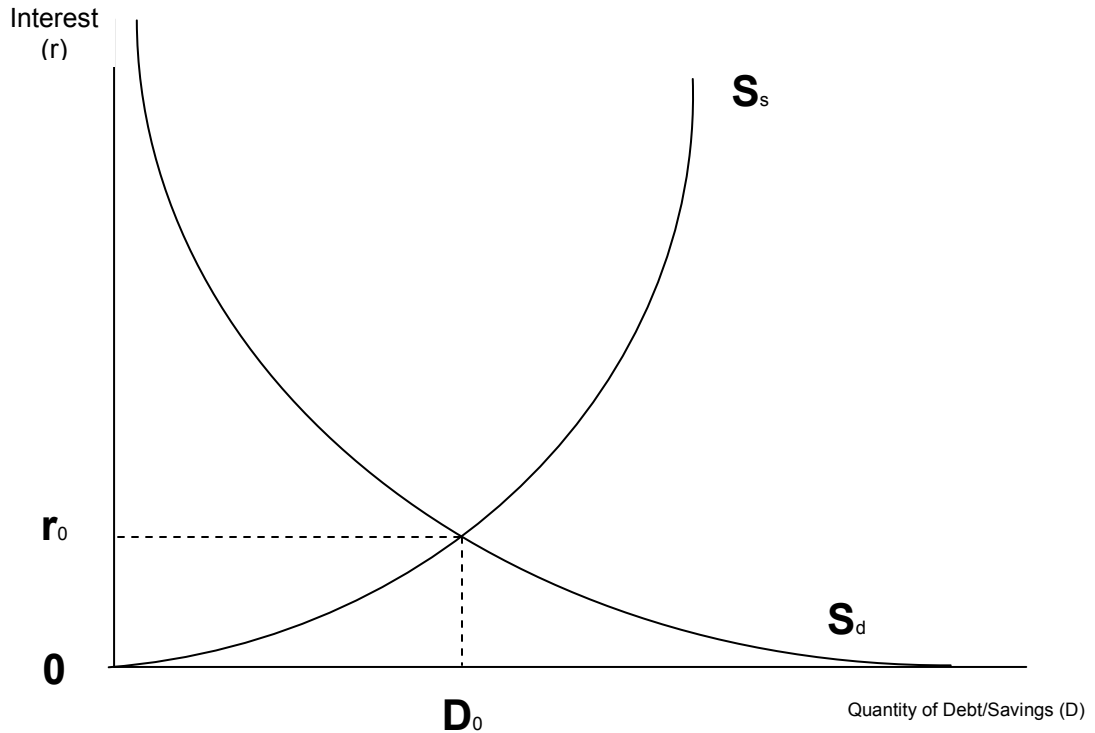
The Savings Preference will be a constant at any specific point in time. Encouragement from interest rates will be upward sloping due to marginal utility of each new unit of Interest Rate Encouragement. Encouragement from risk premiums will also be upward sloping due to marginal utility of each new unit of Risk Premium Encouragement. The sum of interest for rent and risk premium will be the market rate of interest (r).

Savings supply may originate from national or international destinations.

### 4.3 Supply and Demand for Credit without monetary intervention

The Savings Supply curve (**S<sub>s</sub>**) is derived from (viii)[ in section 4.2 and the Savings Demand curve (**S<sub>d</sub>**) from (iv) in section 3.3.

**Figure 1**

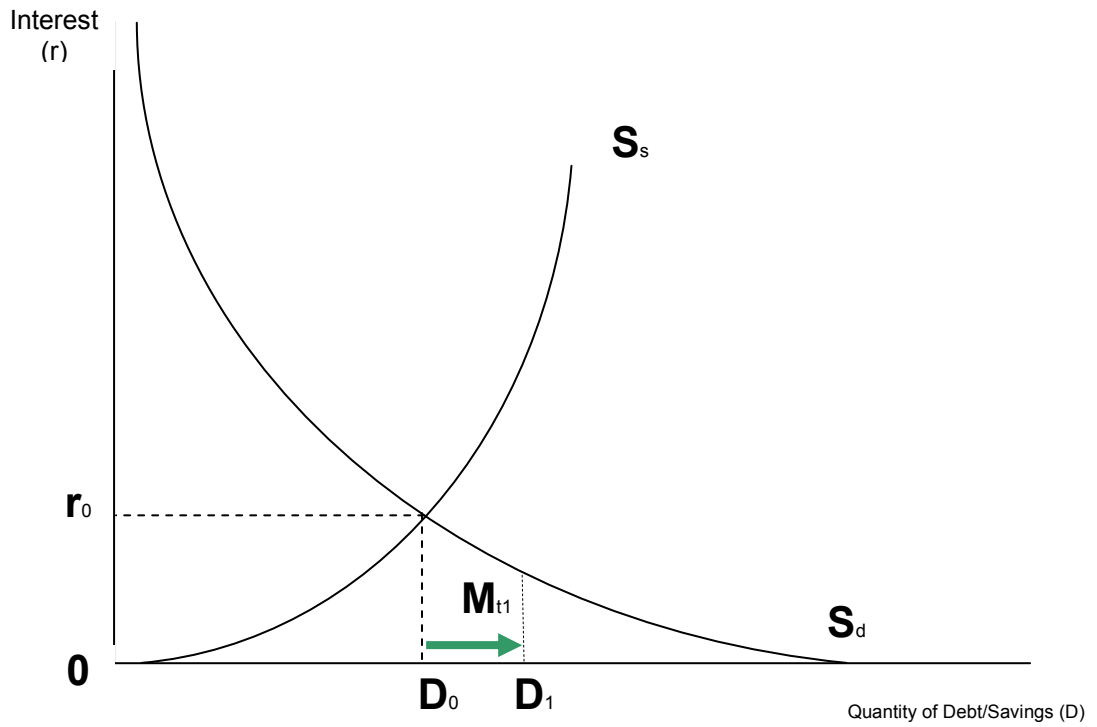


Equilibrium in the market for Savings and Debt is achieved at a market interest rate of  $r_0$  and at a quantity  $D_0$ . Note the fact that the **S<sub>d</sub>** curve does not extend into infinity along the x-axis. The reason is Debt Saturation which I deal with in 4.7.

### 4.4 Supply and Demand for Credit with a monetary intervention

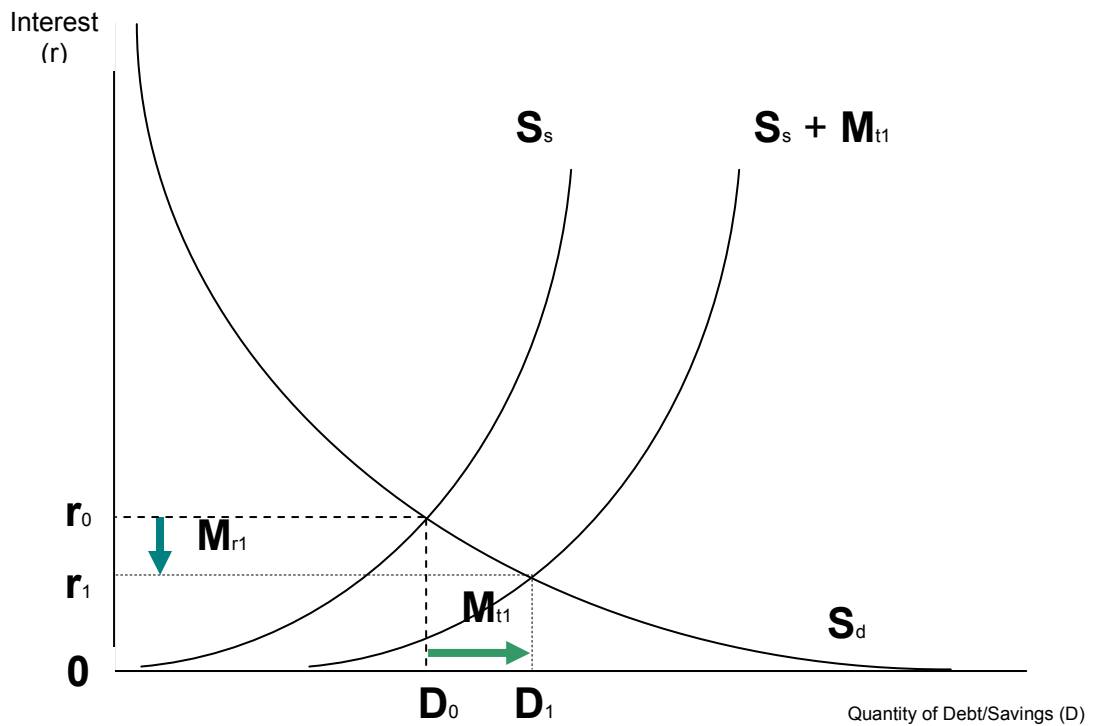
(Fig 2) A Temporary Monetary Stimulation (**Mt1**), will provide an additional supply of funds available for debt via any combinations of the Debt Channel or Central Government Channel for new money creation. Mt1 includes international flows of monetary stimulation,  $Mt1 = Mt1n + Mt1i$ .

**Figure 2**



(Fig 3) A combined  $S_s$  and  $M_{t1}$  curve ( $S_s + M_{t1}$ ) is created for the duration of a Temporary Monetary Stimulation and a new Target Interest Rate of  $r_1$  is established at the new  $D_1$  Quantity of Savings level.

**Figure 3**

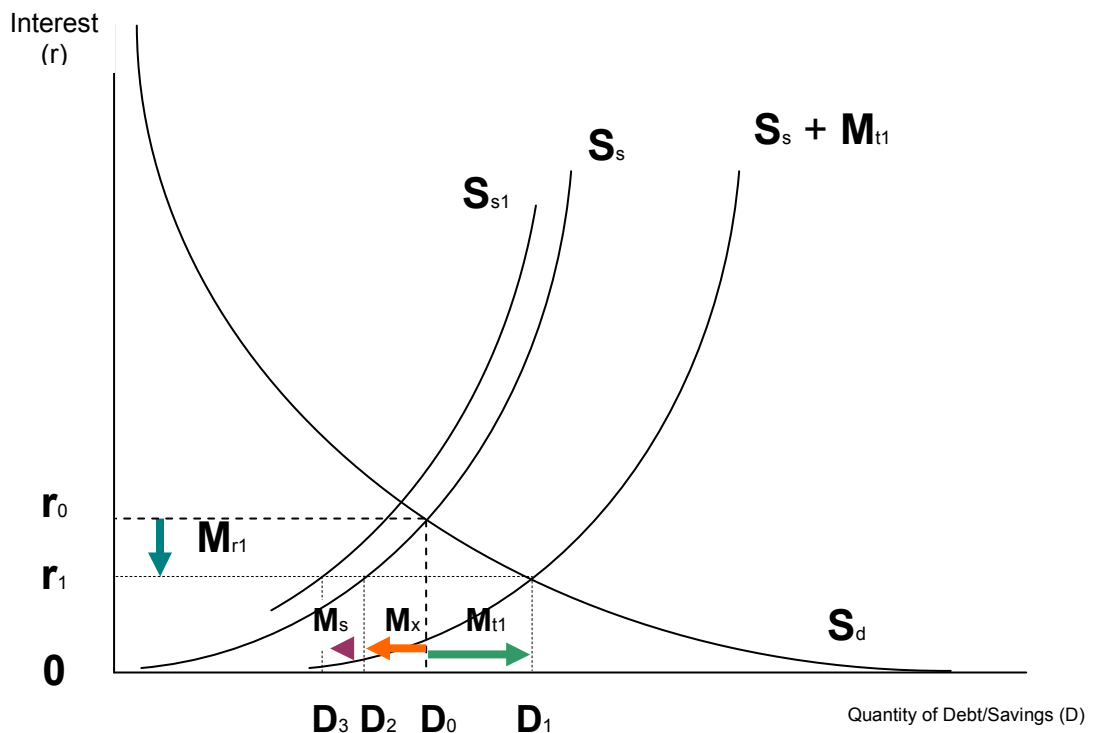


The immediate effect of the Temporary Monetary Stimulation is to reduce the interest rate to  $r_1$  but it is an unstable equilibrium.

(Fig 4) Savers will now re-evaluate their savings decisions and reduce their savings to a Savings ( $S_s$ ) equilibrium at  $D_2$  for the lower interest rate  $r_1$ . This reduction will require a further monetary stimulation  $M_x$  to maintain the Target Interest Rate  $r_1$ .

Store of value concerns will reduce the Savings for all levels of interest rates and will move the  $S_s$  Savings curve left to  $S_{s1}$ . The Monetary Authority will have to add more Temporary Monetary Stimulation ( $M_s$ ) to keep the Target Interest Rate at  $r_1$  to eliminate store of value and International Risk (Currency Risk & Sovereign Risk) concerns.

**Figure 4**

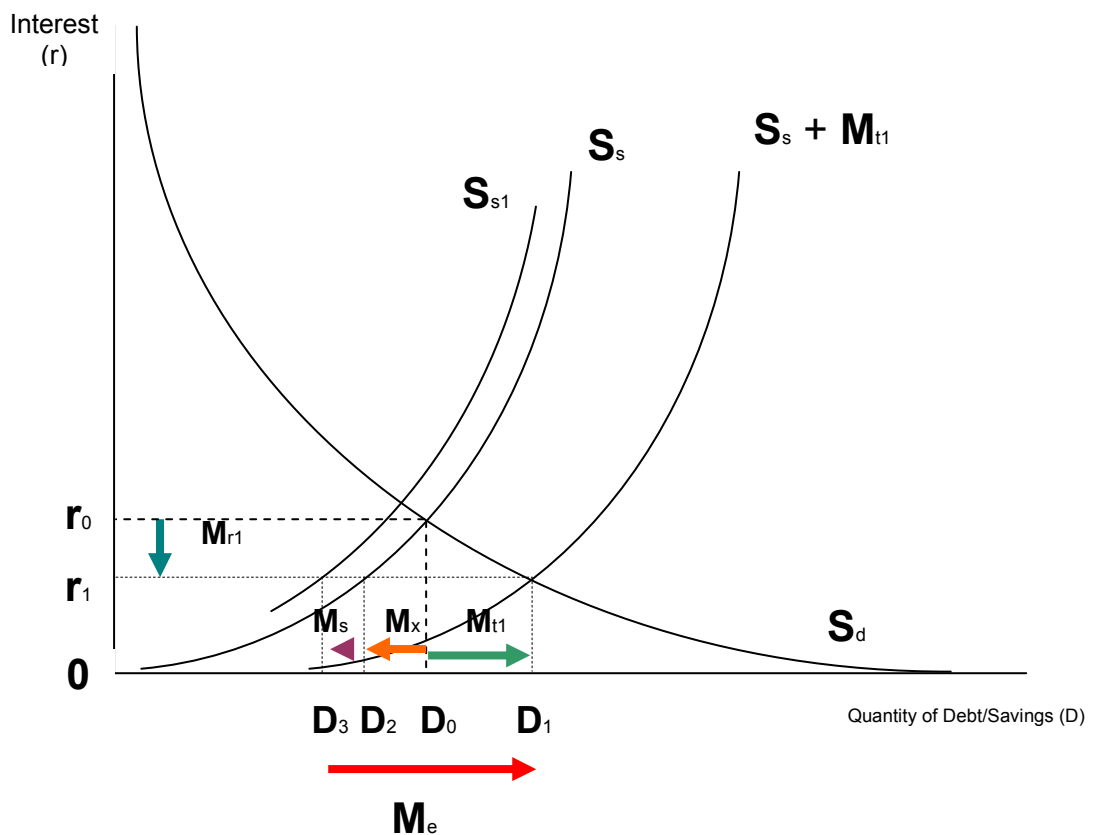


All these interventions will be guesswork and reactive in a trial and error process. The process of intervention is inherently unstable and every intervention requires a further intervention to maintain a structural imbalance.

#### 4.5 Consumer and Asset Inflation – The effect of Unfunded Monetary Credit on Prices

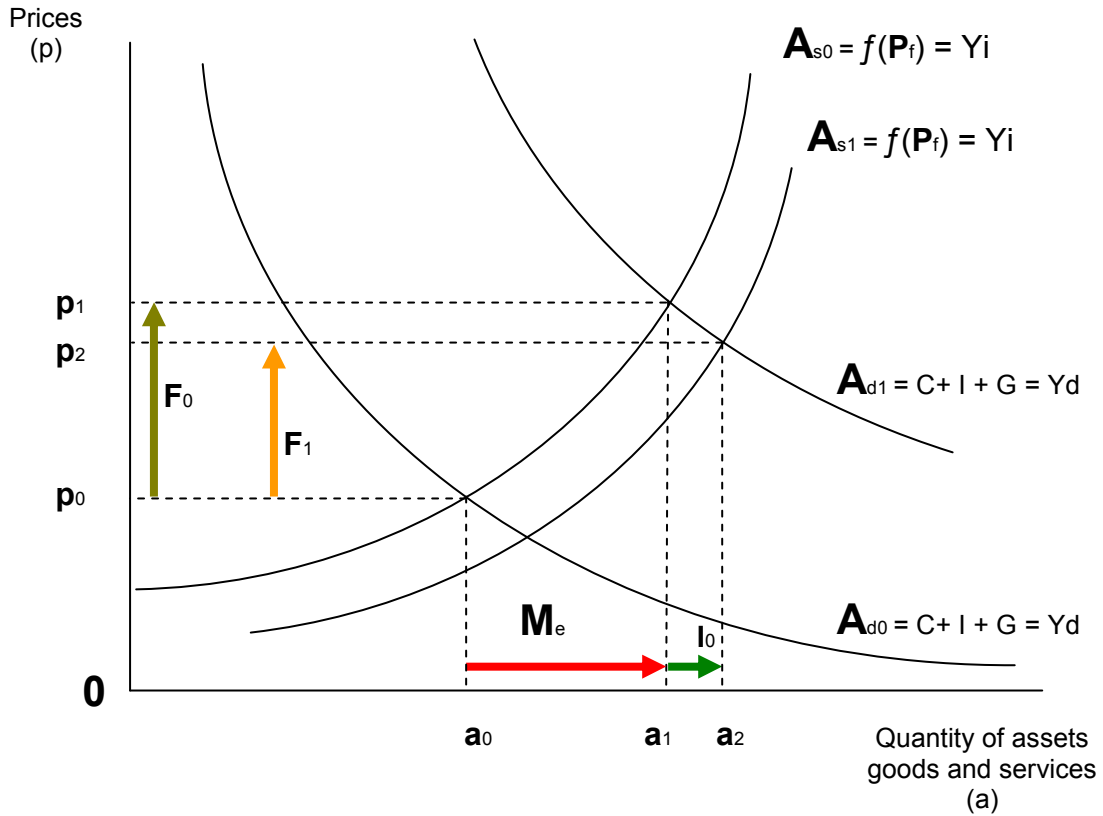
(Fig 5) The impact of Temporary Monetary Stimulation on available Debt has increased aggregate demand ( $Y_d$ ). Private Consumption ( $C$ ), Investment ( $I$ ) and Government Consumption ( $G$ ) will now compete for the use of the Eventual Monetary Stimulation ( $M_e$ ) =  $M_{t1} + M_x + M_s$ .

Figure 5



(Fig. 6) Collectively all goods, services and assets will be subject to the law of marginal utility and collectively all Factors of Production ( $Pf$ ) will be subject to the law of diminishing returns.  $A_{s0} = f(Pf) = Y_i$

**Figure 6**



Macroeconomic equilibrium exists where  $A_{d0} = A_{s0}$  at production level  $a_0$  and price level  $p_0$ .

$M_e$  as the driving force increases aggregate demand for goods, services and assets from  $a_0$  to  $a_1$ . The result is a new Aggregate Demand curve  $A_{d1}$  at an equilibrium  $A_{d1} = A_{s0}$  with production  $a_1$  at price level of  $p_1$ .

A portion of  $M_e$  is applied as Investment spending which increases Aggregate Supply by  $I_0$  as a result of temporary economies of scale advantages. I have for simplicity used a small increase. The reality is that any increase in Investment will likely cause harm as mal-investment and overcapacity when  $M_e$  is removed as part of a temporary monetary stimulation. Beware of this impact, as a greater allocation to the Investment effect will cause more harm at the withdrawal of  $M_e$  (another contributing factor to the eventual choice of Stasis). The result is a new Aggregate Supply curve  $A_{s1}$  and equilibrium  $A_{d1} = A_{s1}$  at an equilibrium production level  $a_2$  and equilibrium price level of  $p_2$ .

$F_0$  is the gross inflation as a direct result of  $M_e$ .  $F_1$  is the net inflation after the production gain from investment.

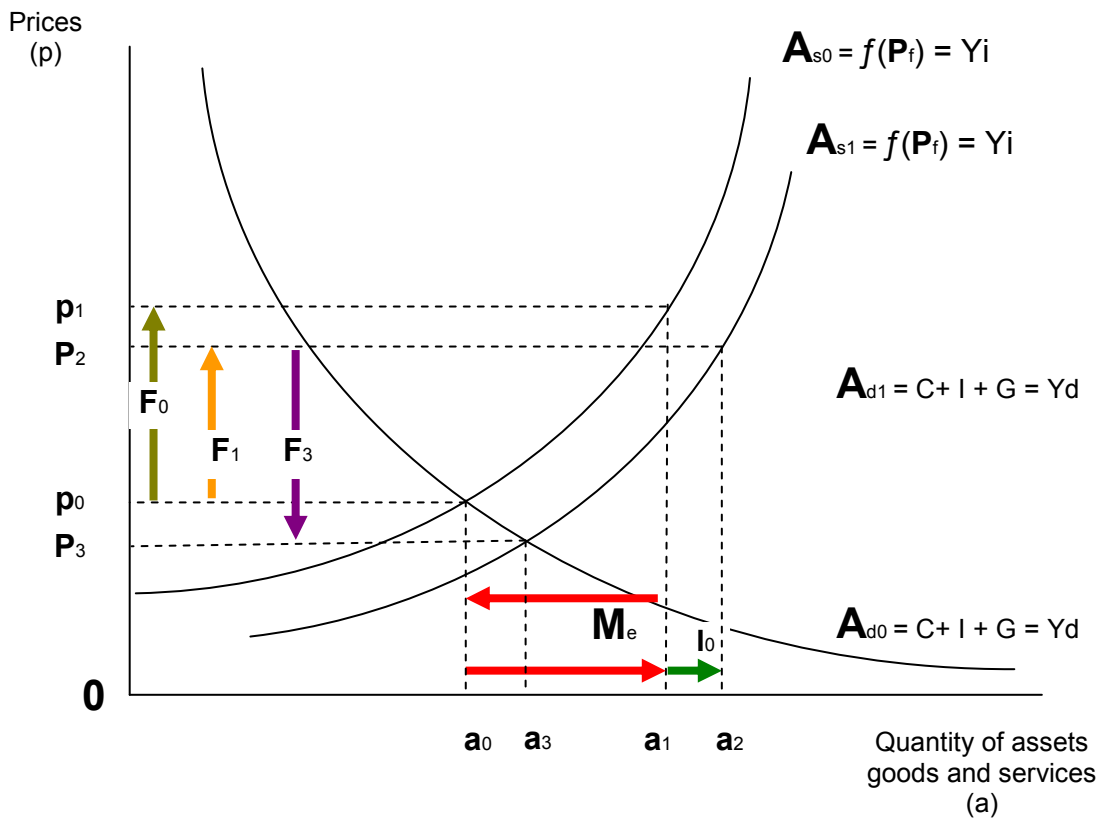
The allocation of **Me** to aggregate demand may be channelled via a Stock Exchange into the Balance Sheets of Listed enterprises and from the Balance Sheets into aggregate demand. Any portion of **Me** which is captured in a speculative cycle of listed shares will not reach other aggregate demand but will create a speculative bubble in the stock exchange which will reverse when **Me** is removed from the economy.

The increase (**Me**) to aggregate demand will be allocated to different asset classes, goods and services. The inflation  $F_1$  will show up in those assets, goods and services being placed under stress by the new demand. The interest rate will signal an incorrect price for the use of Savings and will create temporary rent or capital appreciation arbitrage opportunities in certain asset classes. Effects, which in modern applied monetary policy are called “wealth effects”. Wealth effects can never be treated as permanent even when the monetary intervention is intended to be permanent.

Real estate is a good example of such an arbitrage opportunity. Real estate will offer rent in excess of the cost of finance as well as asset inflation and will generate demand for real estate. Prices of real estate will increase with new demand and will initiate an expectation of capital appreciation gains. The process will continue until the interest rate signal changes which would happen when the availability of **Me** is exhausted. (See for example **Exhibit 10**). Compounding monetary interventions can drive this process to the point of Debt Saturation where it will reverse irrespective of interest rate signals.

(Fig 7) **Mt1** growing into **Me** must be a temporary monetary stimulation and must be removed in  $t_2$ . I will assume no external changes to the economy (all things being equal) for the sake of explanation but it is not a prerequisite.

**Figure 7**



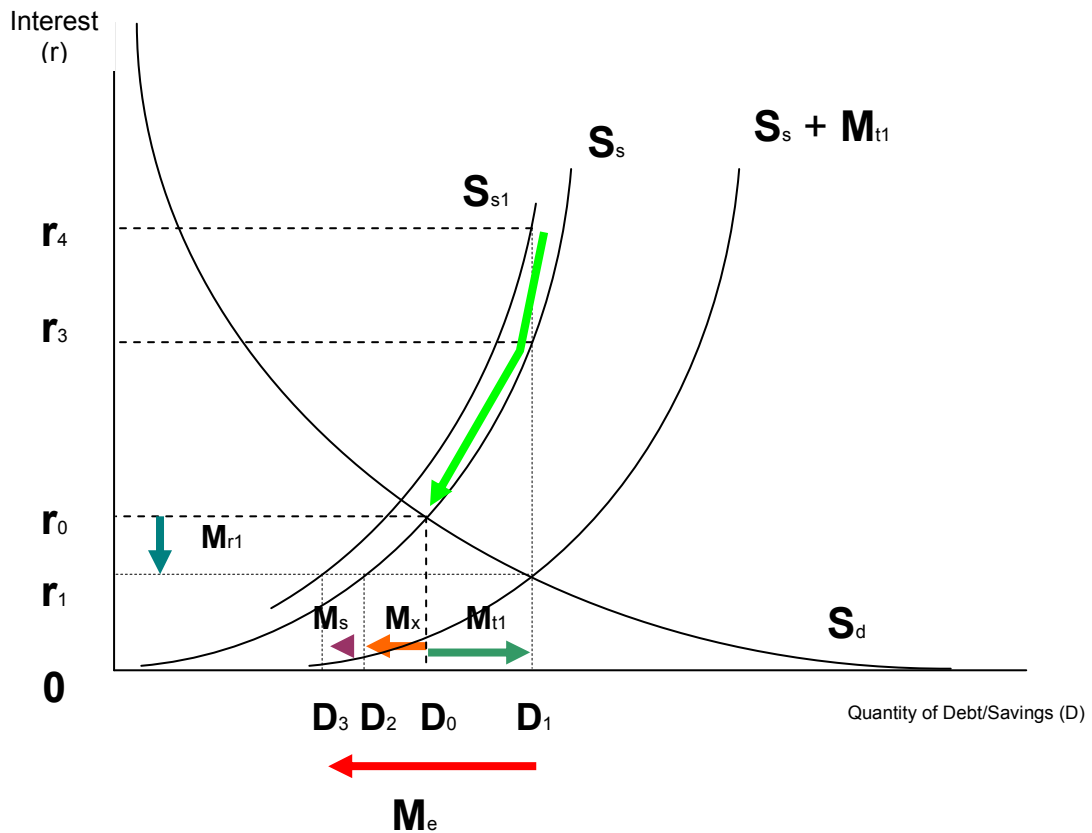
Remove **Me** and the quantity of Assets, Good and Services demanded reduces to  $a_0$ . The removal of **Me** will automatically also remove the economies of scale advantages for a loss of  $I_0$ . Aggregate Demand ( $Y_d$ ) returns to  $A_{d0}$  from  $A_{d1}$  for a new equilibrium at quantity  $a_0$  and price level  $p_0$ .

Deflation will occur from  $p_2$  to  $p_0$  but could temporary reach  $p_3$  or even lower due to the clearing of malinvestment and overcapacity. The Asset classes, Goods and Services which previously experienced the most demand stress would likely be most affected by the deflation.

The problems of malinvestment, overinvestment and overconsumption all become apparent at this point exactly as the Austrian economists Mises, Hayek and Rothbard asserted. Aggregate demand without **Me** falls back to  $a_0$  but economic capacity remains at  $a_2$ , a malinvestment and overinvestment gap ( $a_2 - a_0$ ).

This imbalance must clear and the clearing will be shared between the factors of production. The investment spending into production capacity between  $a_2$  and  $a_0$  will now be wasted. Most of it will probably be lost as permanent malinvestment.

**Figure 8**



(Fig 8) Remove **M<sub>e</sub>** from the market as this is the quantity of money which will sterilise the money creation in the Balance Sheet of the Central Bank. The level of Debt remains at **D<sub>1</sub>** but the interest rate must initially increase to **r<sub>4</sub>** without the monetary stimulation.

The removal of the monetary stimulation will improve store of value expectations and move **S<sub>s1</sub>** back to **S<sub>s</sub>**. The interest rate will reduce to **r<sub>3</sub>** and create a temporary equilibrium at **D<sub>1</sub>**. Savings supported demand for debt must be reinstated and the higher rate of interest will encourage borrowers to repay their debt. Debt repayment in turn would reduce the need for Savings and reduce the interest rate.

A stable equilibrium will return when **S<sub>s</sub> = S<sub>d</sub>** at **D<sub>0</sub>** quantity and **r<sub>0</sub>** market interest rate. Here is an important observation; the repayment of Debt will be equal to the original stimulation of **M<sub>t1</sub>** which is equal to **M<sub>t2</sub>**. The reversal on savings is the **M<sub>s</sub>** and **M<sub>x</sub>** effects. The rent for the use of **M<sub>e</sub>** will be extracted from borrowers by the market through the temporary high interest rates of **r<sub>4</sub>** and **r<sub>3</sub>**.

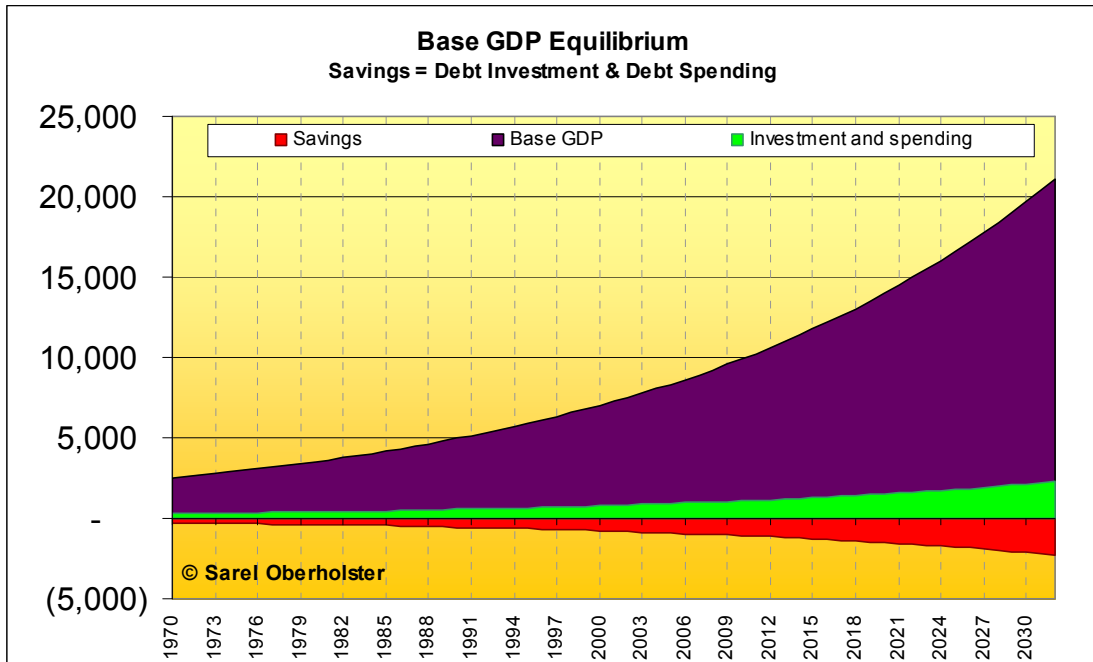
The net result for the economy is a permanent cost equal to the mal-investment and wasteful consumption.

#### 4.6 The compounding effect of Unfunded Monetary Credit

Modern Monetary interventions are not isolated events and the temporary nature of such interventions is more a matter of political bluster than a serious intention to reverse the intervention. It follows logically that the economic losses from multiple interventions only partially removed, will accumulate in the economy. The compounding nature of growth in monetary interventions will equally compound the growing error of accumulating mal-investments.

Exhibit 4 shows a base case of a GDP growing at a constant rate of 3.5% with a savings rate expressed as a function of the GDP and a variable interest rate. For more detail see Annexure 1.

**Exhibit 4:**

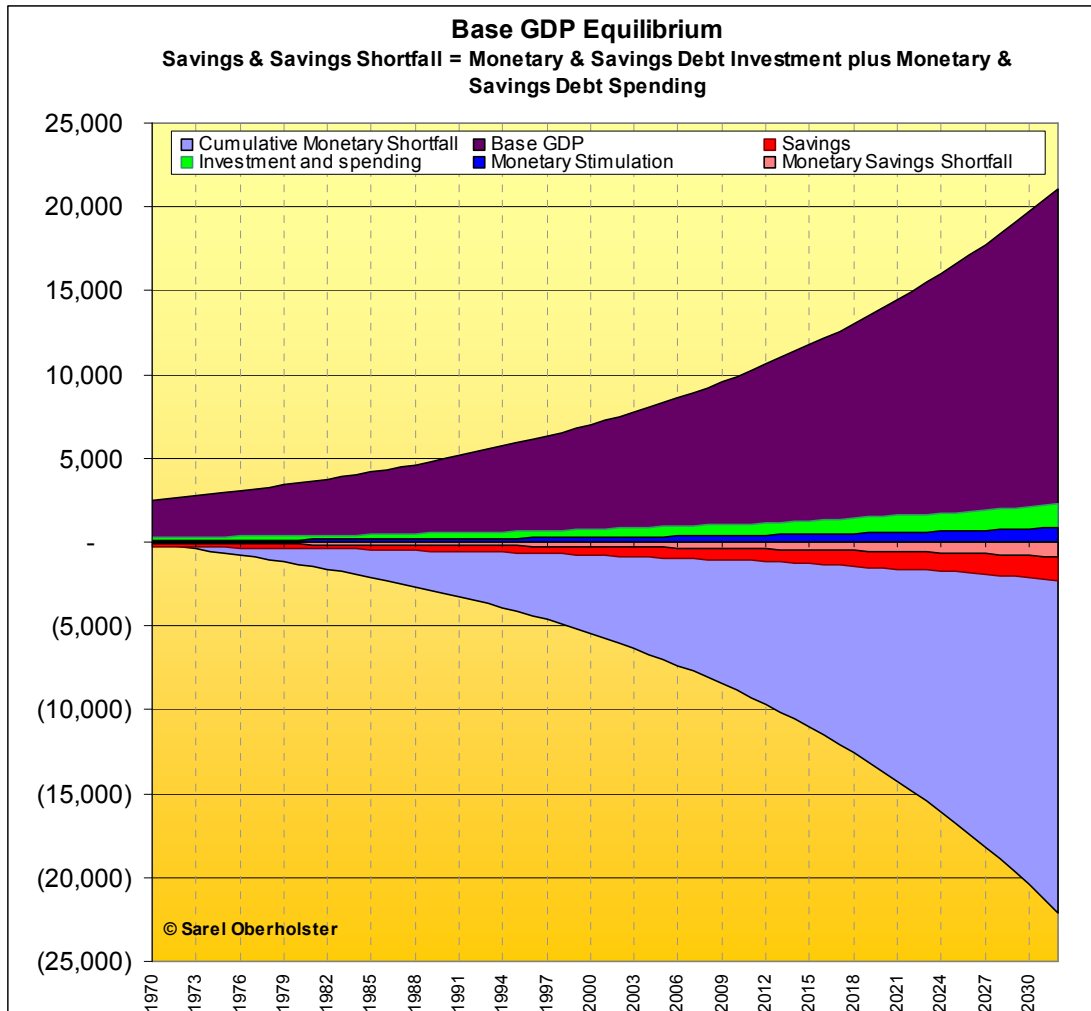


The amounts are shown in \$billions. The amount of Savings is equal to Investment and spending ( $S = C_s + I_s + G_s$ ). The effect is a stable equilibrium construct. There is no loss of income as a result of savings. In fact, the higher the propensity to save the higher the potential for Investment.

(Exhibit 5) A constant Monetary Stimulation of 4% of GDP is added to the Base Case to test the effect of compounding. The 4% Monetary Stimulation is fully allocated to malinvestment. The compounding effect is calculated as a cumulative Savings shortfall. The cumulative Savings

shortfall compounds from a very low base but will exceed the annual value of the GDP long before the end of the experimental period.

**Exhibit 5:**



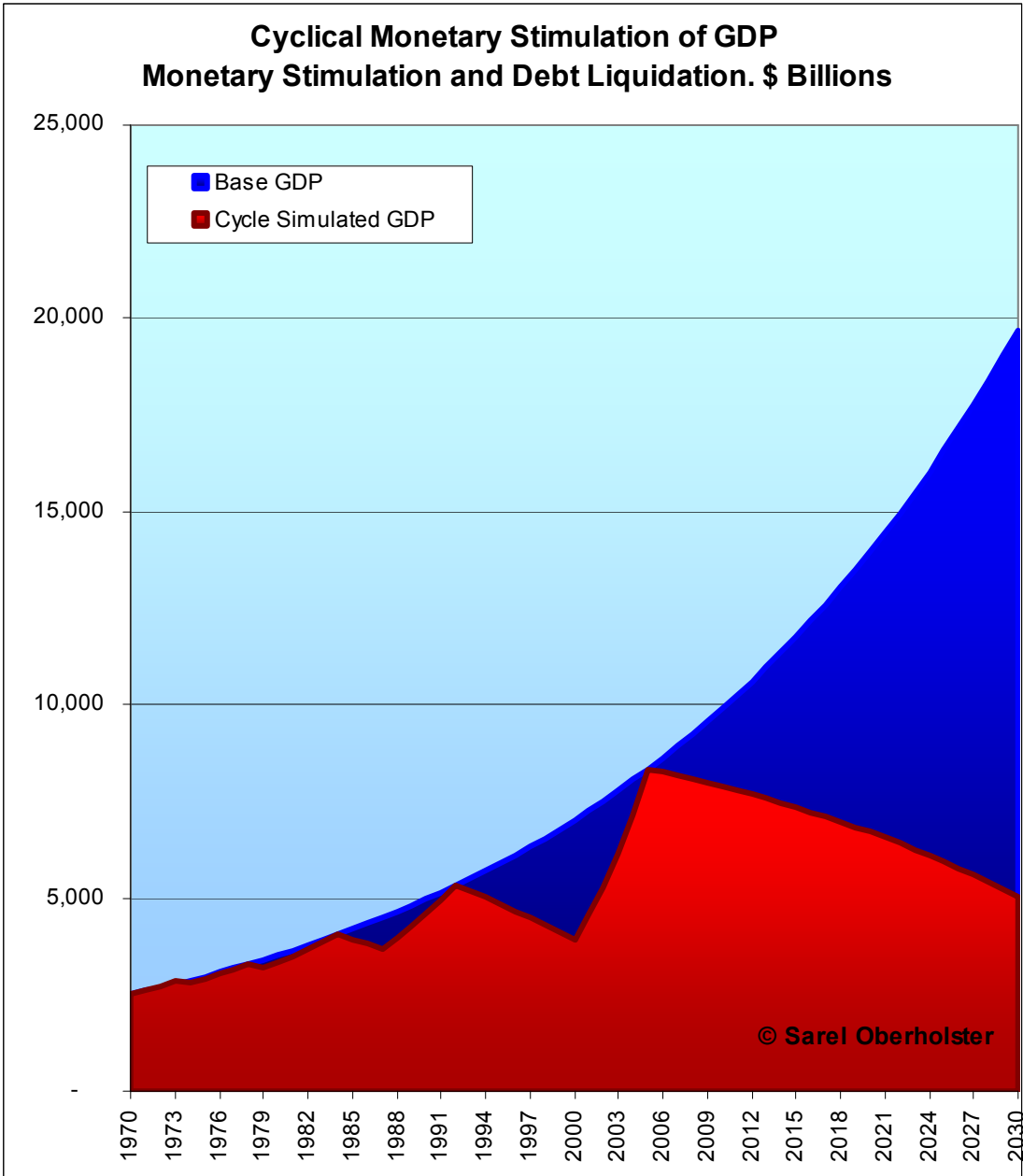
I follow up this basic experiment with a scenario analysis still using the same GDP stable growth Base Case. I simulate cyclical monetary interventions but require each monetary intervention to clear before a next cycle of intervention. The clearing process will cause a decline in GDP.

The decline is restricted to a maximum -5% of GDP per annum and spread over such period as would be required to stay within the maximum decline. Each stimulation cycle after the first stimulation is aimed at simply restoring the stimulated GDP back to the Base Case. The stimulation cycle starts at 3 years in the first cycle, then 4 years in the next and 5 years for each stimulation cycle thereafter. For more details see Annexure 2.

The monetary interventions are in fact a process of discounting future macroeconomic income ( $Y_i$ ). Each intervention causes malinvestment and places the economy on a weaker and deteriorating growth path. The compounding effect of repetitive malinvestments can be observed in the results. Malinvestments compound as economic deficits to permanently lower economic growth. The number of years required to clear the previous stimulation expands rapidly from one stimulation cycle to the next.

The growth path without intervention is vastly superior to the growth path littered with malinvestment errors from unfunded monetary stimulation.

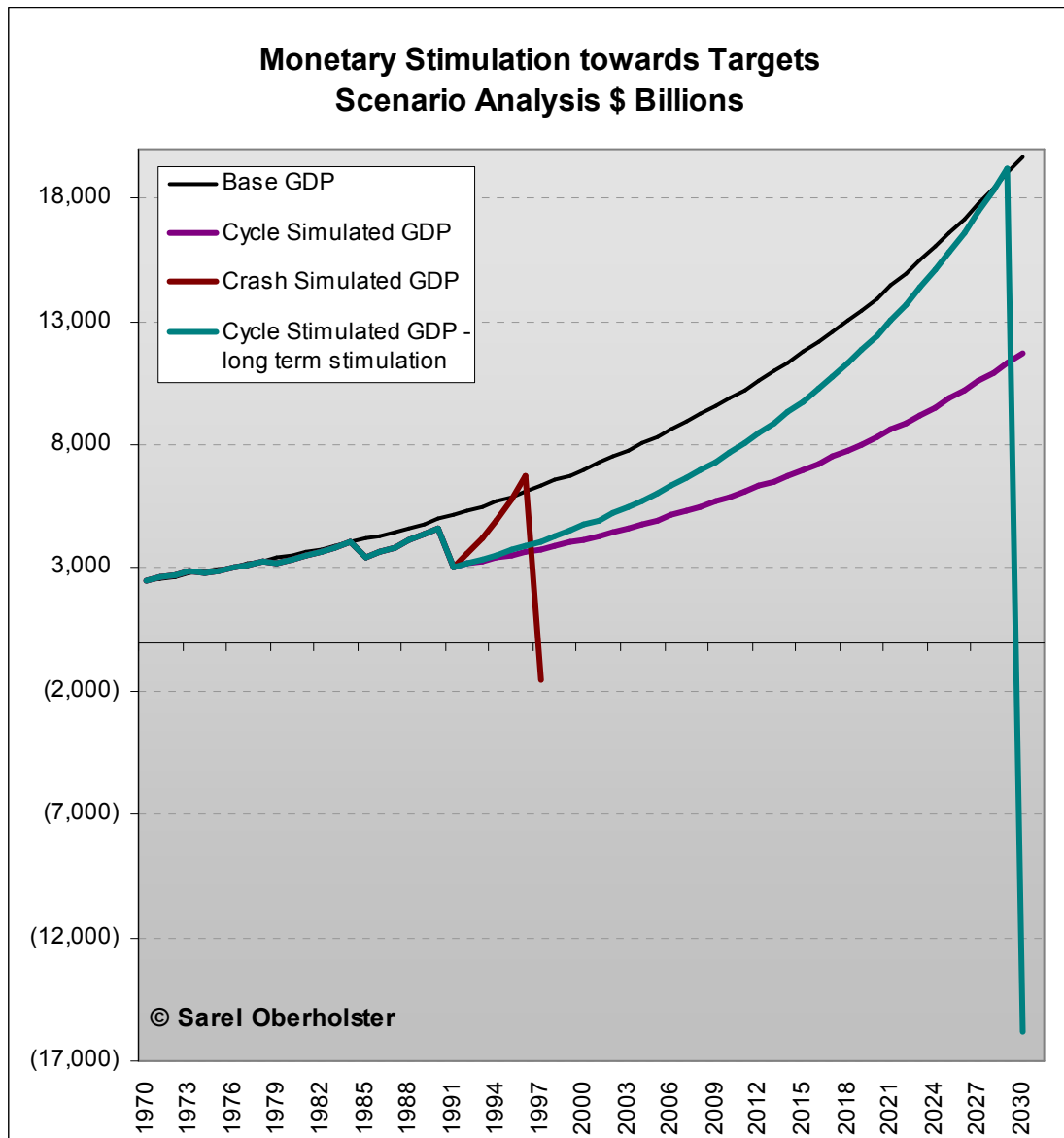
**Exhibit 6:**



(Exhibit 7) The next experiment requires a repeat of the cyclical monetary interventions but allowing a single period clearing until the clearing exceeds the GDP for a crash scenario (brown curve). I then follow through the stimulation without allowing the intermediate crash, to test for a long term stimulation crash event.

The effect is so dramatic that the final crash (blue curve) will obliterate more than double the total value of compounded annual GDP. The calculations for this scenario are in Annexure 3. A pre-interim crash can be avoided if no further stimulation is attempted in the event before the crash for a much reduced GDP growth path (purple curve).

**Exhibit 7:**



These experiments again confirm the Austrian economic writings. The GDP growth and particularly the compounded GDP growth without intervention is a powerful message. It is not a message of doom and gloom or hardship. It is a message of hope and prosperity. A monetary policy choice of non-intervention is vastly superior to an interventionist policy.

#### **4.7 Debt Saturation**

The power of the distribution channel of debt in the relationship between Private Banks and the Central Bank has hints of infinity. The power of a Central Bank to create money has a hint of infinity. I think it would be irrational to try and dispute the ability to create infinite amounts of fiat money. The question is; can the economy absorb infinite amounts of money? This question can be answered by revisiting the demand equation for Debt (iv)  $S_d = C_s + I_s + G_s$ . The formula is applicable to both national (including Savings Demand from international sources applicable to each of the categories) and global analysis. The norm would be to argue that the demand for debt will tend to approach zero but will stretch into infinity. However, two important influences will stop debt demand at the extreme.

- Freedom of choice; and
- Credit risk.

Individuals make rational choices with regards to debt and will individually have a maximum tolerance for exposing themselves to debt. Economic participants are fully aware that debt has risk consequences for their economic health.

Each individual will have a maximum debt tolerance level and that will translate into a maximum debt tolerance for a national economy or a global economy. The same principle applies to private enterprises. Even politicians will have a maximum tolerance level for Central Government debt.

Central Government, however, is a special case. Central Government's debt limit is at the point where the population revolts against the debt or its consequences. Political risk will manifest long before the Central Government maximum tolerance level is achieved.

Credit risk relates to the risk of default. Credit risk will rise for every unit of debt and eventually will exceed the risk tolerance of even the most generous credit provider. The Central Bank may appear to stand apart from this rule when it buys dubious securities but it is still constrained. The Central Bank weakens its risk profile when it engages in such activity but always functions with an implicit guarantee from Central Government. Thus the Central Government limitation of a popular revolt applies equally to the Central Bank.

It follows that there is a finite demand for Debt defined as Debt Saturation. Debt absorption will diminish as the point of Debt Saturation is approached.

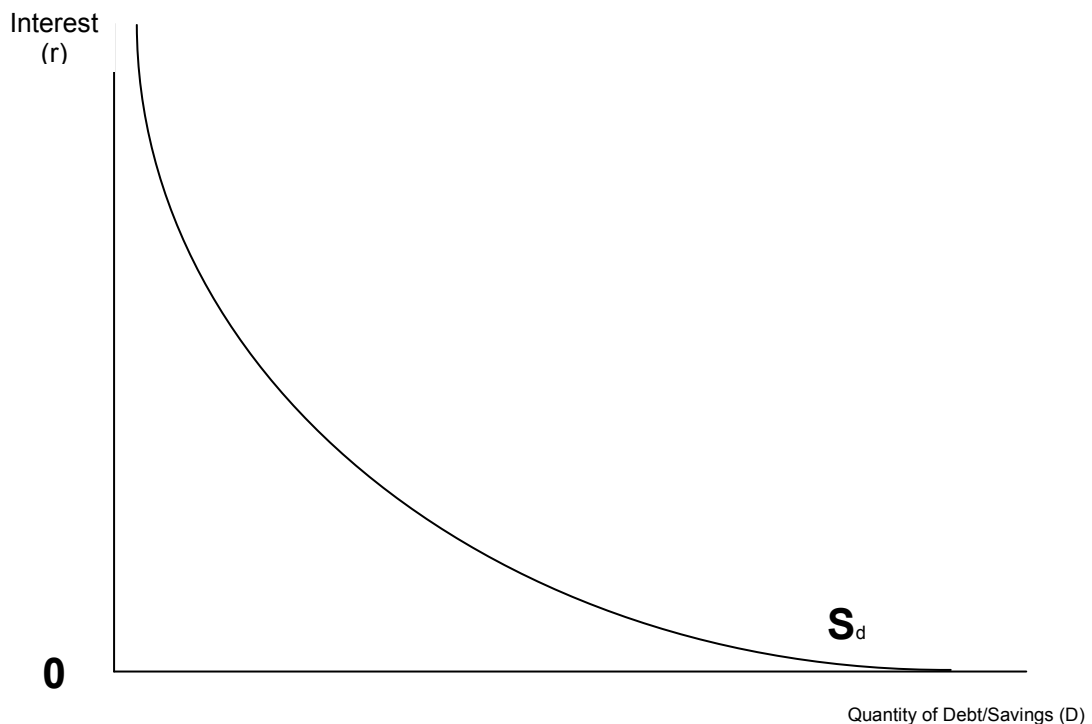
Observing the behaviour of Central Banks and Central Governments, particularly when they start advocating the policies of Keynesian economics, and the relative lack of credit risk constraints makes it a simple task to postulate that the Public Sector's Debt Saturation point is of a higher order than the Debt Saturation point of the Private sector.

Interest rates cannot be less than zero but some credit formation can and will take place even when interest rates are zero, right up to the point of Debt Saturation.

It follows that the demand curve for debt  $S_d$  will reach into zero and will still allow debt expansion along the zero interest rate level with the help of unfunded monetary stimulation.

Debt formation fails at Debt Saturation but will become inefficient long before that point. Thus a Central Bank may have an unlimited ability to create money but it cannot force debt onto the private sector even at zero interest rates when the Private Sector is approaching Debt Saturation.

**Figure 9**



These are the absolute barriers:

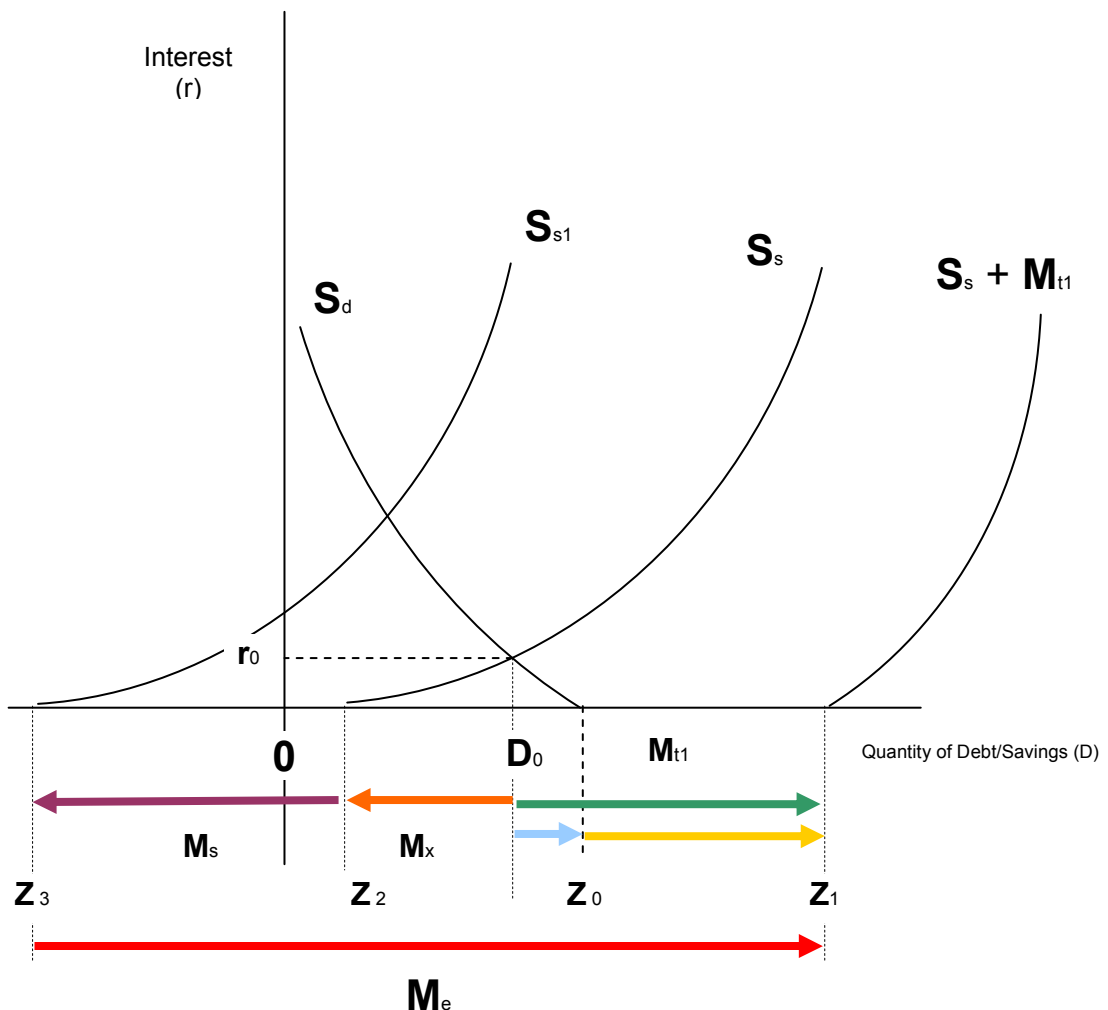
- Bad Credit Risk = Even an interest rate approaching infinity will not be sufficient to pay for the credit risk and induce a lender to advance the money.
- Bad Debt Risk = Even a zero interest rate will not negate the net negative utility of the individual of taking up the debt.

#### 4.8 Debt Formation Failure

Central Banks promise that they will act in a counter cyclical manner. They never actually promise to remove all the monetary stimulations of the past. They also never commit themselves to a specific date at which they will remove the monetary stimulation. Intervention will probably fail unless the economic participants expect it to be semi-permanent. Persistent monetary stimulation will eventually reach the Private Sector Debt Saturation threshold and thereafter the Central Government threshold.

Here is what happens. Let's say Private Sector Debt Saturation is at zero market interest rate for the sake of explanation. Note that this is not a prerequisite.

Figure 10

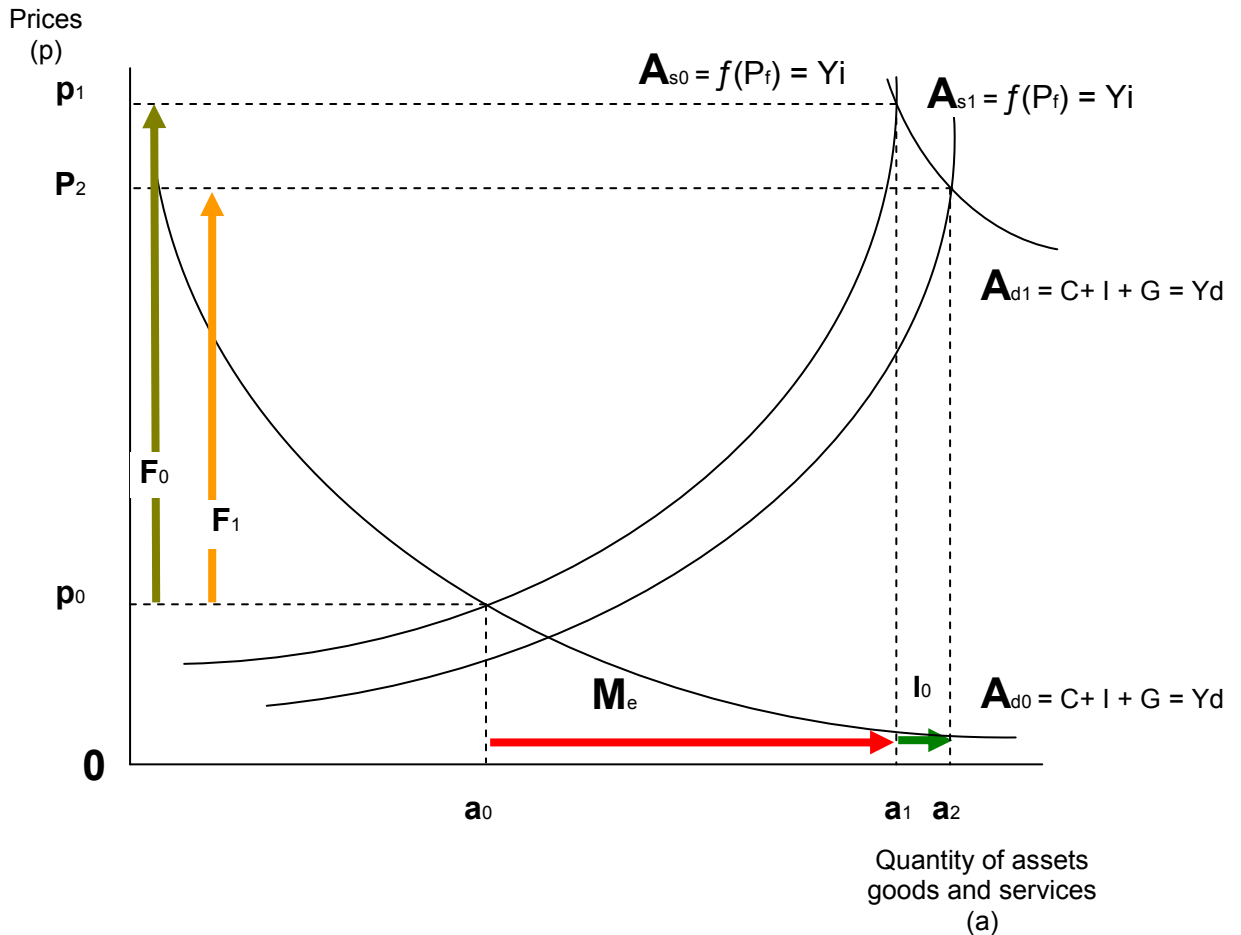


(Fig. 10) Here one sees monetary policy out of control. I will explain the reconstruction of monetary policy at a zero Target Interest Rate in point form.

- Equilibrium is where  $S_d = S_s$  at quantity  $D_0$  and market interest rate  $r_0$ .
- Unfunded Monetary Stimulation  $Mt1$  is undertaken by the Central Bank for a zero Target Interest Rate and a debt quantity beyond the zero targeted interest rate.
- Private Sector Debt Saturation is achieved at  $Z_0$  Quantity of Debt.
- Public Sector Debt Saturation is achieved at  $Z_1$  Quantity of Debt.
- Interest Rate Encouragement and Risk Premium encouragement for Savings is zero at zero interest rates which reduce Savings to only the Savings Preference [equation (viii)].
- Additional Unfunded Monetary Stimulation  $Mx$  must be undertaken to maintain a zero Target Interest Rate.
- The monetary interventions cause a loss of faith in the store of value of money to such an extent that the citizens of that country move out of the monetary stimulated currency into another currency (which can also find expression in precious metals or other national or international stores of value). The loss of faith moves the  $S_s$  curve left beyond zero quantity of savings to  $S_{s1}$ . Savers are extremely discouraged from Saving and in fact could engage in borrowing (from unfunded monetary credit  $M_s$ ) to invest in alternative stores of value.
- The structural distortion in the economy is extreme and any attempt to reduce monetary intervention will initiate a severe correction (see extreme market clearing hereunder).
- The next alternative would be to freeze the economy in Stasis at the point of Debt saturation and hope for an external rescue from Stasis (say a major new technological breakthrough). The situation is extreme and it may take a very long time and many external rescues before the Stasis policies can be relaxed.
- Another alternative is to push through the Stasis ignoring the severe political risk and crash the money in a Hyperinflationary episode. This would require that the Central Bank utilise the Central Government Debt Channel and accelerate monetary expansion by supplying Central Government with large or unlimited quantities of newly created money.

(Fig. 11) What happens simultaneously in the market for Assets, Goods and Services?

Figure 11



There is no technical change in the Assets, Goods and Services market, which was not discussed with regards to Fig 6 other than the huge additional increase in prices (inflation).

The speed of distribution of the Unfunded Monetary Stimulation relative to the ability of enterprises engaged in production becomes important at this level of intervention. Unfunded Monetary Stimulation via both of the debt distribution channels is available almost instantaneously. Manufacturers on the other hand cannot react to the expansion at the same speed. This will foster a macroeconomic environment conducive to speculation.

The Private Bank's preference for near zero or zero Capital Risk Weighted rated loans will guide the distribution of the Unfunded Monetary Stimulation (see Tables 1 & 2). The top three classes for Capital Risk Weightings, as discussed, will be favoured destinations for the unfunded monetary stimulation.

Which enterprises are rated AAA to AA and are capable of absorbing vast quantities of newly created money without long lead times? It is common knowledge that it is the Hedge funds, the Insurance giants, the finance divisions of the motor manufacturers, the Investment Banks, the mortgage banks, Government Supported Enterprises and the treasury functions of the AAA to AA rated Corporate Sector. The larger the enterprise, the better. It is inevitable that by far the majority of the newly created money will enter these “too-large-to-fail” empires, soon to be even larger than too-large-to-fail.

The Private Bank Debt Channel will be dominated by the capital allocation rules applicable to banks in terms of the Basle Accords. The newly created money will most certainly arrive at the Stock Exchange early in the process given the dominant position of AAA to AA rated institutions being active in this market. The fact that this money creates asset inflation is a given and therefore the prices of Stocks will become inflated.

Each asset class so affected by the flow of newly created money will become inflated, cars, houses, commercial property, commodities, precious metals, art and even collectables. Industrial property tends not to inflate as fast due to its use as part of the slower production process but enough new money will inflate even the laggards.

The asset inflation will create the “wealth effects” which modern monetary interventionists believe are permanent. The Private Sector Banks will adjust credit evaluations to incorporate the asset inflations in the value of collateral as if those inflations are permanent. That in turn will facilitate a self reinforcing debt absorption process until Debt Saturation is reached. Debt Saturation negates the semi-permanence of compounded unfunded monetary stimulations.

The effect of the Private Bank Debt Channel is well documented in history and is the reason why the distribution channel is choked off, usually after a monetary stimulated collapse. Barriers will be erected between Banks and Mortgage Lenders, Investment Banks, Mutual Funds, Stock Brokers, Hedge Funds and any other entities which can facilitate the distribution into speculative asset bubbles. Inflation would then dominate in consumption assets and cause the endemic recorded CPI problems. Unfortunately these cycles are long and soon forgotten from one generation to a next.

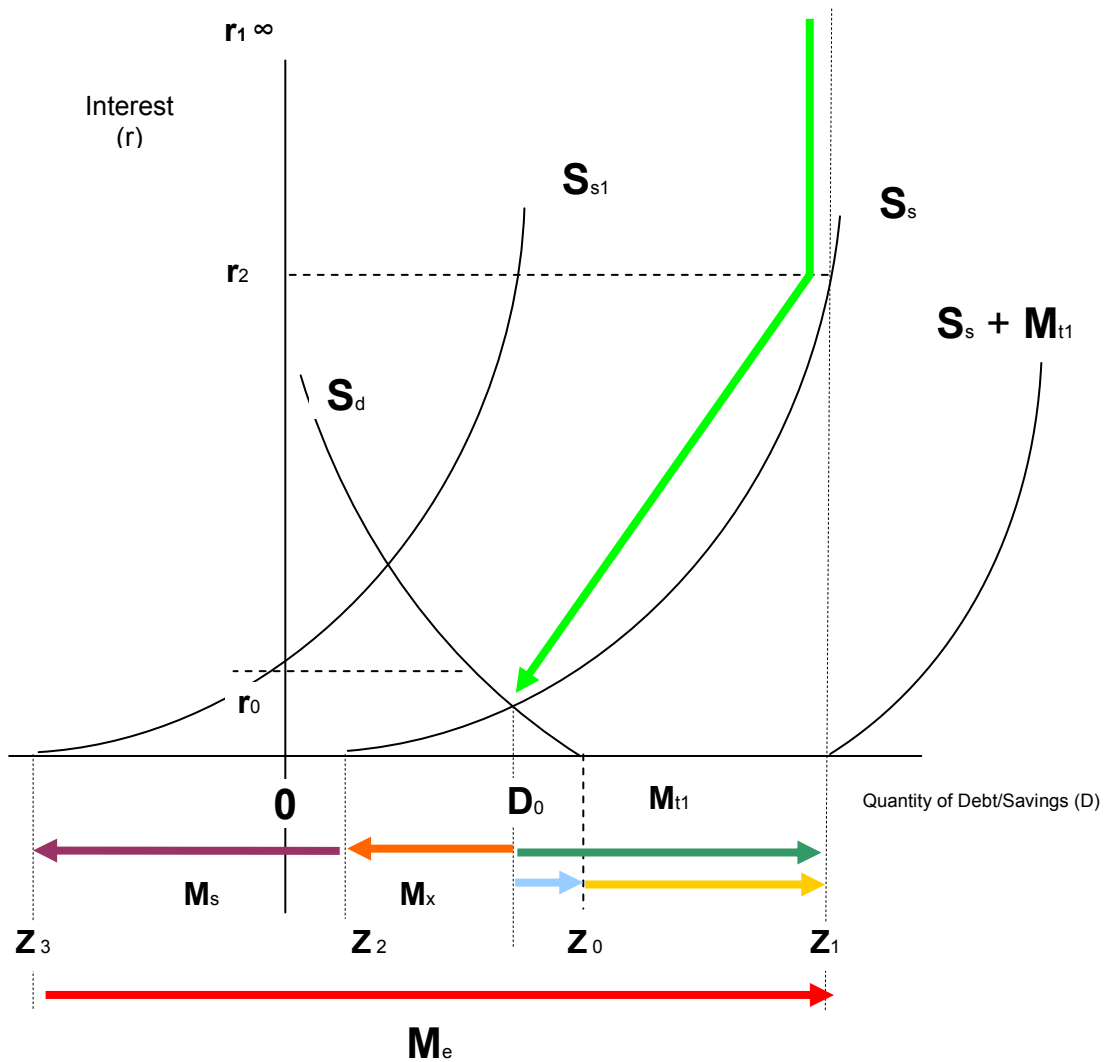
With the passage of time the barriers are removed. All the channels are opened for maximum new money absorption and the monetary stimulation process progressed right up to Debt Saturation for a new financial crisis. The lure of the monetary boom is irresistible and politically a crowd pleaser.

### 4.9 The economy frozen in Stasis

A Target Interest Rate at near zero or at zero is irrefutable proof that the economy has reached monetary induced stasis, a monetary cul-de-sac as discussed in 4.8.

It is appropriate to proceed by testing the structural stress for an economy in this condition.

**Figure 12**



In Fig 12 we continue from section 4.8.

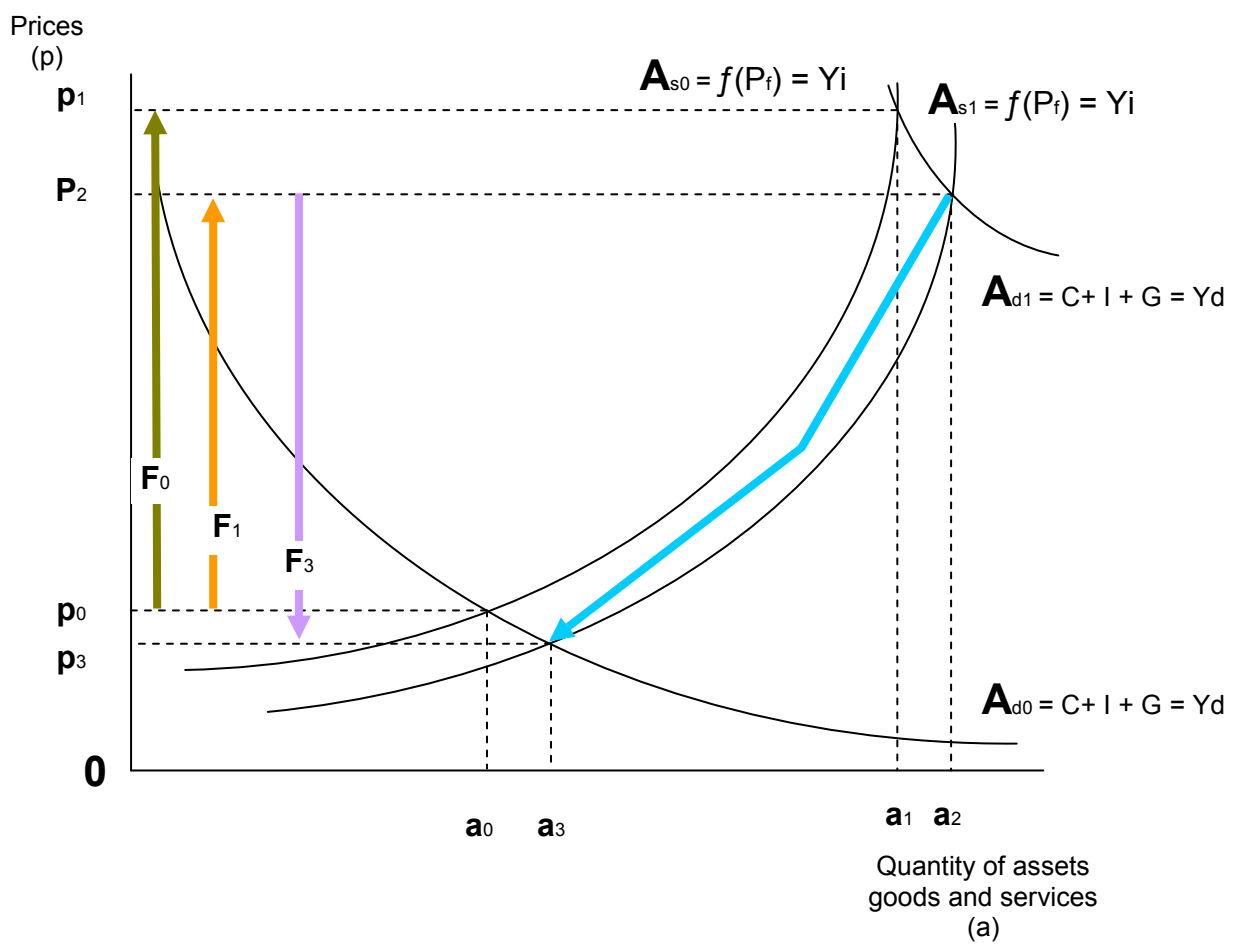
- Unfunded Monetary Stimulation ( $M_e$ ) has been implemented for a Quantity of Debt right up to Debt Saturation  $Z_1$ .

- The effect of the Unfunded Monetary Stimulation has been to open up an Interest Rate Trap to near infinity as the required rate level to restore the first level of confidence is where  $Z_1$  meets  $S_{s1}$ . This meeting point is near infinity.
- The Interest Rate Trap is not fatal, as any interest rate above  $r_2$  will initiate the process (restore confidence) towards the second level of imbalance where  $Z_1$  meets  $r_2$ . The debt utilisation at  $Z_1$  is being sustained by the monetary intervention and not by Savings. Savings quantity must be encouraged aggressively to sustain the  $Z_1$  Quantity of Debt and that would require a temporary Market Interest Rate of  $r_2$ .
- It is intuitive that Market Interest Rate ( $r_2$ ) should be at a level of a high real rate of interest to express the default risk premium and the inflation premium. (See also Exhibit 10).
- No new debt formation is taking place at this stage. The consequence is that asset markets are starved for new Unfunded Monetary Stimulation in the next period. The existing debt is frozen and no new debt is flowing into those asset markets. Demand in those markets must now fall back to the levels of demand without any debt formation. All the markets in effect become near cash markets as there is insufficient Savings to sustain stimulated debt funded demand. Prices must fall to a level where the cash demand can sustain demand. Deflation will happen when Stasis is a fact in the economy irrespective of massive monetary interventions.
- The “wealth effects” previously anticipated as permanent inflations reverse as the assets deflate to a new level of equilibrium under Debt Saturation conditions.
- Stasis monetary interventions will continue to redistribute purchasing power from the holders of the currency to new recipients of Unfunded Monetary Credits without overcoming the deflationary effects.
- The incorrect belief in an omnipotent Central Bank power to inflate gives rise to an expectation that new interventions and bailouts will restore asset inflations in due course. The zero interest rate in turn facilitates a zero cost of carry and further perpetuates the process of Stasis. A mass of Non Performing Loans appear once the asset deflation process starts. Private Sector Banks with access to unlimited liquidity will practice forbearance lending to prevent default on Non Performing Loans in anticipation of a new inflation cycle which cannot take place under Debt Saturation conditions.
- The monetary policies aimed at sustaining Stasis create a continuous redistribution of income towards the recipients of monetary bailouts. Attempts by these recipients to save in the form of balance sheet restoration contributes to the process of desperate Savings formation but must be considered a perverse outcome of Central Government intervention favouring inefficient and irresponsible users of Savings.
- A monetary policy choice to access the Central Government distribution channel will cause a taxpayer rebellion and a loss of faith in the currency if applied with sufficient aggression.

- Aggressive monetary interventions utilising the Central Government's distribution channel for Debt must be interpreted as a policy choice in favour of a Hyperinflationary episode with a Hyperinflationary Depression thereafter.
- A Hyperinflationary episode with its roots in a loss of faith in money will create a near perfect demand relative to the currency for alternative stores of value.
- The termination of stasis remains subject to the three conditions as discussed in 4.8. Restore Savings, await external influences to mitigate stasis over time or create a Hyperinflationary episode.

(Fig 13) The effect of Monetary Stasis on Aggregate Demand (**Ad**) after Debt Saturation is not neutral and **Ad** is not in limbo.

**Figure 13**



The demand curve **A<sub>d1</sub>** was created by the monetary stimulation **Me** right up to Stasis. No new monetary stimulation reaches aggregate demand

after Debt Saturation and the aggregate demand curve  $A_{d1}$  moves back to the original aggregate demand curve  $A_{d0}$  in the absence of a debt effect.

- The new equilibrium level will be where  $A_{d0} = A_{s1}$  at a price level of  $p_3$  and quantity of  $a_3$ .
- The decline in demand for Assets, Goods and Services from  $a_2$  to  $a_3$  is simultaneously accompanied by a deflation from  $p_2$  to  $p_3$  (assume the malinvestment and overcapacity effect).
- A monetary stimulation response equal to the total stimulation of the previous  $Me$  which could have been accumulated over many years is now required to simply prevent the deflationary effect in period 2, and must be repeated in period 3 ... until period  $n^\infty$ . The risk of a loss of confidence will grow. The extreme monetary policy, which must be maintained to achieve a reversal, will trigger a Hyperinflationary event. It is logical to expect that the monetary policy will be managed to prevent excessive political risk and Hyperinflation but in a manner which will mitigate some of the deflation. Such a process is a Monetary Policy choice of Stasis.
- The deflation effect will materialise irrespective of attempts by the monetary authorities to maintain the structural imbalances of economic Stasis. It is only a policy choice in favour of a Hyperinflationary episode which will allow a monetary stimulatory escape from Stasis.
- All factors of production which are variable costs (as opposed to fixed costs) such as raw materials and employment will be particularly vulnerable to the deflationary effect introduced by Debt Saturation.
- Stasis policies of increased Deposit Insurance, Forbearance Lending, re-capitalisation of bankrupt Private Sector Banks, bailouts of Government Supported Entities and bailouts of other too-large-to-fail industries irrespective of Moral Hazard are all part of the process to manage the political risks inherent to Stasis. These policies will not be effective in preventing the deflation effect in the absence of debt funded aggregate demand. The Debt Channel is broken and will remain broken until an external event occurs. It is perhaps noteworthy to refer to the Japanese experiences of instability in political office including appointments of leaders of the Central Bank over the past 19 years of Stasis in Japan.

**The major conclusions from Credit Theory upon Stasis analysis are:**

- 1. The economic cost of liquidating the monetary stimulation at the point of Stasis may seem very high but it is the least expensive choice and most efficient policy choice.**
- 2. The policy choice of long term Stasis will become an economic cost equal to a multiple of the cost of liquidation at Stasis.**

**3. The choice of a Hyperinflationary Depression is a choice for total structural failure.**

**5 The expansive power of Unfunded Monetary Credit stimulation on Mortgage Debt Formation – a case study.**

The price and real interest rate behaviour of the Residential Real Estate sector in the pre- and post-Stasis periods can be seen as a proxy for aggregate demand and structural interest rate stress.

Monetary Stimulation effects on the residential real estate sector can be measured in terms of cash flow. The individual borrower can afford a specific repayment at a specific point in time, his willing and able mortgage debt limit. I will use the following parameters to establish the mortgage borrower's levels of debt for different mortgage rates, a derivative from the Monetary Policy of a Target Interest Rate:

Starting mortgage bond \$500,000 (Present value of the Loan)  
 Mortgage Rate 10% pa (nacr)  
 Term 20 years (or 240 months)  
 Payment: \$4825.11 per month.

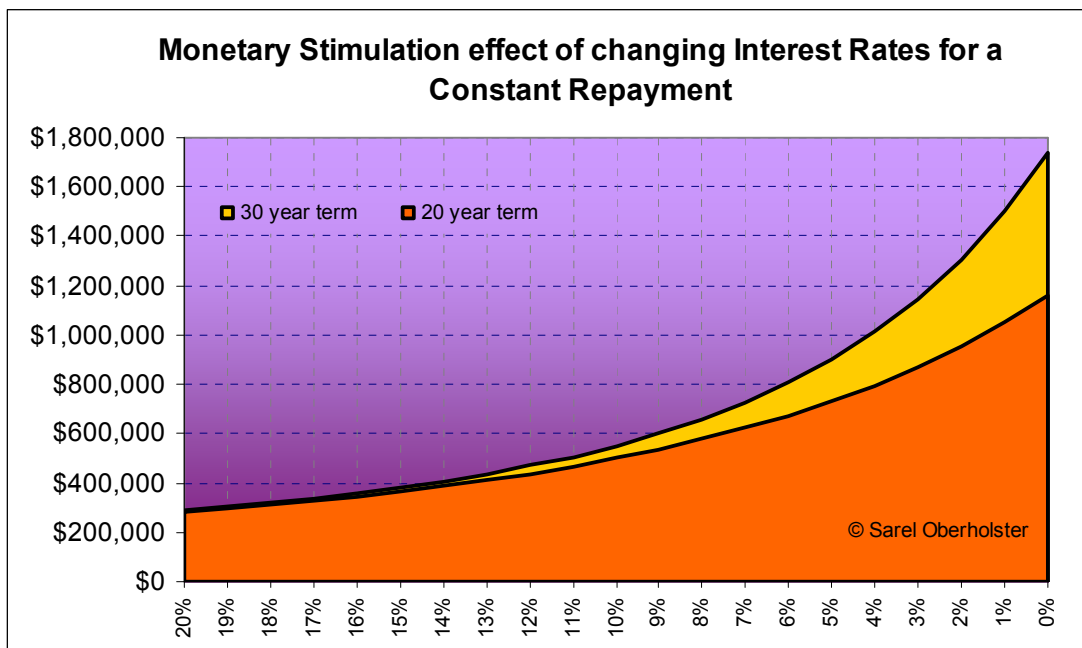
The monetary policy test will be to keep the repayment amount stable at \$4825 and vary the interest rate and the term to calculate the affordable amount of mortgage debt at different interest rates for 20 and 30 year mortgage loans.

**Table 3**

<b>Monetary Stimulation effect of changing Interest Rates for a Constant Repayment</b>		
	240 months	360 months
20.00%	\$284,026	\$288,752
19.00%	\$297,720	\$303,677
18.00%	\$312,646	\$320,162
17.00%	\$328,955	\$338,444
16.00%	\$346,817	\$358,809
15.00%	\$366,430	\$381,599
14.00%	\$388,020	\$407,226
13.00%	\$411,848	\$436,188
12.00%	\$438,214	\$469,089
11.00%	\$467,464	\$506,667
10.00%	\$500,000	\$549,825
9.00%	\$536,286	\$599,673
8.00%	\$576,862	\$657,583
7.00%	\$622,355	\$725,250
6.00%	\$673,492	\$804,788
5.00%	\$731,126	\$898,829
4.00%	\$796,248	\$1,010,673

3.00%	\$870,020	\$1,144,464
2.00%	\$953,799	\$1,305,426
1.00%	\$1,049,178	\$1,500,160
0.00%	\$1,158,026	\$1,737,039
	<b>20 year bond</b>	<b>30 year bond</b>
© Sarel Oberholster		

### Exhibit 8



The mortgage borrower can obtain a debt amount of **\$284,026** at a 20%pa interest rate and loan repayable over 20 years for his \$4825 payment. The same mortgage borrower can obtain **\$1,010,673** at a 4%pa interest rate and loan repayable over 30 years. Monetary Policy of targeted interest rates is therefore very important to the absolute levels of mortgage debt formation.

The borrower, however, is probably at his mortgage debt maximum at around \$1,000,000 as mortgage rates will not be at zero even when the Monetary Policy Target Interest Rate is at zero. We can conclude that the inflation effect of monetary policy on his real estate was **\$1,010,673 less \$500,000 = \$510,673** if we assume that the \$500,000 mortgage debt was backed by Savings in the economy. A monetary policy induced debt level at the

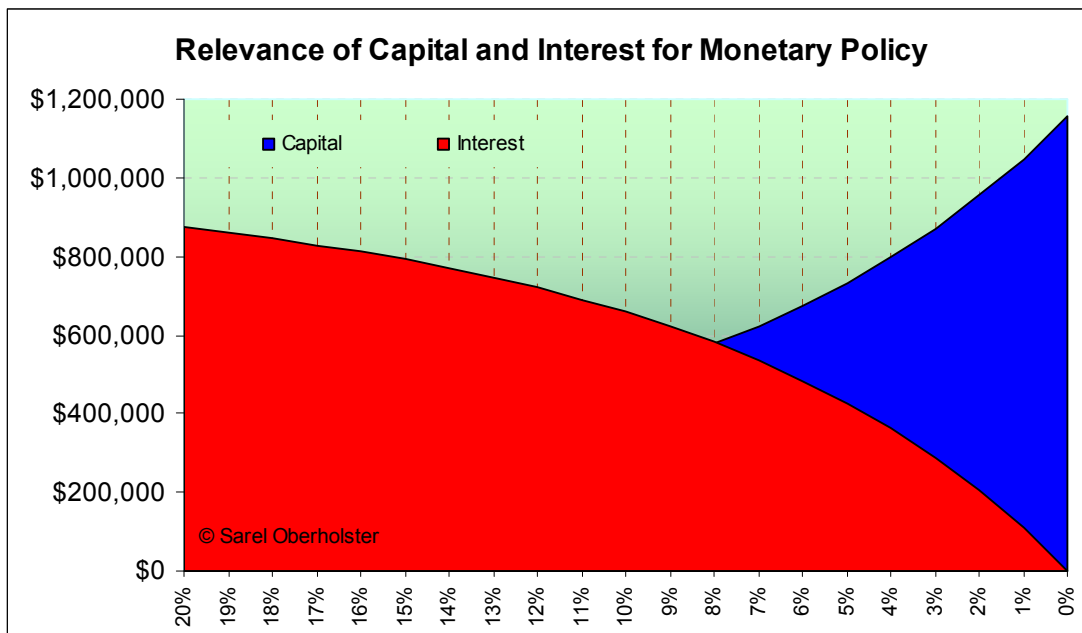
maximum is a Stasis Trap as interest rates can only go up but the basis is not **\$284,026** but a massive **\$1,010,673**.

We can also establish the relative sensitivity of interest rates on such a mortgage loan by observing the interest impact on the repayment of the mortgage debt over the term of the debt. Note that the effect of an interest rate change is important. Falling interest rates can predominantly be expected at a 20%pa interest rate. The effect of the change will be calculated on a base of **\$284,026** even if rates were to rise say 1% for a \$ amount of **\$236.69** per month. The effect of an interest rate change with a zero target rate in place is only an increase. A 1% increase calculated off a **\$1,010,673** base amount to **\$842.23**, significantly higher than the same movement off a lower base.

**Table 4**

<b>Relevance of Capital &amp; Interest for Monetary Policy</b>			
Sum of repayments	Capital	Interest	Rate
\$1,158,026	\$284,026	\$874,000	20.00%
\$1,158,026	\$297,720	\$860,306	19.00%
\$1,158,026	\$312,646	\$845,380	18.00%
\$1,158,026	\$328,955	\$829,071	17.00%
\$1,158,026	\$346,817	\$811,209	16.00%
\$1,158,026	\$366,430	\$791,596	15.00%
\$1,158,026	\$388,020	\$770,006	14.00%
\$1,158,026	\$411,848	\$746,178	13.00%
\$1,158,026	\$438,214	\$719,812	12.00%
\$1,158,026	\$467,464	\$690,562	11.00%
\$1,158,026	\$500,000	\$658,026	10.00%
\$1,158,026	\$536,286	\$621,740	9.00%
\$1,158,026	\$576,862	\$581,164	8.00%
\$1,158,026	\$622,355	\$535,671	7.00%
\$1,158,026	\$673,492	\$484,534	6.00%
\$1,158,026	\$731,126	\$426,900	5.00%
\$1,158,026	\$796,248	\$361,778	4.00%
\$1,158,026	\$870,020	\$288,006	3.00%
\$1,158,026	\$953,799	\$204,227	2.00%
\$1,158,026	\$1,049,178	\$108,848	1.00%
\$1,158,026	\$1,158,026	\$0	0.00%
© Sarel Oberholster			

**Exhibit 9**

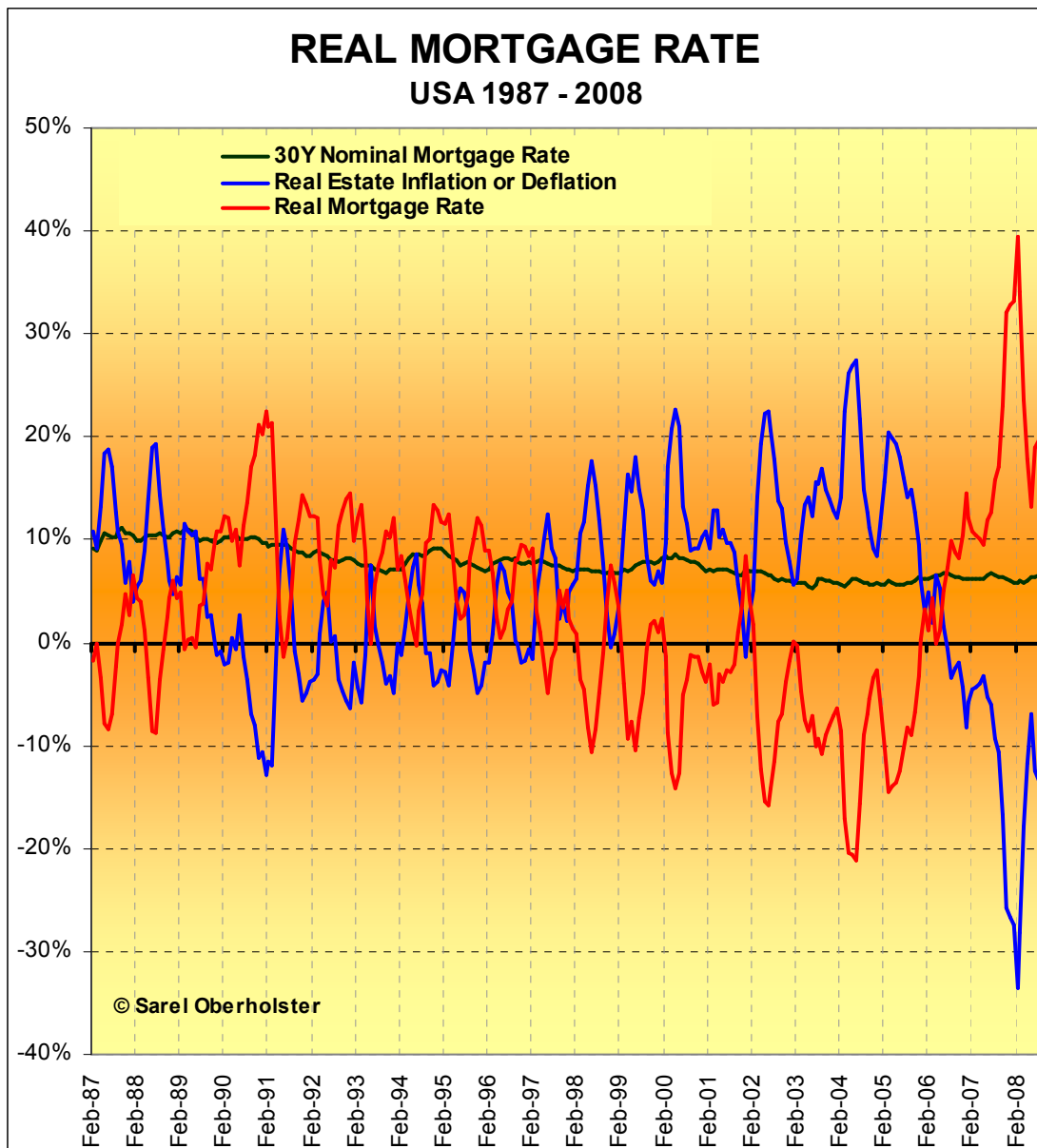


(Exhibit 9) The interest rate is very important at levels higher than 8% but repayment of capital and interest rate risk on the upside become more important when interest rates fall below 8%. This benchmark is an important indicator of monetary policy efficiency. Exhibit 9 gives a visual impact of the significance of the capital repayments when the Target Interest Rate policy is approaching zero interest rates.

It also shows how such low interest rates trap a borrower at a repayment level which is at maximum affordability. This Stasis Trap will combine with unemployment when aggregate demand adjusts downward.

Last we look at the nominal mortgage rate relative to the real mortgage interest rate in a time series of the mortgage market spanning the pre and post Stasis event in the economy of the USA.

## Exhibit 10



*Date Sources: 30-Year Conventional Mortgage Rate (MORTG series), Board of Governors of the Federal Reserve System. Composite CSXR, S&P/Case-Shiller Home Price Indices converted to an annualised rate of change.*

The Real Mortgage rate as shown in **Exhibit 10** reveals the extent of the power of monetary policy to cause inflation and deflation. The nominal interest rate is of minor importance. The real estate prices adjust to monetary policy with volatile inflation, making a mockery of official announcements of price stability.

The expansive monetary policy created a negative real interest rate cycle from 1991 until 2004 where after additional debt formation was unable to sustain the inflation in this real estate asset class. At least thirteen years of monetary policy induced inflation reversed in dramatic fashion to deflate this asset class in a process which is ongoing.

We know from the Credit Theory above that the compounded effect of thirteen years of monetary stimulation will have to be removed from the pricing of this asset class together with the malinvestment in real estate capacity. It will certainly keep this asset class in a long term correction phase. We also know that any monetary stimulations previously injected into this asset class but not cleared in previous downswings, will contribute to the deflation in real estate. The failure to recognise asset inflations is a fatal shortcoming of applied modern monetary policy.

This abridged study of the relationship between mortgage debt and residential real estate confirmed the thesis of Credit Theory.

## 6 Conclusions

The development of a Credit Theory consistent with the practices of Modern Monetary Policy has given rise to a rich new body of economic theory and a host of conclusions can be reached. Credit Theory can explain the co-existence of Inflationary and Deflationary forces in any stage of an economic cycle. The desperation of Modern Monetary practitioners and politicians alike is exposed in the resuscitation of fallacious and dated Keynesian economics. The time worn theme of insufficient money during financial crisis is shown to be like many other monetary themes, an oxymoron when the reality is an extreme excess of new money creation. Monetary policy wages war upon savings until an extreme shortage of Savings has to be replenished. The efficiency of the debt distribution channels must be celebrated but its abuse for political expedience must be recognised, recorded and discouraged. Monetary history is littered with financial crisis, severe depressions, manic hyperinflations and famine which can all be traced to the incessant creation of new money. Credit theory exposes the devastation brought about by monetary policy out of control.

All the conclusions in this paper culminate in the policy options of Stasis which are of particular importance to a global economy in financial crisis.

1. **Restore Savings.** The economic cost of liquidating the monetary stimulation at the point of Stasis may seem very high but it is the policy choice of least cost to rectify a structural depletion of Savings.
2. **Perpetuate the war on Savings in Stasis.** The policy choice of long term Stasis will become an economic cost equal to a multiple of the cost of liquidation at Stasis. This choice will bind the economy in long term stagnation while incurring tremendous real and opportunity costs. Exit from stasis will have to come from an external economic impact or a number of impacts and may take decades.

3. **Commit structural economic suicide and start over.** The choice of a Hyperinflationary Depression is a choice for total structural failure and must be recognised as an official policy choice. All savings and debt is wiped out in a process which suits the biggest single debtor, Central Government.

**Sarel Oberholster**

BCom (Cum Laude) CAIB(SA)

28 November 2008

*I wish to extend a special “thank you” to my friends Rudi vd Merwe and Jose Da Silva for editing content, suggestions and presentation.*

© Sarel Oberholster

Please email me at [ccpt@iafrica.com](mailto:ccpt@iafrica.com) with any comments. More essays can be found on my blog at <http://sareloberholster.blogspot.com/>.

**Annexure 1 - Copy of Monetary Stimulation Compounding Model.**

**Annexure 2 - Copy of Monetary Stimulation GDP Discounting Model with clearing.**

**Annexure 3 - Copy of Monetary Stimulation GDP Discounting Model with crash testing.**

## Bibliography of Research:

Ahearne Alan, Gagnon Joseph, Haltmaier Jane, and Kamin Steve and Erceg Christopher, Faust Jon, Guerrieri Luca, Hemphill Carter, Kole Linda, Roush Jennifer, Rogers John, Sheets Nathan, and Wright Jonathan, (2002), <b>Preventing Deflation: Lessons from Japan's Experience in the 1990s</b> , International Finance Discussion Papers Number 729 June 2002, Board of Governors of the Federal Reserve System.
Allen Franklin and Gale Douglas, (1998 - revised), <b>Bubbles and Crises</b> , Philadelphia: Wharton School, University of Pennsylvania.
Altman Edward I, Resti Andrea and Sironi Andrea, (2002), <b>The link between default and recovery rates: effects on the procyclicality of regulatory capital ratios</b> - BIS Working Papers No 113 - July 2002, Basel: Monetary and Economic Department of the Bank for International Settlements.
Annex Table 19. <b>Oil and other primary commodity markets</b> , Annex Table 63. <b>Monetary and credit aggregates: recent trends</b> , Annex Table 10. <b>Output gaps</b> , Annex Table 23. <b>Household saving rates</b> , Annex Table 22. <b>Structural unemployment and unit labor costs</b> , OECD Economic Outlook 83 database.
<b>Assets and Liabilities of Domestically Licensed Banks</b> - Banking Accounts (1975--2005), Data Series, Bank of Japan
<b>Assets, Liabilities and Capital of Incorporated Enterprises</b> - All Industries, Manufacturing, Wholesale and Retail Trade (C.Y.1948--1959, F.Y.1960--2003), Data Series, Bank of Japan
Baba Naohiko and Inamura Yasunari, (2004), <b>The Japanese Repo Market: Theory and Evidence</b> , BOJ - MONETARY AND ECONOMIC STUDIES/MARCH 2004, pp 65-90.
Bank for International Settlements, (1997), <b>Core Principles for Effective Banking Supervision</b> - final version - Oct 1997, Basle: Basel Committee Publications September 1997
Bank of Japan - Financial Systems and Bank Examination Department, (2008), <b>Senior Loan Officer Opinion Survey on Bank Lending Practices at Large Japanese Banks (October 2008)</b> , Tokyo: BOJ.
Bank of Japan, (2005), <b>Japan's Financial Structure since the 1980s – in View of the Flow of Funds Accounts</b> , Tokyo: March 15, 2005 Research and Statistics Department, Bank of Japan.
Basel Committee on Banking Supervision, (2004), <b>International Convergence of Capital Measurement and Capital Standards - A Revised Framework</b> , June 2004 - part 2, BIS, pp12-157.
Basel Committee on Banking Supervision, (2006), <b>Annexes to "International Convergence of Capital Measurement and Capital Standards: A Revised Framework - Comprehensive Version"</b> , June 2006

Bernanke Ben S, (1999), <b>Japanese Monetary Policy: A Case of Self-Induced Paralysis?</b> , Presentation at the ASSA meetings, Boston MA, January 9, 2000.
Bernanke Ben S., (2007), <b>The Subprime Mortgage Market</b> - Speech by Chairman Ben S. Bernanke At the Federal Reserve Bank of Chicago's 43rd Annual Conference on Bank Structure and Competition, Chicago, Illinois May 17, 2007, Board of Governors of the Federal Reserve System.
Bhala Raj, (2001), <b>International Dimensions of Japanese Insolvency Law</b> , BOJ - MONETARY AND ECONOMIC STUDIES/FEBRUARY 2001, pp 131-180.
Bryan Michael F. and Cecchetti Stephen G, (1990), <b>The Monthly Measurement of Core Inflation in Japan</b> , BOJ - MONETARY AND ECONOMIC STUDIES/MAY 1999, pp 77-102
Chithra Gopal R.S, (2006), <b>Global Automobile Industry: Changing with Times</b> .
Cotis Jean-Philippe, Elmeskov Jørgen, Mourougane Annabelle, <b>ESTIMATES OF POTENTIAL OUTPUT: BENEFITS AND PITFALLS FROM A POLICY PERSPECTIVE</b> , OECD Economics Department.
Daniélsson Jón and Morimoto Yuji, (2000), <b>Forecasting Extreme Financial Risk: A Critical Analysis of Practical Methods for the Japanese Market</b> , BOJ - MONETARY AND ECONOMIC STUDIES/DECEMBER 2000, pp 25-48
<b>Dealings in Real Estate by Region (1975--2004), Average Prices of Housing Land by Use and Prefecture (Per 1sq. m) (1980--2004), Index of Urban Land Price by Use (1955--2004), Loans and Discounts Outstanding by Sector (by Type of Major Industries) Banking Accounts of Domestically Licensed Banks (1970--2005), National Government Debt Outstanding (C.Y.1872--1912, F.Y.1913--2002), Profit and Loss, Disposition of Profits and Distribution of Value Added of Incorporated Enterprises - All Industries, Manufacturing, Wholesale and Retail Trade (C.Y.1949--1959, F.Y.1960--2003), Amount of Savings and Liabilities Held per Household (All Households and Workers' Households) - All Japan (2002--2005), Amount of Savings and Liabilities Held per Household (All Households and Workers' Households) - All Japan (1959--2000), Consumer Finance (Estimated Value) (1981--2004), Data Series, Ministry of Internal Affairs and Communication, Statistics Bureau, Japan.</b>
Desroches Brigitte and Francis Michael, (2007), <b>World Real Interest Rates: A Global Savings and Investment Perspective</b> , Working Paper/Document de travail 2007-16, Ottawa: International Department, Bank of Canada, Ontario, Canada.
Diamond Douglas W, (2001), <b>Should Japanese Banks Be Recapitalized?</b> , BOJ - MONETARY AND ECONOMIC STUDIES/MAY 2001, pp1-19.
Dow James, (2000), <b>What Is Systemic Risk? Moral Hazard, Initial Shocks, and Propagation</b> , BOJ - MONETARY AND ECONOMIC STUDIES/DECEMBER 2000, pp 1-24.
Federal Home Loan Mortgage Corporation, (2008), <b>Series ID: MORTG</b> - Board of Governors of the Federal Reserve System.

<p><b>Forecast for Japan's Vehicle Demand in Calendar Year 2008</b>, Japan Automobile Manufacturers Association.</p>
<p>French Douglas Edward, (1992), <b>EARLY SPECULATIVE BUBBLES AND INCREASES IN THE SUPPLY OF MONEY</b>, Las Vegas: Department of Business and Economics University of Nevada, May, 1992.</p>
<p>FRIEDMAN BENJAMIN M, (2000), <b>Japan Now and the United States Then: Lessons from the Parallels</b>, Institute for International Economics, pp 37-56.</p>
<p>Fujiki Hiroshi and Shioji Etsuro, (2006), <b>Bank Health Concerns, Low Interest Rates, and Money Demand: Evidence from the Public Opinion Survey on Household Financial Assets and Liabilities</b>, BOJ - MONETARY AND ECONOMIC STUDIES/NOVEMBER 2006, pp 73-124.</p>
<p>Fujiki Hiroshi, (2002), <b>Money Demand near Zero Interest Rate: Evidence from Regional Data</b>, BOJ - MONETARY AND ECONOMIC STUDIES/APRIL 2002, pp 25-42.</p>
<p>Fujiki Hiroshi, Okina Kunio, and Shiratsuka Shigenori, (2001), <b>Monetary Policy under Zero Interest Rate: Viewpoints of Central Bank Economists</b>, BOJ - MONETARY AND ECONOMIC STUDIES/FEBRUARY 2001, pp 89-130.</p>
<p>Fujiwara Ippei, Hara Naoko, Hirakata Naohisa, Kimura Takeshi, and Watanabe Shinichiro, (2007), <b>Japanese Monetary Policy during the Collapse of the Bubble Economy: A View of Policymaking under Uncertainty</b>, BOJ - MONETARY AND ECONOMIC STUDIES/NOVEMBER 2007, pp 89-128.</p>
<p>Gagnon Joseph E and Chaboud Alain P, (2007), <b>What Can the Data Tell Us about Carry Trades in Japanese Yen?</b>, International Finance Discussion Papers Number 899 July 2007, Washington: Board of Governors of the Federal Reserve System.</p>
<p>Garrison Roger W., (2006), <b>Capital-Based Macroeconomics - Keynes and Hayek: Head to Head</b>, PowerPoint Presentation from the Ludwig von Mises Institute.</p>
<p>Garrison Roger W., (2006), <b>Capital-Based Macroeconomics - Sustainable and Unsustainable Growth The Macroeconomics of Boom and Bust</b>, PowerPoint Presentation from the Ludwig von Mises Institute.</p>
<p>Green Edward J, (1997), <b>Money and Debt in the Structure of Payments</b>, BOJ - MONETARY AND ECONOMIC STUDIES/MAY 1997, pp 63-87.</p>
<p>Hoshi Takeo, (2001), <b>What Happened to Japanese Banks?</b>, BOJ - MONETARY AND ECONOMIC STUDIES/FEBRUARY 2001, pp 1-29.</p>
<p><a href="http://cepa.newschool.edu/het/essays/macro/macrocont.htm">http://cepa.newschool.edu/het/essays/macro/macrocont.htm</a>, <b>The Neoclassical Macromodel, The Hicks-Hansen IS-LM Model.</b></p>
<p>Hugh Patrick, (1999), <b>The Causes of Japan's Financial Crisis</b>, Pacific Economic Papers No. 288 February 1999, Canberra: Australia-Japan Research Centre Asia Pacific School of Economics and Management The Australian National University.</p>

<p>Ing. Asadullah Asadulla, (2005), <b>MINIMUM CAPITAL REQUIREMENT FOR COVERING CREDIT RISK UNDER THE NEW BASEL CAPITAL ACCORD – BASEL II</b> Part 1, BIATEC, Volume XIII, 10/2005 - Narodna Banka Slovenska.</p>
<p>Kaminsky Graciela L., (2000), <b>Currency and Banking Crises: The Early Warnings of Distress</b> (This Version: July 2000), Washington: George Washington University Washington.</p>
<p>Kawamoto Takuji, (2005), <b>What Do the Purified Solow Residuals Tell Us about Japan's Lost Decade?</b>, BOJ - MONETARY AND ECONOMIC STUDIES/FEBRUARY 2005, pp 113-148</p>
<p>Krugman Paul, (1998), <b>IT'S BAAACK! JAPAN'S SLUMP AND THE RETURN OF THE LIQUIDITY TRAP</b>, <a href="http://web.mit.edu/krugman/www/bpea_jp.pdf">web.mit.edu/krugman/www/bpea_jp.pdf</a> .</p>
<p>Kuroda Sachiko and Yamamoto Isamu, (2005), <b>Wage Fluctuations in Japan after the Bursting of the Bubble Economy: Downward Nominal Wage Rigidity, Payroll, and the Unemployment Rate</b>, BOJ - MONETARY AND ECONOMIC STUDIES/MAY 2005, pp 1-29.</p>
<p>Kuwayama P H, <b>POSTAL BANKING IN THE UNITED STATES AND JAPAN: A COMPARATIVE ANALYSIS</b>, BOJ - MONETARY AND ECONOMIC STUDIES/MAY 2000, pp 73-104.</p>
<p>Liu Henry C K, (2006), <b>Of debt, deflation and rotten apples</b>, Asia Times Online Ltd 11 January 2006.</p>
<p>Mann Ronald J, (2002), <b>Credit Cards and Debit Cards in the United States and Japan</b>, BOJ - MONETARY AND ECONOMIC STUDIES/JANUARY 2002, pp 123-160.</p>
<p>Masahiro Higo and Sachiko Kuroda Nakada, (1998), <b>How Can We Extract a Fundamental Trend from an Economic Time-Series?</b>, BOJ - MONETARY AND ECONOMIC STUDIES/DECEMBER 1998, pp 61-112.</p>
<p>McCallum Bennett T, (2006), <b>Misconceptions Regarding the Zero Lower Bound on Interest Rates</b> - Keynote Speech, BOJ - MONETARY AND ECONOMIC STUDIES (SPECIAL EDITION)/DECEMBER 2006, pp 13-26.</p>
<p>Milhaupt Curtis J, (1999), <b>Japan's Experience with Deposit Insurance and Failing Banks: Implications for Financial Regulatory Design?</b>, BOJ - MONETARY AND ECONOMIC STUDIES/AUGUST 1999, pp 21-46.</p>
<p>Ministry of Housing, (2008), <b>Overcoming the Finance and Resource Challenge for Sustainable Housing and Urban Development Through CREATION OF HOUSING SECTOR INCENTIVES</b>, Nairobi: Republic of Kenya.</p>
<p>Mises, Ludwig von (1881-1973), <b>Human Action: A Treatise on Economics</b>, Indianapolis, IN: Liberty Fund (2007), Inc (The Ludwig von Mises Institute e-book version)</p>

Mises, Ludwig von (1881-1973), <b>The Theory of Money and Credit (Foreword by Murray Rothbard (1981))</b> , Indianapolis, IN: Liberty Fund, Inc (The Ludwig von Mises Institute e-book version)
Miyajima Shigeki and Weber Warren E, (2001), <b>A Comparison of National Banks in Japan and the United States between 1872 and 1885</b> , Tokyo: BOJ - MONETARY AND ECONOMIC STUDIES/FEBRUARY 2001, pp 31-48
Mori Naruki, Shiratsuka Shigenori, and Taguchi Hiroo, (2001), <b>Policy Responses to the Post-Bubble Adjustments in Japan: A Tentative Review</b> , BOJ - MONETARY AND ECONOMIC STUDIES (SPECIAL EDITION)/FEBRUARY 2001, pp 53-112.
Oberholster Sarel, (2007), <b>When Debt Comes Calling: A Recent History of Financial Crises</b> , Johannesburg - Gauteng, Ludwig von Mises Institute.
Oda Nobuyuki and Shimizu Tokiko, (2000), <b>Prospects for Prudential Policy: Toward Achieving an Efficient and Stable Banking System</b> , BOJ - MONETARY AND ECONOMIC STUDIES/MAY 2000, pp 119-136.
Oda Nobuyuki and Ueda Kazuo, (2005), <b>The Effects of the Bank of Japan's Zero Interest Rate Commitment and Quantitative Monetary Easing on the Yield Curve: A Macro-Finance Approach</b> , CARF-F-031 Working Paper, Tokyo: Centre for Advanced Research in Finance.
Oda Nobuyuki, (1999), <b>Estimating Fair Premium Rates for Deposit Insurance Using Option Pricing Theory: An Empirical Study of Japanese Banks</b> , BOJ - MONETARY AND ECONOMIC STUDIES/MAY 1999, pp133-172.
OECD Economic Outlook 66, (1999), <b>THE SIZE AND ROLE OF AUTOMATIC FISCAL STABILISERS</b> , pp 137-149, <a href="http://www.oecd.org/">www.oecd.org/</a>
OECD Economic Outlook 68, (2000), <b>HOUSE PRICES AND ECONOMIC ACTIVITY</b> , pp 169-184, <a href="http://www.oecd.org/">www.oecd.org/</a>
OECD Economic Outlook 71, (2002), <b>ONGOING CHANGES IN THE BUSINESS CYCLE</b> , pp 141-157, <a href="http://www.oecd.org/">www.oecd.org/</a>
OECD Economic Outlook 80, (2006), <b>HAS THE RISE IN DEBT MADE HOUSEHOLDS MORE VULNERABLE?</b> , pp 135-158, <a href="http://www.oecd.org/">www.oecd.org/</a>
Okina Kunio and Shiratsuka Shigenori, (2002), <b>Asset Price Bubbles, Price Stability, and Monetary Policy: Japan's Experience</b> , BOJ - MONETARY AND ECONOMIC STUDIES/OCTOBER 2002, pp 35-76.
Okina Kunio, (1999), <b>Monetary Policy under Zero Inflation: A Response to Criticisms and Questions Regarding Monetary Policy</b> , BOJ - MONETARY AND ECONOMIC STUDIES/DECEMBER 1999, pp 157-200.
Public Affairs Division, Public Affairs and Communications Directorate, OECD, (1999) , <b>OECD Policy Brief - OECD Economic Projections</b> June 1999, <a href="http://www.oecd.org/publications/Pol_brief/">www.oecd.org/publications/Pol_brief/</a> .

Reinhart Carmen M and Rogoff Kenneth S, (2008), <b>Is the 2007 U.S. Sub-Prime Financial Crisis So Different? An International Historical Comparison</b> (February 5, 2008), Maryland: School of Public Policy and Department of Economics, University of Maryland.
Rothbard Murray N, (1992), <b>The Present State of Austrian Economics</b> , This paper was delivered at the Tenth Anniversary Scholars' Conference of the Ludwig von Mises Institute, October 9, 1992, Ludwig von Mises Institute.
Sato Takafumi, (2008), <b>Global financial crisis and Japan's experience in the 1990s</b> - Keynote speech by Dr. Takafumi Sato Commissioner, Financial Services Agency Symposium on Building the Financial System of the 21st Century, October 25, 2008.
Sekine Toshitaka, Kobayashi Keiichiro, and Saita Yumi, (2003), <b>Forbearance Lending: The Case of Japanese Firms</b> , BOJ - MONETARY AND ECONOMIC STUDIES/AUGUST 2003, pp 69-92
Shiratsuka Shigenori, (2003), <b>Asset Price Bubble in Japan in the 1980s: Lessons for Financial and Macroeconomic Stability</b> , Discussion Paper No. 2003-E-15 - for the IMF/BIS Conference on Real Estate Indicators and Financial Stability, held at IMF Headquarters in Washington, D.C. during October 27-28, 2003., TOKYO: INSTITUTE FOR MONETARY AND ECONOMIC STUDIES, BANK OF JAPAN.
Standard & Poor's, (2008), <b>S&amp;P/Case-Shiller Home Price Indices</b> , <a href="http://www.homeprice.standardandpoors.com">www.homeprice.standardandpoors.com</a> .
Taylor John B, (2000), <b>Low Inflation, Deflation, and Policies for Future Price Stability</b> , Prepared for the Ninth International Conference, "The Role of Monetary Policy under Low Inflation: Deflationary Shocks and their Policy Responses," sponsored by the Institute for Monetary and Economic Studies, Bank of Japan, July 3-4, 2000.
The Japan Automobile Manufacturers Association, Inc, (2008), New Registrations-Sales (Motor Vehicle) Year & Month / Type Sep 1993-Sep 2008, <a href="http://www.jama-english.jp/">http://www.jama-english.jp/</a> .
THE WORLD BANK, edited by Robert M. Buckley and Jerry Kalarickal, (2006), <b>Thirty Years of World Bank Shelter Lending: What Have We Learned?</b> , Washington: The International Bank for Reconstruction and Development / The World Bank.
Thornton Daniel L, (2004), <b>Testing the Expectations Hypothesis: Some New Evidence for Japan</b> , BOJ - MONETARY AND ECONOMIC STUDIES/MAY 2004, pp 45-70
Ueda Kazuo, (1999), <b>The Japanese banking crisis in the 1990s</b> (abridged and revised version of Ueda (1998)), BIS Policy Papers - Bank for International Settlements.
Ugai Hiroshi, (2007), <b>Effects of the Quantitative Easing Policy: A Survey of Empirical Analyses</b> , BOJ - MONETARY AND ECONOMIC STUDIES/MARCH 2007, pp 1-48.
van Mourik Carien, (2007), <b>GLOBALISATION AND THE ROLE OF FINANCIAL ACCOUNTING INFORMATION IN JAPAN</b> , London: Tinbergen Institute Research Series.

Veneroso Frank, (2007), **The Commodity Bubble, The Metals Manipulation, The Contagion Risk To Gold And The Threat Of The Great Hedge Fund Unwind To Spread Product** - Revised as of today July 19, 2007, World Bank Presentation.

Vrbanc Igeta, (2006), **ESTIMATE OF POTENTIAL GROSS DOMESTIC PRODUCT USING THE PRODUCTION FUNCTION METHOD**, 12th Dubrovnik Economic Conference, Croatian National Bank, Econometric Modelling Department, CROATIA

Walsh Carl E, (1997), **Inflation and Central Bank Independence: Is Japan Really an Outlier?**, BOJ - MONETARY AND ECONOMIC STUDIES/MAY 1997, pp 89-117.

Watanabe Kenichiro, Sudo Hiroshi and Tanaka Masayuki, (1998), **Characteristics and Appraisal of Major Rating Companies (1999) --Focusing on Ratings in Japan and Asia--** (Preliminary Translation), Japan Center for International Finance.

Watanabe Wako, (2004), **DOES A LARGE LOSS OF BANK CAPITAL CAUSE EVER-GREENING OR FLIGHT TO QUALITY?: EVIDENCE FROM JAPAN**, Discussion Paper No. 618, Osaka: The Institute of Social and Economic Research Osaka University.

Worth Terri and Wang Xu, (2008), **Economic Analysis of Banking Regulation** , PowerPoint Presentation, Oswego: State University of New York at Oswego.

Yamasawa Nariyasu, (2006), **An Analysis: Quantitative Easing Policy Was Effective in Buoying the Japanese Economy**, Tokyo: JCER Staff Report, August 24, 2006, Japan Center for Economic Research

**Annexure 1 - Copy of Monetary Stimulation Compounding Model.**

Base Growth Rate	3.50%	<b>Monetary Stimulation - Compounding</b>				<b>Unfunded future liability</b>		
Base Savings Rate	10%	*Scenario		**Debt	Base GDP	4%	Monetary	Cumulative
	Base Case	Interest Rate	**Savings	Investment & spending	less Savings	Monetary Debt	Savings Shortfall	Savings Shortfall
<b>Date</b>	<b>GDP Billions \$</b>	<b>Percent</b>	<b>GDP Billions \$</b>	<b>GDP Billions \$</b>	<b>GDP Billions \$</b>	<b>GDP Billions \$</b>	<b>GDP Billions \$</b>	<b>GDP Billions \$</b>
Dec-70	2,500	5%	(263)	263	2,238	100	(100)	(100)
Dec-71	2,588	6%	(274)	274	2,313	104	(104)	(204)
Dec-72	2,678	7%	(287)	287	2,392	107	(107)	(311)
Dec-73	2,772	8%	(299)	299	2,472	111	(111)	(421)
Dec-74	2,869	9%	(313)	313	2,556	115	(115)	(536)
Dec-75	2,969	10%	(327)	327	2,643	119	(119)	(655)
Dec-76	3,073	11%	(341)	341	2,732	123	(123)	(778)
Dec-77	3,181	12%	(356)	356	2,824	127	(127)	(905)
Dec-78	3,292	11%	(365)	365	2,927	132	(132)	(1,037)
Dec-79	3,407	10%	(375)	375	3,032	136	(136)	(1,173)
Dec-80	3,526	9%	(384)	384	3,142	141	(141)	(1,314)
Dec-81	3,650	8%	(394)	394	3,256	146	(146)	(1,460)

Dec-82	3,778	7%	(404)	404	3,373	151	(151)	(1,611)
Dec-83	3,910	6%	(414)	414	3,495	156	(156)	(1,768)
Dec-84	4,047	5%	(425)	425	3,622	162	(162)	(1,930)
Dec-85	4,188	6%	(444)	444	3,744	168	(168)	(2,097)
Dec-86	4,335	7%	(464)	464	3,871	173	(173)	(2,271)
Dec-87	4,487	8%	(485)	485	4,002	179	(179)	(2,450)
Dec-88	4,644	9%	(506)	506	4,138	186	(186)	(2,636)
Dec-89	4,806	10%	(529)	529	4,278	192	(192)	(2,828)
Dec-90	4,974	11%	(552)	552	4,422	199	(199)	(3,027)
Dec-91	5,149	12%	(577)	577	4,572	206	(206)	(3,233)
Dec-92	5,329	11%	(591)	591	4,737	213	(213)	(3,446)
Dec-93	5,515	10%	(607)	607	4,909	221	(221)	(3,667)
Dec-94	5,708	9%	(622)	622	5,086	228	(228)	(3,895)
Dec-95	5,908	8%	(638)	638	5,270	236	(236)	(4,131)
Dec-96	6,115	7%	(654)	654	5,461	245	(245)	(4,376)
Dec-97	6,329	6%	(671)	671	5,658	253	(253)	(4,629)
Dec-98	6,550	5%	(688)	688	5,863	262	(262)	(4,891)
Dec-99	6,780	6%	(719)	719	6,061	271	(271)	(5,162)

Dec-00	7,017	7%	(751)	751	6,266	281	(281)	(5,443)
Dec-01	7,263	8%	(784)	784	6,478	291	(291)	(5,733)
Dec-02	7,517	9%	(819)	819	6,697	301	(301)	(6,034)
Dec-03	7,780	10%	(856)	856	6,924	311	(311)	(6,345)
Dec-04	8,052	11%	(894)	894	7,158	322	(322)	(6,667)
Dec-05	8,334	12%	(933)	933	7,401	333	(333)	(7,001)
Dec-06	8,626	11%	(957)	957	7,668	345	(345)	(7,346)
Dec-07	8,928	10%	(982)	982	7,946	357	(357)	(7,703)
Dec-08	9,240	9%	(1,007)	1,007	8,233	370	(370)	(8,072)
Dec-09	9,563	8%	(1,033)	1,033	8,531	383	(383)	(8,455)
Dec-10	9,898	7%	(1,059)	1,059	8,839	396	(396)	(8,851)
Dec-11	10,245	6%	(1,086)	1,086	9,159	410	(410)	(9,261)
Dec-12	10,603	5%	(1,113)	1,113	9,490	424	(424)	(9,685)
Dec-13	10,974	6%	(1,163)	1,163	9,811	439	(439)	(10,124)
Dec-14	11,358	7%	(1,215)	1,215	10,143	454	(454)	(10,578)
Dec-15	11,756	8%	(1,270)	1,270	10,486	470	(470)	(11,048)
Dec-16	12,167	9%	(1,326)	1,326	10,841	487	(487)	(11,535)
Dec-17	12,593	10%	(1,385)	1,385	11,208	504	(504)	(12,039)

Dec-18	13,034	11%	(1,447)	1,447	11,587	521	(521)	(12,560)
Dec-19	13,490	12%	(1,511)	1,511	11,979	540	(540)	(13,100)
Dec-20	13,962	11%	(1,550)	1,550	12,412	558	(558)	(13,658)
Dec-21	14,451	10%	(1,590)	1,590	12,861	578	(578)	(14,236)
Dec-22	14,957	9%	(1,630)	1,630	13,326	598	(598)	(14,835)
Dec-23	15,480	8%	(1,672)	1,672	13,808	619	(619)	(15,454)
Dec-24	16,022	7%	(1,714)	1,714	14,308	641	(641)	(16,095)
Dec-25	16,583	6%	(1,758)	1,758	14,825	663	(663)	(16,758)
Dec-26	17,163	5%	(1,802)	1,802	15,361	687	(687)	(17,445)
Dec-27	17,764	6%	(1,883)	1,883	15,881	711	(711)	(18,155)
Dec-28	18,386	7%	(1,967)	1,967	16,418	735	(735)	(18,891)
Dec-29	19,029	8%	(2,055)	2,055	16,974	761	(761)	(19,652)
Dec-30	19,695	9%	(2,147)	2,147	17,548	788	(788)	(20,439)
Dec-31	20,385	10%	(2,242)	2,242	18,142	815	(815)	(21,255)
Dec-32	21,098	11%	(2,342)	2,342	18,756	844	(844)	(22,099)

**Base GDP Equilibrium assumption: Savings = Debt at a market established interest rate of equilibrium.**

\*Scenario Interest Rate: Assume equilibrium rate

\*\*Savings/Investment & spending finances from savings are equal at equilibrium interest rate (Savings = Debt)

**Annexure 2 - Copy of Monetary Stimulation GDP Discounting Model with clearing.**

Discounting GDP without external impacts				Liquidation malinvestment)		Scenarios (100%	
** Test for Max 5%	Base Growth Rate	3.50%					
	Beneficiary Years (Inc)		1971-1973	1975-1978	1980-1984	1987-1991	2001-2005
	Penalty Year		1974	1979	1985-1987	1992-2000	2006-2033
	Stimulation Target		4.50%	4.20%	4.90%	7.65%	16.40%
		Base Case	3y Cycle	4y cycle	5y cycle	5y Cycle	5y Cycle
Date	GDP Billions \$	GDP Billions \$	GDP Billions \$	GDP Billions \$	GDP Billions \$	GDP Billions \$	GDP Billions \$
	Dec-70	2,500	2,500	2,500	2,500	2,500	2,500
4.50%	Dec-71	2,588	2,613	2,613	2,613	2,613	2,613
4.50%	Dec-72	2,678	2,730	2,730	2,730	2,730	2,730
4.50%	Dec-73	2,772	2,853	2,853	2,853	2,853	2,853
-2.24%	Dec-74	2,869	2,789	2,789	2,789	2,789	2,789
4.20%	Dec-75	2,969	2,887	2,906	2,906	2,906	2,906
4.20%	Dec-76	3,073	2,988	3,028	3,028	3,028	3,028
4.20%	Dec-77	3,181	3,092	3,156	3,156	3,156	3,156
4.20%	Dec-78	3,292	3,201	3,288	3,288	3,288	3,288
-3.13%	Dec-79	3,407	3,313	3,185	3,185	3,185	3,185

4.90%	Dec-80	3,526	3,429	3,297	3,341	3,341	3,341
4.90%	Dec-81	3,650	3,549	3,412	3,505	3,505	3,505
4.90%	Dec-82	3,778	3,673	3,531	3,677	3,677	3,677
4.90%	Dec-83	3,910	3,801	3,655	3,857	3,857	3,857
4.90%	Dec-84	4,047	3,934	3,783	4,046	4,046	4,046
-2.87%	Dec-85	4,188	4,072	3,915	3,929	3,929	3,929
-3.06%	Dec-86	4,335	4,215	4,052	3,809	3,809	3,809
-3.27%	Dec-87	4,487	4,362	4,194	3,685	3,685	3,685
7.65%	Dec-88	4,644	4,515	4,341	3,814	3,966	3,966
7.65%	Dec-89	4,806	4,673	4,493	3,947	4,270	4,270
7.65%	Dec-90	4,974	4,836	4,650	4,085	4,596	4,596
7.65%	Dec-91	5,149	5,006	4,813	4,228	4,948	4,948
7.65%	Dec-92	5,329	5,181	4,981	4,376	5,327	5,327
-2.96%	Dec-93	5,515	5,362	5,156	4,529	5,169	5,169
-3.15%	Dec-94	5,708	5,550	5,336	4,688	5,006	5,006
-3.37%	Dec-95	5,908	5,744	5,523	4,852	4,838	4,838
-3.61%	Dec-96	6,115	5,945	5,716	5,022	4,663	4,663
-3.87%	Dec-97	6,329	6,153	5,916	5,197	4,483	4,483

-4.17%	Dec-98	6,550	6,368	6,123	5,379	4,296	4,296
-4.50%	Dec-99	6,780	6,591	6,338	5,568	4,102	4,102
-4.88%	Dec-00	7,017	6,822	6,559	5,762	3,902	3,902
16.40%	Dec-01	7,263	7,061	6,789	5,964	4,038	4,542
16.40%	Dec-02	7,517	7,308	7,027	6,173	4,180	5,287
16.40%	Dec-03	7,780	7,564	7,272	6,389	4,326	6,154
16.40%	Dec-04	8,052	7,828	7,527	6,613	4,477	7,163
16.40%	Dec-05	8,334	8,102	7,790	6,844	4,634	8,337
-1.02%	Dec-06	8,626	8,386	8,063	7,084	4,796	8,253
-1.06%	Dec-07	8,928	8,680	8,345	7,331	4,964	8,165
-1.11%	Dec-08	9,240	8,983	8,637	7,588	5,138	8,074
-1.17%	Dec-09	9,563	9,298	8,940	7,854	5,318	7,980
-1.22%	Dec-10	9,898	9,623	9,253	8,129	5,504	7,882
-1.28%	Dec-11	10,245	9,960	9,576	8,413	5,697	7,782
-1.34%	Dec-12	10,603	10,309	9,912	8,707	5,896	7,677
-1.41%	Dec-13	10,974	10,669	10,259	9,012	6,102	7,569
-1.48%	Dec-14	11,358	11,043	10,618	9,328	6,316	7,458
-1.55%	Dec-15	11,756	11,429	10,989	9,654	6,537	7,342

-1.63%	Dec-16	12,167	11,829	11,374	9,992	6,766	7,222
-1.72%	Dec-17	12,593	12,243	11,772	10,342	7,002	7,098
-1.81%	Dec-18	13,034	12,672	12,184	10,704	7,248	6,970
-1.90%	Dec-19	13,490	13,115	12,610	11,078	7,501	6,837
-2.01%	Dec-20	13,962	13,574	13,052	11,466	7,764	6,700
-2.12%	Dec-21	14,451	14,050	13,509	11,867	8,036	6,558
-2.24%	Dec-22	14,957	14,541	13,981	12,283	8,317	6,411
-2.38%	Dec-23	15,480	15,050	14,471	12,713	8,608	6,258
-2.52%	Dec-24	16,022	15,577	14,977	13,158	8,909	6,101
-2.67%	Dec-25	16,583	16,122	15,501	13,618	9,221	5,937
-2.84%	Dec-26	17,163	16,686	16,044	14,095	9,544	5,769
-3.03%	Dec-27	17,764	17,270	16,605	14,588	9,878	5,594
-3.23%	Dec-28	18,386	17,875	17,187	15,099	10,223	5,413
-3.46%	Dec-29	19,029	18,501	17,788	15,627	10,581	5,226
-3.71%	Dec-30	19,695	19,148	18,411	16,174	10,952	5,032
-3.99%	Dec-31	20,385					4,831
-4.30%	Dec-32	21,098					4,624
3.50%	Dec-33	21,836					4,786

3.50%	Dec-34	22,601				4,953
3.50%	Dec-35	23,392				5,126
3.50%	Dec-36	24,210				5,306

**\*\* Number of years in liquidation unrestricted but negative growth in GDP restricted to a maximum of -5%.**

**Annexure 3 - Copy of Monetary Stimulation GDP Discounting Model with crash testing.**

Discounting GDP without external impacts				Crash Scenario's (100% malinvestment)			
Base Growth Rate	3.50%						
Beneficiary Years (Inc)		1971-1973	1975-1978	1980-1984	1986-1990	1992-1996	
Penalty Year		1974	1979	1985	1991	Crash 1997	Impossible* Continuous
Stimulation result		4.50%	4.20%	4.90%	6.40%	17.20%	4.95%
	Base Case	3y Cycle	4y cycle	5y cycle	5y Cycle	5y Cycle	
<b>Date</b>	<b>GDP \$ Billions</b>	<b>GDP \$ Billions</b>	<b>GDP \$ Billions</b>	<b>GDP \$ Billions</b>	<b>GDP \$ Billions</b>	<b>GDP \$ Billions</b>	<b>GDP \$ Billions</b>
Dec-70	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Dec-71	2,588	2,613	2,613	2,613	2,613	2,613	2,613
Dec-72	2,678	2,730	2,730	2,730	2,730	2,730	2,730
Dec-73	2,772	2,853	2,853	2,853	2,853	2,853	2,853
Dec-74	2,869	2,789	2,789	2,789	2,789	2,789	2,789
Dec-75	2,969	2,887	2,906	2,906	2,906	2,906	2,906
Dec-76	3,073	2,988	3,028	3,028	3,028	3,028	3,028
Dec-77	3,181	3,092	3,156	3,156	3,156	3,156	3,156
Dec-78	3,292	3,201	3,288	3,288	3,288	3,288	3,288
Dec-79	3,407	3,313	3,185	3,185	3,185	3,185	3,185
Dec-80	3,526	3,429	3,297	3,341	3,341	3,341	3,341

Dec-81	3,650	3,549	3,412	3,505	3,505	3,505	3,505
Dec-82	3,778	3,673	3,531	3,677	3,677	3,677	3,677
Dec-83	3,910	3,801	3,655	3,857	3,857	3,857	3,857
Dec-84	4,047	3,934	3,783	4,046	4,046	4,046	4,046
Dec-85	4,188	4,072	3,915	3,414	3,414	3,414	3,414
Dec-86	4,335	4,215	4,052	3,533	3,632	3,632	3,632
Dec-87	4,487	4,362	4,194	3,657	3,865	3,865	3,865
Dec-88	4,644	4,515	4,341	3,785	4,112	4,112	4,112
Dec-89	4,806	4,673	4,493	3,917	4,375	4,375	4,375
Dec-90	4,974	4,836	4,650	4,054	4,655	4,655	4,655
Dec-91	5,149	5,006	4,813	4,196	3,066	3,066	3,066
Dec-92	5,329	5,181	4,981	4,343	3,174	3,594	3,218
Dec-93	5,515	5,362	5,156	4,495	3,285	4,212	3,377
Dec-94	5,708	5,550	5,336	4,653	3,400	4,936	3,545
Dec-95	5,908	5,744	5,523	4,815	3,519	5,785	3,720
Dec-96	6,115	5,945	5,716	4,984	3,642	6,780	3,904
Dec-97	6,329	6,153	5,916	5,158	3,769	(1,561)	4,097
Dec-98	6,550	6,368	6,123	5,339	3,901		4,300

Dec-99	6,780	6,591	6,338	5,526	4,038	4,513
Dec-00	7,017	6,822	6,559	5,719	4,179	4,737
Dec-01	7,263	7,061	6,789	5,919	4,325	4,971
Dec-02	7,517	7,308	7,027	6,126	4,477	5,217
Dec-03	7,780	7,564	7,272	6,341	4,633	5,475
Dec-04	8,052	7,828	7,527	6,563	4,796	5,746
Dec-05	8,334	8,102	7,790	6,793	4,963	6,031
Dec-06	8,626	8,386	8,063	7,030	5,137	6,329
Dec-07	8,928	8,680	8,345	7,276	5,317	6,643
Dec-08	9,240	8,983	8,637	7,531	5,503	6,971
Dec-09	9,563	9,298	8,940	7,795	5,696	7,316
Dec-10	9,898	9,623	9,253	8,067	5,895	7,679
Dec-11	10,245	9,960	9,576	8,350	6,101	8,059
Dec-12	10,603	10,309	9,912	8,642	6,315	8,458
Dec-13	10,974	10,669	10,259	8,944	6,536	8,876
Dec-14	11,358	11,043	10,618	9,258	6,765	9,316
Dec-15	11,756	11,429	10,989	9,582	7,001	9,777
Dec-16	12,167	11,829	11,374	9,917	7,246	10,261

Dec-17	12,593	12,243	11,772	10,264	7,500	10,769
Dec-18	13,034	12,672	12,184	10,623	7,763	11,302
Dec-19	13,490	13,115	12,610	10,995	8,034	11,861
Dec-20	13,962	13,574	13,052	11,380	8,315	12,448
Dec-21	14,451	14,050	13,509	11,778	8,607	13,064
Dec-22	14,957	14,541	13,981	12,190	8,908	13,711
Dec-23	15,480	15,050	14,471	12,617	9,220	14,390
Dec-24	16,022	15,577	14,977	13,059	9,542	15,102
Dec-25	16,583	16,122	15,501	13,516	9,876	15,850
Dec-26	17,163	16,686	16,044	13,989	10,222	16,634
Dec-27	17,764	17,270	16,605	14,478	10,580	17,458
Dec-28	18,386	17,875	17,187	14,985	10,950	18,322
Dec-29	19,029	18,501	17,788	15,510	11,333	19,229
Dec-30	19,695	19,148	18,411	16,052	11,730	(15,838)
Dec-31						
Dec-32						