

# IS THERE A “LOW INTEREST RATE TRAP”?

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**Abstract.** *This article stylizes the monetary policy features applied during the chairmanship of Mr. Alan Greenspan and condenses statistical discussion into the “low interest rate trap” in the U.S. economy. Data from the U.S. in the decade prior to the 2008 financial crisis are used. A monetarist solution to the “low interest rate trap” is provided. The paper challenges the theoretical discussion on the Keynes’ interest rate – output relationship, and poses the question whether difference in investment returns would present a different picture in output growth.*

**Key words:** *interest rate, interest rate – output relationship*

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## 1. Introduction

The September 2008 financial meltdown in the U.S., which began with the collapse of the subprime mortgage industry in early 2007, eventually led to closures of such financial institutions as Lehman Brothers and Washington Mutual. Two schools of thoughts have emerged from recent analyses and policy responses. The financial market school advocated for the correction of financial fundamentals on such issues as financial regulations, bank liquidity, role of the CEO, moral hazards and corporate governance of financial institutions (International Monetary Fund, 2009; Financial Services Authority, 2009; Samwick, 2009; Trichet, 2009; French et al., 2010). On the contrary, the monetarist school reiterated the role of monetary policy and interest rates as the underlying factors in the 2008 financial crisis (Schwartz, 2009; Meltzer, 2009; Gokhale, Van Doren, 2009; Dorn, 2009). Supported by the U.S. monetary data, this paper examines and extends the monetarist view and argues conceptually the probable presence of a low interest rate trap in the U.S. economy.

Section 2 summarizes the various monetary policy features in the era under Chairman Alan Greenspan in the U.S. Federal Reserve (U.S Fed), and Section 3 looks at the U.S. statistical data in the decade prior to the 2008 financial crisis. Section 4 stylizes the US monetary policy behaviour and elaborates on the possibility of a “low interest rate trap”, which can conveniently be dubbed as the “Greenspan trap”. The section also ends

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by presenting a monetary solution to financial crises. Section 5 re-visits the Keynesian “interest rate – output” relationship and challenges some of the outcomes of the IS-LM model by making a distinction between the low and high interest rate movements that could lead to differences in the productivity of investments. The last section concludes the paper.

## **2. Monetary policy features**

The 2008 financial crisis has led to a renewed interest in whether the monetary policy operated through the Federal Fund Rate (FFR) instituted during Mr. Alan Greenspan’s era of chairmanship (July 1989 – August 2005) in the U.S. Federal Reserve (U.S. Fed) could explain the poor performance in the financial market. Studies have shown that there are five features in the U.S. monetary policy during the chairmanship of Mr. Alan Greenspan. Firstly, Greenspan practiced an interest rate smoothing policy that involved a stepwise interest rate trend movement, and often made known the direction of the trend such that investors could easily predict the trend movement. For example, the Federal Open Market Committee (FOMC) has changed the FFR 68 times from June 1989 to January 2006; 51 (16) of those were of 25 (50) basis points. The only exception was the 75 basis point increase on November 15, 1995. In terms of frequency, a total of 18 separate steps were taken in the monetary contraction exercise in 1988–1989. Shortly afterwards, the U.S. Fed took another 24 steps to lower the interest rate by 681 basis points. In 1999–2000, the U.S. Fed took a total of 7 steps to raise interest rates by 175 basis points, and another 11 steps to lower interest rates by 425 basis points after the dotcom bubble in mid-2000. These steps only included the prolonged periods when the pattern of the stepwise policy was especially conspicuous, and the few changes in the middle of the periods where there was no particular direction to the change in the Federal Fund Rate (e.g., an increase followed by a decrease of 0.25 percent within the period) are omitted.

Studies have pointed to the advantages of the interest rate smoothing that included the stability and certainty of the financial system (Bullard, Mitra, 2007; Doyle, 2006). Others have argued that Greenspan’s policy can be anticipated and the public can react to the monetary changes and that would lead the U.S. Fed to respond too slowly to real shocks. Consequently, inflation variability was greater than it otherwise would be, and the policy might actually introduce instability and volatility into the real economic sector (Lowe, Ellis, 1997; Caplin and Leahy, 1996; Cecchetti, 1996).

Secondly, Greenspan also followed the inflation targeting principle and acknowledged publicly its implicit priority for low long-run inflation (Mankiw, 2002; Blinder, Reis, 2005; Judd, Rudebusch, 1998; Goodfriend, 2005; Bernanke, Mishkin, 1997). Mr. Greenspan probably believed that interest rate can exercise an impact on inflation as output rises and that, according to the Keynes’ “interest rate – output” relationship, a fall

in interest rate ( $r\downarrow$ ) that led to a rise in investment ( $I\uparrow$ ) and subsequently in output ( $Y\uparrow$ ) would generate inflation ( $\pi\uparrow$ ) at the end of the process.

Mr. Greenspan has also practiced discretion in setting monetary policy. It has been argued that a pre-committed rule often produced an optimal solution (Blanchard, Fischer, 1989; Bryant et al., 1993, McCallum, 1988). On the contrary, arguments against discretion are the uncertainty facing policymakers and the time-inconsistency problem when setting monetary policy (Kydland, Prescott, 1977; Fischer, 1990; Barro, Gordon, 1983; Cukierman, 1992). The U.S. Fed under Greenspan has also followed the Taylor rule, although there were also periods of deviation when the U.S. Fed reacted to special macroeconomic developments (Taylor, 1992, 1993a, 1993b; Blinder, Reis, 2005; Yellen, 2004; Woodford, 2001; Mehra, Minton, 2007).

Mr. Greenspan's personalization of the monetary policy has even led to the discussion on the "Greenspan put" (Miller et al., 2002; Cecchetti et al., 2000), which is an ill-advised belief by the investors that Mr. Greenspan would definitely do something to save them if stock markets go down. Such a belief would act as a "put" to investors in the sense that they fell insured against downside risk by the U.S. Fed, which often took swift actions to prevent the market from falling but not to stop it from rising. For example, during the market crash of 1987 and the liquidity crunch of 1998, Mr. Greenspan acted swiftly to lower interest rates and pumped in liquidity to rescue the stock market.

### **3. What do the U.S. data show?**

The monthly U.S. data for the sample period that began in 1989 and ended before the burst of the financial crisis in September 2008, namely 1989.1–2008.7, are obtained from the DataStream and International Financial Statistics (IFS) data base. The monetary data are shown along with other relevant data on GDP, investment, prices and consumer confidence. The two monetary policy variables are the FFR and the M2 that showed the overall monetary movement. The monthly real GDP ( $Y$ ) and real investment data are constructed from the quarterly real GDP and real investment data by using the state space approach with the monthly industrial production data serving as the related interpolator variable. The two price indices are the U.S. Consumer Price Index (CPI) and the world price of oil (OPW) as the latter has increased drastically during the sample period. For example, the crude oil price had risen to an all-time high at US\$ 147.27 per barrel on July 11, 2008. The import price can be used as an indicator of the movement of CPI.

The two indicators of consumer confidence index in the 12-month interest rate higher and 12-month interest rate same can be used as proxy indicators of consumer behaviour and the dynamic response to interest rate expectation. The nominal economy is reflected in both the S&P500 that provides information on changes in the stock market and the total amount of home mortgages that reflects the demand for residential property. One can use the effective exchange rate as the unit of measure in capital flows, but an

alternative could be the use of the nominal exchange rate of the U.S. dollar against the British pound.

These twelve variables are presented in six different charts in Fig. 1; seven of these variables are expressed in the logarithm form. On real GDP and real investment, the recession in the US in the mid-1980s had resulted in a prolonged period of weakness, with the fall in both real GDP and real investment, which lasted until 1992. A sustained upward movement in the nominal exchange rate since 2002 could be seen. An apparent trend of capital outflow appeared due probably to the historical low level of FFR. The two consumer expectation variables tended to move in the opposite directions, though the consumer expectation variable with a higher interest rate had remained high at different periods and had fluctuated more than the consumer expectation variable. When considering the consumer confidence index interest rate higher in 12 months, one can see that the interest rate expectation of consumers was highly volatile at around 35 to 75 percent in the period from 1989 to 1993 when investors did not seem to have a definite expectation regarding the future interest rate.

The FFR chart showed two distinct and prolonged low interest rate periods in 1993–1995 and 2002–2004. A clear downward movement of the FFR can be seen in the period between 1989 and 1994, and the U.S. Fed lowered the FFR from 6 to 1.75 percent in 2001. The economic recovery in the U.S. began in 1992, and all variables showed a continuous rise, suggesting that the low interest rate policy then had successfully stimulated the U.S. economy. After the burst of the dotcom bubble in March 2000, however, the U.S. Fed took 11 steps to lower the interest rates. One can also note that significant changes in interest rate expectation often occurred in months ahead of the FFR movement, implying that the monetary policy was fully anticipated by investors months ahead.

By March 2001, the economy was in recession according to the National Bureau of Economic Research. An apparent downward movement of interest rate expectation can also be found in the period between 2001 and 2003. However, in the later part of the sample period, the adjustment on the FFR was not effective in controlling the economy overheating which probably started in 2004. The increase in the FFR from 1 to 1.25 percent on June 30, 2004, however, brought a two-year upward trend which ended in September 2006 and clearly resulted in an upward movement in all variables. This could be due to the full anticipation by investors as the high interest rate expectation movement remained steady in the period between 2004 and 2006, although one can alternatively interpret that the persistently low FFR in the period between 2002 and 2004 could have stimulated massive investment, and its impact on output and investment continued till 2006.

Both the U.S. stock markets and the total amount of home mortgage had turned bullish and had increased to a historical high level until early 2008. In the real estate market, the

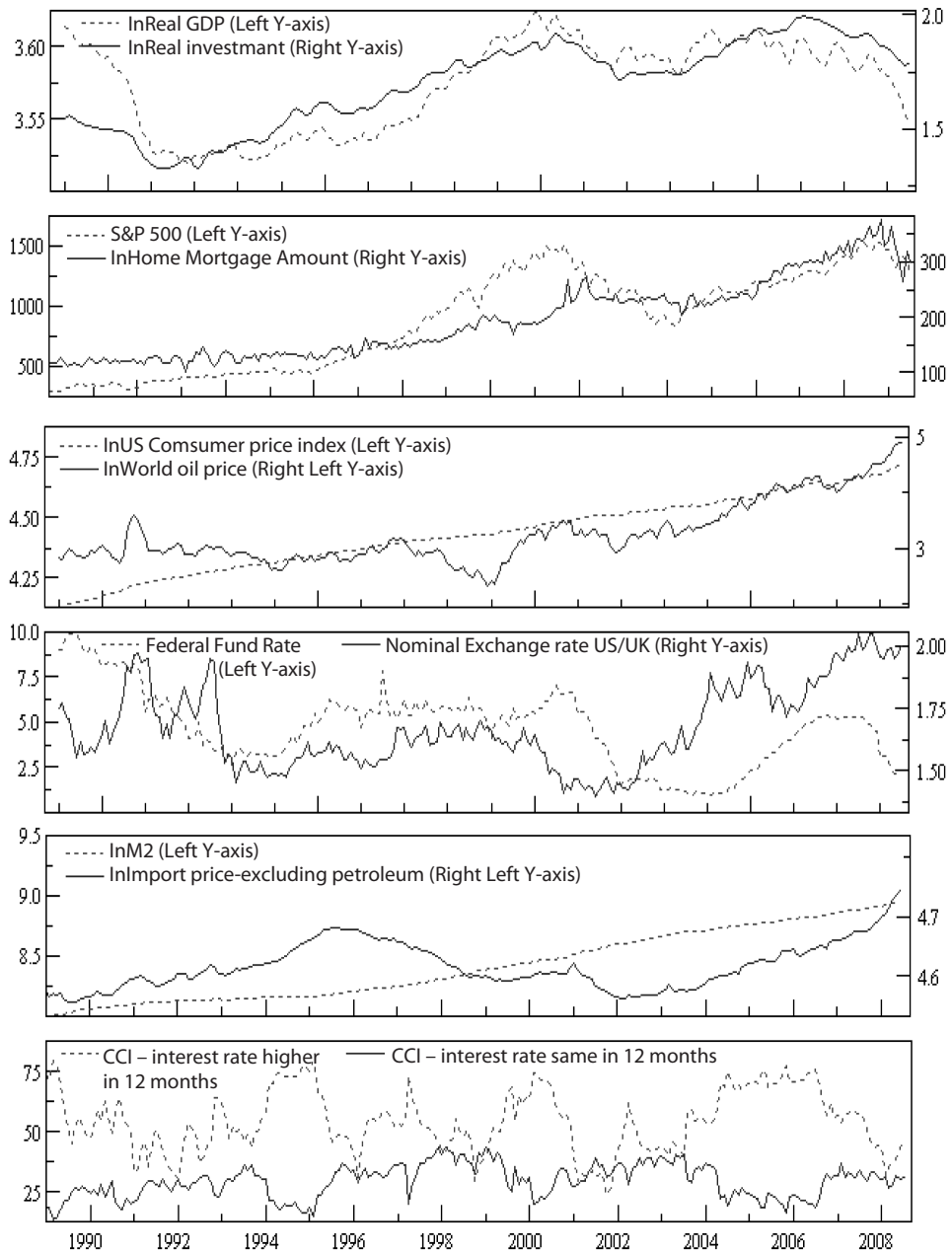


FIG. 1. The time series of U.S. variables

Community Reinvestment Act of 1995 was reformed to prevent ‘red-lining’, while the 1997 Taxpayer Relief Act exempted tax from profits made from sales of residences up to US\$ 0.5 million for married couples. The home ownership growth rates subsequently peaked in 2004, but signs of the end of the housing boom appeared in 2005, and the median price of new home fell by more than 3 percent in the first quarter of 2006. In early 2007, the problem of subprime mortgage began to surface when the Bear Stern closed one of its funds related to subprime mortgage in June. The Housing and Economic Recovery Act and the Emergency Economic Stabilization Act were eventually signed into law on July 30, 2008, and October 3, 2008, respectively.

The log CPI trend has shown a steady increase, and the trend seemed to follow that of the world oil price, which showed a steady trend in much of the 1990s but turned to a rapid increase since 1999. The log CPI and log M2 also produced a similar trend, while the log import price (excluding petroleum) had fallen since 1996 and dived considerably after 2001 before it revised upwards since 2004. One possible reason could be the large amount of low-cost import from China, which had reduced the import price substantially.

By merely looking at the U.S. data shown in Fig. 1, one can observe that the FFR does not move inversely with real investment in a number of periods. Indeed, they moved positively with each other. When the FFR fell in the early 1992, real investment dropped. On the contrary, real investment picked up in 1995–1996 when the FFR increased. Similar situations occurred in other cycles in 2002–2003 and 2005–2006.

A simple correlation test is shown in Table 1, with variables expressed in first difference. The growth of M2 correlated more with changes in the Fed Fund Rate and import price. Inflation (change of CPI) correlated more with oil price and import price than with the Fed Fund Rate. This simple finding suggests that inflation is related more with imports to U.S. than to movements in interest rate.

Figure 2 reproduces a comparison between the FFR movement of and real investment. One can see that the FFR did not follow the Keynes’ inverse relationship in the movement between interest rate and investment in a number of periods. Indeed, they

TABLE 1. Correlation between variables

	$\Delta M2$	<i>Inflation rate</i>	$\Delta FFR$	$\Delta Oil Price$	$\Delta Import Price$	$\Delta LUS/UK$
$\Delta M2$	1.000	-0.040	-0.134	-0.076	-0.135	-0.012
<i>Inflation rate</i>		1.000	0.054	0.415	0.317	-0.025
$\Delta FFR$			1.000	0.057	-0.085	0.005
$\Delta Oil price$				1.000	0.168	0.027
$\Delta Import price$					1.000	0.026
$\Delta LUS/UK$						1.000

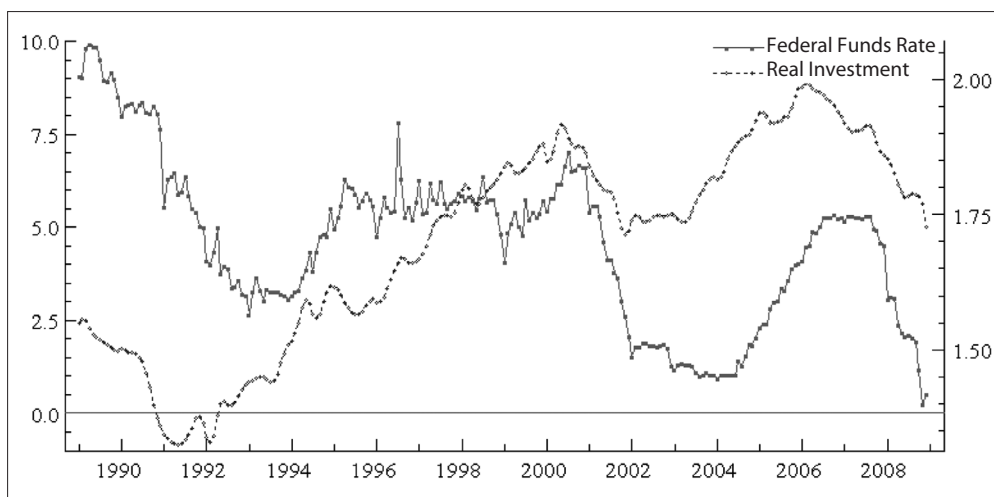


FIG. 2. The U.S. federal funds rate (%), LHS) and real investment (log, RHS)

moved positively with each other. When the FFR fell in the early 1992, for example, real investment dropped. On the contrary, real investment picked up in 1995–1996 when the FFR increased. Similar situations occurred in other cycles in the periods 2002–2003 and 2005–2006.

#### 4. The “Low Interest Rate Trap” hypothesis

Figure 3 hypothetically stylizes the steps and economic responses in Chairman Greenspan’s interest rate smoothing policy. When the interest rate fell and investors could fully anticipate Greenspan’s next round of interest rate movement, it would be rational for investors to act when the interest rate had fallen to its lowest possible level (Lucas, 1973, 1981; Muth, 1961; Sargent, Wallace, 1975; Modigliani, 1977). Thus, the initial fall in the interest rate may not lead to much of economic adjustment, and the anticipated monetary policy changes could often add “monetary noise” in the real sector (Barro, 1976).

The downward interest rate trend is shown by the arrow *a* in Fig. 3. When investors fully anticipate and recognize that the pattern of interest rate would fall further, the initial fall in interest rate may not have generated the expected rise in investment. As such, policymakers would have thought that further drop in interest rate was needed in order to stimulate investment. Knowing this, investors would have a further incentive to wait for further rate cuts. It was only when the interest rate had subsequently reached a very low level, say point *b* in Fig. 3, that investors would decide to borrow extensively. The extremely low interest rate now could encourage investment, including its unproductive, low-return and speculation varieties.

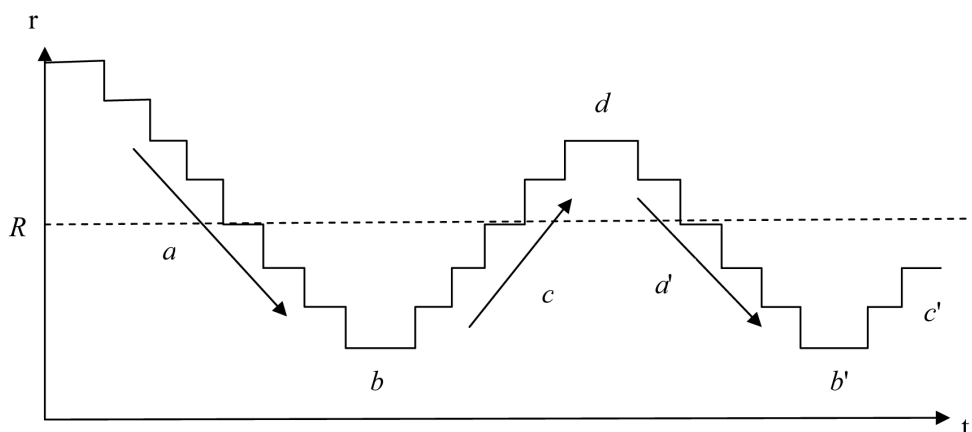


FIG. 3. The “low interest rate trap” hypothesis

With banks adopting a loose loan policy and after a time lag, however, the rapid increase in investment could soon produce signs of overheating, and the subsequent rise in inflation would call for a policy reversal, as indicated by the arrow *c* in Fig. 3. It was even possible that the initial reversal in interest rate would lead to a rise in investment as investors anticipated the end of a low interest regime, and a higher cost of borrowing was expected to come.

As the movement of interest rate was revised further upwards, the fall in investment might soon lower the economic activities. Furthermore, those who had borrowed at the lowest interest rate at *b* might now face a repayment problem. By the time the stepwise interest rate reached a high level at *d*, a potential economic slowdown emerged and the monetary authority would have to revise the interest rate downward; a new round of the stepwise downward movement in the interest rate policy was repeated, and investors would similarly repeat their behaviour, as is shown by the sequence of points *a'*, *b'* and *c'* in Fig. 3.

When investors could fully anticipate the interest rate movements, some fragile investors would surely have waited until the interest rate reached the lowest possible level where low-return, unproductive or risky investments could have been encouraged. For example, home ownership was encouraged during the second term of the Clinton administration in the U.S., but the subsequent low interest rate that meant to encourage home ownership could also have resulted in a rise of property price. It could have turned out that as the property price increased, the demand for property also increased as home buyers now feared that the property price would rise further. Some home buyers might not have the full financial creditability, but were prepared to take risk and hedge against the rising property price. Studies have shown that banks overextended their credits in the housing bubble between 2000 and 2007 (Shiller, 2008). At a persistently low interest rate, the rise in the demand for home ownership led to a rise in property price, and more



home buyers entered the market before the property price went higher, thus generating a self-fulfilling prophecy of a rising property demand and price spiral.

Fragile or low productivity investments were encouraged at the lowest interest rate if these investments were largely speculative in nature and failed to contribute to real output, and these fragile investments would face repayment difficulty once the interest rate was revised upwards. The threat of economic recession at a higher rate of interest would discourage the monetary authorities from keeping a high interest rate for too long, and instead they would prefer to maintain a prolonged period of a low interest rate that eventually encouraged more speculation and promoted only the nominal financial economy.

As such, the economy is “trapped” at the lowest interest rate level at points *b*, *b'* and so on, as, on the one hand, the investors had got used to the low interest rate and, on the other hand, the monetary authorities found it difficult to maintain a higher level of interest rate for long, e.g., at point *d* in Fig. 3; at a low interest rate, speculation could not be discouraged and, together with loose financial regulations and a strong consumption-based economic behaviour, economic shallowness cumulated to form the roots of a financial bubble. Mr. Greenspan’s stepwise interest rate smoothing policy was an unsustainable form of monetary policy, as the persistent and prolonged low interest rate policy helped rather to fuel financial instability than to build up a sustainable economic capacity.

The policy of stable money supply has been the monetarists’ answer to money and inflation fluctuations (Friedman, 1968; Dorn, Schwartz, 1987). Could a stable interest rate provide for a more stable investment environment and help avoid unnecessary economic fluctuations and unwanted speculations? There are a number of flaws in Greenspan’s interest rate smoothing policy. Firstly, despite the low interest rate that fuelled speculation and low return investment and the full anticipation on the part of the investors, investment becomes “Fed-led”, and business cycles simply responded to the Fed policy, contrasting sharply with the classical role of interest rate. On the contrary, for the private sector and investors to take a lead in the business cycle, a stable and rather high “interest rate anchor” as, for example, indicated by R and the dotted horizontal line in Fig. 3, is necessary. It would be appropriate for the policy makers to decide on an interest rate anchor such that the adoption of a steady interest rate would allow the business cycle to develop, evolve around and respond to the interest rate rather than changing the interest rate ostensibly to suit the business cycle. With the interest rate anchor, investment will take place according to profitability rather than as a borrowing opportunity. Another role the interest rate anchor plays is to ‘screen out’ unproductive investments, thus channeling the limited funds to high-return investments.

Inflation is normally treated as a short-term phenomenon, while the interest rate is aimed at influencing long-term activities. Inflation-targeting basically employs the

interest rate, which is regarded as a long-term economic variable, to deal with inflation which is often considered as a short-term phenomenon. The question is whether it is desirable to use a long-term economic variable to deal with a short-term economic phenomenon. Demand management through fiscal adjustment can be a more suitable short-term variable to correct inflation, while such a long-term variable as the interest rate serves typically to promote long-term investment which increases the output in a real economy. The adoption of a low interest rate regime could eventually foster the establishment of risky financial products, encourage misconduct in financial practice, promote a nominal bubble economy, distort the household economic behaviour between saving and consumption, allow financial agents to exploit the loose credit and loan policy, and finally to radiate financial instability to other world economies.

The interest rate smoothing policy may have a further contagion effect because as the interest rate chosen by the Fed will often be adopted subsequently by other world economies. Thus, the sequence of activities described in Fig. 3 would be “exported” to other world economies, leading to a domino effect across the world should financial instability arise. A stable interest rate anchor would be the starting point to rescue the world economy from potential instability resulting from the low productivity investment and excessive speculations.

The immediate post-crisis options taken up by the G7 central banks have concentrated mainly on the provision of liquidity by purchasing assets, commonly known as “quantity easing” (see, for example, Meier, 2009). The Fed has made it known that the exceptionally low interest rate would likely stay for “an extended period”. The dilemma facing G7 governments was, on the one hand, the need to provide stability and avoid extreme shocks and the early unwinding of monetary stimulus that might jeopardize the economic recovery; on the other hand, a prolonged intervention would further distort private incentives and delay market corrections. To rescue the “low interest rate trap”, the appropriate strategy is a balanced application of both fiscal policy and monetary policy.

The unwinding of the monetary stimulus, including the revision of the exceptionally low interest rate, could only be executed when the U.S. economy had recovered from the shocks generated by the crisis, which included reduction in banking troubles, normalcy in real estate development and a fall in unemployment.

## **5. Revisiting the Keynes’ interest–output relationship**

The basic Keynesian IS-LM economics model argues that the demand for investment (I) is negatively related to the level of interest rate. A fall in interest rate ( $r\downarrow$ ) provides a market signal to investors, and the resulting increase in investment ( $I\uparrow$ ) leads eventually to a rise in output ( $Y\uparrow$ ). The Keynesian chain of relationship is that investment, and

subsequently output, will rise when the interest rate falls, namely  $r \downarrow \rightarrow I \uparrow \rightarrow Y \uparrow$ . The New Keynesian debate has extended the interest rate – output relationship by taking into account the lag effect of interest rate on output (see, e.g. Carlin, Soskice, 2005).

However, Keynes' interest rate and output relationship was subsequently corrected by new situations. For example, the financial repression school (McKinnon, 1973; Shaw, 1973) argued that government intervention in bank loans and interest rate policy often ended up with distortions in the opportunity cost of loans. Financial liberalization advocates suggested that Keynes' interest rate – output relationship should be considered in two separate relationships between interest rate and investment ( $r \rightarrow I$ ) and between investment and output ( $I \rightarrow Y$ ). Secondly, the concept of investment also changed. A large number of financial innovations, such as stocks, bonds and derivatives, have been developed over the last decades, and many financial investments are no longer related to the real economy, but are speculative with a high degree of risk. Thus, one has to make a careful distinction between productive investment that could lead to growth in real output, and low-productive or unproductive investment that could result in the rise of bank loans and money supply but not increase the real output.

The simple Keynes'  $r \rightarrow I \rightarrow Y$  relationship should be re-examined. A lower  $r$  would surely encourage  $I$ , but whether  $I$  could positively impact  $Y$  would depend on the productivity and profitability of  $I$ . The difference in the cost of borrowing could yield different investment returns. Since the interest rate is in theory the cost of money, a low borrowing cost would allow investment with a low productivity to gain access to loans and funds. Hence, the low borrowing cost could permit low return investments to secure loans. Nonetheless, one can conceptually group or scale investments into productive investment (PI) which leads to an increase in real output, and unproductive investment (UI) which may increase the monetary flows and eventually inflation, but may not increase real output as loans could possibly be geared to speculative or low-productivity activities.

At a persistently low interest rate, money would become cheap, and investors would naturally encouraged to borrow. To compete, banks and financial institutions would impose an easier requirement on profitability and return on investment projects. Thus, the increase of unproductive investment would only enlarge the money supply ( $m$ ) that would end up with a higher inflation ( $\pi$ ) without a corresponding increase in real output. Thus, the chain of relationship in the case of unproductive investment becomes  $r \downarrow \rightarrow UI \uparrow \rightarrow m \uparrow \rightarrow \pi \uparrow$ .

The two separate relationships,  $r \rightarrow I$  and  $I \rightarrow Y$ , could pose a challenge to the understanding of the Keynesian relationship. The crucial point is the distinction between high return or productive investment and low return or unproductive investment. The former could survive in a high interest rate regime, while the latter could only emerge in a low interest rate regime. Thus, it is theoretically possible to have two separate investment behaviour relationships. In Fig. 4, where the vertical axis shows the rate

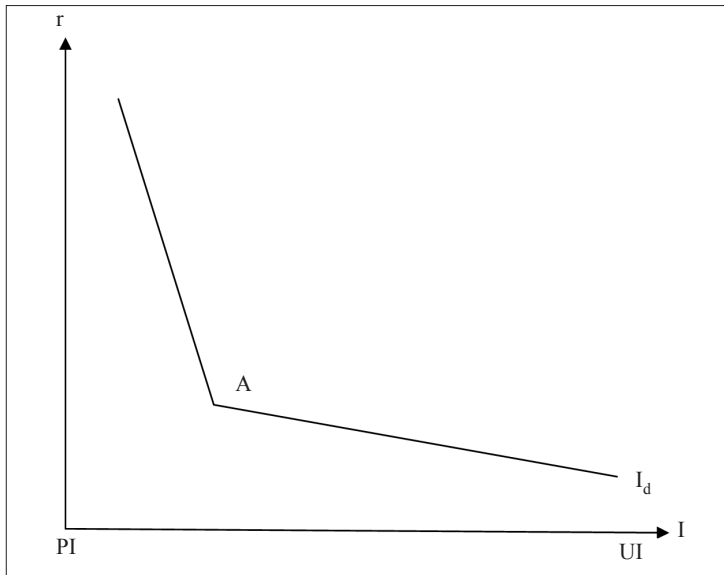


FIG. 4. The demand for investment under different behaviour

of interest, the further it is away from the origin the higher the rate of interest. On the horizontal axis, however, there is a distinction between productive and unproductive investments. The ranking of investment productivity begins from the most productive to the least productive as compared with the original. The nearer the investment is to the origin, the higher the level of productivity. On the contrary, the further it is from the origin, the lower is the level of investment productivity.

Consequently, investors who would borrow at a high interest rate must have investment projects that could produce a high return and high productivity investments. A low return of an unproductive investment would not be able to secure funding. When the interest rate was kept at a low level, a low return or unproductive investments could have an equal access to investment funding. This group of investors, however, could engage more in speculative activities that would not generate real output. Thus, it would be possible to argue that at a critical point of the demand for investment schedule ( $I_d$ ), for example, point A in Fig. 4, the investment behaviour changes, and as the interest rate declines further, the funding would have geared to low-return, unproductive investments. Thus, as the demand for investment increased, much of that would have a low return that would generate more loans and money supply than a real output. The rise in money supply through the increase in loans to low return investments would eventually fuel inflation.

When the demand for investment is translated into the IS relationship, the rise in productive investment would result in a rise in output, but the rise of investment that occurred at a low interest rate would generate inflation which would result of a fall in

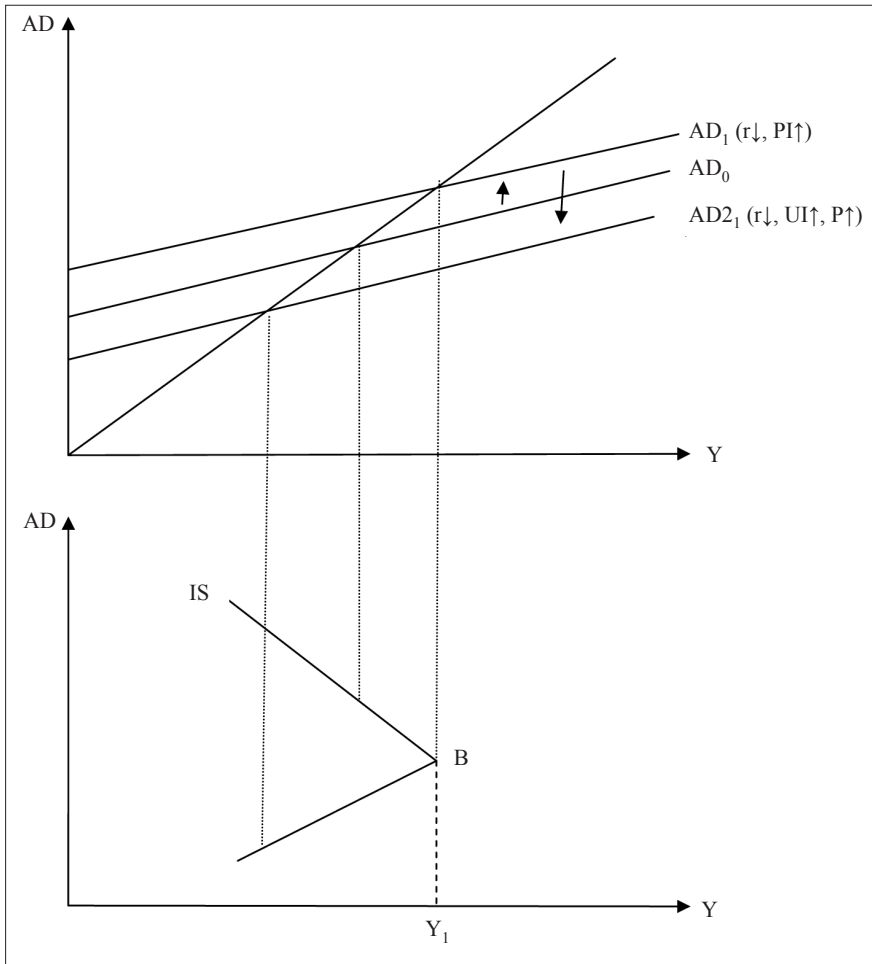


FIG. 5. The bent IS curve

output. The upper part of Fig. 5 shows the relationship between aggregate demand (AD) and real out (Y). Productive investment as a result of the fall in interest rate would shift up the AD curve, leading to a rise in output in the lower part of Fig. 5, which shows the IS curve. The rise in unproductive investment, which would result in inflation, however, would lower the level of AD and eventually the level of Y, as is shown by the fall in Y after point B is reached in the IS curve (Fig. 5).

The IS curve bent at point B suggests that the maximum output would be reached at output  $Y_1$ . Further investments in low return activities would generate only money supply and not output, and the subsequent rise in price as the loan has expanded could even lead to a fall in the output. Thus, the monetary policy would equally become ineffective after output  $Y_1$  is reached. The theoretical conclusion is that a change in investment

behaviour due to different levels of interest rates could back-fire as a prolonged low interest rate regime could simply lead to a rise in loans which would be geared to low return activities.

## **6. Conclusions**

Interest rate expectation plays an important role in the U.S. economy in the sample period, and the positive interest rate expectation shock encouraged not only investment but also speculation in the financial market. The response of economic variables to a monetary policy shock may not follow the conventional wisdom when the policy is fully anticipated. The anticipated upward movement in interest rate could encourage investors to borrow before the actual increase in interest rate, and the massive increase in investment could fuel speculation. It would be of interest to show whether the smoothing policy has played a responding role in the business cycles in the sample period of the U.S. economy.

Written in a simple language, the stylized analysis in this paper aims to direct the discussion and attention back to the problem of monetary policy uncertainties (Friedman, 1968; Poole, 1970; Romer and Romer, 1989; Brainard, 1967). Similarly to Friedman's (1948, 1960) idea of a steady money supply in controlling inflation, the unintended consequences of a possible "low interest rate trap" can be mitigated by applying a stable and steady interest rate policy. The discussion on the "low interest rate trap" does highlight an important monetary phenomenon. To start with, it does encourage low return investment and speculation. Investors with a full anticipation of the interest rate movement would react accordingly, resulting in a business cycle that builds around the policy determined by the policy makers. The economy is trapped in low interest rate regimes, as the upward revision would soon become recessionary. One should advocate for an effective but steady interest rate anchor so as to allow the business cycle to run its own course. The government would then at most need to fine-tune the interest rate anchor, should the business cycle deviate from the trend.

The Keynesian discussion on the demand for investment will need to be changed if there is a difference in the investment behaviour between high and low interest rate regimes. While a high interest rate would encourage a high return and productive investment, a low interest rate would stimulate a low return investment and speculative activities that would only lead to an increase in nominal loans and money supply but not in real output. The 2008 financial crisis in the U.S. did give rise to a number of issues for a new discussion and future analysis. One of them is the distinction between the financial and monetary causes of the financial crisis, and the other is the distinction between investment behaviour in the high interest rate regime versus the low interest rate regime. The U.S. experience can also be extended to the analysis of other financial crises in other economies. In conclusion, this paper is mainly statistical in nature, but it has raised a number of issues that deserve further academic and theoretical investigations.

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