

## Which is more reliable: Inflation Targeting, Price-Level Targeting or NGDP Level Targeting?

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The past few years have witnessed a revival of the idea of central bank targeting of Nominal GDP. I say revival because the idea had been discussed many years ago, most notably by James Meade in his 1977 Nobel Lecture: The Meaning of “Internal Balance”. Interestingly, long before inflation targeting became *de rigueur*, James Meade thought it dangerous:

*Earlier I spoke of 'price stability' as being one of the components of 'internal balance'. Yet in the outline which I have just given of a possible distribution of responsibilities no one is directly responsible for price stability. **To make price stability itself the objective of demand management would be very dangerous. If there were an upward pressure on prices because the prices of imports had risen or because indirect taxes had been raised, the maintenance of price stability would require an offsetting absolute reduction in domestic money wage costs; and who knows what levels of depression and unemployment it might be necessary consciously to engineer in order to achieve such a result?** This particular danger might be avoided by choice of a price index for stabilisation which excluded both indirect taxes and the price of imports; but even so, the stabilisation of such a price index would be very dangerous. If any remodelled wage-fixing arrangements were not working perfectly, - and it would be foolhardy to assume a perfect performance - a very moderate excessive upward pressure on money wage rates and so on costs might cause a very great reduction in output and employment if there were no rise in selling prices so that the whole of the impact of the increased money costs was taken on profit margins. If, however, it was total money incomes which were stabilized, a much more moderate decline in employment combined with a moderate rise in prices would serve to maintain the uninflated total of money incomes.*

Flash forward thirty years to 2007 and the “danger” materializes under Bernanke Chairmanship of the Fed. And this mostly happens because Bernanke was known as an ardent defender of inflation targeting and would likely act accordingly.

Later in the Lecture he proposes NGDP Level Targeting

*I have told this particular story simply to make the point that the choice between fiscal action and monetary action must often depend upon basic policy issues which should certainly be the responsibility of the government rather than of any independent monetary authority. **Perhaps the best compromise is an independent monetary authority charged so to manage the money supply and the market rate of interest as to maintain the growth of total money income on its 5-per-cent-per-annum target path, after taking into account whatever fiscal policies the government may adopt.** One would hope, of course, that there would be a suitable discussion of their plans and policies between the government and the monetary authority; but the latter would be given an ultimately independent duty and independent choice of monetary policy for keeping total money incomes on their target path.*

However, more than ten years after being deemed “dangerous”, in 1989 the Reserve Bank of New Zealand was charged, by the Reserve Bank Act, to pursue price stability, defined as an

inflation target. The key aspects of the policy framework were (1) the establishment, in discussions between the Reserve Bank and the government, of a means to measure the Bank's performance (the inflation target); (2) the grant to the Reserve Bank of the powers to pursue its assigned goal without government interference (operational independence); and (3) a means to establish accountability (through making the target public and holding the Governor of the Reserve Bank responsible for achieving it).

The idea spread quickly, and soon the central banks of Chile, Canada, Sweden Australia and UK formally adopted "inflation targeting".

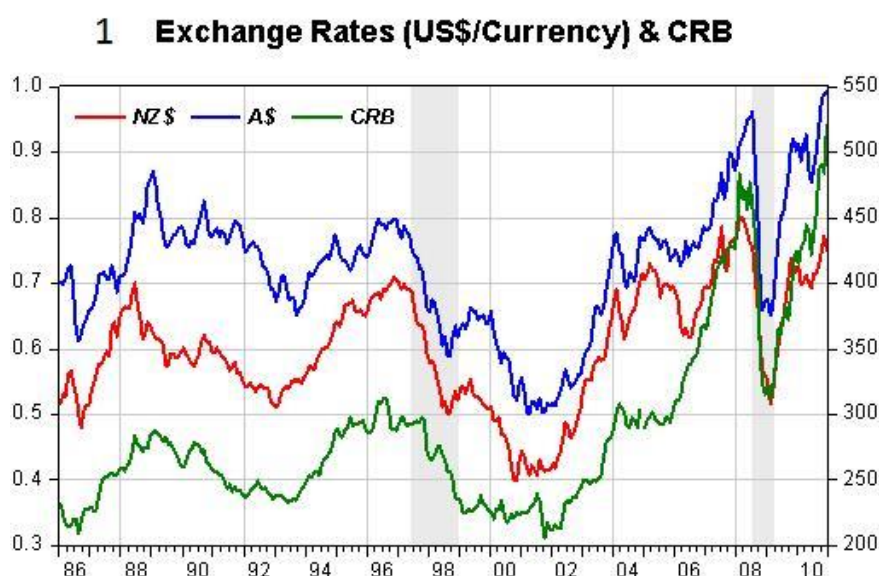
The rest of this paper examines different situations that are consistent with Meade's 1977 conjectures on the "relative virtues" of "inflation targeting" and "NGDP Level targeting".

### **New Zealand and Australia**

The "danger" alluded to by James Meade in 1977 soon cropped up. And central banks that pursued inflation targeting more tenaciously found themselves in trouble. A good case study is provided by the Reserve Banks of New Zealand and Australia during the Asia crisis of 1997-98.

How did these two economies compare in the conduct of monetary policy, remembering that both adopt the "inflation targeting" approach to monetary policy?

The first picture gives a good characterization of both countries, showing the long running close relationship of their exchange rates against the dollar and commodity price index (CRB). It's hard to distinguish exchange rate movements between the two countries.



Although hard to distinguish, the interpretation of this process by the Reserve Banks of each country was very different in the late 1990's. At the time, the Reserve Bank of New Zealand adhered to a strict Monetary Conditions Indicator (MCI) according to which any depreciation of the NZ\$ had an expansionary/inflationary impact (i.e. tantamount to policy "easing"). The Reserve Bank of Australia was much more pragmatic, trying to interpret the "nature" of the

shock, in this case a negative shock to the terms of trade from the Asia Crisis, which tended to be contractionary/deflationary.

Let's pause and look at their respective monetary policy statements.

#### New Zealand

The Reserve Bank uses monetary policy **to maintain price stability as defined in the Policy Targets Agreement (PTA). The current PTA requires the Bank to keep inflation between 1 and 3 percent on average over the medium term, with a focus on keeping future average inflation near the 2 percent target midpoint.** The Bank implements monetary policy by setting the Official Cash Rate (OCR), which is reviewed eight times a year.

#### Australia

The Reserve Bank is responsible for Australia's monetary policy. Monetary policy involves setting the interest rate on overnight loans in the money market ('the cash rate'). The cash rate influences other interest rates in the economy, affecting the behaviour of borrowers and lenders, economic activity and ultimately the rate of inflation.

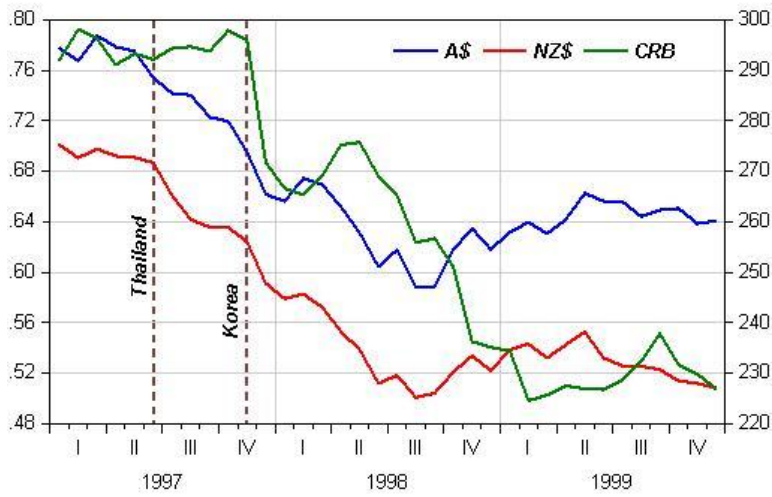
In determining monetary policy, the Bank has a **duty to maintain price stability, full employment, and the economic prosperity and welfare of the Australian people.** To achieve these statutory objectives, the Bank has an 'inflation target' and seeks to keep consumer price inflation in the economy to 2–3 per cent, on average, over the medium term. Controlling inflation preserves the value of money and encourages strong and sustainable growth in the economy over the longer term.

While New Zealand's 'purpose' is solely concerned with the inflation target, Australia mentions, in addition, "economic prosperity and welfare of the Australian people."

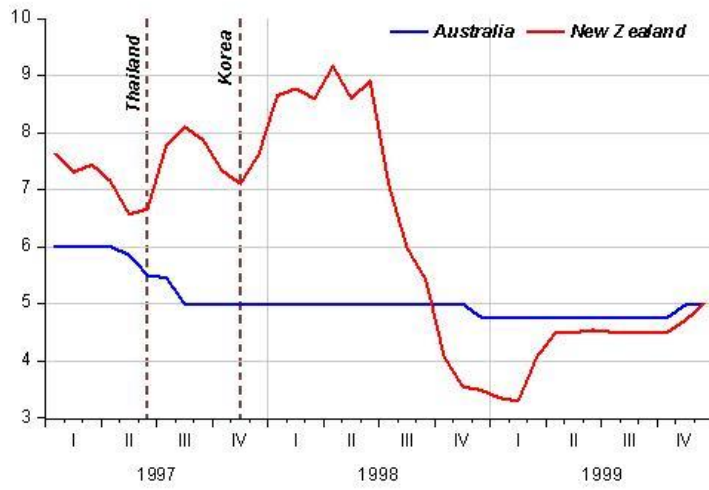
They both say that they implement monetary policy by juggling the cash rate. So let's check who 'juggled best'.

The following set of pictures show the behavior, for the period under study, of exchange rates and commodity prices, the monetary policy action described by the policy rate and what happened to real growth and inflation (headline and core) in both countries. No contest, Australia "wins" hands down!

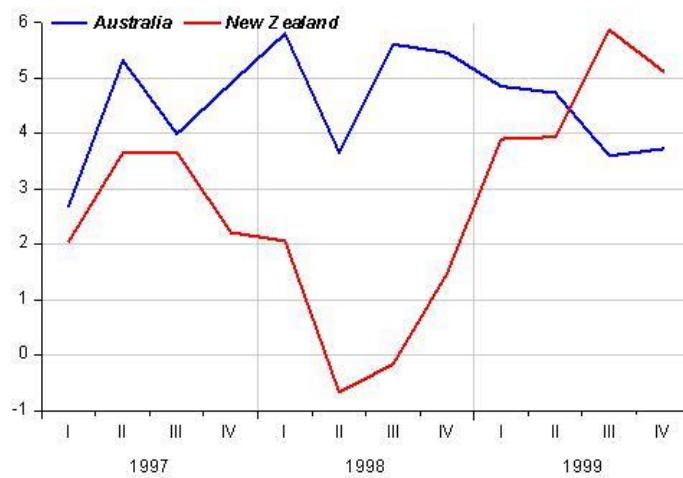
## 2 Exchange Rates (US\$/Currency) & CRB



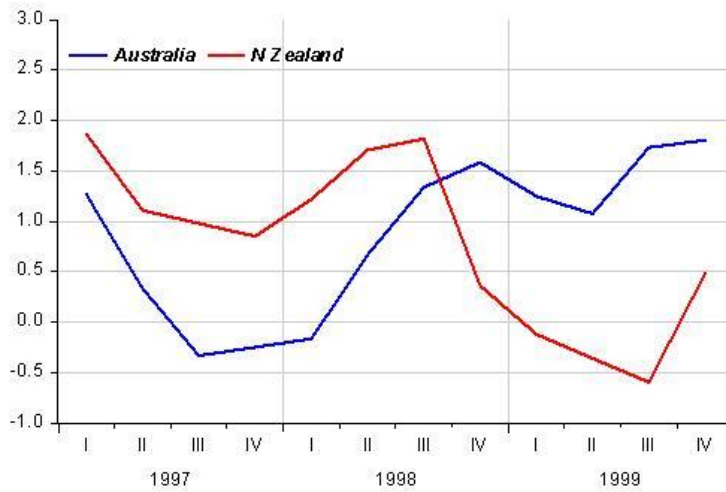
## 3 Policy Rate



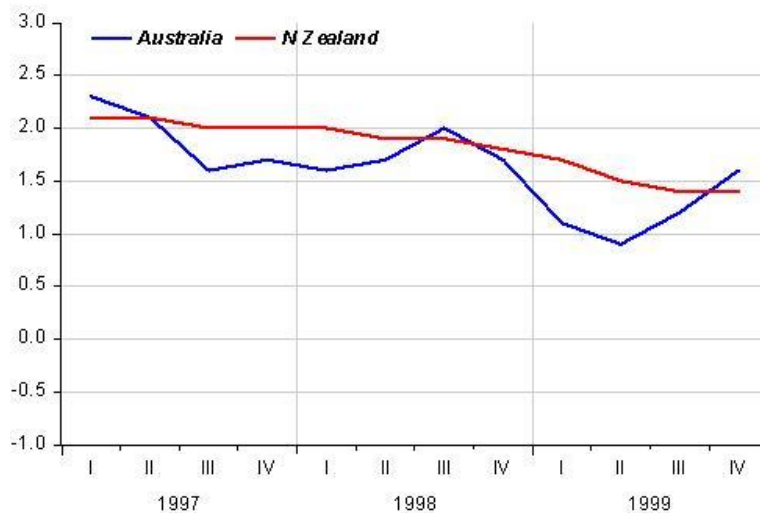
## 4 RGDP Growth



## 5 Headline Inflation

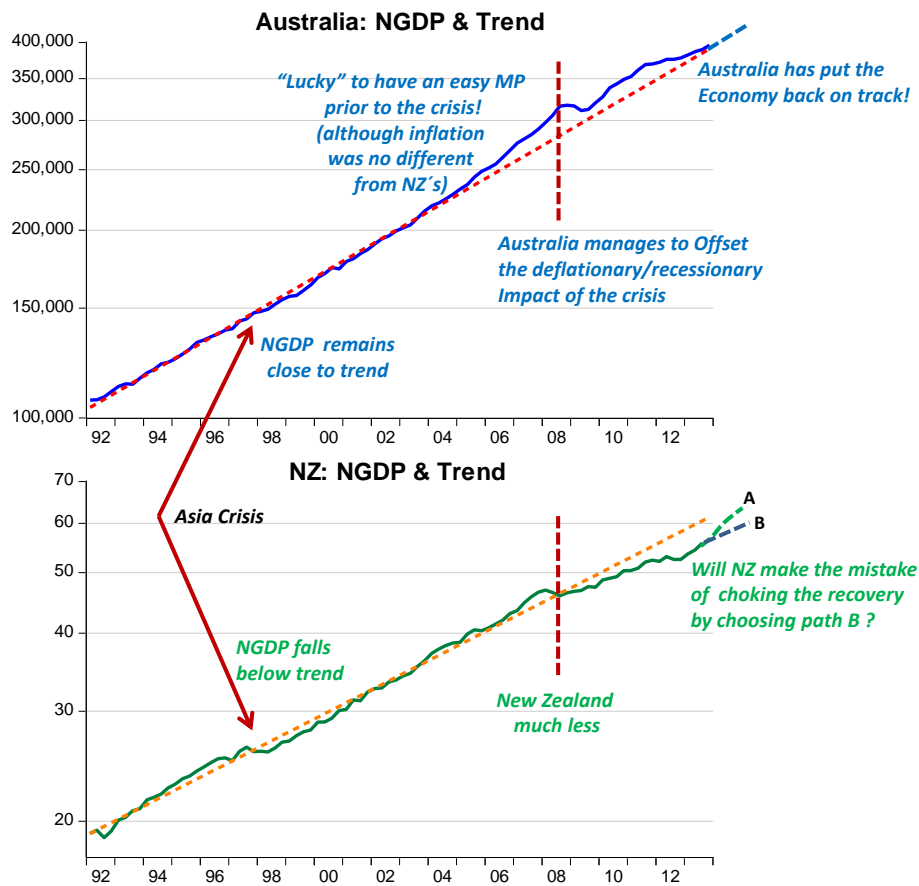


## 6 Core Inflation



The Asia crisis provides a marvelous example of monetary policy competence by Australia. Both countries were victims of the same exogenous shock (a strong drop in commodity prices). That's a real and deflationary shock; nevertheless New Zealand thought that the resulting depreciation of the Kiwi dollar presaged inflation. Later it realized the grave mistake made!

But some know that interest rates are not good indicators of the monetary policy stance. A better gauge is to observe the behavior of NGDP relative to its trend. The chart below extends the period to the present. It speaks much louder than words!



While both Australia and New Zealand are first comers to inflation targeting, the US only adopted that particular monetary regime in January 2012, long after the crisis hit. So it should be interesting to examine US monetary policy during the period that many other developed countries adopted inflation targeting.

### U.S. MONETARY POLICY 1992 -2009: A MARKET MONETARIST PERSPECTIVE

As soon as you mention “market monetarist” (MM), NGDP comes to mind. While for most the all-encompassing variable is inflation, to MMs, the “target” variable is NGDP being kept at a steadily rising trend level.

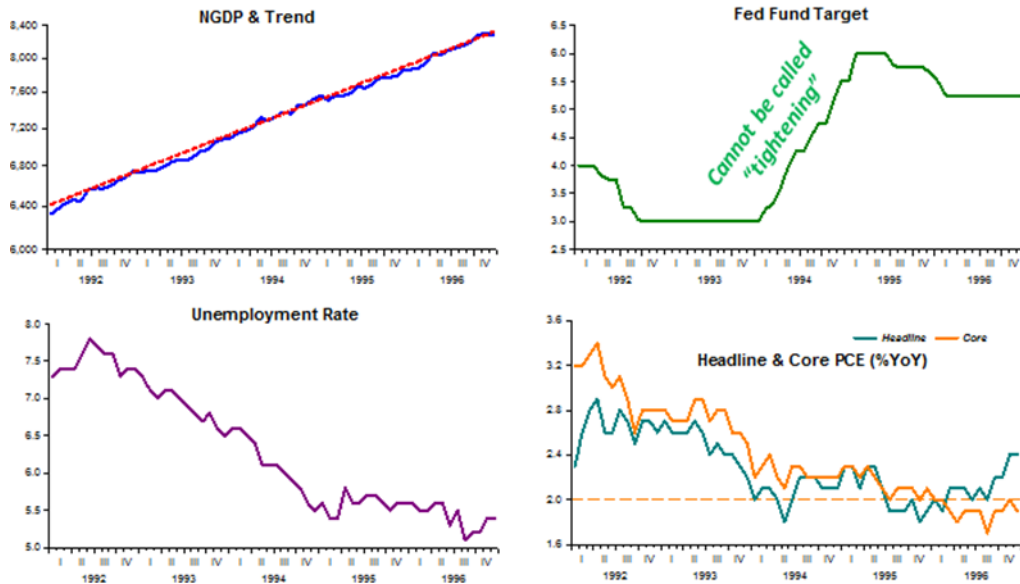
While “inflation targeters” look at inflation, real growth and unemployment to gauge the “need” for monetary policy “action”, MMs look only at NGDP relative to its trend level.

While “inflation targeters” look at the change/level of the FF rate to gauge if monetary policy is easing/tight (expansionary/loose), MMs say monetary policy is easing/easy (tightening/tight) if NGDP is rising/remaining above trend (falling/remaining below trend).

While “inflation targeters” decide on the “correct” stance of monetary policy (the “correct” level of the FF rate) by comparing the level of actual/expected inflation relative to the target level and the gap of output/unemployment relative to the “potential”/“natural” level, MMs strive to offset changes in velocity (money demand) with money supply, thus obtaining overall nominal stability (NGDP evolving as close as possible to trend).

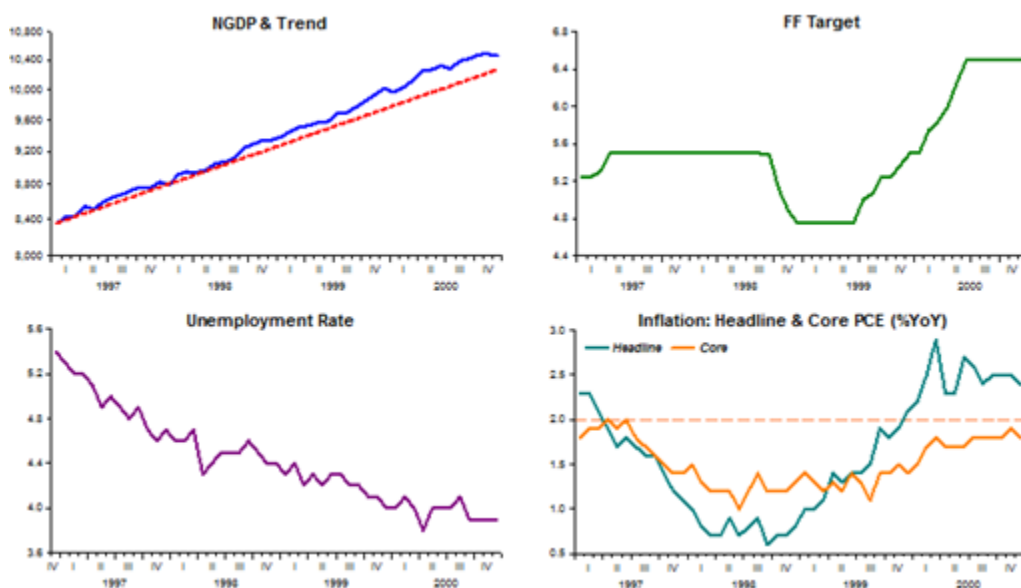
The performance of monetary policy over the 1992-09 period is discussed below through a series of illustrations. The NGDP trend depicted in the charts began in the mid-1980s after Volcker’s successful adjustment and evolved at a 5.4% rate of growth.

The first panel covers 1992-96.



That can be seen as a period of “superb” monetary policy. NGDP remained very close to trend, unemployment was on a downward trend as was inflation. The FF rate was first lowered and stayed leveled at 1% for two years before climbing significantly. Does that indicate that monetary policy was “eased”, remained “easy” and then was “tightened”? From an MM perspective it would be hard to justify that taxonomy!

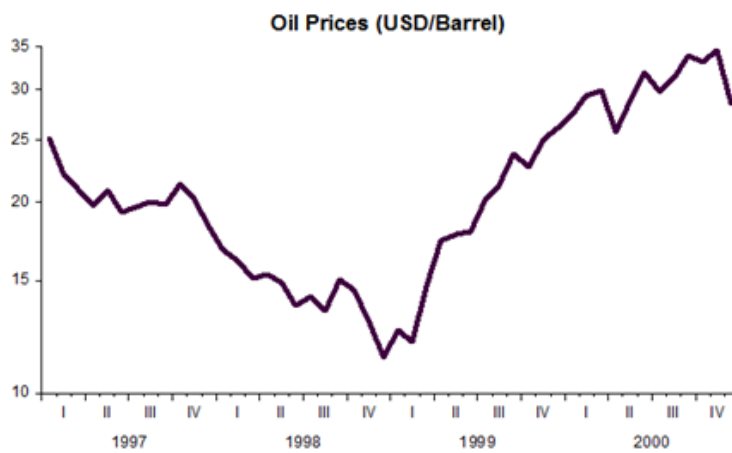
The 1997-00 period is interesting in that it illustrates what happens when the economy is buffeted by a positive supply shock, in this case a rise in productivity growth that took place after 1997. The charts illustrate.



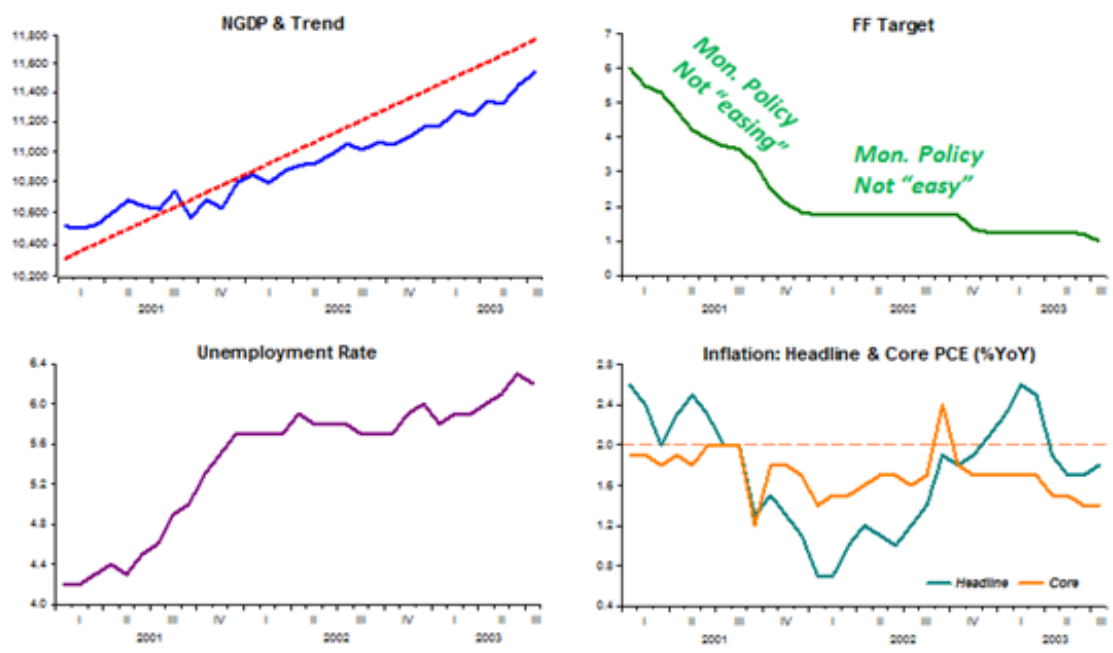
In 1998, monetary policy is “eased”. NGDP rises above trend AND the FF rate is lowered. Maybe because inflation (both headline and Core) was way below “target” (implicit in the case of the US), the Fed was “tricked” into adopting a more expansionary monetary policy. This provides a good illustration of the danger associated with inflation targeting.

At the time the economy was undergoing a productivity shock, something that shifts the AS curve down and to the right, increasing real output growth and reducing inflation. By keeping NGDP “on trend”, the Fed would have avoided the nominal instability that ensued.

It also shows how misleading it is to look at inflation, especially the headline variety, which is strongly affected by things such as oil and commodity price shocks. As the chart shows, oil prices decreased significantly following the 1997 Asia crisis, only to come back up strongly afterwards. At that point, the Fed reacted by jacking up the FF rate.



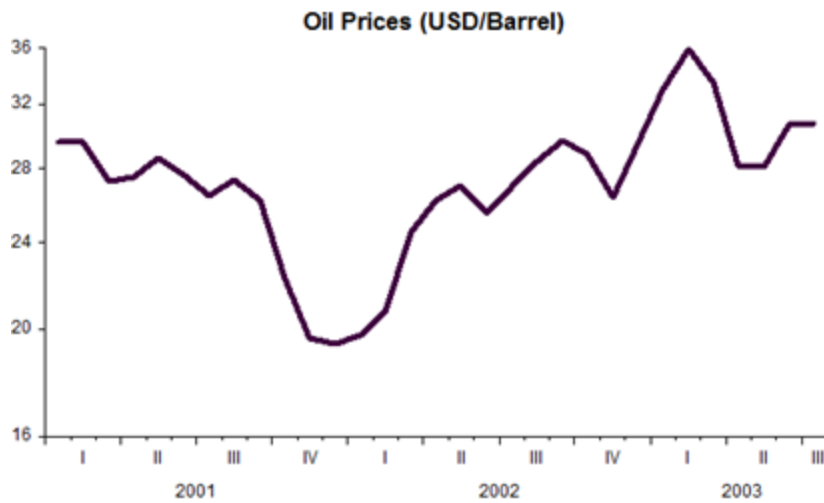
The “flip-side” of the resulting instability is seen in the following period (2001-03).



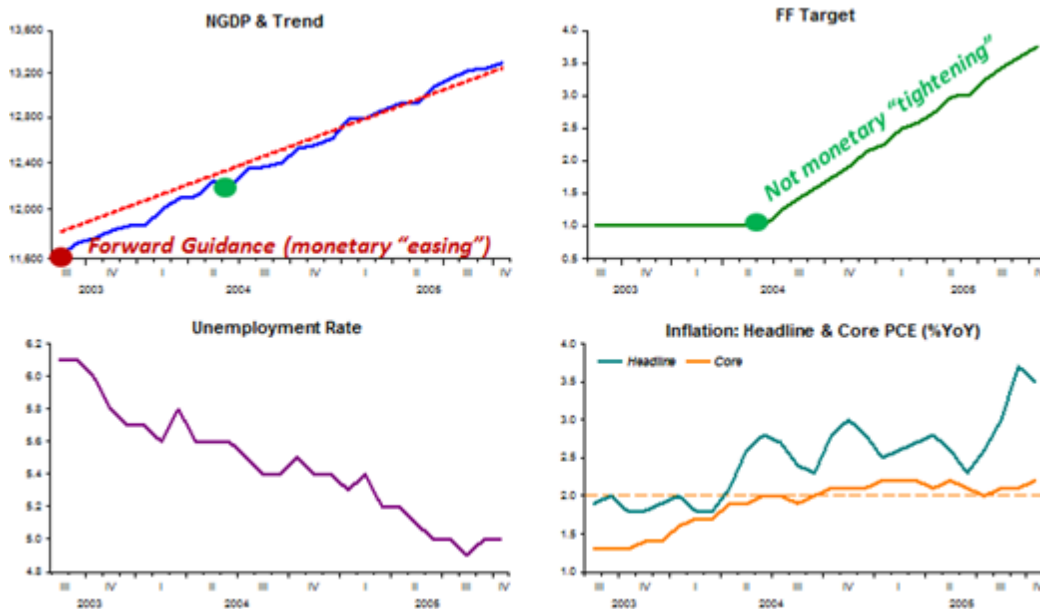
NGDP falls below trend, indicating monetary policy was tightening, despite the strong decrease in the FF rate. Although the FF rate remained “low”, it didn’t mean monetary policy was easy! By NGDP remaining below trend we know policy was “tight”.



Once again, headline inflation danced to the beat of oil prices!



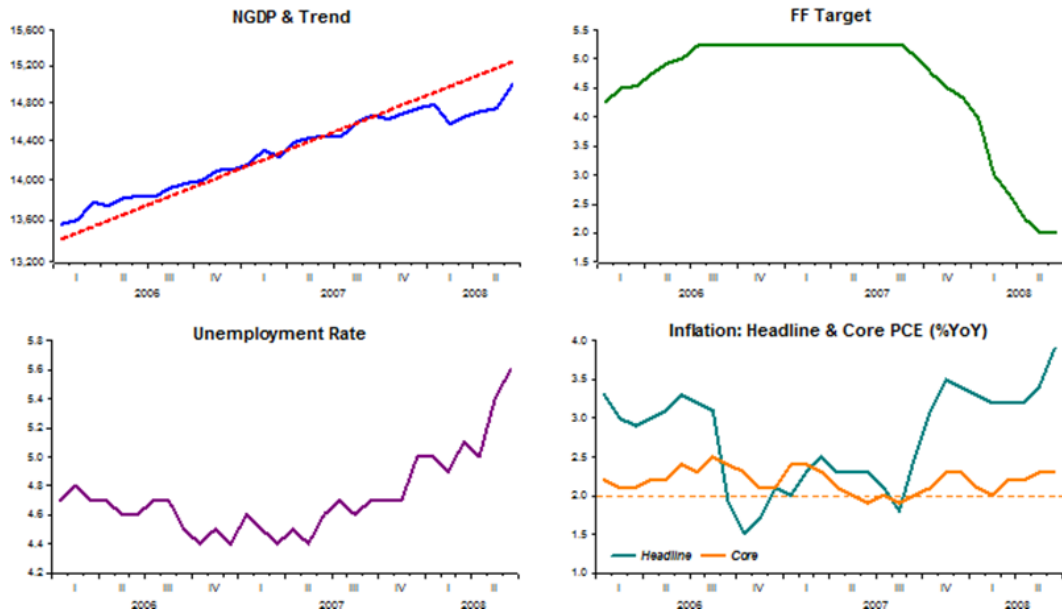
From an MM perspective, monetary policy was made “right” in the following period, which coincides with Greenspan’s last years as Fed Chairman.



Forward guidance signaled that monetary policy would be expansionary. And it was successful in taking NGDP back to trend. This shows how misconceived the notion, most closely associated with John Taylor, that during 2002-04 interest rates were “too low for too long”.

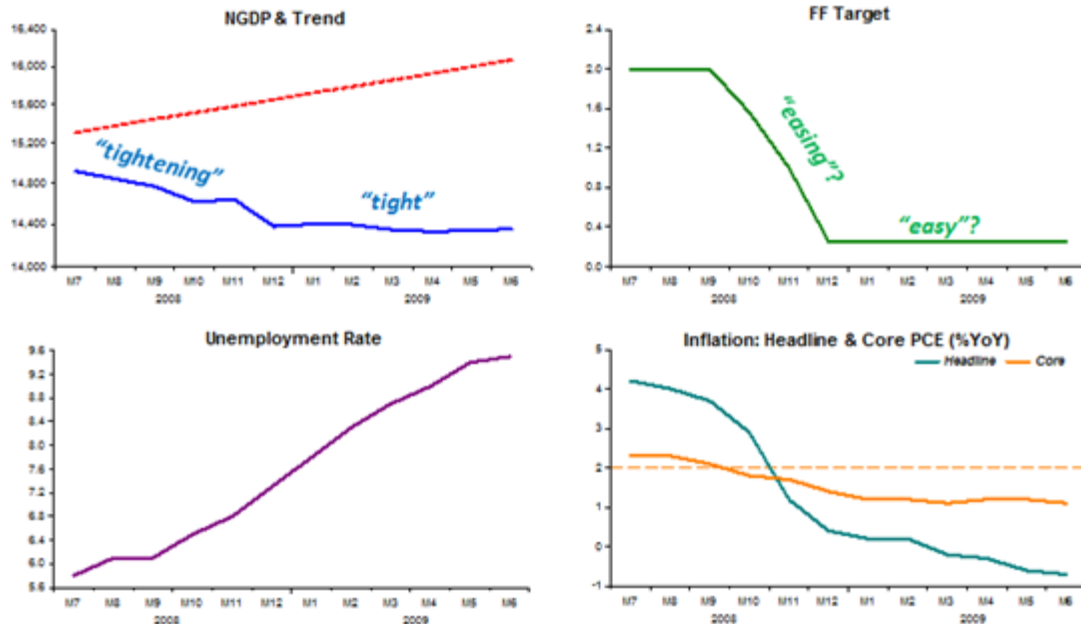
“Good” monetary policy was successful in bringing unemployment down and in keeping core inflation close to “target”. Needless to show, headline inflation “adapted” to oil prices!

When he replaced Greenspan, Bernanke was at first successful in maintaining nominal stability, but when financial troubles hit in mid-2007 he “failed”.



Monetary policy was tightened as indicated by NGDP dropping below trend **despite** the reduction in the FF rate. Unemployment began to rise and headline inflation was impacted by oil prices. Bernanke’s well know preference for inflation targeting led the Fed to indicate NGDP would be constrained.

This “challenging” environment would be a test for any central bank. Unfortunately the Fed (and many other central banks) failed miserably as seen below.

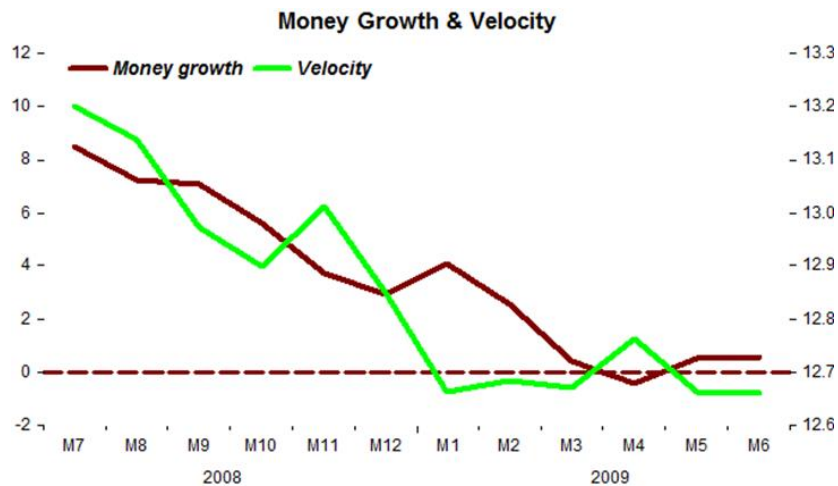


Nowhere else the notion that reducing rates means policy “easing” and low rates means “easy” policy is so clearly shown to be false. Every conceivable indicator was flashing “policy is too tight” signal.

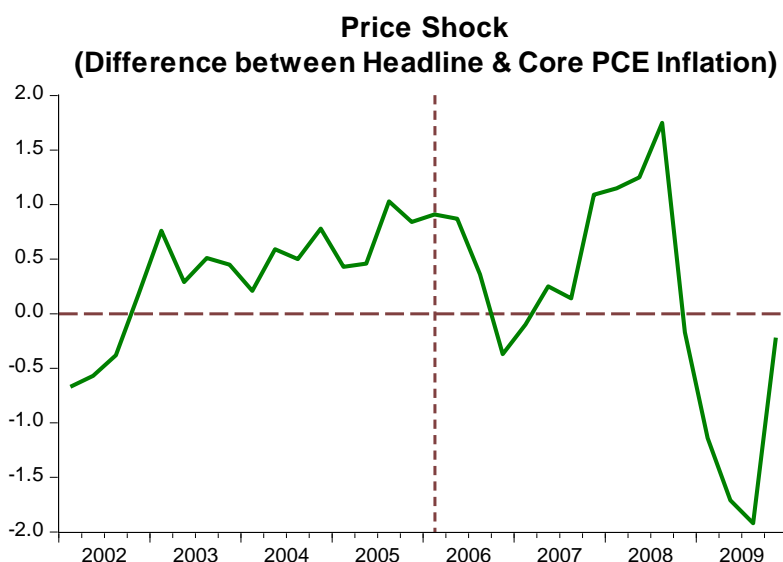
Why did that happen?

Following his seminal paper from 1982 – “[Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression](#)” – Bernanke’s “credit view” was that what was required was emergency lending to banks to keep credit flowing. And so he did, “saving” the banks but “downgrading” the overall economy!

The market monetarist view is that the Fed should have offset the big drop in velocity (rise in money demand) by raising the growth of money supply. The chart shows how, in fact, instead of offsetting the fall in velocity, the Fed “magnified” its impact on nominal spending (NGDP), allowing broad (Divisia M3) money growth to fall steeply and even contract!



Note: The chart below is a proxy measure for the intensity of price (oil) shocks. Note that during Greenspan’s last years the oil shock was not as acute but was more persistent than during the first years of Bernanke’s command of the Fed. Why, then, did Greenspan managed to maintain nominal stability?



This is another example of Meade’s conjecture on the “dangers” of inflation targeting. While Greenspan would talk about “appropriate monetary policy”, Bernanke was much more focused on the inflationary impact of oil prices. Economic agents correctly perceived that

policy objectives would give more weight to inflation, thereby increasing the volatility of real output.

The last sentence naturally leads to thoughts about the “proper” level of the inflation target. Soon after the zero lower bound (ZLB) on interest rates was reached, there have been suggestions that the Fed should increase the target level of inflation. Initially this was very curious because prior to January 2012 the Fed was not an explicit inflation targeting central bank!

Even more interesting, despite the clamor for a higher inflation target, when the Fed formally adopted the framework it chose the “conventional” 2% target level. This leads me to conjecture that:

### **THERE’S NO “PROPER” INFLATION TARGET, JUST A “PROPER” NOMINAL SPENDING LEVEL TARGET**

Brad DeLong writes “[On the Proper Inflation Target](#)”. After some “basis points” gymnastics he wraps up:

*If you don’t mind kissing the zero lower bound when you cut interest rates by 600 basis points, you could get away with a 4%/year inflation target.*

*And if you don’t mind dissing the zero lower bound and do not buy the argument that the “natural” short-term safe real interest rate when the economy is in the growth-along-the-potential-path phase of the business cycle is now not 3%/year but 2%/year, then you could get away with a 3%/year inflation target.*

***But I do not see how you can justify a 2%/year inflation target today.***

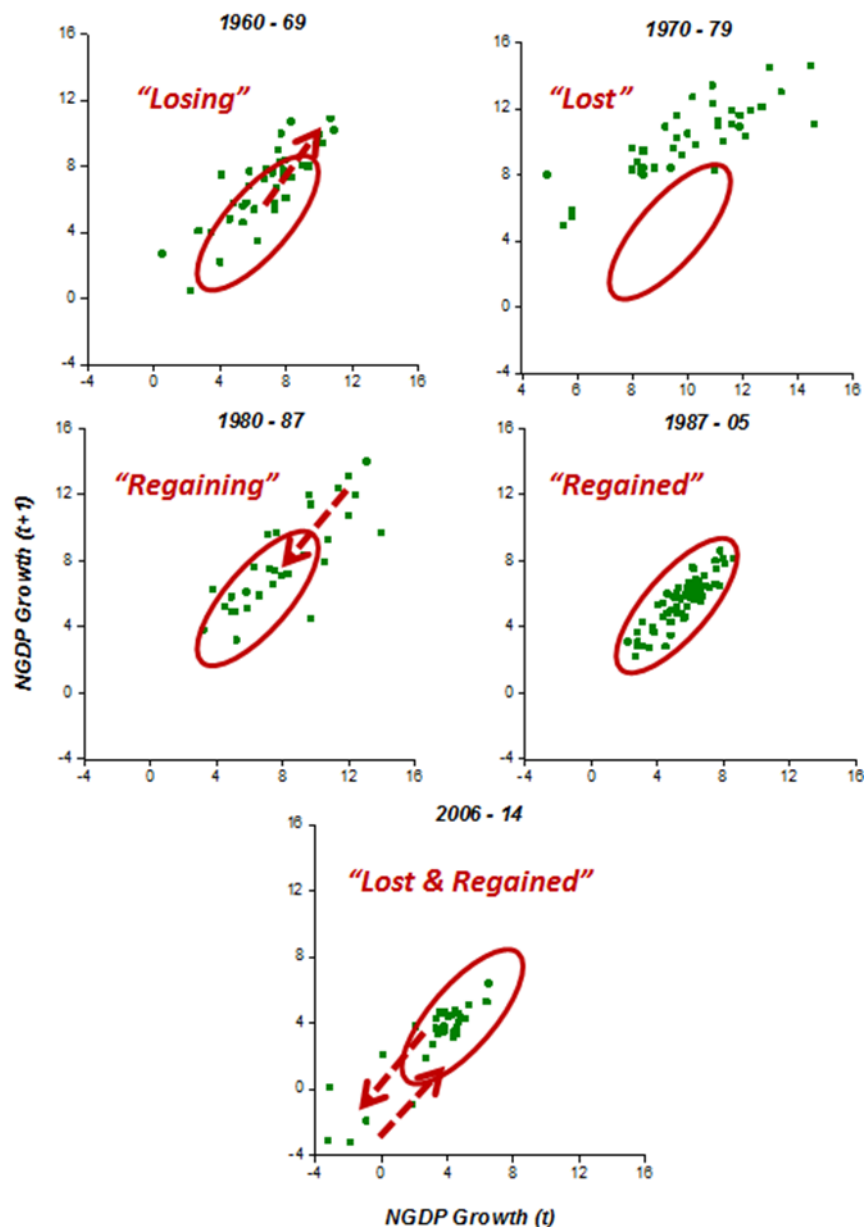
*Suppose that you want a 200-basis point cushion—that you are not happy with putting your commercial banks in a situation in which their business model requires that they take huge risks to even try to cover the costs of maintaining their ATMs and their branches—and buy the 2%/year “natural” short-term safe real interest rate when the economy is in the growth-along-the-potential-path phase of the business cycle, but recoil at a 6%/year inflation target as too high? What then? **Then you have to go for régime change:***

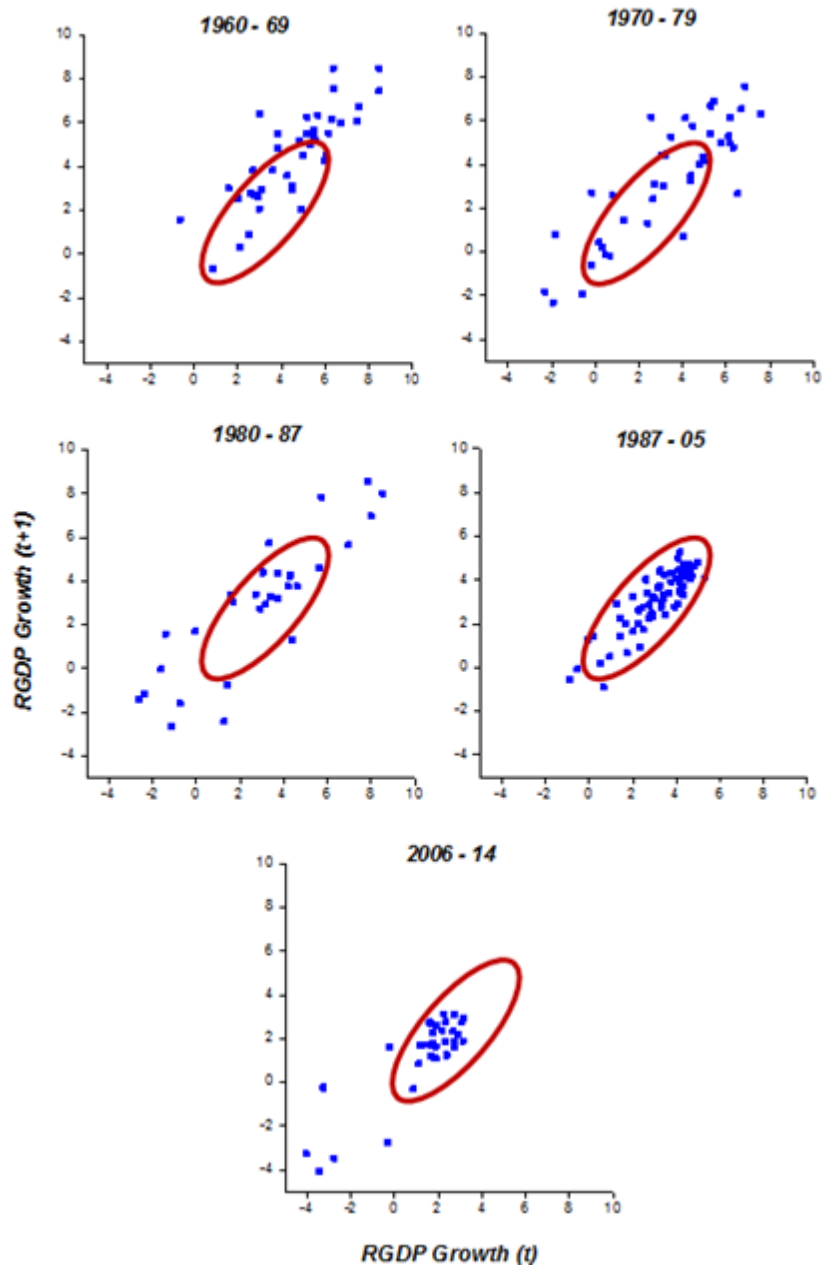
- 1. Reform fiscal policy so that—unlike 2008-present—it does its stimulative job to boost aggregate demand when interest rates are at their zero lower bound.*
- 2. Move to some form of level targeting so that the inflation target is no longer fixed, but rises and rises sharply whenever aggregate demand or the price level undershoots its previously-expected growth path.*
- 3. Allow the central bank to engage in expansionary fiscal policy on a large scale on its own say-so, via helicopter drops—the Social Credit solution.*
- 4. Move to [Miles Kimball Land](#)*

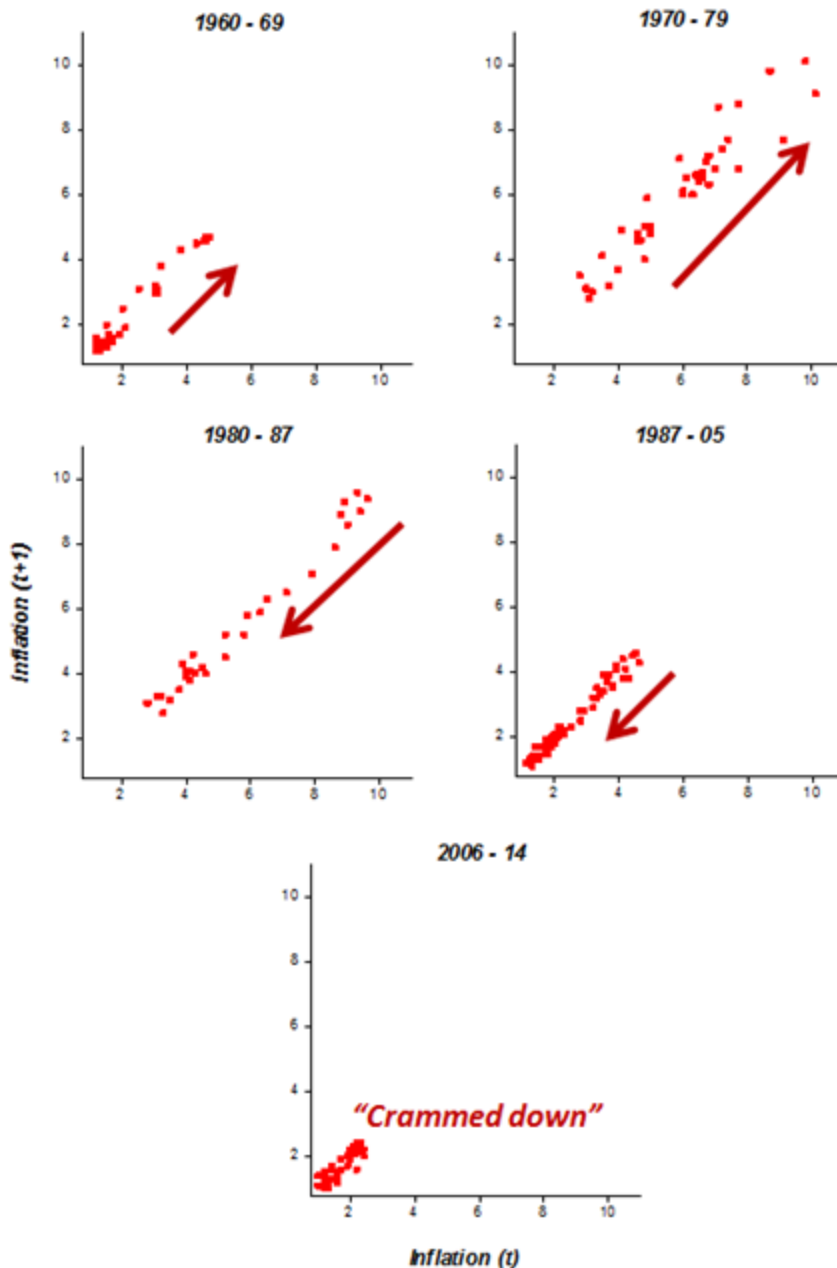
I won’t consider Miles Kimball’s “e-money”. Of the other three alternatives for a régime change, two deal with fiscal policy and one with “some form of level targeting”.

But notice that inflation is still very much present, only the “inflation target is no longer fixed”! I’ll concentrate on the suggested Aggregate Demand (or NGDP) level target. The historical evidence is compelling. When the Fed manages to provide Nominal Stability, all the pieces fall into place: NGDP growth is stabilized (the essence of what I mean by Nominal Stability (along a level path), real output growth is stabilized close to “potential” AND inflation remains low and stable. In this set-up, there’s no role for fiscal policy as a stabilization tool!

The panels below, constructed as “phase space”, comparing variations (growth or inflation) in quarter  $t$  with those in quarter  $t+1$ , well illustrate mean variations and its volatilities. The periods are divided closely matching what has become known as the “Golden Age” (1960s) when the Fed was manned by William Martin, the “Great Inflation” (1970s) when the Fed was manned by Arthur Burns (and G William Miller for a brief span), Paul Volcker’s (1979-87) “Transition” from high to low inflation, Greenspan’s 1987 – 05 “Great Moderation” and Bernanke’s (more recently Yellen) “Great Recession” 2006-14.







Observe that the increasing nominal instability from the 1960s to the 1970s does not impact real growth or its (in)stability significantly, but the rising nominal instability has a strong effect on inflation.

In the more recent period (“Great Recession”) we have first a loss of nominal stability, with NGDP growth dropping strongly. Note that nominal stability has been “regained”, but at a lower average growth and not having compensated for the previous loss in the LEVEL of spending. Real growth has gone back into the “circle of stability”, also at a lower average level and inflation has been “crammed down”.

This is why many are calling the more recent period “Great Moderation 2”, but it importantly leaves out the **level** target. The consequence is low real growth and employment.

It is clear that to regain a “Great Moderation”, monetary policy has to place the economy at a **higher trend level** and then keep it there!

As this recent Economist article makes clear – [Politicians and central bankers are not providing the world with the inflation it needs](#) some economies face damaging deflation instead – **the focus on inflation targets is misplaced:**

*IT is a pernicious threat, all the more so because, at its onset, it seems almost benign. After two generations of fighting against inflation, why be worried if the victory looks just a bit too complete, if the ancient enemy is so cowed as to no longer strain against the chains in which it is bound? But the stable low inflation fought for in the 1980s and 1990s and inflation hazardously close to zero are not so far apart. And as inflation drops, slipping into deflation becomes ever easier. **It is in that dangerous position that the world now stands.***

One nagging question is: Given that NGDP targeting was widely discussed in academic circles (and even in FOMC meetings in 1982, under Volcker, and 1992, under Greenspan) why did it never “catch on”? On the other hand, although an inflation targeting framework was never discussed, it “caught on” like bush fire.

Maybe the answer lies in the fact that inflation targeting was “imposed”. This was the result of New Zealand’s Labor government under Prime Minister David Lange embarking on wide-ranging economic and governmental reforms that sought to define clear performance measures and systems of accountability for all government departments.

I can just imagine what went on in the head of the RBNZ Governor when asked how he would be evaluated. Seeing that inflation was falling after being in the two-digit range for many years, his quick answer must have been something like “keep inflation low”. Thus was born IT!

That doesn’t give IT a good “pedigree”. Nevertheless, academics were quick to develop theoretical and model-based frameworks that gave IT the “pedigree” it needed to flourish. So why is it that at present there’s so much discussion on “regime change”?

And, why so much interest being generated in NGDP Level Targeting?

To me, one important, maybe even defining, reason is that over the whole of the pre 2008-09 crisis “inflation targeting period”, including all the non-IT central banks, like the Federal Reserve, that nevertheless managed to keep inflation low and stable, all the “targets” were observationally equivalent.

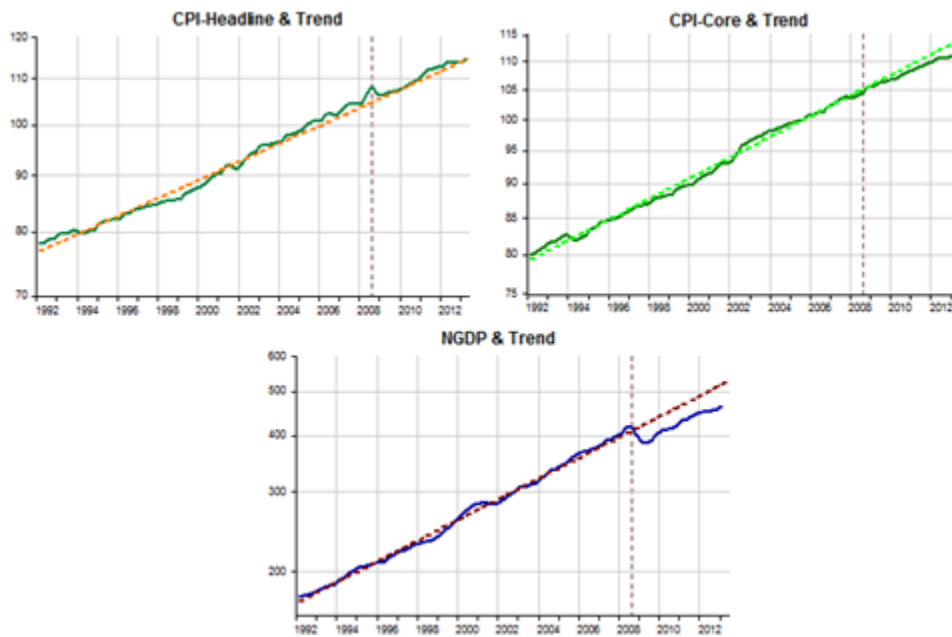
To illustrate I look at Canada, an inflation targeter and the US, which did not target anything explicitly.

### **Observation Equivalence: Inflation Targeting (IT), Price Level Targeting (PLT) and NGDP Level Targeting (NGDP-LT)**

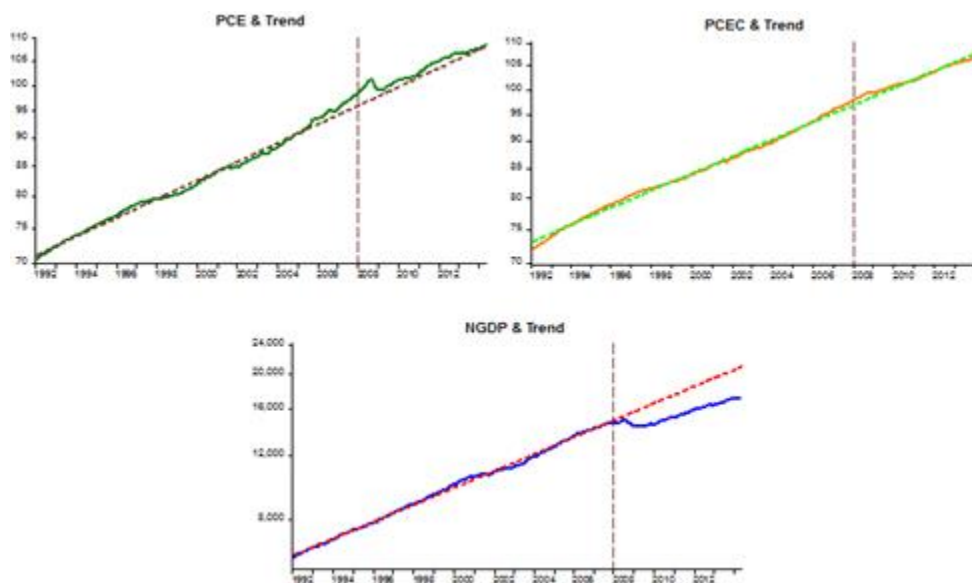
The charts illustrate.

For Canada





For the U.S.



For both countries the NGDP growth trend is 5.4% while both Headline and Core inflation are approximately 2% in the two countries.

Note that up to the moment the crisis hit, you wouldn't be wrong to think, if you didn't know otherwise, that both countries could be doing either IT, PLT or NGDP-LT. There's no way to distinguish among the alternatives.

What the crisis showed is that inflation or price level targets are not robust, or dependable, "target rules". If an NGDP-LT target had been explicitly pursued, both the Fed and the Bank of Canada (and many other central banks) would have heard the "dog bark" loud and clear! (Note that the IT and PLT "dogs" "barked up the wrong tree"!)

## Conclusions

From the cases studied, we note that inflation targeting is not something that naturally defines central bank procedures. In fact, the contrast between New Zealand and Australia above shows that macroeconomic outcomes other than inflation can be widely different even for inflation targeting central banks.

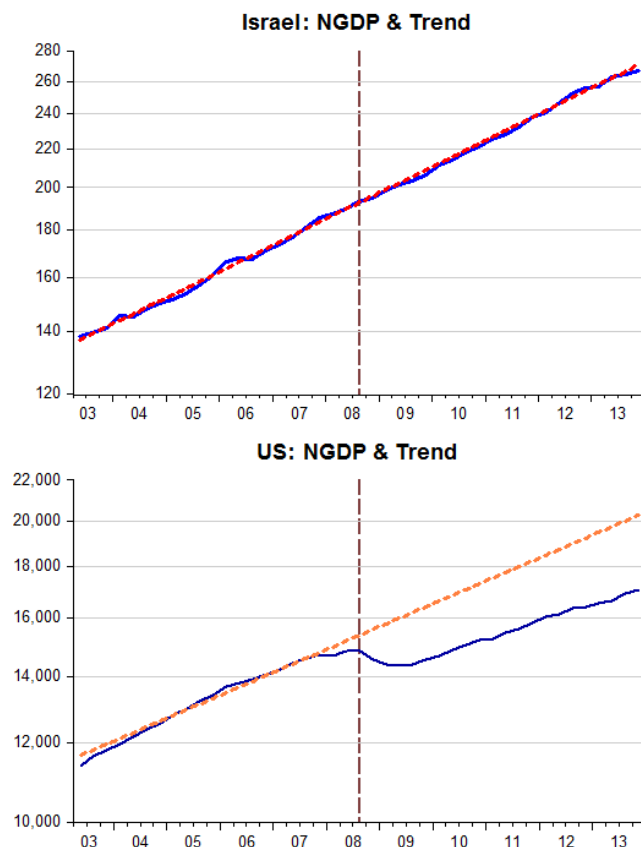
This adds to Ball and Sheridan's findings in their 2005 article "Does Inflation Targeting Matter" that since the early 1990s inflation has been lower and more stable in both IT and non-IT countries.

Ball and Sheridan's findings are consistent with the idea of observational equivalence between IT, PLT and NGDP-LT that I illustrated using Canada and the U.S. From this, one could infer that low and stable inflation countries followed *de facto* NGDP-LT targeting. The crisis had the effect of "revealing" the actual targeting regime.

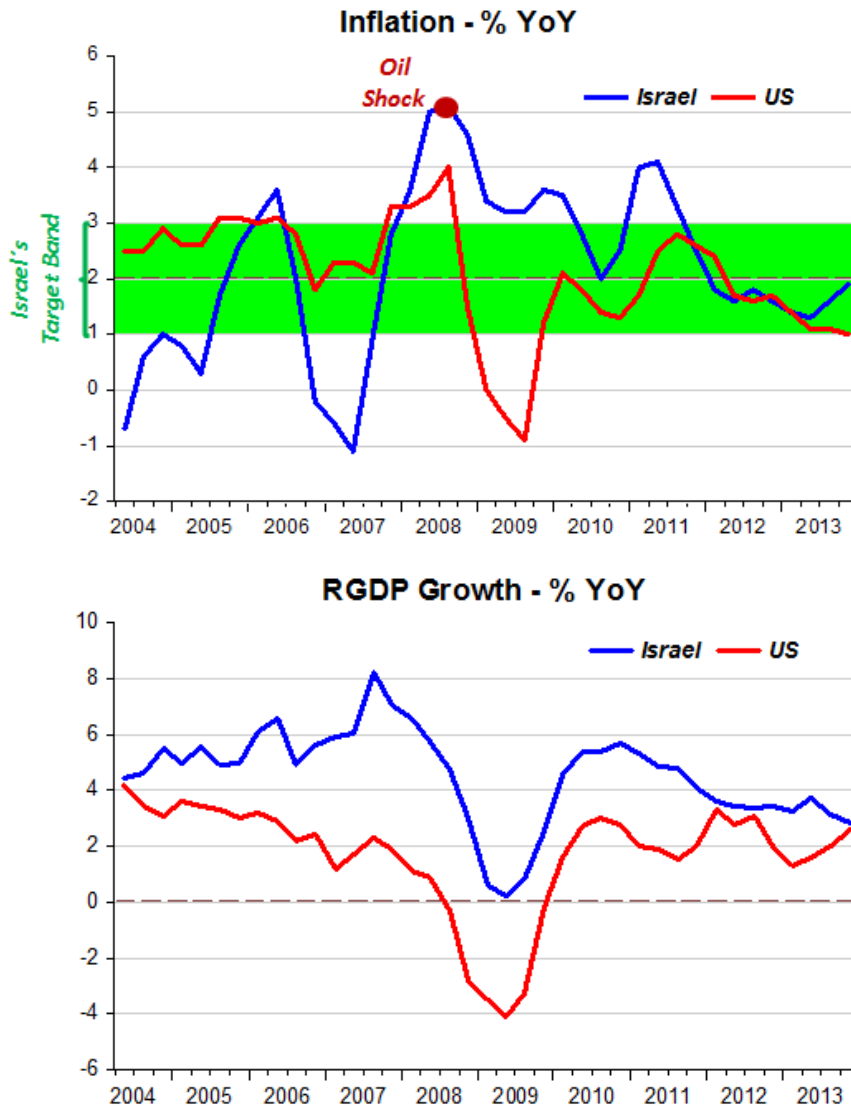
A country such as Australia, where NGDP remained close to trend is more likely to have been following a NGDP-LT targeting regime than Canada or the U.S., where NGDP dropped well below trend.

Another inflation targeting country that the crisis "revealed" was *de facto* targeting NGDP is Israel. The contrast between Israel and the U.S. clearly brings out the danger of IT alluded to by James Meade. Although the U.S. was not formally an IT country, when Bernanke took the helm at the Fed in early 2006, it got much closer to being an IT country.

The charts illustrate



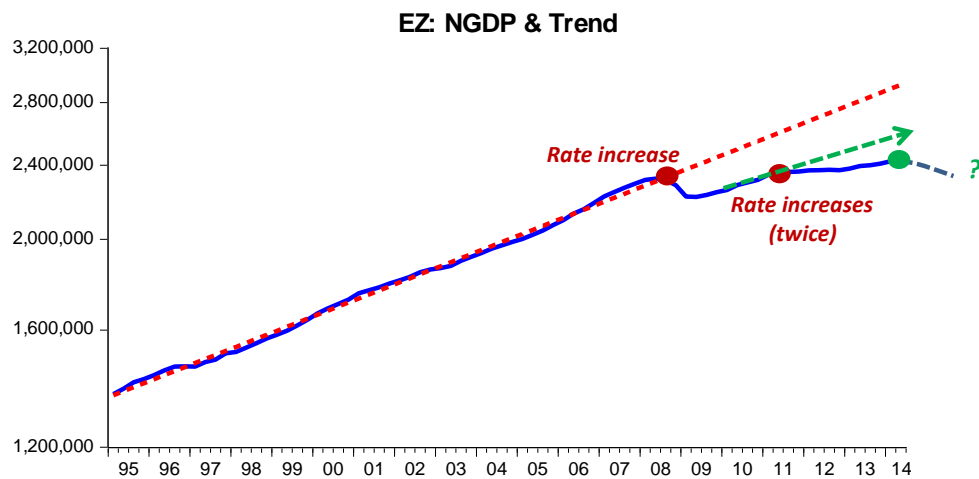
The different reaction of each Central Bank to the oil shock explains the different outcomes. While an oil shock (a negative supply shock) increases inflation and reduces growth, those effects tend to be temporary and the best monetary policy can do is to keep nominal spending close to trend. The charts show that by doing exactly that Israel avoided the real output contraction that befell the US.



The German-centric ECB is arguably the most ardent IT central bank. For market monetarists, who strongly favor NGDP-LT, it is not surprising to observe the dramatic results, with the region going into deflation and real growth being close to zero and negative for some individual countries.

The chart below removes any doubt one may have on the dangers of inflation targeting in the face of supply shocks.

In the chart we observe the dramatic consequences of the ECB tightening in reaction to the rise in oil prices in 2008 and again in 2010-11.



Given the evidence I find Carl Walsh's conclusion in his 2009 paper "Inflation Targeting: What Have we Learned", depressing. To Walsh:

"Financial meltdowns, such as the United States is experiencing at the time this is written, pose similar problems for IT and non-IT central banks. In that sense, they are **irrelevant** for the inflation targeting debate..."

They certainly are not irrelevant. Countries that were on a de facto NGDP-LT regime fared much better than the de facto inflation targeters. And the reason is straightforward. NGDP-LT provides a much higher degree of nominal stability to the economy, and thus is much more effective in limiting the propagation of real shocks.