Post Inflation Targeting Monetary Policy:
A Study of Britain, Japan and the United States

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There is now considerable disquiet about the appropriate monetary strategy that central banks should follow in the aftermath of the global financial crisis. Several influential commentators have called for the abandonment of inflation targeting. Empirical research examining three major economies demonstrates that inflation targeting was effective prior to the crisis and a more flexible form of targeting may still be appropriate after the crisis.

1. Introduction

In the January 31, 2013 issue of Financial Times, Charles Goodhart argued that the recovery from the Great Recession (GR) of 2007-2008 has been slow and disappointing. There are indications that central banks of major industrial countries are using different monetary policy strategy. For example, suggestion that Bank of England is moving towards targeting nominal income, Bank of Japan emphasising employment growth and the Federal Reserve setting a limit for unemployment are all indications of central banks direction monetary policy towards output and employment. Taking Goodhart's suggestion further, it is imperative to see how different types of targeting evolved prior to the GR.

Inflation targeting as a strategy for conducting monetary policy became popular among the industrial and developing countries during the decade of 1990s. The strategy for conducting monetary policy in the 1970s, 1980s and the 1990 respectively changed from money supply targeting, inflation control and central bank independence and inflation targeting. It is interesting to note that the change in the strategy occurred at the same time for the countries that followed the above monetary policy strategies.

Oechsle (2013) argues that "Krugmanite" is a strategy under which the central bank has the mandate to target some growth rate of nominal GDP. The central bank attempts to maintain the actual growth rate of nominal GDP within the target through the use of monetary instruments. Under this strategy, if because of some unexpected negative shocks, the target is missed, the central bank uses its instrument to maintain a higher future rate of growth.

The purpose of this paper is to examine the extent to which real sector targeting has replaced other forms of targeting in three major industrial countries. In Sections 2-4 the concept of targeting and different

forms of targeting are examined. Theoretical discussions and empirical results are presented in Section 5, and summary and concluding results are offered in Section 6.

2. Monetary Targeting

In conducting monetary policy some variables such as inflation, rate of growth output and unemployment rate are called final targets and some such as money supply, interest rate and exchange rate are called intermediate targets. The central bank attempts to influence the final targets by setting the intermediate targets.

For a successful targeting, an intermediate target must meet the following conditions:
  i.   The relationship between intermediate and final targets must be stable. If this condition is not met, changes in the intermediate target may not influence the final target or it may change the final target in an undesirable direction.
  ii. Data on the intermediate target must be available prior to the data on the final target. This condition allows the central bank to forecast the future changes in the final target by observing the behaviour of the intermediate target.
  iii. The intermediate target must be under the control of the central bank.

Monetary targeting was exercised during the 1970s for controlling inflation in Britain, United States, Canada, Australia and New Zealand. This procedure relied on Friedman Schwartz (1963) where the authors showed a long run close relationship between money and prices in the United States.

Monetary targeting adds to the credibility of the central bank and prevents inflationary consequences of a discretionary policy based on the choice between growth and inflation. Moreover, the existence of a target creates transparency in implementation of monetary policy and allows the privates sector to anticipate the direction of monetary policy.

The central bank cannot control both money and interest rate simultaneously. If money is controlled interest rate is left free and vice versa. Poole (1970) proposed conditions for choosing money or interest rate as an intermediate target. Poole assumed that the objective of the central bank is to minimize the deviation of output from its desired level.

Monetary targeting is preferable if the economy is subject to a real sector shock such as changes in consumption, investment or exports. Interest rate targeting is preferable if the source of instability is from the financial sector.

Monadjemi and Kearney (1990) showed that in the 1970s in the United States, United Kingdom, Canada, Germany and Australia monetary targeting was successful in reducing inflation. During the 1980s, financial innovations and financial deregulations caused a considerable instability in the velocity of money. Fluctuations in the velocity of money introduced several problems in conducting monetary targeting. For example, financial deregulations led to a significant expansion of bank deposits and the supply of money (money supply include bank deposits). An increase in the supply of money without a corresponding rise in nominal GDP led to a fall in velocity of money. Most of the above-mentioned countries suspended monetary targeting in the 1980s.

3. Exchange Rate Targeting

During the 1980s, several countries conducted monetary policy by targeting the exchange rate. Stability of the exchange rate is important particularly for countries that international trade comprises a large proportion of their aggregate economic activity.

In 1979, in the context of the European Monetary System (EMS), eight European countries decided to limit fluctuations of their exchange rates within ± 2.5 percent relative to the German Mark. EMS was successful in keeping the inflation rates of the member countries in line with the rate of inflation in Germany, which was the lowest in Europe. EMS actively continued operation until 1992 when a significant depreciation of the British Pound and an increasing limit of fluctuations to ± 15 percent automatically caused the breakdown of the system. Eventually the European Monetary Union and the single currency were introduced in 1999 and the European Central Bank (ECB) was assigned the task of managing euro's liquidity.

In the commodity producing countries, the exchange rate is highly correlated with the commodity prices. In these countries exchange rate targeting may cause problems that are similar to the Argentine (2001), Mexico, (1994) and Britain (1992). In these cases eventually the central bank floated the exchange rate.

4. Inflation Targeting

During the 1990s, some countries such as Australia, Brazil, Britain, Canada, Chilli, Norway, South Africa, Korea, and New Zealand commenced conducting monetary policy base on inflation targeting. In this procedure, the central bank attempts to conduct monetary policy such that the expected rate of inflation remains within a specified range. Countries that exercised inflation targeting were successful in keeping their rate of inflation within the targeted range.

The preference of price stability against growth and employment was demonstrated in Rogoff (1985). Rogoff argued that the society is better-off if the objective function of the central bank is different than the objective function of the society. In other words the monetary authorities must be conservative with an objective function that assigns higher weight to price stability than employment. Decisions made by a conservative central bank must be independent of the expansionary policies of the government. Alesina and Summers (1993) showed that over a decade, Germany and Switzerland with most independent central banks experienced lowest possible rate of inflation.

Preference of price stability over employment follows separate articles by Friedman (1968) and Phelps (1968). Both studies showed that an expansionary monetary policy increases employment in the short run but in the long run employment returns to the natural rate and inflation remains at a higher level. In other words, in the long run an expansionary monetary policy increases inflation without affecting unemployment. Kyland and Prescott (1977) society's welfare is improved if in conducting monetary policy the central bank follows a rule rather than discretion. The authors showed that conducting monetary policy based on a rule generates no inflation whereas a discretionary monetary policy produces positive inflation. Rogoff (1985) argues that in the absence of productivity shocks, inflation targeting is the best strategy because it has no trade-off between inflation and unemployment.

In Argentine one unit of local currency was set to one US dollar. This procedure reduced inflation but created banking crises. In 1994 Mexico attempted to limit fluctuations of peso against the US dollar. However, political turmoil and the loss of foreign exchange reserves forced the government to devalue the peso. In 1992 Britain was forced to leave the EMS fixed exchange rate system when Bank of England experienced heavy losses.

Inflation targeting is not suitable in the presence of a supply shock. In this case control of inflation is associated with a large drop in output and employment.

In inflation targeting by publicly announcing targets and monetary policy strategy the central bank becomes more transparent and responsible. Mishkin and Posen (1997) argued that those countries that implement inflation targeting must have developed financial markets, macroeconomic stability, an independent monetary policy and a credible monetary policy. Moreover, the central bank must not be committed to maintain the exchange rate.

The logic behind the inflation targeting is based on the long run policy ineffectiveness of monetary policy. In the long run monetary policy affects prices but not output.

The importance of maintaining an inflation target varies among different countries. At the top of the list is New Zealand where the governor of the central bank's job depends on the maintenance of the inflation targets. Inflation targeting is not sensitive to the terms of trade shocks because generally prices of food, energy and interest rate on mortgages are excluded from the consumer price index. Prices of these items are very volatile and cause changes in the aggregate supply curve.

Those economists who are against the inflation targeting such as Debelle and Fischer (1994) and Posen (1995) argue that in Germany and Switzerland inflation targeting was successful enforced at the cost of high unemployment. Recently most of the macroeconomists and central bankers believe that maintaining a low inflation target leads to macroeconomic stability in the long run. Supporters of inflation targeting are not in favour of zero inflation. They argue that since nominal wages are rigid downward, having a positive inflation is the only way to reduce real wages and create employment. Moreover, maintenance of a very low inflation target may lead to the dander of deflation. Bernanke and Mishkin (1997) argue that similar situation existed in Japan in the late 1990s.

Svensson (1999) identifies three features for inflation targeting:
   i.   Existence of a clear numerical target for inflation,
   ii.   Forecasts of inflation as a framework for conduction monetary policy,
   iii. High level of transparency and responsibility.

McCallum (1996) examined the success of inflation targeting in Canada, Britain, Sweden and New Zealand that conducted monetary policy in the context of inflation targeting in 199o to 1993. All of these

countries used consumer price index, excluding food and energy prices, as a measure of price level. McCallum argues that inflation targeting is preferable to the discretionary policy because in the latter method more attention is paid to the benefits of an expansionary policy than the costs of the policy.

McCallum showed that high rates of inflation that existed in the above mentioned countries in the 1970s and the 1980s, declined to 2 to 4 percent in the 1990s.

Among the developed and developing countries respectively New Zealand and Chilli were the first countries that commenced inflation targeting. Bosede (2004) showed that before the implementation of inflation targeting the average rate of inflation in the developed and the developing countries were 3.72 and 13.11 percent respectively. 12 months after the implementation both rates declined to 2.71 and 8.3 percent respectively.

5. Real Sector Targeting: Empirical Evidence

The choice between inflation targeting and real sector targeting is similar to the choice between fixing the price and letting the quantity be determined in the market or setting the quantity and letting the price to be freely determined. The authorities cannot set the price and quantity together at the same time. Historically, real sector targeting rather than inflation targeting became important when the economy was far away from the potential output and inflation is not a serious problem. Notable examples of real sector targeting are during the Great Depression of 1930s and the GR of 2007-2008.

Figures 1 and 2 show quarterly data on inflation and growth of real GDP for Japan, United Kingdom and United States, 1990- 2013.
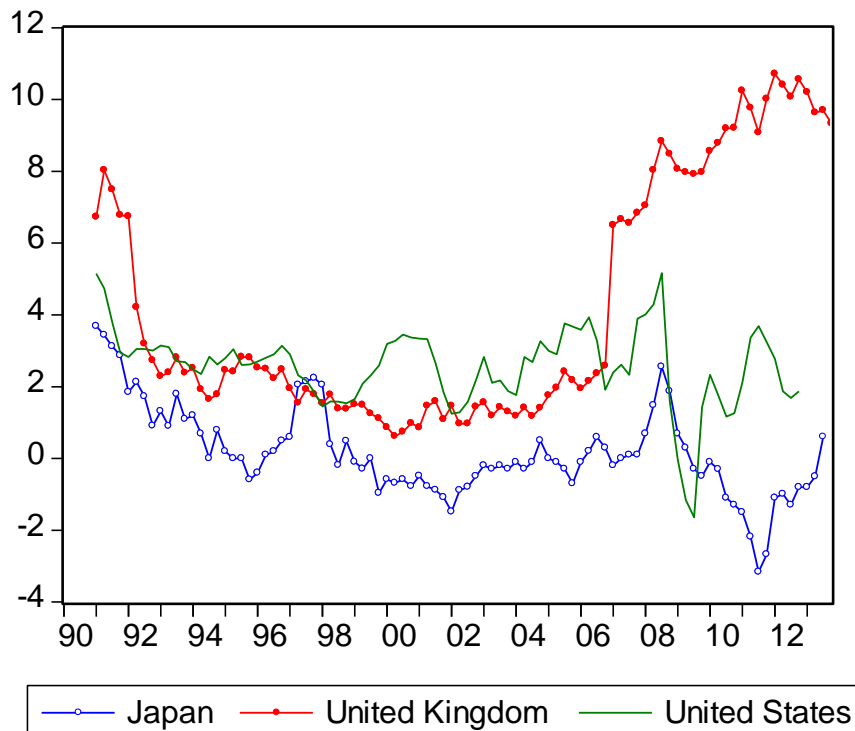

Figure 1*. Inflation Rates: Japan, United Kingdom, and United States*
Source: All of the series in this study including CPI, growth rates, government expenditure and nominal GDP for Japan, UK and US were collected from the OECD website under quarterly national income account.
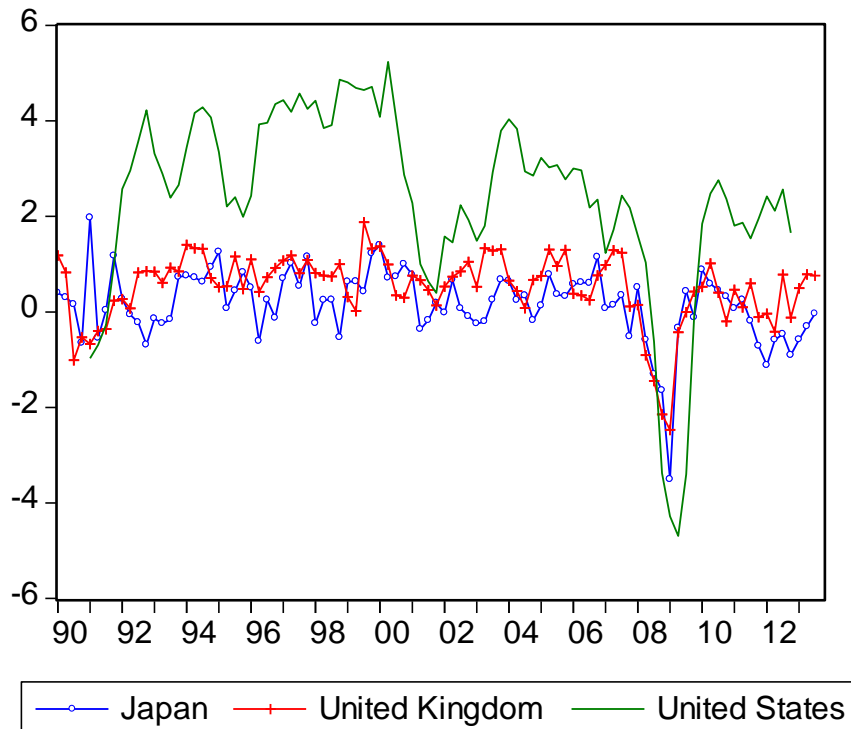
Figure 2. Growth Rates: Japan, United Kingdom, and United States

Figure 1 indicates stability of the inflation rates in three countries over roughly about 14 years (1992 to 2006). This period coincides with the period of inflation targeting in all of the three countries. However, the prolong period of tranquil inflation stability did not continue as inflation rates behaved erotically after 2006.

Figure 2 also shows a prolong period of about 17 to 18 years growth for three countries prior to the GR of 2007-2008. All of the three countries experienced a dramatic fall in their growth rates in 2008. Subsequently the fall of growth rates were reversed as governments' macroeconomic policies and rescue packages attempted to restore output and employment. The primary emphasis was placed on growth rather than inflation.

Further information regarding volatility of inflation and growth rates in three selected countries prior and after 2007 are reported in Tables 1and 2.

Table 1. Standard Deviations of Inflation Rates

Country	1992-2006	2007-2012
Japan	0.91	1.34
UK	0.93	1.33
USA	0.66	1.60

Table 2. Standard Deviations of Growth Rates

Country	1992-2006	2007-2012
Japan	0.49	0.93
UK	0.40	0.96
USA	1.12	2.31

Both tables show more volatile inflation and growth in the latter sub-period. Stability of the inflation rates during the earlier period is indicative of the inflation targeting which was less emphasised as output and employment significantly dropped during the GR in most of the affected countries.
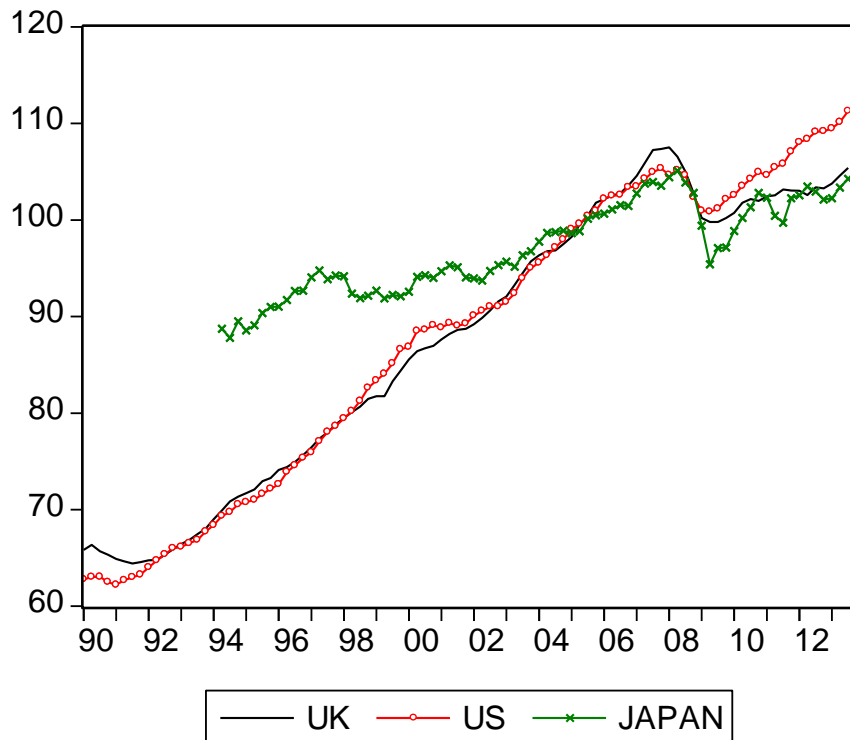
Figure 3. *General Government Expenditure: Japan, UK and USA*

Figure 3 shows that government expenditure in three countries rose steadily until beginning of the financial crises and then after a sharp fall started to rise again indicating fiscal authorities intention to compensate for the decline in output and employment. Figure 3 also suggests that falling government expenditure around 2007 may have contributed to the recession in three selected counties. Monadjemi (2011) argues that rising oil prices coupled with falling government expenditure contributed to the recession in the United States in 2008.

Further evidence on inflation targeting is provided using Hodrick-Prescott (1997) (HP) filter. HP method divides a time series into growth and cyclical components. Using a statistical filter, the growth component can be removed, leaving the cyclical component as deviations around a smooth trend line. Assume Y is a time series on real GDP or CPI.

$$Y = y_c + y_g$$

where y_c and y_g respectively are cyclical and growth components of Y. Assuming that inflation targeting was in effect 1990 – 2006, the cyclical component of CPI is not expected to deviate substantially from the trend line. However, with the abolition of inflation targeting after 2006, price level is uncontrolled and is expected to deviate from the trend line.

Applications of HP method for US, UK and Japan are presented in Figures 4 to 9.
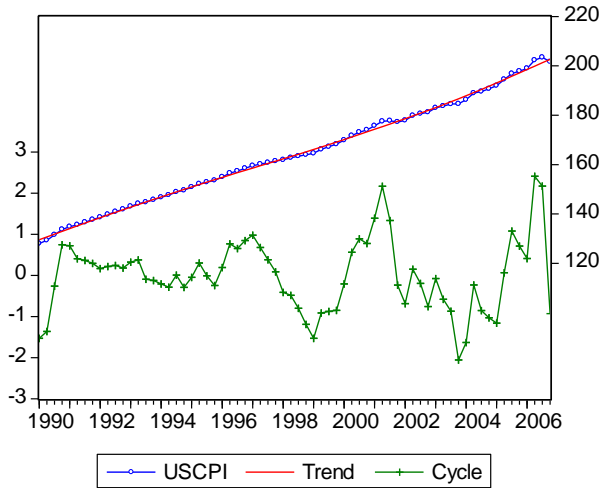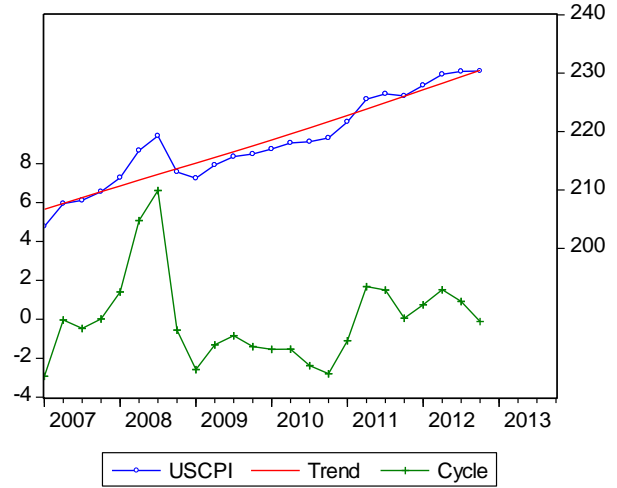
Figure 4. *Hodrick-Prescott Filter US CPI 1990-2006*

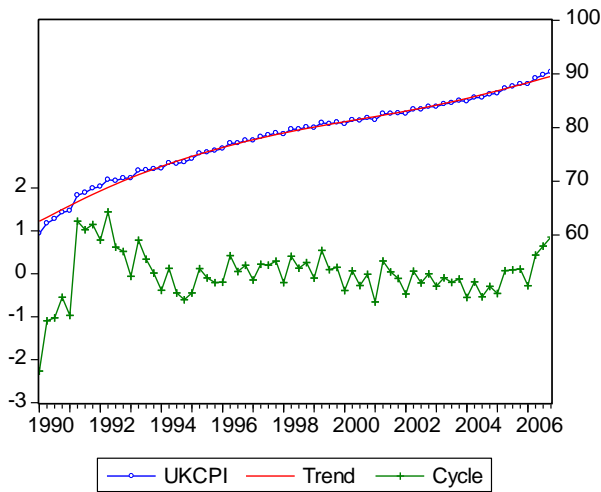

Figure 5. *Hodrick-Prescott Filter US CPI 2007-2013*
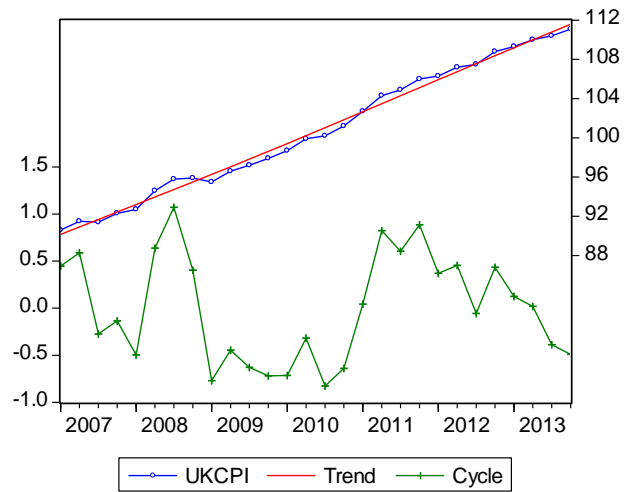

Figure 6. *Hodrick-Prescott Filter UK CPI 1990-2006*

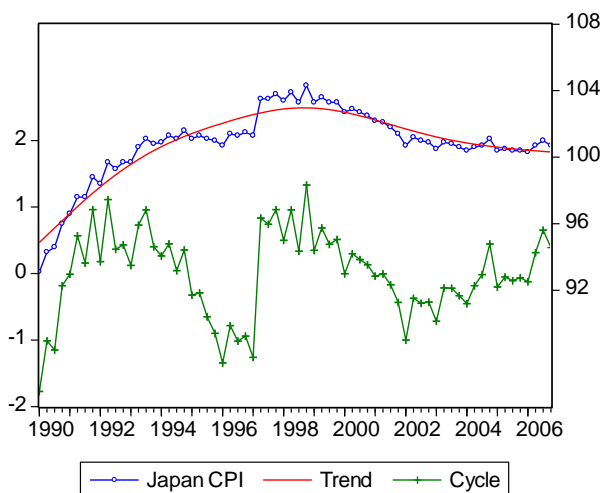*Figure 7*. *Hodrick-Prescott Filter UK CPI 2007-2013*

Figure 8. *Hodrick-Prescott Filter Japan CPI 1990-2006*
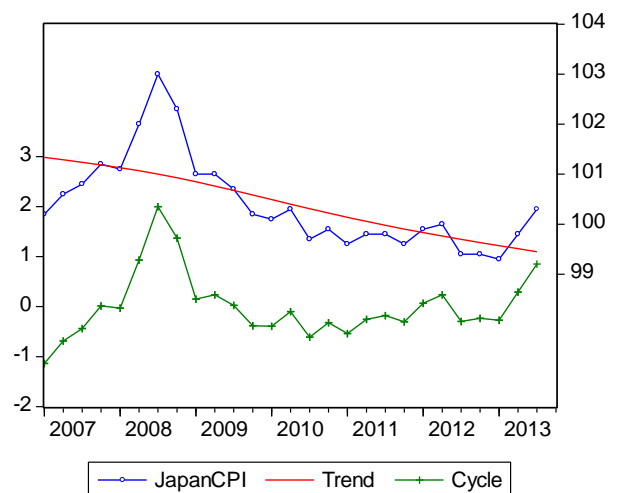

Figure 9. *Hodrick-Prescott Filter Japan CPI 2007-2013*

All of the figures indicate that prices moved much more closely along the trend lines in 1990 – 2006 than they did in the latter period after 2006. In cases of UK and US in the earlier period, CPIs moved almost completely on the trend lines. These figures provide further evidence on the stability of the prices in three countries enforced by the existence of inflation targeting prior to the GR.

6. Conclusions

Macroeconomic Policy is under review after the harrowing experiences with the global financial crisis and its lingering effects, especially in Europe. The International Monetary Fund, for example, is sponsoring several conferences on 'Rethinking Macro Policy'. There is considerable divergence of views about what the appropriate monetary targets should be after the crisis. A pivotal statement in this respect is the paper by Blanchard et al (2010). This study looks at "what we thought we knew" about the benefits of having just one target of inflation and how "we were wrong" and that "what we have learned from the crisis" is that central banks aimed for too low a level of inflation. The target should be raised to provide liquidity more broadly and to reduce the value of real debt when extensive financial deleveraging is occurring. Coming from an institution such as the International Monetary Fund, which had been a champion of inflation targeting in the past, really does indicate how much central bank behaviour has been transformed.

Michael Woodford (2012, 2013) suggests caution before we discard the conventional wisdom. Our empirical results support this proposition. Inflation targeting has provided stability for medium-run inflation expectations before the crisis and has prevented a deflationary spiral, during and after the crisis. What the profession has learned is that inflation stabilization, in itself, does not guarantee macroeconomic stability. A more flexible form of inflation targeting is called for. For example, a central bank may target nominal GDP in such a way that it hits an inflation target over a medium-run rather than in the short-run. Official interest rates might be lowered even if inflation targets are not being met at that point in time as long as nominal GDP is below or is trending below a nominal GDP target. Similarly, interest rates may be raised even if inflation targets are being met if there are indications of excessive debt accumulations, property bubbles and fear of financial crises. Monetary policy needs to be cognisant of not only inflation and real activity forecasts but also the spectre of financial crises.

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