Price Level Targeting: The Fed Has It About Right

CENTRAL to AMERICA'S ECONOMY™

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4 October 2012

Memphis, Tennessee

Any opinions expressed here are my own and do not necessarily reflect those of others on the Federal Open Market Committee.

Introduction

The question

- The U.S. economy experienced a large shock in 2008-2009.
- Main question:
  - Imagine monetary policy reacted in just the right way to the large shock.
  - What should have happened?
- One answer:
  - The FOMC should have maintained the price level on the established path.
  - So-called "price level targeting" can be the optimal monetary policy according to some leading theories.

A singular achievement

- A singular achievement of recent monetary policy:
  - The FOMC has in fact essentially behaved as if it was price level targeting.
  - In this sense, policy since 2008 looks close to optimal.

- This is true even though the Committee did not explicitly say that maintaining the price level path was an ultimate goal.

- Instead, the Committee simply kept inflation close to a value of 2 percent even in the face of the large shock.

The aftermath

- As the dust has settled since 2008, it has become more and more apparent that U.S. real GDP is growing along a different path than the bubble-induced, pre-crisis path.

- This is consistent with the findings of C. Reinhart and K. Rogoff.*
  - They analyze financial crises over the last 800 years.
  - A key conclusion is that post-financial crisis economies grow more slowly.

* *See* C. Reinhart and K. Rogoff, 2009, *This Time is Different*, Princeton University Press.

The implications for future monetary policy

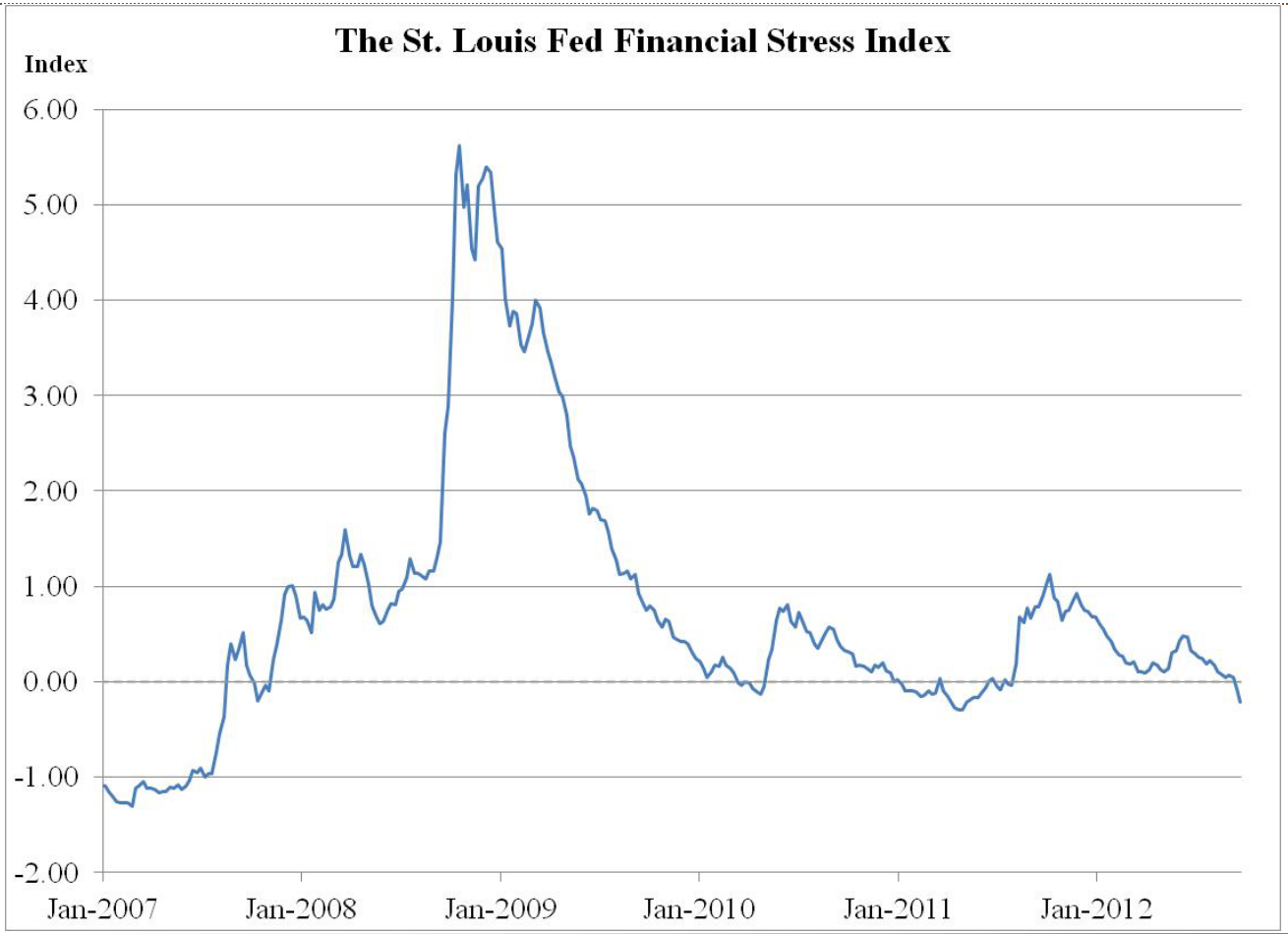
- Nominal GDP targeting would be similar to price level targeting, but not as good, according to leading theories.
  - My argument is that the Fed is, in effect, price level targeting anyway.
- Attempting to target nominal GDP without adjustment for the Reinhart-Rogoff effect could be a policy disaster.
- Alternative theories include the idea that surprise inflation is a way to partially default on debt.
  - This type of policy would likely impair U.S. credit markets for many years.

The large shock

The large shock

- One way to look at the shock that occurred in the U.S. in 2008 is to consider an index of financial stress.
- The St. Louis Fed Financial Stress Index incorporates many measures of financial stress, including interest rate spreads and volatility indicators like VIX.
- The index shows that financial stress was extremely high during late 2008 and early 2009.
  - A reading of more than 2 would be very high; in the crisis, this index hit 5 or more.

The financial crisis shock



Source: Federal Reserve Bank of St. Louis. Last observation: week of September 21, 2012.

Price level targeting

The idea of price level targeting

- A leading theory is due to Michael Woodford of Columbia University and his co-authors.
- The main idea in the theory is that prices are "sticky," in that they do not adjust immediately to changes in supply and demand conditions.
- Optimal monetary policy corrects for this deficiency.
  - When the economy is hit by a shock, the optimal policy returns the price level back to its previous path.

The idea of price level targeting

- Consider Figure 1 from Woodford's paper, "Optimal Monetary Stabilization Policy." *
- On the left hand side of the graph, a shock hits the economy. The graphs trace out the path of inflation, output, and the price level after the shock.
  - "Zero" refers to "normal level."
- The black line indicates the path under a fully optimal monetary policy.
- In the bottom panel, the price level is displaced after the shock but is returned to its normal level under optimal policy.

* *See* M. Woodford, 2010, "Optimal Stabilization Policy," in B. Friedman and M. Woodford, eds., *Handbook of Monetary Economics*, Elsevier.

A simple example

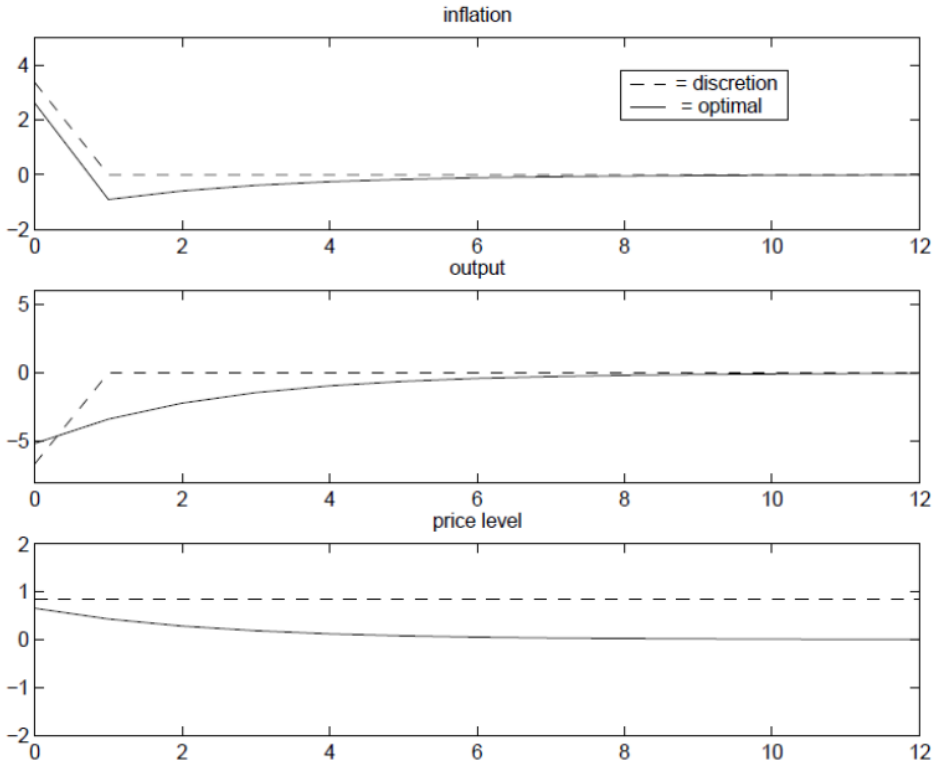


Figure 1: Impulse responses to a transitory cost-push shock under an optimal policy commitment, and in the Markov-perfect equilibrium with discretionary policy.

Source: M. Woodford, 2010, "Optimal Stabilization Policy," in B. Friedman and M. Woodford, eds., *Handbook of Monetary Economics*, Elsevier.

A signature

- The behavior of the aggregate price level might be viewed as a "signature" of optimal monetary policy in this simple framework.

The actual price level

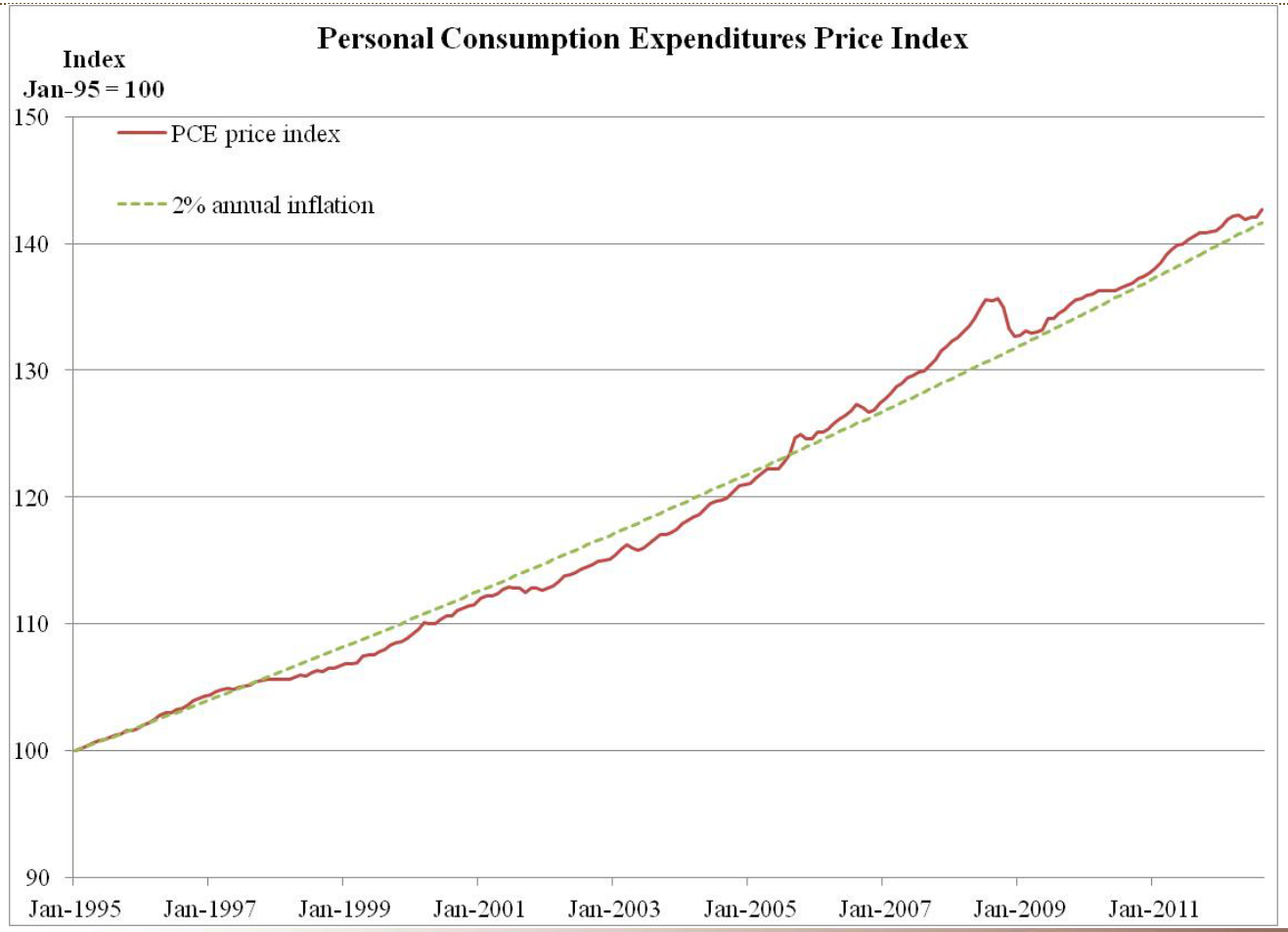
Advice from models

- Professor Woodford's model is very stylized.
- Still, the model might give good advice with respect to the behavior of the price level under optimal monetary policy.
  - The advice is that policymakers should take care to keep the price level on an established path when a large shock hits the economy.
- Has the U.S. price level remained on an established path?

The actual price level in the U.S.

- One issue in thinking about the U.S. price level is the choice of a starting date.
- During the mid-1990s, the FOMC began to establish inflation rates of around 2 percent as the norm in the U.S.
  - During the 1970s, 1980s, and early 1990s, inflation was higher than 2 percent.
- Let's take the 1995 price level and project a 2 percent inflation price level path from that point forward.
- Is the actual U.S. price level close to this path? Yes, it is.

The price level path seems appropriate



Source: Bureau of Economic Analysis and author's calculations. Last observation: August 2012.

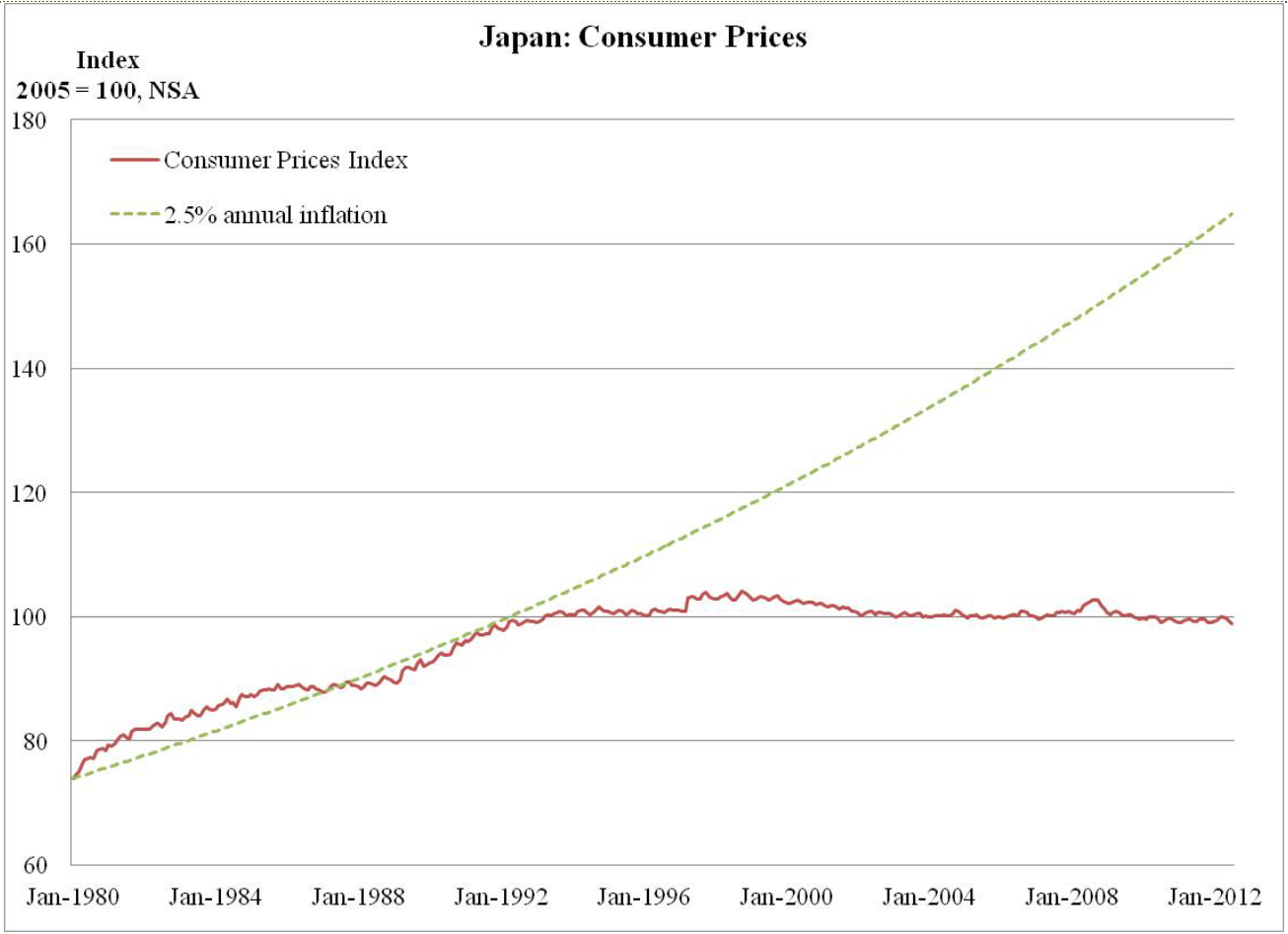
The advice implemented

- Taken at face value, this suggests that the basic advice from the model has been implemented in the U.S.
- In particular, despite the large financial crisis shock depicted earlier and the downward pressure on the price level that such a shock might have caused, today's price level is not far from the path established in the U.S. during the mid-1990s.
- This could be interpreted as "monetary policy has done exactly what it was supposed to do in response to the large shock."

What would other policies do?

- Could it be that the implementation of this advice has not been exact enough?
- I do not think so: Misses in this arena tend to be large.
- For an alternative policy, consider Japan.
- Again, the starting point matters. Let's take the 2.5 percent inflation rate established in Japan during the 1980s and early 1990s and suppose that the implied price level path was the appropriate target.

The Japanese price level since 1980



Source: International Monetary Fund and author's calculations. Last observation: July 2012.

Japan

- The policy in Japan has been different, and has sometimes been criticized.
- My purpose here is only to show an example of an economy that fell off an established price level path.
- When this happens, it is fairly obvious in pictures like these, and not a matter of a few decimals on the price level index.

The Reinhart-Rogoff effect

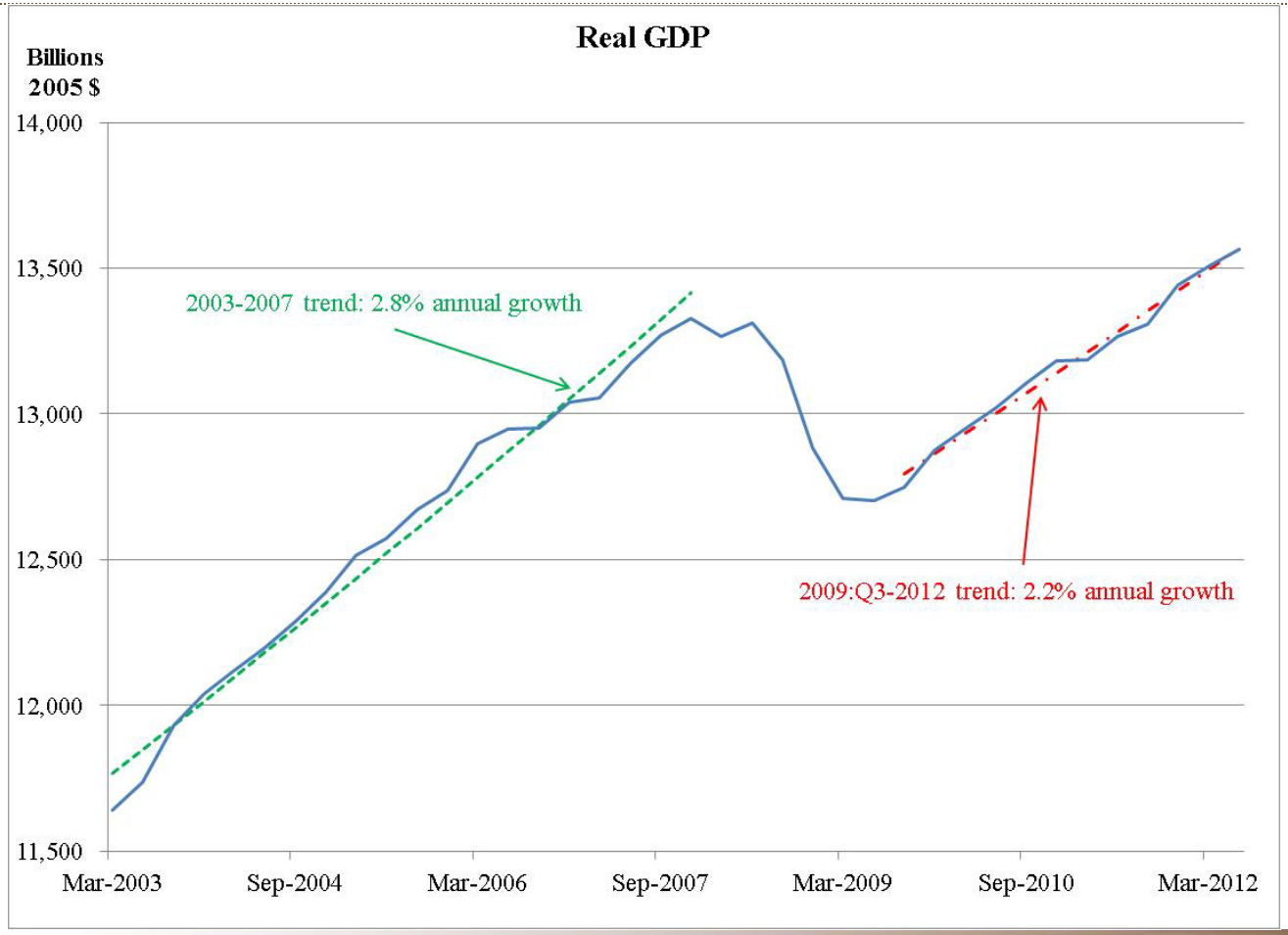
The real economy

- In the model, the policymaker attempts to return the price level to its established path following the shock.
- By doing this, the policymaker also allows the real economy to adjust as quickly as it can to the effects of the shock.
- The households in the model prefer this path of adjustment of prices and output to any other that could be achieved.
  - This is the sense that the policy is "optimal."
- But … what if the shock was so large and so unusual that it caused especially severe damage to the economy?

The Reinhart-Rogoff effect

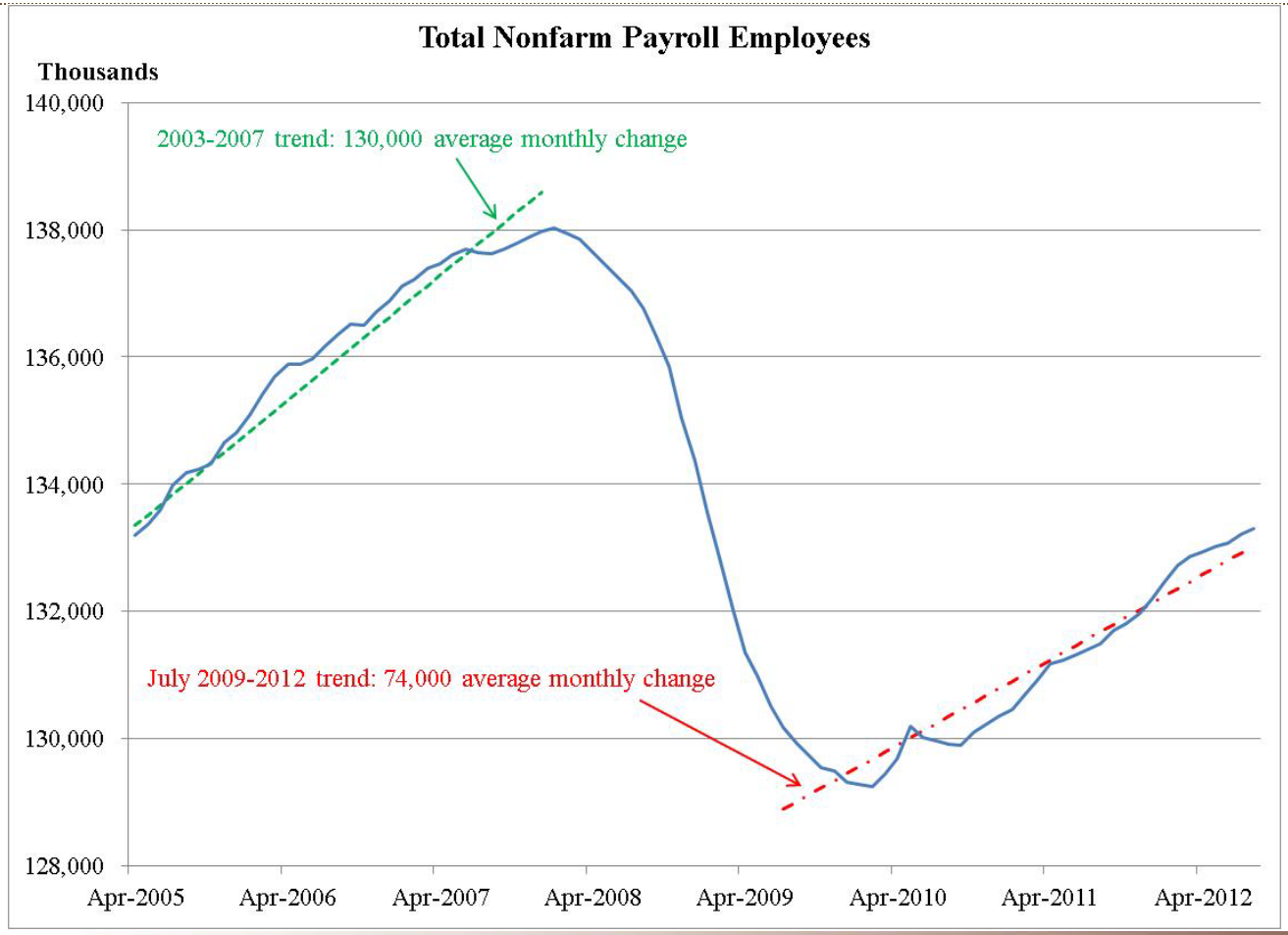
- In their book, Reinhart and Rogoff warned that the aftermath of major financial crises tends to be marked by many years of slower-than-normal growth.
- A version of this seems to have happened in the U.S.
- Before 2007, growth was likely artificially high due to the housing bubble.
- After 2009, growth has likely been slowed by deleveraging.

Real GDP



Source: Bureau of Economic Analysis and author's calculations. Last observation: 2012:Q2.

Total nonfarm payroll employment

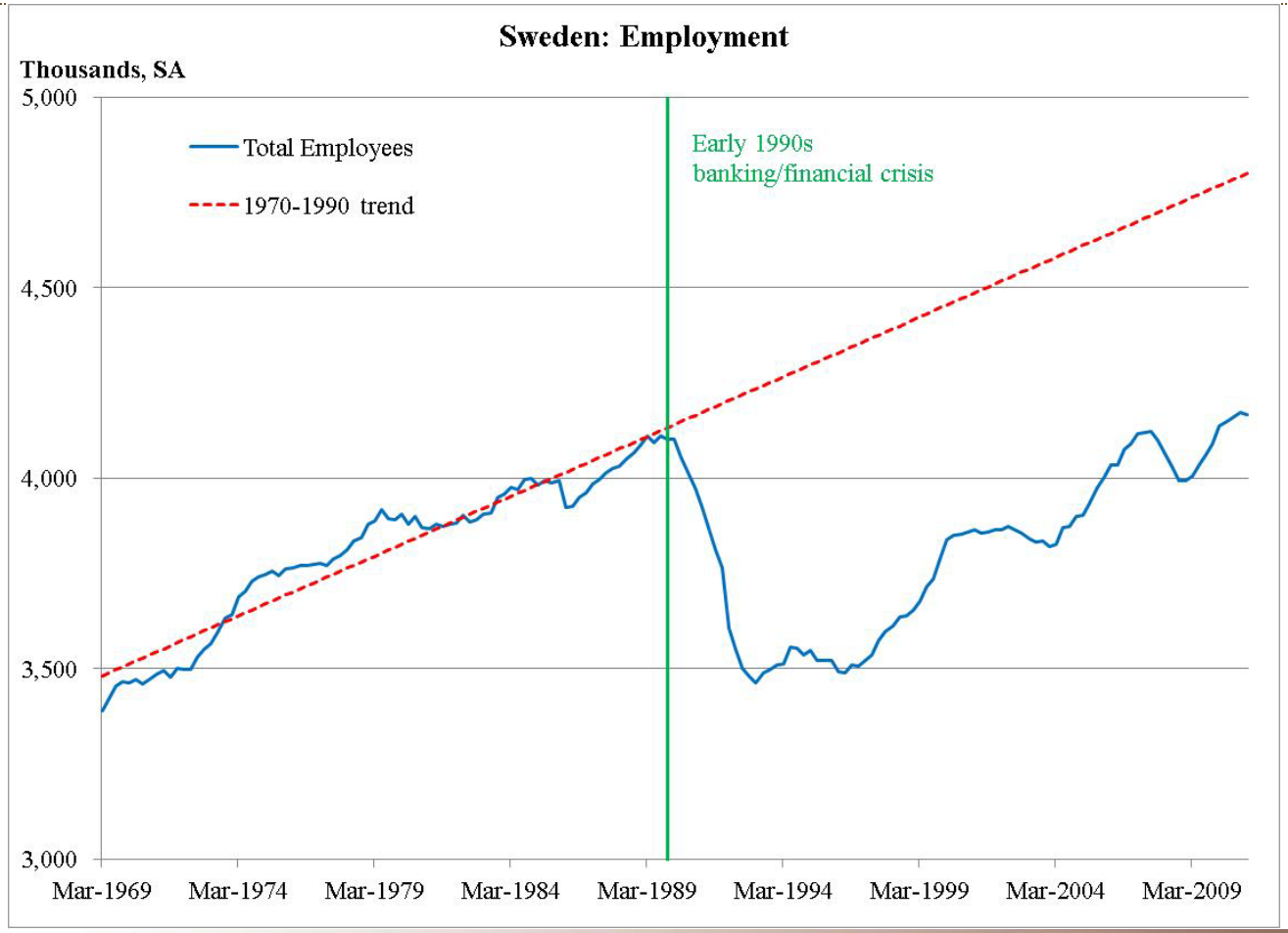


Source: Bureau of Labor Statistics and author's calculations. Last observation: August 2012.

More on Reinhart and Rogoff

- The Reinhart and Rogoff hypothesis seems to have at least some validity for the U.S. during the last several years.
- For comparison, one might consider the Swedish experience.
- Sweden suffered through a major financial crisis in the early 1990s.
- Their policy response has often been regarded as especially aggressive and sensible.
- Still, their employment levels never returned to the pre-crisis trend.

Swedish employment



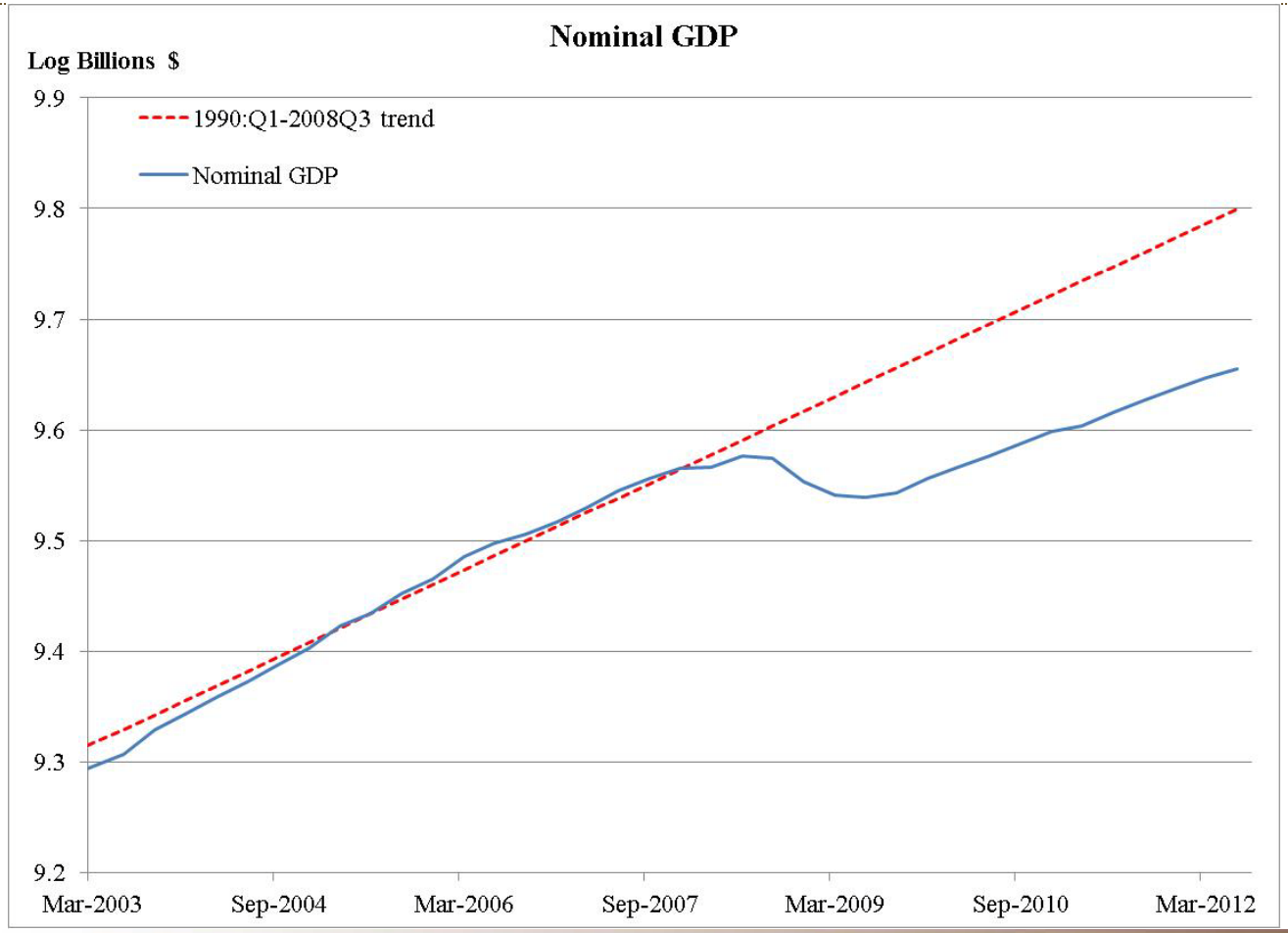
Source: OECD and author's calculations. Last observation: 2012:Q1.

Failing to adjust for the Reinhart-Rogoff effect

Nominal GDP targeting

- Nominal GDP includes both the price level and real GDP in one aggregate; it does not separate the two.
- As we have seen, the aggregate price level seems to be right about on target.
- Real GDP, on the other hand, seems to have been markedly influenced by the Reinhart-Rogoff effect.
- At the recent Jackson Hole conference, Prof. Woodford used the following chart of nominal GDP.

Nominal GDP without adjustment



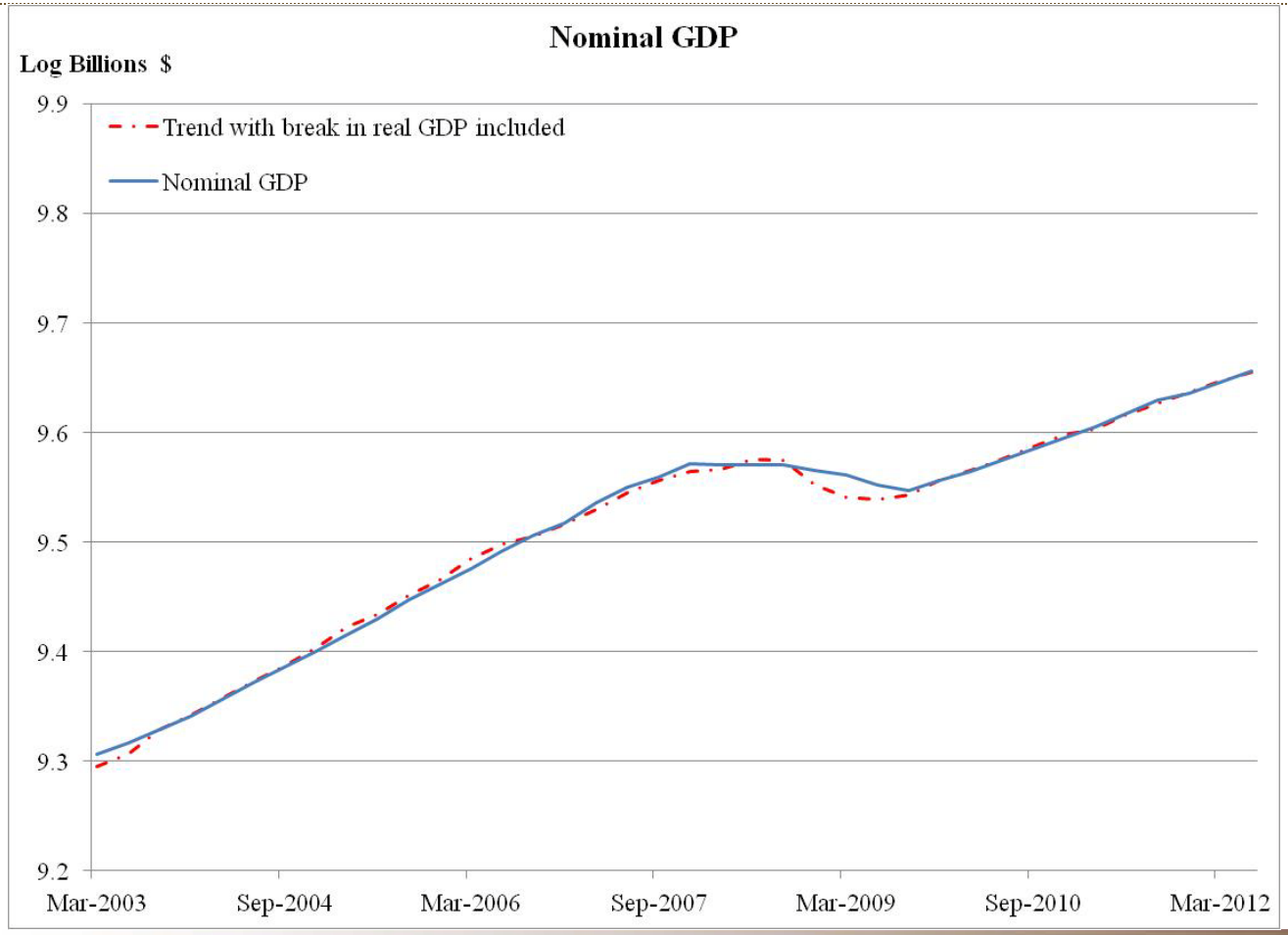
Source: Fig. 13 in M. Woodford, 2012, "Methods of Policy Accommodation at the Interest-Rate Lower Bound," presented at the Jackson Hole Symposium, "The Changing Policy Landscape."

Nominal GDP without adjustment

- Based on this picture alone, one might conclude that U.S. monetary policy has been far off track—way too tight (I am not making this up!)—during the last several years.
- How could this be? The one variable the Fed can control in the medium and long term, the aggregate price level, is exactly on track.
- The problem is the failure to adjust nominal GDP for the Reinhart-Rogoff effect.
- With this adjustment made, nominal GDP fits into the picture quite well.

For more analysis of the price level path versus nominal GDP in the U.S., see G. Davies, M. Brookes, Z. Daoud, and J. Antolin-Diaz, 2012, "Professor Woodford and the Fed," *Fulcrum Research Papers*.

Nominal GDP targeting with proper adjustment



Source: Bureau of Economic Analysis and author's calculations. Last observation: 2012:Q2.

Nominal GDP: Adjusting for Reinhart-Rogoff

- The story told by this figure now fits together:
  - The price level is on the path established in the U.S. since 1995, passing the signature test of optimal monetary policy.
  - Real GDP is growing slowly post-crisis due to the Reinhart-Rogoff effect.
  - Nominal GDP is also about on target once one adjusts appropriately for the Reinhart-Rogoff effect.
- Attempts to push nominal GDP higher would push the price level off its path, violating the signature of optimal monetary policy.*

* *Also, see* R.E. Hall and N.G. Mankiw, 1994, "Nominal Income Targeting," in *Monetary Policy*, N.G. Mankiw ed., University of Chicago Press, pp. 71-94.

The 1970s experience

- In some well-regarded research, Athanasios Orphanides has emphasized that the early 1970s were characterized by a productivity slowdown, but that policymakers at the time did not recognize the slowdown.*

- Policymakers kept policy very easy in response to output and employment growth they regarded as "too slow."

- The eventual result was simultaneous double-digit inflation and double-digit unemployment.

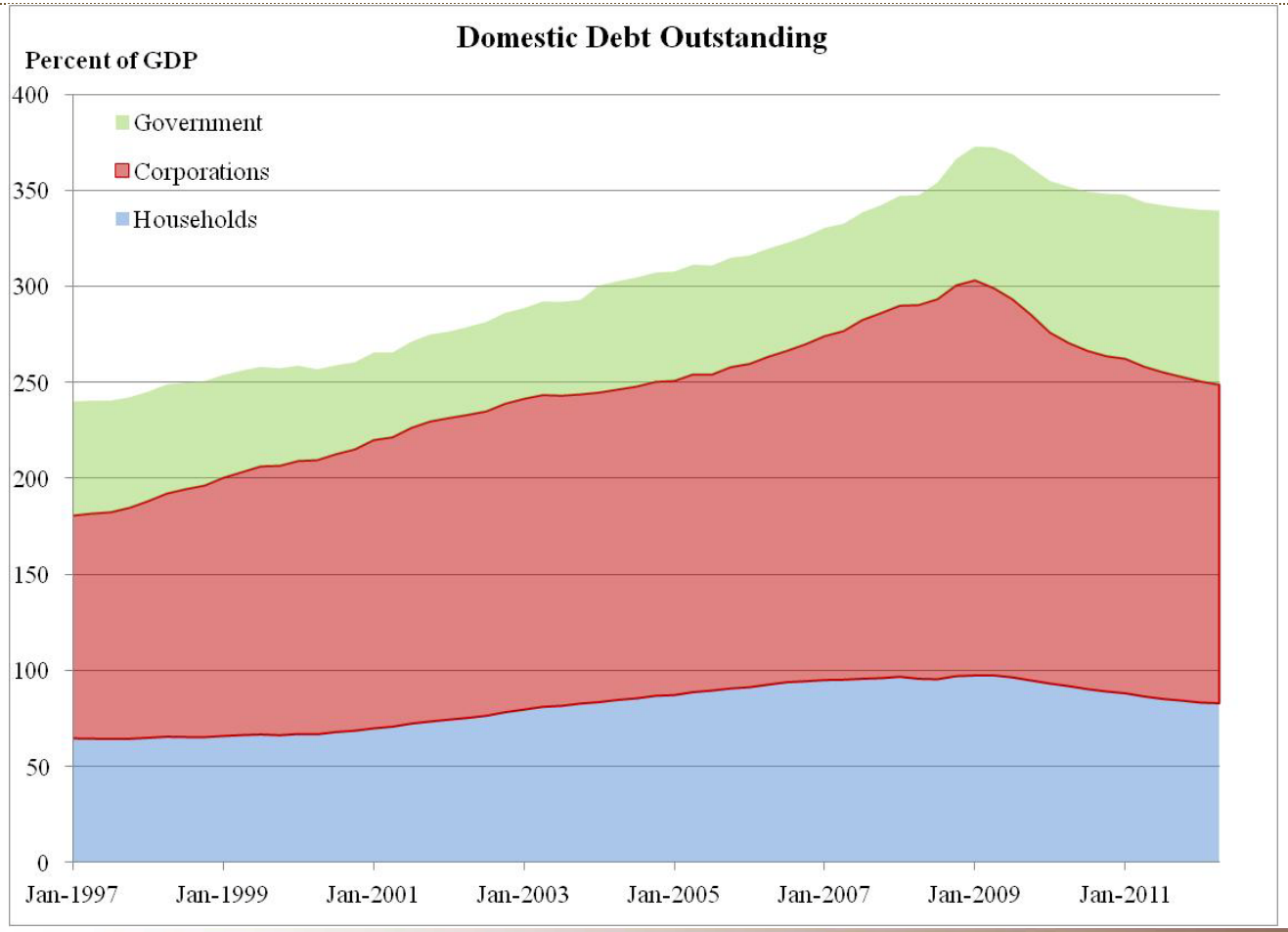
* *See* A.Orphanides, 2001, "Monetary Policy Rules, Macroeconomic Stability, and Inflation: A View from the Trenches," *Journal of Money, Credit and Banking*, 36(2), pp. 151-75.

Alternative theories

Alternative theories

- Professor Woodford's framework has only the "sticky price" problem, and monetary policy is supposed to "fix" that problem by keeping the price level on path in the face of disturbances.
- Perhaps it is not wise to rely only on that model to try to understand the current situation in the U.S.
- The actual U.S. economy seems to have a very different problem: Too much debt.

U.S. debt



Source: Federal Reserve Board, Bureau of Economic Analysis and author's calculations. Last observation: 2012:Q2.

Defaulting on debt

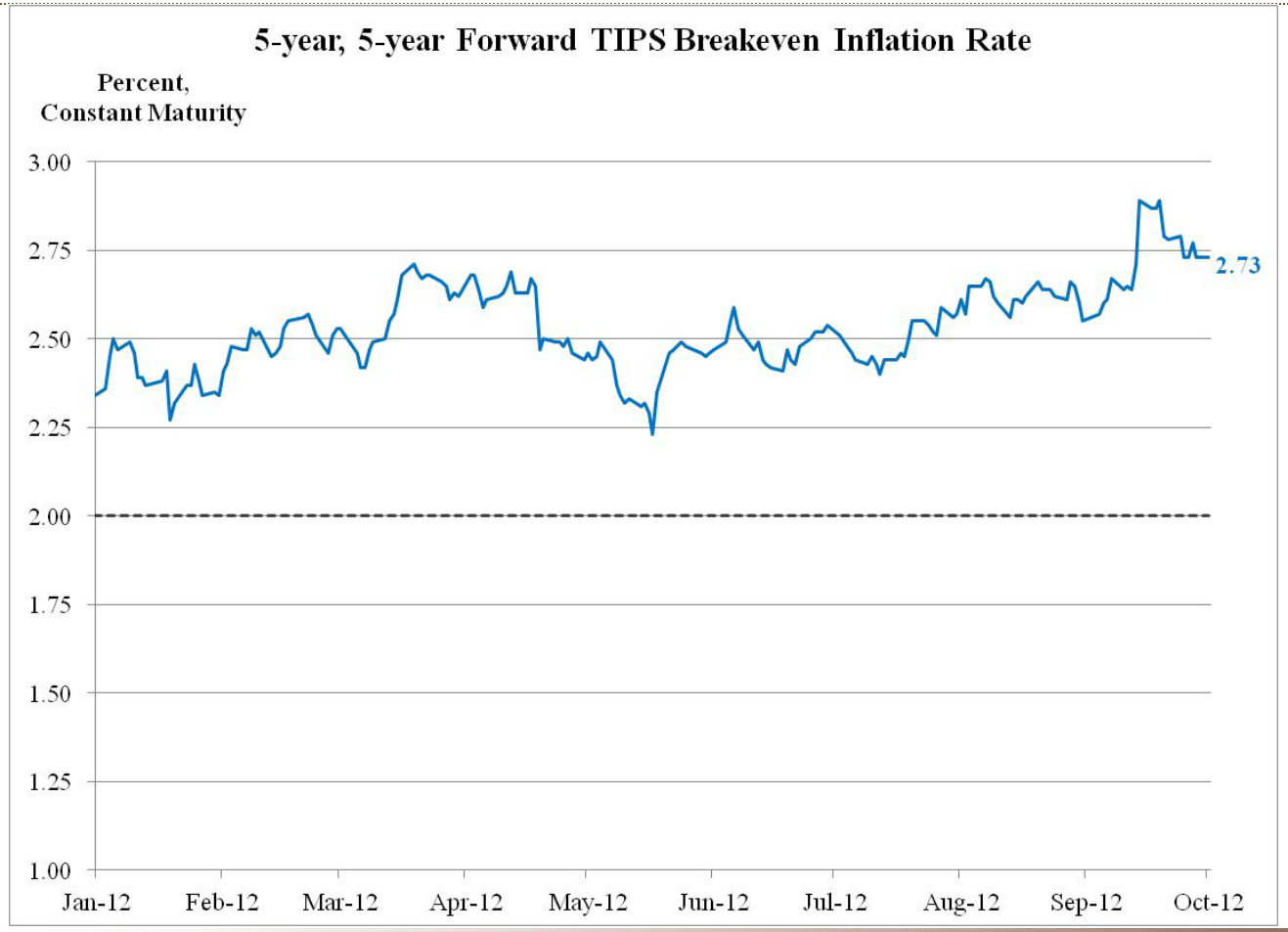
- Inflation is sometimes seen as a way to partially default on existing nominal debts.
  - The debts were incurred given certain expectations about future inflation.
  - If actual inflation during the length of the contract turns out to be higher than anticipated, then the debtor is in effect paying less to the lender in real terms.
- Professor Rogoff has sometimes articulated this view.*
- The partial default would occur against savers, mostly older U.S. households, and against foreign creditors.

** See Ken Rogoff's interview with John Ydstie in* Morning Edition *aired on October 7, 2011 on NPR.*

No free lunch

- Alas, in economics there is no free lunch.
- A partial default today through higher inflation would be paid for via higher inflation premiums in future borrowing.
  - Creditors would want to protect themselves against the unpredictable central bank that might surprise them with a burst of inflation.
  - Nominal interest rates would be higher than otherwise into the distant future.
- Is this happening? Distant inflation expectations from the TIPS market seem to suggest that investors do not completely trust the Fed to deliver on its 2 percent inflation target.

No free lunch



Source: Federal Reserve Board. Last observation: October 1, 2012.

Center the discussion

- If the goal is to talk about the over-indebtedness of U.S. households, then Woodford's baseline model is not the appropriate vehicle.

- Even in models where there is in some sense "too much debt," it is unlikely that partial default through inflation is good policy.

- Such a policy would distort credit markets far into the future.

Conclusions

Summary

- Simple versions of a leading macroeconomic theory suggest that the price level path can provide a "signature" for optimal monetary policy.

- The U.S. experience seems to satisfy this signature test, because the actual aggregate price level in the U.S. is quite close to the path established beginning in the mid-1990s.

- Real GDP, however, has grown slowly in recent years due to the Reinhart-Rogoff effect.

Summary, continued

- Nominal GDP, the combination of the aggregate price level and real GDP, is about on target if properly adjusted for the Reinhart-Rogoff effect.
  - Nominal GDP targeting, without proper adjustment, could be a policy disaster.

- Higher U.S. inflation could alternatively be viewed as a way to partially default on nominal debts.
  - That type of policy choice would likely impair U.S. credit markets into the distant future.

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