

The Monetary Stimulus Myth – An Evidence based Analysis

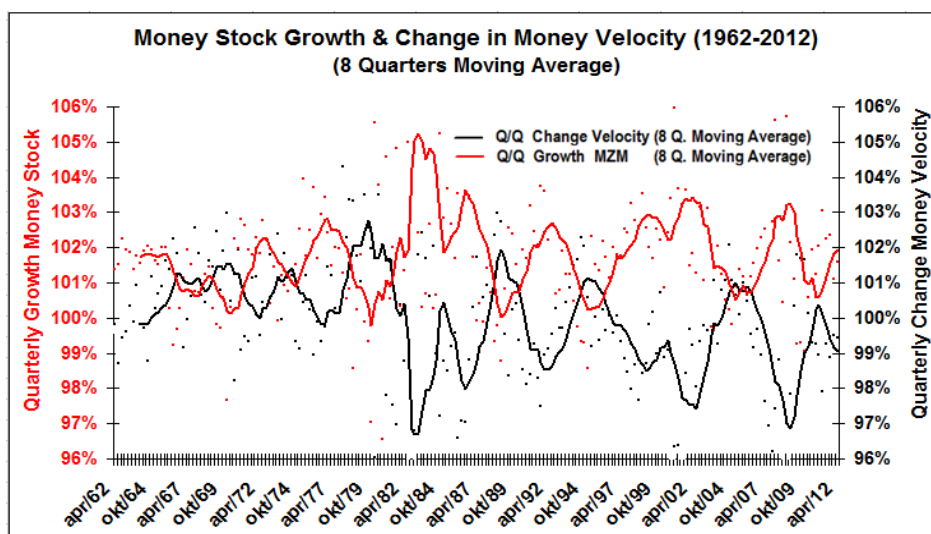
Can our Monetary System survive another Shock?

Abstract

This analysis examines the effectiveness of monetary policy as a contra-cyclical instrument. The survey covers three basic fields of monetary policy. The first part investigates to what extent expansion of the money supply effectively results in the alleged growth effect. The second section studies the effect of monetary expansion on money velocity. The third part investigates the outcome of interest rate policy on hoarding behaviour.

Data covering 50 years of monetary history provide the evidence that expansion of the money supply has no significant effect on GDP growth. The impotence of monetary expansion proves to be due to the simultaneous decline of money velocity, which systemically neutralises monetary expansions. As to interest rate policy, the empirical evidence suggests that low interest rates have (*besides the stimulating effect of boosting demand for credit*) also the unintended outcome of weakening the eagerness to lend. Mispricing credit systemically unbalances supply and demand for loans. Interest rate suppression so constitutes a major cause of declining lending levels eventually resulting in a credit crunch. Low yields also tend to stimulate the liquidity preference and promote hoarding behaviour resulting in a further decline of money velocity. As a result, Keynesian low-interest rate policy is found to be counterproductive as a remedy against a credit crunch and recessions in general.

Recent expansion of the monetary base resulted in a critical decline of the quality and liquidity of the assets held by both the ECB and the FED. The precarious liquidity deterioration compromises swift withdrawal of money from circulation should price inflation flare up. In conjunction with the massive accumulation of idle cash reserves, the central banks' asset illiquidity constitutes a precarious recipe for run on hard assets and run away inflation.



I. Fifty years of monetary data suggest that monetary expansion has no effect on growth.

Expanding the money supply is widely considered as a powerful contra-cyclical tool capable of boosting economic activity. The economic logic is that the decline of interest rates ensuing monetary expansion reduces the borrowing cost and stimulates entrepreneurs as well as consumers to increase borrowing, ultimately resulting in higher spending levels as well as increased business investment.

In this first part we calculate the quantitative impact of expansions of the MZM⁽¹⁾ money supply on US GDP growth. The analysis is based on the empirical evidence provided by the [data set of the Federal Reserve of St Louis](#) covering 202 quarters (50 years) of monetary data from 1962 till present. Single Pearson correlations considering time-lags from zero to ten quarters show no significant relation between GDP growth and growth of the money stock. (*See single correlation plots in the charts section page 8*).

In a multiple regression (OLS) we also measure the sequential impact and cumulative growth effect in quarter (t_0) of the successive monetary expansions during the current and each of the six preceding quarters (t_0) to (t_{-6})

$$\Delta(\text{GDP } t) = \beta + \sum_{t=0}^{-6} \alpha_t \Delta(\text{MZM } t)$$

As to the significance and magnitude of the growth effect, the model results in the findings below. Regressions using shorter and longer time-lags gave similar results and prove the model to be robust.

R²= 0,11020	Elasticity	P-value	95% Confidence Interval		Significance
Interscept β	0,8827668	0,0000000	0,7192808	1,0462529	
α_0 (0Q Time-lag)	-0,0278849	0,6024557	-0,1333182	0,0775484	-
α_1 (1Q Time-lag)	0,2389301	0,0000908	0,1211365	0,3567237	* * *
α_2 (2Q Time-lag)	-0,0816448	0,1667308	-0,1976702	0,0343807	-
α_3 (3Q Time-lag)	0,0625224	0,2898529	-0,0536789	0,1787236	-
α_4 (4Q Time-lag)	-0,1357193	0,0221799	-0,2517987	-0,0196399	* *
α_5 (5Q Time-lag)	0,1030724	0,0865811	-0,0149550	0,2210998	-
α_6 (6Q Time-lag)	-0,0277309	0,6050818	-0,1333463	0,0778845	-

Overview of the Regression Results

The overall growth effect attributable to expansion of the money supply proves extremely weak. ($R^2=0,11$). The regression result is consistent with the literature review by [Ben Bernanke & Marc Gertler](#)⁽²⁾ as well as with the multi-country study by [McCandless & Weber](#)⁽³⁾ covering 110 nations over 30 years. No significant growth effect can be accredited to the cash injection during the current quarter or to the injections 2,3,5 and 6 quarters earlier. ($\text{Sig} > 0.05$). Weak GDP variation can be attributed to the monetary expansion during the preceding quarter and to the injection four quarters earlier; the growth effect with one quarter time-lag being positive and the growth effect with four quarters time-lag being negative. Although statistically significant ($\text{Sig} < 0.05$), both effects are weak. Confidence intervals are wide, elasticity's are low, and the single correlation coefficient ($R^2= 0.076$) suggests that only 7.6% of GDP variation can be attributed to the cash injection during the preceding quarter.

¹ [MZM: Money with Zero Maturity](#). A measure of the liquid money supply within an economy. It measures the supply of financial assets redeemable at par on demand. MZM represents all money in M2 less the time deposits, plus all money market funds. MZM has become the preferred measure of money supply because it represents money readily available within the economy for investment and consumption.

² [Ben Bernanke and Mark Gertler](#), "Inside the Black Box" p27 "Empirical studies of supposedly interest sensitive components of aggregate spending have in fact had great difficulty in identifying a quantitatively important effect".

³ [George T. McCandless and W.E. Weber](#), "Some Monetary Facts", Fed. Res. Bank of Minneapolis Quarterly

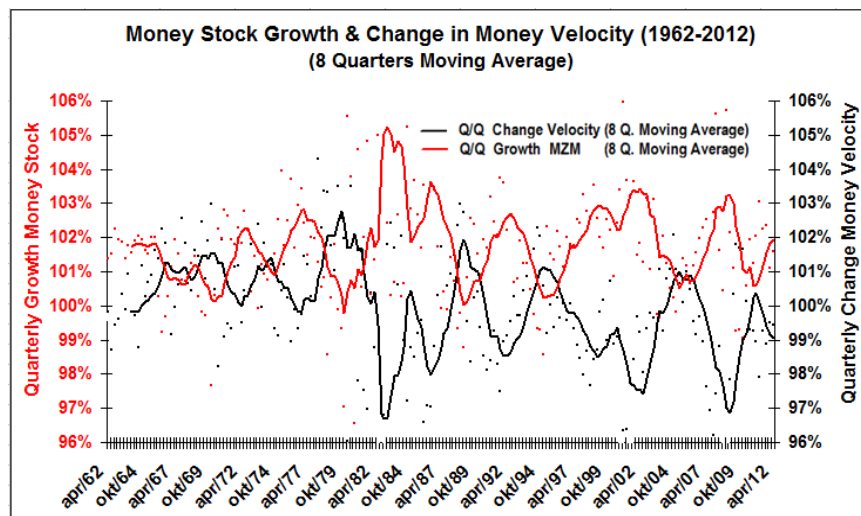
As an overall conclusion we can summarise that the stimulus effect attributable to expansion of the money supply is negligible. The result is restricted to a minor effect during the one quarter succeeding the expansion. This effect is short lived and entirely evaporates one quarter later to be followed by a significant growth contraction three quarters later.

In search for the deeper causes of the lack of transmission and the impotence of monetary expansion we investigate the relationship between growth of the money stock and money velocity.

II. Monetary expansion is incapacitated by a simultaneous decline of money velocity.

Money velocity is defined as the rate at which money circulates or the number of times each unit of currency is used during a year. The belief that velocity hardly changes over time is widespread. Mainstream monetarists have even long assumed that money velocity is constant. Under the monetarist assumption of constant velocity, Fisher's equation of exchange (*amount of Money x Velocity of circulation = Total spending*)⁽⁴⁾ leads to believe that expansion of the money supply results in higher spending. Such would indeed be the case if only velocity would not change over time.

In reality money velocity is far from constant. Sometimes people tend to hoard substantially larger amounts of cash reserves. And so do banks. Higher hoarding levels by definition result in a decline of the velocity of the money in circulation. Over the last 50 years velocity of MZM money ranged [between 1.4 and 3.5](#). The fluctuations of money velocity thereby follow a remarkably inverse pattern with the money supply. The coincidence of money stock inflation and the decline of the money velocity is indeed surprisingly strong (Correlation: $R^2=0.64$; $Sig=1.3^{E-46}$). As a consequence and contrary to monetarist belief, inflating the money supply does *not* systemically result in increased spending or in output growth. The monetary expansion is neutralised largely by the simultaneous decline of money velocity. Most of the cash injected in the economy is neither spent nor lent but hoarded. Empirical evidence seems to confirm the all-time wisdom that one can lead a horse to water, but not make it drink.



Hoarding is commonly accepted to depress aggregate demand and to foster recessions. Keynes attributed hoarding to three motives: cash reserves are put aside either for transaction purposes, out of precaution or for the speculative reason that investment conditions or spending opportunities may improve in the future.⁽⁵⁾ Keynes thereby largely ignored that the decisions to hoard or spend are also inspired by the interest rate level. The negation of “price” as a decisive incentive is common in the whole Keynesian analysis. It is rooted in deep scepticism about people’s rationality, their assessment capacity as well as about their talent to make consistent anticipations about the future.⁽⁵⁾

⁴ **Fisher's equation of exchange** states that the *Amount of Money x Velocity of Circulation = Total Spending* ($MV = PT = GDP$). *M* is the money supply; *V* is the velocity of money in circulation; *P* is average prices and *T* is the number of transactions. This equation is in fact an identity as it will always be true.

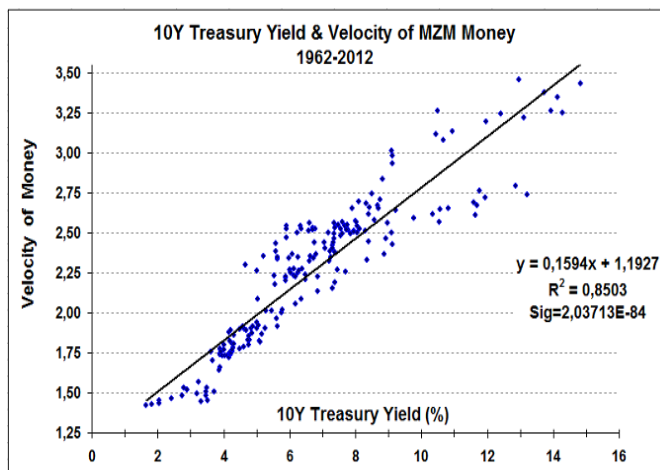
⁵ See **John Maynard Keynes**, “*The General Theory of Employment, Interest and Money. Chapter 12*” “We are merely reminding ourselves that human decisions affecting the future, whether personal or political or economic, cannot depend on strict mathematical expectation, since the basis for making such calculations does not exist”

III. Counterproductive Interest Rate Policy, inspired by False Keynesian Assumptions

Keynesian theory holds that hoarding behaviour and business cycles are steered by irrational waves of optimism and pessimism, and that the market sentiment is fuelled by alternating emotions of fear and greed. There is little doubt that fear and greed are most potent emotions indeed, and occasionally prevail on reason in individual spending decisions. The controversial point of the Keynesian assumption is whether *personal emotions* ever synchronise into *collective mood changes*. Whether and how erratic sentiments can spontaneously coordinate into waves of simultaneous optimism or pessimism.

In spite of all the controversy, Keynes' empathic "*animal spirits*" assumption continues to inspire monetary policy worldwide. Most central banks continue to fight recessions with the Keynesian mix of anti-cyclical policies: abundant money supply, low interest rates and reassuring communication. However the outcome of these policies remains highly contentious to say the least.

As a matter of fact, fifty years of monetary history provide the evidence that *the "animal spirits" assumption is empirical nonsense*. Hoarding behaviour is not steered by emotions, but by the interest rate level: the lower the opportunity cost of foregone yield, the more people and banks tend to hoard and the more money velocity declines. Hoarding levels are indeed closely correlated with the yield levels. The Pearson correlation between MZM money velocity and the key 10-year yield is near flawless and suggests that variations in the liquidity preference are attributable for 85% to the interest rate level. ($R^2=0.85$; $Sig=2^{E-84}$; Also see charts page 9).



There is no evidence on the macro-level of systemic disruptions of this prime regularity. Emotions prove too inconsistent to subvert people's pursuit of utility. Individual sentiments lack the coordination to induce collective mood changes or interference with the business cycle. The market reality is that permanent price adjustments cause bulls to match bears and contrarians to balance the herd followers. The price mechanism so allows for individual emotions to equilibrate and reason to prevail. **The crucial issue is that the Keynesian anti-cyclical strategy is based on wrong assumptions. Interest rate suppression in particular proves counterproductive with devastating deflationary effects as a result:**

- **Low yields obviously tend to stimulate hoarding depressing aggregate demand even more.**
- **Manipulating the "price of credit" unbalances supply and demand for loans.** Low interest rates have besides the intended effect of boosting demand for credit also the effect of depressing the supply. The lenders' eagerness grant loans declines along with declining rates and margins. The lower interest rates, the higher the likelihood of subsequent rate hikes and the lower the banker's eagerness to engage in (long term) lending .
- **Rate suppression provokes a systemic mismatch between durations of the loans needed and the loans on offer.** The lenders' inclination to shorten credit durations during rate cuts is not matched by a corresponding shift of investment projects in the real economy. Confronted with the scarcity of appropriate long-term credit, long-term investors face a dilemma. Either they **freeze their planned investments or they compromise their financial stability** by agreeing to loan durations that are incompatible with the long term nature of their project. On the macro-level, the likely outcome is a devastating mix of both. The housing debacle was a typical example of the last.
- **Artificially low interest rates tend to over-stimulate long-term investments to the detriment of short-term projects.** The resulting misallocation of resources is incompatible with people's time preference and the actual needs of the real economy. The distortion leads to misadventures and massive loss of resources and utility.

- *The borrower's gain merely is the lender's loss. Besides the intended reduction of the borrower's loan burden, rate suppression also causes the lenders' income to drop to the same extent, leaving no net gain for the economy as a whole. Savers, insurance trusts, investment funds, retirees etc. thereby see their spending power structurally impaired. The lower yields, the more pension reserves need to be provisioned and the less cash remains available for immediate spending.*

Mispricing credit provokes a mismatch between supply and demand for loans. The mismatch concerns both quantities and durations and eventually results in a credit crunch.

Rather than by sentiment changes, the basic trend of business cycles proves to be steered by rational spending and investment decisions. Investment decisions are the outcome of rational assessments of current opportunities and risks. Decisions whether to hoard or spend are the result of the evaluation of present wants and future needs. In all these assessments, the interest rate level plays the key role. The basic tide of business cycles is so guided by the collective wisdom issuing from the rational assessments of millions of market participants, all of whom are endowed with reason and in pursuit of optimal utility.

The lending business in particular is a highly rational trade with very few emotions indeed. Opportunities and risks are weighed by means of complex mathematical models. Bankers hoard cash reserves and forsake the profits from lending only when returns are too low to compensate for the costs and risks currently involved. The higher the interest rate, the higher the lenders' inclination to lend. The lower the interest rates, the higher the likelihood of subsequent rate hikes and the lower the banker's eagerness to grant (*long term*) loans. The same economic logic also applies to both businesses and private investors. Their decision to hoard idle cash reserves rather than to invest is the result of the same concern that actual yields are too low to compensate for giving up the safety and convenience of liquidity. Current yields are judged too low to cover the risks of capital loss either in bank failures or whenever interest rates eventually start to rise. For all market participants alike, hoarding is the result of too low yields.

As interest rates constitute the decisive determinant of money velocity, the obvious conclusion must be that the appropriate policy against hoarding or a credit crunch would be to *raise* interest rates. Rather than stimulating *demand* for loans, the *supply* needs to be encouraged. The traditional Keynesian policy does the opposite. Central banks suppress rates far below the natural free market level. As over 20 years of Japanese stagnation exemplify, (near) zero interest rate policy (ZIRP) is likely to prolong recessions rather than ending them.

The economic logic is obvious. Rate suppression distorts the investment calculation, systemically misallocating capital towards low-yielding business ventures. The longer ZIRP lasts, the more yield-starved investors take reckless risks and the more capital flows into dubious investments, yielding ever lower returns. ZIRP so has the counter-productive outcome of eroding capital productivity and its contribution to GDP growth as well as to slow down capital accumulation, with a prolonged and deepened recession as the final result.

Mood Control versus Rational expectations

In spite of the contra-indications and poor performance, both the FED and the ECB persist in their monetary policies in line with the "animal spirits" assumption. In addition to the detrimental interest-rate policy and ineffective monetary expansion, both heavily rely on communication in an effort to manage people's sentiments. The intention is reshape people's time preference and remodel their rational expectations by means of biased information about upcoming inflation, interest rates and the state of the economy. Misguided by over-optimistic assumptions, consumers as well as businesses are lead to budget their optimal utility erroneously. Many thereby engage in unsustainable consumption and investment levels that later prove incompatible with the real development of their income and cash flows. Massive loss of utility and solvability are the result. Apart from the utilitarian and moral aspect of the central banks' deceit, mood management is unlikely to bring about lasting behavioural change. As Lincoln said: "You can fool some of the people all of the time, and all of the people some of the time, but you can not fool all of the people all of the time."

Sooner or later people find out about reality and redouble their endeavour to optimise utility according to the real state of affairs. As a consequence, boosting people's morale through peptalk and statistical deceit can generate only very temporal changes of people's spending behaviour. Only an effective change of the rational incentives behind people's spending behaviour can bring about a resilient behavioural change. Only the return to sound monetary policy with market-conform interest rates can restore spending, lending and investment to sustainable levels which are compatible with the authentic market conditions.

The Inflation Scam

Austrian economists have described in great detail the adverse effects of inflation on both the economy and the proper functioning of society. Inflation not only causes a most inequitable wealth transfer from savers to big spenders. Inflation also undermines the workers' buying power, ruining their legitimate pension prospects. Vital societal functions such as insurance companies and pension funds are jeopardised ultimately destabilising the proper functioning of society. Inflation also erodes the productivity of capital and causes systemic distortions in the economic calculation resulting in massive malinvestment. Even Keynes himself has warned for the destructive consequences. *"By a continuing process of inflation, governments can confiscate, secretly and unobserved, an important part of the wealth of their citizens. There is no subtler, no surer means of overturning the existing basis of society than to debauch the currency. The process engages all the hidden forces of economic law on the side of destruction, and does it in a manner which not one man in a million is able to diagnose."*⁽⁶⁾

It is true that the exorbitant expansion of the monetary base during the last few years has caused remarkably limited price-inflation so far. However, price-inflation is likely to remain low only for as long as money velocity remains low. Particularly for as long as banks continue to freeze the newly created money at the central bank. The massive amounts of unallocated, high-powered and ready-to-spend money now hoarded by private bankers at both the FED (\pm 1600 Billion \$) and ECB (\pm 1200 Billion \$) are a ticking time bomb. Sooner or later this gigantic mass of cash will inevitably be spent.

Run on hard Assets the probable or only Exit?

Even in the very best case that spending comes about in a gradual process, keeping inflation under control by means of open market operations will prove unfeasible. As long as governments run deficits, markets simply cannot absorb a simultaneous supply of treasuries by both governments and central banks. Interest rates would skyrocket. In the likely case that the spending will take place rather suddenly, run away price inflation is likely to be triggered right away. As the quality and liquidity of both the FED and the ECB's assets have critically deteriorated over the last couple of years, while maturities were stretched, finding a buyer for such illiquid assets will prove problematic in a rising interest rate environment. Toxic and highly illiquid long term mortgage backed securities now account for one third of the FED's balance sheet and have largely replaced the traditional short term Treasuries. On the ECB's balance sheet low graded PIIGS debt have progressively replaced traditional AAA securities.

Both the illiquidity of the central bankers' assets and the massive amounts of cash available to commercial banks have now created perfect conditions for a run on hard assets by the bank sector. Incidents such as a sudden default of a nation or major bank, a derivatives market incident, further Euro-zone disintegration, incident in the Strait of Hormuz all are events capable of triggering such a crack-up boom. A rush on the world's hard assets would likely soon get out of control and trigger run-away inflation and disruptions in our fiat monetary system in just a few weeks. Tightening monetary policy during such a panic will come too late as an interest rate hike would even speed up the feedback loop of accelerating money velocity and price inflation. In such a panic scenario private citizens once again would become the major victims as they would come way behind the bank sector and come too late to take protective action.

⁶ *John Maynard Keynes, "The Economic Consequences of the Peace" p.235-236*

Conclusion

The origins of the present debt crisis go back to 1971 when the Bretton Woods monetary system was abandoned. Ever since Nixon abrogated gold convertibility, the new fiat monetary system allows for unlimited expansion of the monetary base. Ever since, central bankers have (*on basis of the wrong Keynesian assumptions*) artificially lowered interest rates at each first sign of an economic slowdown. In their futile attempts to master business cycles and to generate an eternal boom, central banks have stimulated borrowing and over-inflated indebtedness, never allowing deleveraging to take place. For 40 years, governments, businesses and private citizens alike, all took advantage of the easy access to cheap credit to accumulate liabilities to levels incompatible with their income. The exorbitant debt accumulation has now culminated in a global debt crisis in which many citizens, states and institutions face unserviceable debt. Kicking the can further down the road is no longer an option as such would inevitably result in a still vaster financial debacle later on.

The central banks' megalomaniac project to manage the tide of business cycles has failed. Just as all previous central planning tryouts ended in failure. In an ultimate attempt to stimulate demand, central banks now pushed monetary policy to the edge. Interest rates are close to zero and the monetary base is inflated to the limit. With no more tools left to stimulate, private sector growth remains weak, banks remain fragile, public debt keeps rising, unemployment remains high and lenders are more reluctant to lend than ever. Loose monetary policy brought us no solution but plenty of new problems and unmanageable risks. Extreme low interest rates have once again over-inflated asset bubbles and transformed the derivatives markets into giant casinos for too big to fail banks. The bubbles in the (*junk*) bond markets and in the 440 trillion interest rate swap market already dwarf the debacle of the housing crisis. Meanwhile competitive currency debasements brought us on the brink of a global, trade crippling currency war.

As Robert Lucas already noted in his 1995 [Nobel Prize lecture](#)⁽⁷⁾ monetary expansion has no effect on growth. Inflating the money supply merely causes price inflation, sooner or later. "Monetary stimulus" is a nonsensical deceit in terms. What is sold to the public as a stimulus program is wrong economics at best, but more likely only an excuse for interest rate manipulation and a pretext for institutionalised counterfeiting. While such financial repression robs Joe Sixpack's savings and ruins the life of retirees, it generates massive windfalls for governments and big spenders as well as for bankers with inside knowledge of the FED's next move. The rate manipulations thereby undermine the very essence of our free market system. Manipulation of interest rates, the most important price of the economy, not only destroys the essential function of money as a store of value but also distorts investment calculations with misallocation of resources and massive malinvestment as the final results. The FED's corruption of capital markets ultimately will cause such impoverishment that sooner or later social upheaval will become inevitable.

As central banks reach the boundaries of monetary machination and increasingly run out of options, the 40 year experiment with global fiat money is inevitably coming to an end. The longer central banks delay the return to sound monetary policy the deeper the depression is likely to become and the greater the risk of a chaotic collapse. The longer central banks postpone the return to market-conform interest rates the more painful the reckoning day will be. As Hayek wrote: "*If a policy is pursued over a long period which postpones and delays necessary movements, ... the result must be that what ought to have been a gradual process of change becomes in the end a problem of the **necessity** of mass transfers within a short period.*"⁽⁸⁾

Paul Vreymans, September 16th 2013

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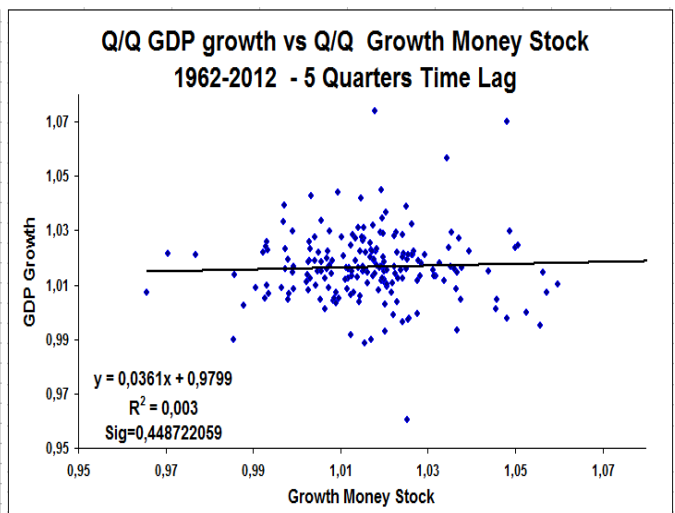
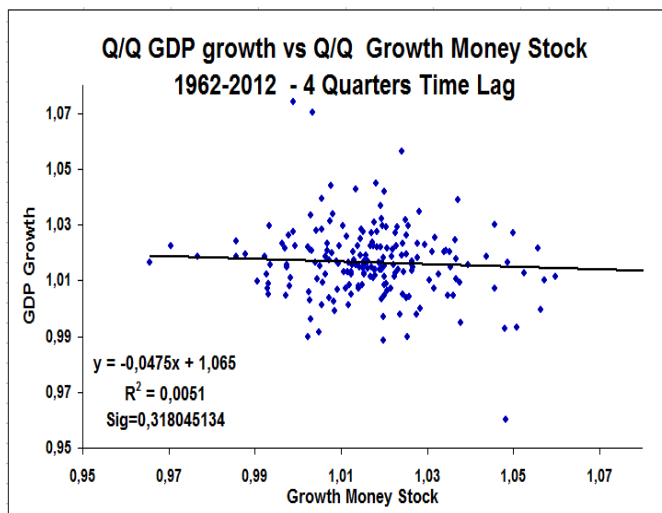
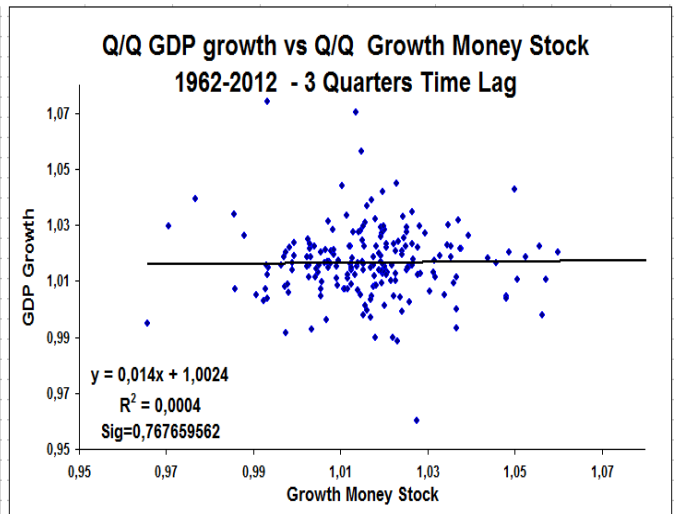
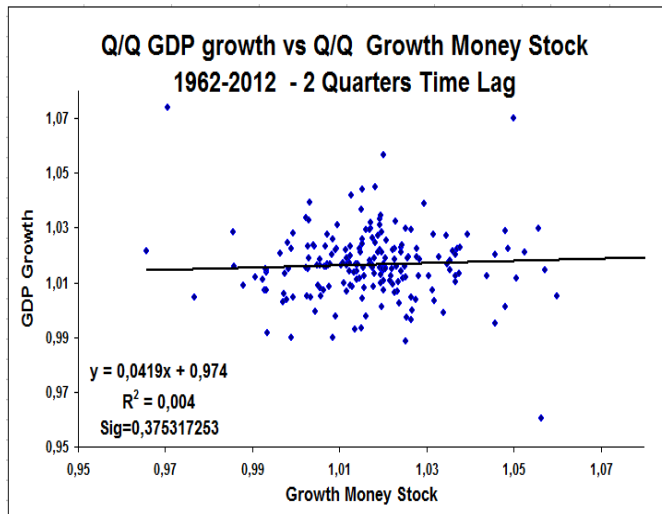
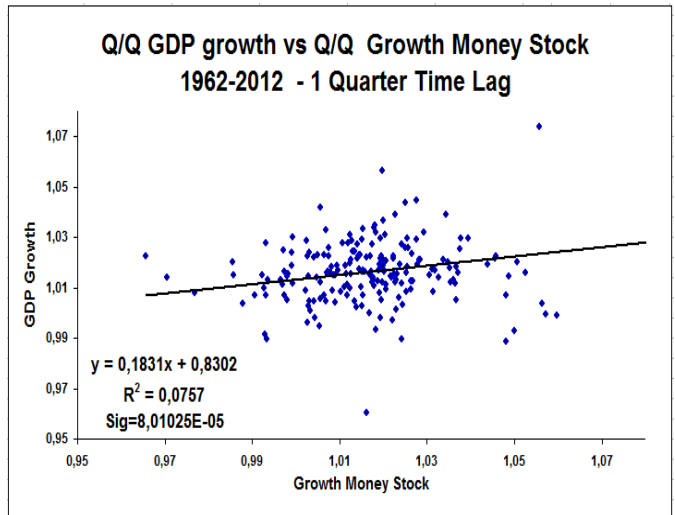
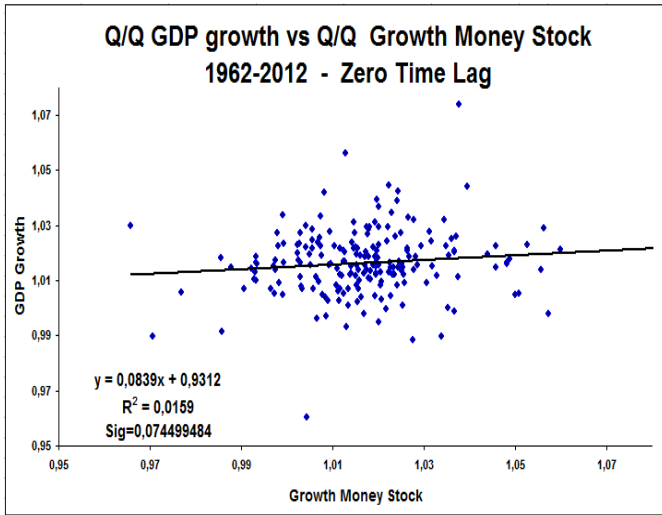
⁷ Robert E. Lucas, "*Monetary Neutrality*" Nobel Prize Lecture 1995

⁸ Friedrich August von Hayek, "*Studies in Philosophy*", *Politics and Economics*, p. 270–276.

CHARTS SECTION

Empirical research reveals that the relation between expansion of the money supply and GDP growth is extremely weak. Single correlations illustrate the absence of significant growth effect. The multiple regression analysis provides the evidence that the GDP growth attributable to expansion of the money supply is negligible and restricted to the quarter following the inflation. The minute growth effect is short lived and entirely evaporates after one quarter to be followed by a significant growth contraction three quarters later.

Single correlations illustrate the absence of significant growth effect



Hoarding behaviour as measured by money velocity is highly correlated with the interest rate level.

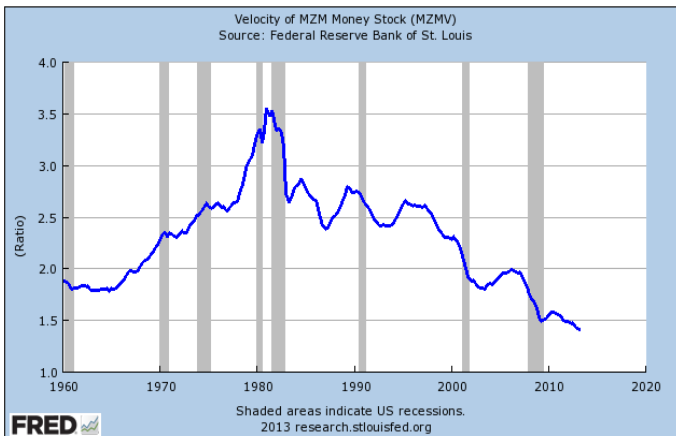


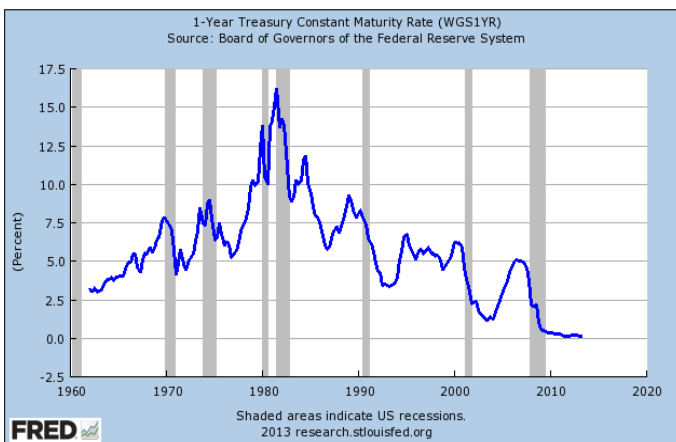
Chart 1: Velocity of MZM Money 1962-2013

Chart 2: One Year Treasury Yield 1962-2013

Chart 3: Ten Year Treasury Yield 1962-2013

Chart 4: Correlation Money Velocity and
10-Year treasury Yield 1962-2012

Data Source: [Federal Reserve of St Louis](http://www.federalreserve.gov)



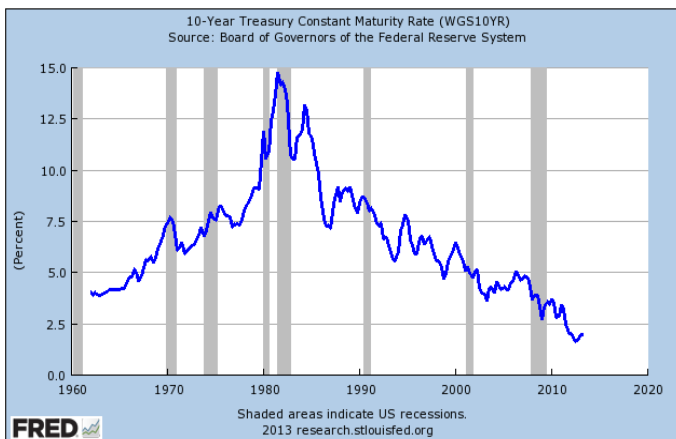
Counterproductive Monetary Policy, inspired by False Keynesian Assumptions.

Keynesian theory holds that hoarding levels and business cycles are steered by waves of optimism and pessimism, fuelled by highly irrational emotions of fear and greed. Keynes' empathic "*animal spirits*" assumption continues to inspire monetary policy worldwide.

Still fifty years of monetary data provide the evidence that the Keynesian assumption is false. Individual emotions of fear and greed prove too aleatory to provoke collective mood changes.

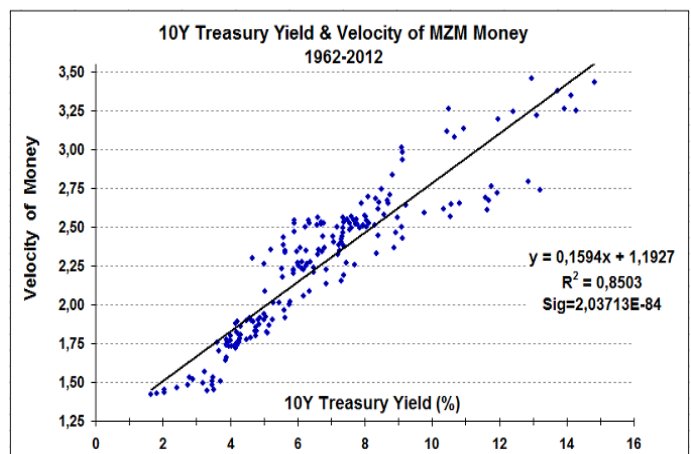
Monetary data do indeed demonstrate that, rather than by Keynesian emotions, hoarding behaviour is steered by the interest rate level.

The lower the opportunity cost of foregone yield, the more people (and banks) hoard cash reserves and the more money velocity declines. Hoarding levels prove indeed highly correlated with the yield level.



The Pearson correlation between money velocity and the key 10-year yield is near perfect and suggests that variations in the liquidity preference are attributable for 85% to the interest rate level. ($R^2=0.85$; $\text{Sig}=2^{E-84}$).

As a result, the Keynesian anti-cyclical monetary policy suppressing interest rates has a vital unintended consequence. Low interest rates have the adverse effect of stimulating hoarding and deepening recessions, obviously making such policy counterproductive



Problematic Deterioration of the FED's Balance Sheet

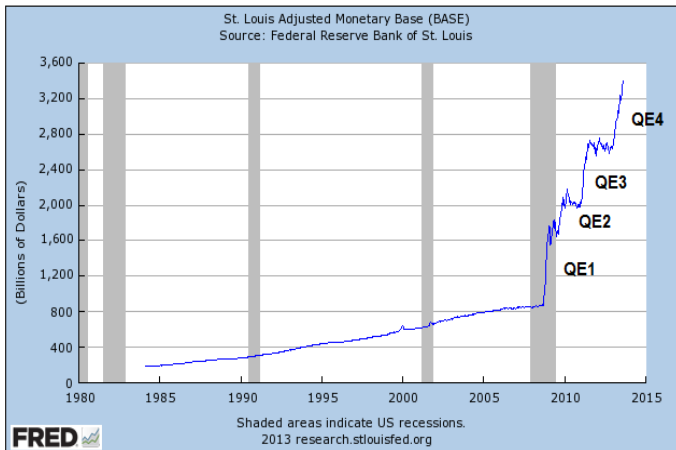


Chart 1: Monetary Base

In an aggressive response to the credit crisis, the Federal Reserve successively launched QE1, QE2, QE3 and QE4. In their fruitless effort to boost demand and lending the FED inflated the monetary base to absurd proportions. The monetary base rose by no less than 400% since 2008.

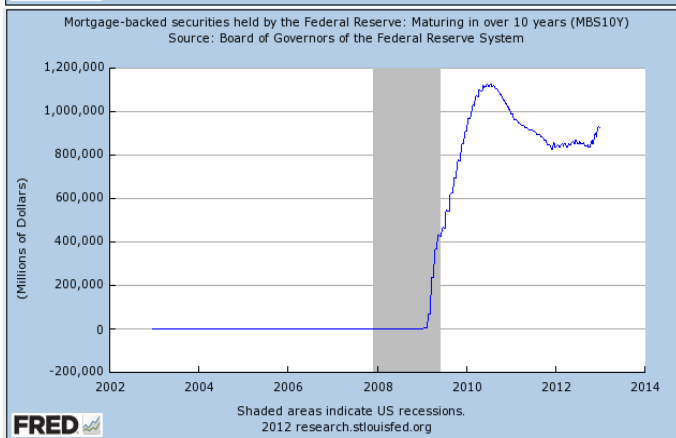


Chart 2: FED's Mortgage-backed securities

The composition of the Federal Reserve's balance sheet shifted dramatically since 2009, when asset purchases took the form of purchases of long term Treasuries and mortgage-backed securities. The quality and liquidity of both the FED and the ECB's assets have critically deteriorated in the last couple of years. Highly illiquid long term mortgage backed securities already stand for one third of the FED's assets. On the ECB's balance sheet low graded PIIGS debt has progressively replaced AAA securities.

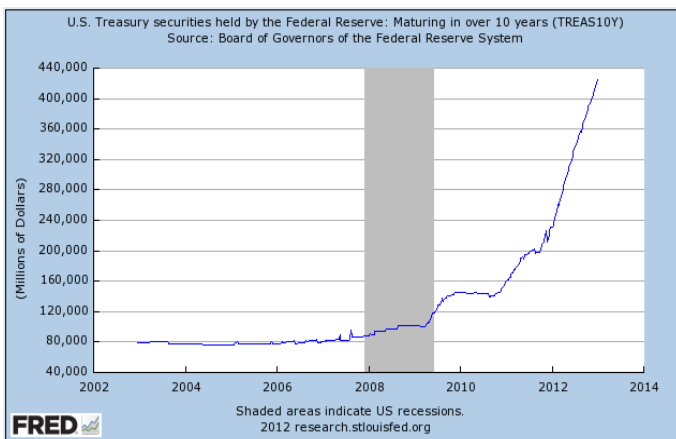


Chart 3: FED's Long term securities

During "Operation Twist" the FED replaced the usual short term treasuries by Long term securities. With yields at historical lows, finding a ready buyer for long term bonds could prove problematic in a rising rate environment.

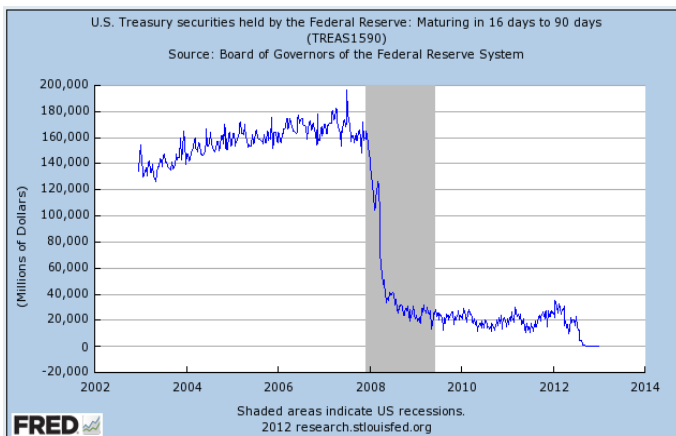


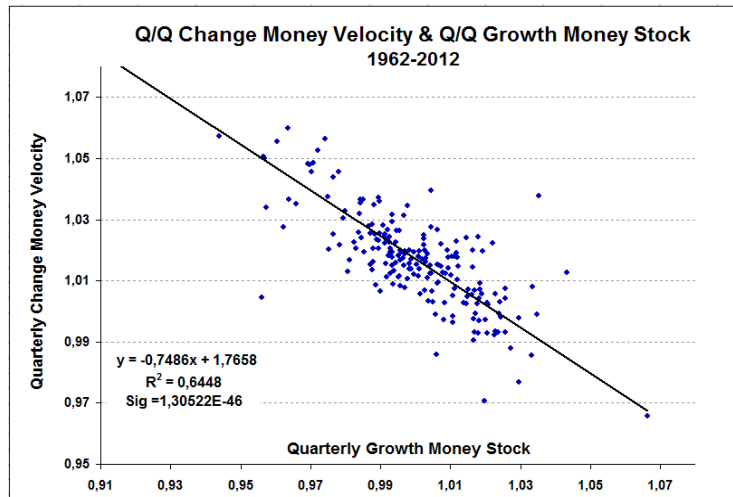
Chart 4: FED's Short term treasuries

The Fed no longer has any treasuries maturing in less than 90 days.

Source: [Federal Reserve of St Louis](http://www.federalreserve.gov)

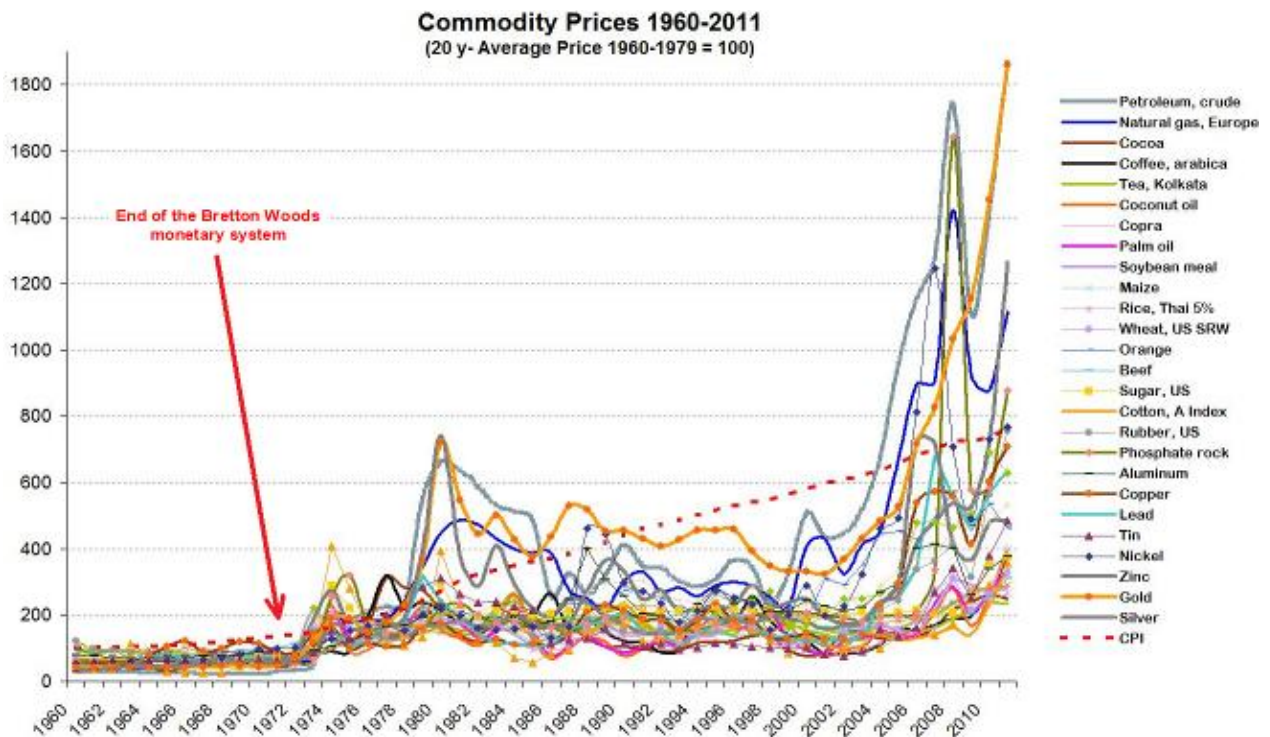
Money Velocity is inversely correlated with the Money supply making monetary expansion ineffective

The correlation between money stock inflation and the decline of the money velocity is remarkably strong (correlation: $R^2=0.64$; elasticity = - 0.75). As a consequence and contrary to monetarist belief, inflating the money stock does not automatically translate in effective spending and output growth as the monetary expansion is neutralised almost entirely by the simultaneous decline of the money velocity. Most of the cash injected in the economy is neither spent nor lent but hoarded.



The origins of the present crisis go back to 1971 when the Bretton Woods monetary system was abandoned and the final link between our currencies and gold was cut. Under the Bretton Woods monetary system commodity prices as well as the consumer price index remained remarkably flat. Since the convertibility was abrogated the new fiat monetary system allows for unlimited expansion of the money supply. Ever since extreme volatility ravages markets. Runaway commodity price inflation is accelerating rapidly from 2006 onwards.

Data source: [World Bank Commodity Price Data \(Pink Sheet\)](#)



DATA SECTION

Frequency Quarterly	10-Y Treasury Yield	Velocity of MZM Money	MZM Money Stock	GDP MZM x MZMV	Q/Q change MZM Velocity	Q/Q Growth Money Stock	Q/Q Growth GDP
date	DGS10	MZMV	MZM	GDP	Δ(MZMV)	Δ(MZM)	Δ(GDP)
1/04/1962	3,880	1,772	327,40	580,15	-	-	-
1/07/1962	3,990	1,769	331,90	587,13	0,998307	1,013745	1,012028
1/10/1962	3,900	1,746	337,00	588,40	0,986998	1,015366	1,002165
1/01/1963	3,890	1,736	344,60	598,23	0,994273	1,022552	1,016695
1/04/1963	3,960	1,729	351,30	607,40	0,995968	1,019443	1,015332
1/07/1963	4,030	1,735	357,90	620,96	1,003470	1,018787	1,022323
1/10/1963	4,120	1,733	362,90	628,91	0,998847	1,013970	1,012802
1/01/1964	4,180	1,749	369,30	645,91	1,009233	1,017636	1,027031
1/04/1964	4,200	1,746	375,10	654,92	0,998285	1,015705	1,013963
1/07/1964	4,190	1,741	382,30	665,58	0,997136	1,019195	1,016276
1/10/1964	4,170	1,720	390,10	670,97	0,987938	1,020403	1,008095
1/01/1965	4,200	1,740	397,60	691,82	1,011628	1,019226	1,031077
1/04/1965	4,210	1,745	404,00	704,98	1,002874	1,016097	1,019016
1/07/1965	4,250	1,757	410,10	720,55	1,006877	1,015099	1,022080
1/10/1965	4,480	1,773	418,30	741,65	1,009106	1,019995	1,029284
1/01/1966	4,770	1,802	426,70	768,91	1,016356	1,020081	1,036766
1/04/1966	4,780	1,827	427,90	781,77	1,013873	1,002812	1,016725
1/07/1966	5,150	1,868	424,60	793,15	1,022441	0,992288	1,014556
1/10/1966	5,000	1,902	423,30	805,12	1,018201	0,996938	1,015084
1/01/1967	4,580	1,918	424,50	814,19	1,008412	1,002835	1,011271
1/04/1967	4,830	1,902	429,30	816,53	0,991658	1,011307	1,002871
1/07/1967	5,250	1,901	437,60	831,88	0,999474	1,019334	1,018798
1/10/1967	5,640	1,913	444,30	849,95	1,006312	1,015311	1,021720
1/01/1968	5,610	1,962	447,60	878,19	1,025614	1,007427	1,033232
1/04/1968	5,750	1,998	450,80	900,70	1,018349	1,007149	1,025629
1/07/1968	5,460	2,011	455,10	915,21	1,006507	1,009539	1,016107
1/10/1968	5,770	2,020	460,70	930,61	1,004475	1,012305	1,016835
1/01/1969	6,170	2,053	467,40	959,57	1,016337	1,014543	1,031117
1/04/1969	6,360	2,083	468,60	976,09	1,014613	1,002567	1,017218
1/07/1969	6,860	2,134	467,70	998,07	1,024484	0,998079	1,022516
1/10/1969	7,310	2,151	466,40	1003,23	1,007966	0,997220	1,005165
1/01/1970	7,380	2,192	469,00	1028,05	1,019061	1,005575	1,024742
1/04/1970	7,710	2,257	458,10	1033,93	1,029653	0,976759	1,005723
1/07/1970	7,460	2,268	459,50	1042,15	1,004874	1,003056	1,007945
1/10/1970	6,850	2,228	469,90	1046,94	0,982363	1,022633	1,004597
1/01/1971	6,000	2,271	479,10	1088,04	1,019300	1,019579	1,039256
1/04/1971	6,250	2,250	492,60	1108,35	0,990753	1,028178	1,018670
1/07/1971	6,490	2,238	505,60	1131,53	0,994667	1,026391	1,020916
1/10/1971	5,890	2,223	515,40	1145,73	0,993298	1,019383	1,012551
1/01/1972	6,030	2,248	524,70	1179,53	1,011246	1,018044	1,029493
1/04/1972	6,140	2,274	536,70	1220,46	1,011566	1,022870	1,034701
1/07/1972	6,290	2,263	546,50	1236,73	0,995163	1,018260	1,013334
1/10/1972	6,370	2,273	561,60	1276,52	1,004419	1,027630	1,032171
1/01/1973	6,600	2,323	574,10	1333,63	1,021997	1,022258	1,044745
1/04/1973	6,810	2,365	576,50	1363,42	1,018080	1,004180	1,022336
1/07/1973	7,220	2,382	584,90	1393,23	1,007188	1,014571	1,021864
1/10/1973	6,760	2,439	584,50	1425,60	1,023929	0,999316	1,023229
1/01/1974	7,060	2,438	591,50	1442,08	0,999590	1,011976	1,011561
1/04/1974	7,540	2,483	597,00	1482,35	1,018458	1,009298	1,027928
1/07/1974	7,960	2,511	601,50	1510,37	1,011277	1,007538	1,018899
1/10/1974	7,670	2,541	607,70	1544,17	1,011947	1,010308	1,022378
1/01/1975	7,540	2,524	616,90	1557,06	0,993310	1,015139	1,008347
1/04/1975	8,050	2,502	632,40	1582,26	0,991284	1,025126	1,016190
1/07/1975	8,290	2,513	657,30	1651,79	1,004396	1,039374	1,043943
1/10/1975	8,060	2,543	668,80	1700,76	1,011938	1,017496	1,029643
1/01/1976	7,750	2,549	685,50	1747,34	1,002359	1,024970	1,027388
1/04/1976	7,770	2,522	710,90	1792,89	0,989408	1,037053	1,026068
1/07/1976	7,730	2,519	723,00	1821,24	0,998810	1,017021	1,015811
1/10/1976	7,180	2,502	744,20	1861,99	0,993251	1,029322	1,022376
1/01/1977	7,360	2,496	769,80	1921,42	0,997602	1,034399	1,031919
1/04/1977	7,370	2,532	788,40	1996,23	1,014423	1,024162	1,038934
1/07/1977	7,360	2,563	800,00	2050,40	1,012243	1,014713	1,027137
1/10/1977	7,600	2,570	816,00	2097,12	1,002731	1,020000	1,022786
1/01/1978	8,010	2,573	832,10	2140,99	1,001167	1,019730	1,020921
1/04/1978	8,330	2,684	842,70	2261,81	1,043140	1,012739	1,056429

1/07/1978	8,490	2,745	847,40	2326,11	1,022727	1,005577	1,028431
1/10/1978	8,820	2,837	854,30	2423,65	1,033515	1,008143	1,041931
1/01/1979	9,110	2,931	842,00	2467,90	1,033134	0,985602	1,018259
1/04/1979	9,120	2,983	844,00	2517,65	1,017741	1,002375	1,020159
1/07/1979	9,100	3,014	859,10	2589,33	1,010392	1,017891	1,028469
1/10/1979	10,440	3,119	858,20	2676,73	1,034837	0,998952	1,033753
1/01/1980	11,960	3,199	852,40	2726,83	1,025649	0,993242	1,018718
1/04/1980	10,480	3,262	827,30	2698,65	1,019694	0,970554	0,989667
1/07/1980	10,940	3,133	873,30	2736,05	0,960454	1,055603	1,013857
1/10/1980	12,410	3,243	906,20	2938,81	1,035110	1,037673	1,074106
1/01/1981	12,950	3,458	875,10	3026,10	1,066297	0,965681	1,029702
1/04/1981	13,740	3,382	915,00	3094,53	0,978022	1,045595	1,022615
1/07/1981	14,840	3,436	920,00	3161,12	1,015967	1,005464	1,021519
1/10/1981	14,120	3,351	938,50	3144,91	0,975262	1,020109	0,994873
1/01/1982	14,270	3,250	983,60	3196,70	0,969860	1,048055	1,016467
1/04/1982	13,940	3,262	986,90	3219,27	1,003692	1,003355	1,007060
1/07/1982	13,110	3,222	1000,20	3222,64	0,987738	1,013477	1,001049
1/10/1982	10,660	3,083	1050,20	3237,77	0,956859	1,049990	1,004692
1/01/1983	10,560	2,650	1213,20	3214,98	0,859552	1,155209	0,992962
1/04/1983	10,550	2,565	1341,30	3440,43	0,967925	1,105589	1,070126
1/07/1983	11,640	2,611	1373,80	3586,99	1,017934	1,024230	1,042598
1/10/1983	11,690	2,674	1377,90	3684,50	1,024129	1,002984	1,027185
1/01/1984	11,950	2,719	1387,30	3772,07	1,016829	1,006822	1,023766
1/04/1984	13,210	2,736	1424,10	3896,34	1,006252	1,026526	1,032944
1/07/1984	12,870	2,792	1428,00	3986,98	1,020468	1,002739	1,023262
1/10/1984	11,760	2,764	1437,20	3972,42	0,989971	1,006443	0,996349
1/01/1985	11,590	2,687	1512,60	4064,36	0,972142	1,052463	1,023143
1/04/1985	10,820	2,654	1555,60	4128,56	0,987719	1,028428	1,015797
1/07/1985	10,340	2,614	1612,50	4215,08	0,984928	1,036578	1,020955
1/10/1985	9,770	2,593	1655,60	4292,97	0,991966	1,026729	1,018480
1/01/1986	8,570	2,582	1683,50	4346,80	0,995758	1,016852	1,012538
1/04/1986	7,600	2,494	1742,80	4346,54	0,965918	1,035224	0,999942
1/07/1986	7,310	2,421	1827,60	4424,62	0,970730	1,048657	1,017963
1/10/1986	7,260	2,349	1911,10	4489,17	0,970260	1,045688	1,014590
1/01/1987	7,200	2,321	1977,50	4589,78	0,988080	1,034744	1,022410
1/04/1987	8,340	2,328	2011,50	4682,77	1,003016	1,017193	1,020261
1/07/1987	8,870	2,368	2010,20	4760,15	1,017182	0,999354	1,016525
1/10/1987	9,130	2,429	2018,40	4902,69	1,025760	1,004079	1,029944
1/01/1988	8,410	2,443	2016,30	4925,82	1,005764	0,998960	1,004717
1/04/1988	8,910	2,466	2044,90	5042,72	1,009415	1,014184	1,023733
1/07/1988	9,100	2,503	2059,70	5155,43	1,015004	1,007238	1,022350
1/10/1988	8,960	2,562	2045,70	5241,08	1,023572	0,993203	1,016614
1/01/1989	9,210	2,638	2041,40	5385,21	1,029664	0,997898	1,027500
1/04/1989	8,760	2,710	2016,50	5464,72	1,027293	0,987802	1,014763
1/07/1989	8,110	2,698	2033,30	5485,84	0,995572	1,008331	1,003866
1/10/1989	7,910	2,654	2085,70	5535,45	0,983692	1,025771	1,009042
1/01/1990	8,420	2,660	2135,20	5679,63	1,002261	1,023733	1,026047
1/04/1990	8,670	2,671	2167,50	5789,39	1,004135	1,015127	1,019325
1/07/1990	8,700	2,654	2187,00	5804,30	0,993635	1,008997	1,002575
1/10/1990	8,410	2,615	2229,20	5829,36	0,985305	1,019296	1,004317
1/01/1991	8,020	2,566	2266,80	5816,61	0,981262	1,016867	0,997813
1/04/1991	8,130	2,525	2338,90	5905,72	0,984022	1,031807	1,015321
1/07/1991	7,950	2,506	2396,10	6004,63	0,992475	1,024456	1,016747
1/10/1991	7,350	2,463	2445,60	6023,51	0,982841	1,020659	1,003145
1/01/1992	7,310	2,401	2537,30	6092,06	0,974827	1,037496	1,011379
1/04/1992	7,380	2,376	2628,70	6245,79	0,989588	1,036023	1,025235
1/07/1992	6,620	2,355	2687,10	6328,12	0,991162	1,022216	1,013182
1/10/1992	6,740	2,344	2758,00	6464,75	0,995329	1,026385	1,021591
1/01/1993	6,260	2,350	2776,90	6525,72	1,002560	1,006853	1,009430
1/04/1993	5,990	2,343	2798,60	6557,12	0,997021	1,007814	1,004812
1/07/1993	5,620	2,336	2851,40	6660,87	0,997012	1,018867	1,015823
1/10/1993	5,620	2,346	2887,00	6772,90	1,004281	1,012485	1,016819
1/01/1994	6,090	2,366	2922,50	6914,64	1,008525	1,012297	1,020926
1/04/1994	7,090	2,401	2936,60	7050,78	1,014793	1,004825	1,019689
1/07/1994	7,330	2,441	2929,10	7149,93	1,016660	0,997446	1,014063
1/10/1994	7,840	2,497	2909,90	7266,02	1,022941	0,993445	1,016236
1/01/1995	7,470	2,548	2889,40	7362,19	1,020425	0,992955	1,013236
1/04/1995	6,600	2,563	2848,10	7299,68	1,005887	0,985706	0,991509
1/07/1995	6,330	2,542	2914,30	7408,15	0,991806	1,023244	1,014860
1/10/1995	5,900	2,543	2958,80	7524,23	1,000393	1,015270	1,015669
1/01/1996	5,910	2,527	2998,30	7576,70	0,993708	1,013350	1,006974
1/04/1996	6,710	2,533	3063,60	7760,10	1,002374	1,021779	1,024205

1/07/1996	6,780	2,524	3117,10	7867,56	0,996447	1,017463	1,013848
1/10/1996	6,350	2,526	3153,10	7964,73	1,000792	1,011549	1,012351
1/01/1997	6,570	2,515	3216,30	8088,99	0,995645	1,020044	1,015602
1/04/1997	6,700	2,517	3273,90	8240,41	1,000795	1,017909	1,018718
1/07/1997	6,240	2,500	3332,00	8330,00	0,993246	1,017746	1,010872
1/10/1997	5,910	2,471	3415,90	8440,69	0,988400	1,025180	1,013288
1/01/1998	5,590	2,433	3498,30	8511,36	0,984622	1,024122	1,008373
1/04/1998	5,590	2,384	3612,70	8612,68	0,979860	1,032702	1,011903
1/07/1998	5,210	2,352	3713,10	8733,21	0,986577	1,027791	1,013995
1/10/1998	4,660	2,297	3875,70	8902,48	0,976616	1,043791	1,019383
1/01/1999	5,000	2,261	4012,90	9073,17	0,984327	1,035400	1,019173
1/04/1999	5,540	2,232	4115,30	9185,35	0,987174	1,025518	1,012364
1/07/1999	5,880	2,228	4197,20	9351,36	0,998208	1,019901	1,018074
1/10/1999	6,140	2,232	4268,30	9526,85	1,001795	1,016940	1,018766
1/01/2000	6,470	2,209	4376,60	9667,91	0,989695	1,025373	1,014807
1/04/2000	6,180	2,225	4472,90	9952,20	1,007243	1,022003	1,029406
1/07/2000	5,890	2,200	4510,80	9923,76	0,988764	1,008473	0,997142
1/10/2000	5,570	2,180	4619,90	10071,38	0,990909	1,024186	1,014876
1/01/2001	5,040	2,087	4776,10	9967,72	0,957339	1,033810	0,989707
1/04/2001	5,280	2,011	5061,70	10179,08	0,963584	1,059798	1,021204
1/07/2001	5,000	1,938	5247,20	10169,07	0,963700	1,036648	0,999017
1/10/2001	4,760	1,854	5513,00	10221,10	0,956656	1,050656	1,005116
1/01/2002	5,080	1,825	5714,50	10428,96	0,984358	1,036550	1,020336
1/04/2002	5,110	1,819	5799,90	10550,02	0,996712	1,014944	1,011608
1/07/2002	4,270	1,805	5905,80	10659,97	0,992303	1,018259	1,010422
1/10/2002	4,000	1,770	5982,00	10588,14	0,980609	1,012903	0,993262
1/01/2003	3,920	1,758	6170,30	10847,39	0,993220	1,031478	1,024485
1/04/2003	3,620	1,754	6236,20	10938,29	0,997725	1,010680	1,008381
1/07/2003	4,230	1,748	6430,80	11241,04	0,996579	1,031205	1,027677
1/10/2003	4,290	1,783	6413,80	11435,81	1,020023	0,997356	1,017326
1/01/2004	4,010	1,802	6390,80	11516,22	1,010656	0,996414	1,007032
1/04/2004	4,600	1,789	6522,00	11667,86	0,992786	1,020530	1,013167
1/07/2004	4,300	1,803	6603,70	11906,47	1,007826	1,012527	1,020450
1/10/2004	4,180	1,822	6637,10	12092,80	1,010538	1,005058	1,015649
1/01/2005	4,300	1,860	6651,70	12372,16	1,020856	1,002200	1,023102
1/04/2005	4,160	1,880	6640,10	12483,39	1,010753	0,998256	1,008990
1/07/2005	4,220	1,892	6700,40	12677,16	1,006383	1,009081	1,015522
1/10/2005	4,490	1,894	6794,00	12867,84	1,001057	1,013969	1,015041
1/01/2006	4,580	1,913	6873,20	13148,43	1,010032	1,011657	1,021806
1/04/2006	5,070	1,922	6917,30	13295,05	1,004705	1,006416	1,011151
1/07/2006	4,890	1,913	6997,70	13386,60	0,995317	1,011623	1,006886
1/10/2006	4,630	1,897	7106,70	13481,41	0,991636	1,015577	1,007082
1/01/2007	4,680	1,891	7247,00	13704,08	0,996837	1,019742	1,016517
1/04/2007	4,850	1,871	7413,80	13871,22	0,989424	1,023016	1,012197
1/07/2007	4,740	1,827	7600,80	13886,66	0,976483	1,025223	1,001113
1/10/2007	4,270	1,771	7966,50	14108,67	0,969349	1,048113	1,015987
1/01/2008	3,670	1,704	8185,60	13948,26	0,962168	1,027503	0,988630
1/04/2008	3,880	1,660	8646,10	14352,53	0,974178	1,056257	1,028983
1/07/2008	3,860	1,640	8785,80	14408,71	0,987952	1,016158	1,003915
1/10/2008	3,230	1,568	8824,30	13836,50	0,956098	1,004382	0,960287
1/01/2009	2,740	1,480	9329,00	13806,92	0,943878	1,057194	0,997862
1/04/2009	3,320	1,448	9530,60	13800,31	0,978378	1,021610	0,999521
1/07/2009	3,520	1,453	9635,80	14000,82	1,003453	1,011038	1,014529
1/10/2009	3,460	1,479	9566,00	14148,11	1,017894	0,992756	1,010521
1/01/2010	3,720	1,504	9500,30	14288,45	1,016903	0,993132	1,009919
1/04/2010	3,490	1,529	9411,00	14389,42	1,016622	0,990600	1,007066
1/07/2010	2,780	1,531	9464,50	14490,15	1,001308	1,005685	1,007000
1/10/2010	2,880	1,520	9649,00	14666,48	0,992815	1,019494	1,012169
1/01/2011	3,460	1,509	9768,70	14740,97	0,992763	1,012405	1,005079
1/04/2011	3,200	1,493	9969,80	14884,91	0,989397	1,020586	1,009765
1/07/2011	2,410	1,462	10274,10	15020,73	0,979236	1,030522	1,009125
1/10/2011	2,050	1,451	10507,00	15245,66	0,992476	1,022669	1,014974
1/01/2012	2,040	1,435	10753,60	15431,42	0,988973	1,023470	1,012184
1/04/2012	1,830	1,428	10873,30	15527,07	0,995122	1,011131	1,006199
1/07/2012	1,640	1,420	11044,50	15683,19	0,994398	1,015745	1,010055

Data source: [Federal Reserve of St Louis](#)