

# OVERCOMING THE ZERO BOUND WITH NEGATIVE INTEREST RATE POLICY

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# Overcoming the Zero Bound with Negative Interest Rate Policy

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# Urgency of the Problem

- Irving Fisher's (1930, 1986) *The Theory of Interest* pointed out that if a commodity could be stored costlessly over time, then the rate of interest in units of that commodity could never fall below zero
- A central bank that pays zero interest on reserves puts a lower bound on the nominal interbank rate of interest
- The power of open market operations to lower short-term real interest rates to fight deflation or recession then is limited when nominal rates are already low on average—as is the case when inflation and the inflation premium are stabilized at a 2% inflation target

## Urgency of the Problem (2)

- Quantitative monetary policy appears to have been effective in averting deflation and stimulating demand with near zero interest rates in the US and the UK
- But Japan did not exit the zero bound or deflation for two decades even with the help of quantitative policy
- The US, the UK, and the Euro area have not yet exited near zero interest rates seven years after the Great Recession
- Sweden exited near zero interest in 2010-2011 elevating the RP rate to 2%, but reversed field subsequently to counter ensuing deflation

# Urgency of the Problem (3)

- The fact that none of these countries has yet succeeded in exiting near zero interest rates, and that zero interest in the 1930s ended only with WW2, suggests that the constraint on interest rate policy near zero has more profound adverse consequences for macroeconomic performance than previously thought
- And the fact that the Euro area, Switzerland, Denmark, and Sweden have moved this past year to cut the interest on reserves floor below zero testifies to the practical value of negative interest rates and the urgency of considering how to remove the zero lower bound on interest rate policy altogether

# Evolution of Monetary Policy

- The focus of monetary policy on price stability via the targeting of inflation has its origins in Irving Fisher's *The Purchasing Power of Money* (1911, 1931, 1985)
- Instability in the purchasing power of money—deflation and inflation—came to be understood to have negative consequences for employment and output
- Central banks came to be seen as having the power to control inflation via their control of the monetary base, short term nominal interest rates, and the money supply
- Central banks have been given “operational independence” to use their policy instruments to target inflation

# Evolution of Monetary Policy (2)

- Full operational independence to stabilize inflation and employment has been impeded historically by three restrictions on monetary policy: 1) the gold standard, 2) a fixed exchange rate, and 3) the zero interest rate bound
- The gold standard constrained central banks to maintain a fixed dollar price of gold, so fluctuations in the gold price of goods would induce fluctuations in the price level, since  $\$/good = [\$s/ounces\ gold][ounces\ gold/good]$
- The fixed exchange rate constrained central banks to maintain a fixed dollar price of foreign currency, so fluctuations in the terms of trade (the real exchange rate) would induce fluctuations in the domestic price level, since  $domestic\ goods/foreign\ good = \{[FXs/foreign\ good]/[\$/domestic\ good]\}(\$/FX)$

# Evolution of Monetary Policy (3)

- The zero nominal interest rate bound puts a floor under the real interest rate at minus the expected rate of inflation
- If 2% targeted inflation is expected, then the zero bound puts a floor on real interest rate policy at -2%
- Interest rate policy is then constrained from shadowing a negative “natural real rate” consistent with full employment and targeted inflation that falls below -2%
- In that case, the ensuing disinflation (or deflation) would raise the real interest rate floor and worsen the situation
- All three abovementioned restrictions subject monetary policy to relative prices beyond its control—namely the relative price of goods in terms of gold, the relative price of foreign goods in terms of domestic goods, and the relative price of current consumption in terms of future consumption

# Why the Zero Bound Constraint Matters

- To return inflation to target and employment to the natural rate after a deflationary shock requires that the central bank has the operational capacity and the independence to do so, and that the public has confidence in the central bank's determination to do so
- The public trusts the proven power of restrictive interest rate policy over inflation because the CB has a demonstrated willingness to overshoot, knowing that it can pull interest rates back flexibly if restrictive interest rate policy proves excessive; the Volcker Fed in 1982 pulled the fed funds rate down sharply in the face of near financial collapse from 14% in June to 9% in November

# Why the Zero Bound Constraint Matters (2)

- The problem near the zero bound is that the central bank lacks the capacity to overshoot interest rate stimulus against deflation and recession, and so lacks the credibility to stimulate aggregate spending sufficiently to facilitate a prompt return of employment to the natural rate and inflation to target
- In practice, it has proven difficult also for “quantitative policy” and “forward guidance” to restore full employment and targeted inflation in a timely manner because neither of these policy options can generate the requisite credibility to do so (Goodfriend 2014)
- Thus, in most countries whose interest rate policy has been constrained by the zero bound, employment has returned to the natural rate very slowly and inflation has lingered below target for years

# Why the Zero Bound Constraint Matters (3)

- Reasons to think that the world may need unusually low or negative real interest rates for a period of time:
  - 1) Distribution of global income favors relatively high saving rates relative to investment demand at zero real interest
  - 2) Productivity growth rates have fallen below the 20<sup>th</sup> century trend
  - 3) High demand for safe, liquid securities pushes short-term nominal interest rates consistent with inflation at target and employment at the natural rate closer to zero

# Mechanics of Negative Interest Rate Policy

- Money has long come bundled with a zero own (nominal) rate of interest, e.g., gold coins pay zero gold interest and modern paper currency pays zero paper money interest; abstracting from marginal safekeeping costs no one would lend currency at negative nominal interest
- Likewise, as long as a central bank pays zero nominal interest on reserves, banks won't lend to each other at negative nominal interest
- However, a central bank can drive the nominal interbank interest rate negative by 1) injecting enough reserves into the banking system to drive the interbank rate to zero and then 2) charging banks a per dollar, per period fee (negative nominal interest) for holding reserves

# Mechanics of Negative Interest Policy (2)

- Competition to lend excess reserves drives interbank rate down to the negative interest on reserves floor
- Banking competition and arbitrage pull money market rates and bank loan rates down
- Longer-term rates move with the average of expected future short rates over the relevant horizon
- Banks are reluctant to “pass through” negative interest costs to deposit rates for fear of driving away legacy depositors ordinarily highly stable and lucrative
- Legacy depositors would have no incentive to withdraw deposits as zero interest currency
- The public has an incentive to shift from holding funds in money markets to holding zero interest deposits, but banks have an incentive to “pass through” negative interest costs to new deposits

# Mechanics of Negative Interest Policy (3)

- The public also has an incentive to move funds from money markets into currency—however handling and storage costs for substantial sums of currency could preclude much arbitrage along these lines
- Thus, even without modifying the terms upon which currency is traditionally made available to the public, it might be possible for central banks to pull short term nominal interest rates below zero by a couple of percentage points or more for some period of time...
- If it hasn't been done already, it would be useful to model quantitatively the limit of negative interest rate policy under current arrangements, given the urgency of dealing with the zero interest bound

# Mechanics of Negative Interest Policy (4)

- To remove entirely the “arbitrage opportunity” constraint on negative nominal interest rate policy due to the presence of currency the central bank could:
  - 1) Eliminate currency entirely and permanently
  - 2) Continue to provide currency demanded elastically at par for deposits, but temporarily impose a per period, per dollar carry tax on currency at least as costly as the negative interest imposed on the banking system—by embedding a time-date strip in notes to record when currency enters and is withdrawn from circulation (Goodfriend (2000), pp. 11-13)
  - 3) Float the deposit price of currency by discontinuing the policy of supplying currency demanded elastically at par for deposits; could be a fully flexible or managed float; grow the stock of currency at a trend chosen so that the deposit price of currency fluctuates around par; deposit price of currency fluctuates as it did during the suspension following the Panic of 1907 in the US (See Goodfriend (2000), p. 44)

# Elevated Inflation Target Not the Answer

- A permanently elevated inflation target would raise permanently the inflation tax on currency to enable a central bank on occasion to create more deeply negative real interest rates
- Deposit price of currency could be floated temporarily, only when in need of leeway for negative nominal interest
- Carry tax on currency could be imposed temporarily, only on those occasions when negative nominal interest is needed
- Development, implementation and administrative costs of removing the zero interest bound would have to be set against elevated distortionary costs due to higher trend inflation, e.g., for price and wage setting
- The permanent elimination of currency also would obviate the need to elevate the inflation target, but that would deprive the public of currency services

# Elevated Inflation Target Not the Answer (2)

- Recent research suggests that an increase in trend inflation is associated with a more volatile and unstable economy and tends to destabilize inflation expectations (Ascari and Sbordone (2014))
- Elevated inflation target still constrains negative real interest, and potentially comes with an inflationary bias in fear of the zero lower bound
- Financial instability has been primary source of aggregate fluctuations necessitating negative real interest in era of low and stable inflation; improved macro-prudential regulations should help maintain more stable banking, credit, and financial markets
- At a 2% inflation target the price level doubles in 30 years; the price level doubles in 17 years at 4% inflation
- Creates substantial inflation risk in long-term nominal bonds—drives the public to hold savings in shorter-term securities subject to interest rate risk

# Conclusion

- In 1999 I outlined how negative nominal interest rate policy could work in practice at a Federal Reserve System conference in Woodstock, Vermont (Goodfriend (2000)). The moderator asked for a vote of those present--how many thought the US would experience zero interest rates any time in the foreseeable future? As I recall, about half thought so...
- I thought otherwise, that Japan's encounter with the zero bound could easily happen in the US and elsewhere
- I was asked to discuss the quantitative policy part of my paper at the 2002 January FOMC meeting in the wake of 9/11; no one wanted to hear about negative interest—the idea was regarded as far-fetched
- Today, not only has negative interest rate policy been undertaken by a number of prominent central banks, this conference is considering how to remove the zero bound altogether—we have come a long way

# Conclusion (2)

- Removing the zero lower bound is nothing more than a sensible application of monetary economics, progressing along a path that has increasingly unencumbered operational interest rate policy to sustain price stability and full employment via a low inflation target
- If the zero lower bound were removed, then monetary policy could target zero inflation and enable the public to enjoy the full benefits of a stable purchasing power of money
- The idea of negative interest rates takes some getting used to, but it should be possible to make the public aware that such flexibility in short term interest rates is well worth it to provide the public with better job security and more secure lifetime savings

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