

# The Case For Negative Interest Rates

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# Introduction

Context: Goodfriend wrote a paper in 1999 that explored the possibility of negative interest rates

Since then, short term negative rates are a reality in Switzerland, Sweden, Japan, and the Euro area.

In an era of low long term rates, monetary policy might be ineffective in the next economic downturn with the presence of a zero bound on interest rates.

Solution: remove zero bound on interest rates

# Brief History of Monetary Policy

What is the motivation of this paper?

Goodfriend starts by discussing:

- The gold standard
- Fixed foreign exchange rates

And why they have been abandoned since the 1970s

Under the gold standard, the price level can be expressed in the following way:

$$\frac{\textit{money}}{\textit{goods}} = \frac{\textit{money}}{\textit{gold}} \times \frac{\textit{gold}}{\textit{goods}}$$

Since the central bank kept  $\frac{\textit{money}}{\textit{gold}}$  fixed,  $\frac{\textit{gold}}{\textit{goods}}$  was the main influence of the price level.

Changes in the underlying determinants of the gold price of goods would then feed into the price level: a bad outcome!

Governments widely abandoned the gold standard by 1970.

# Fixed Foreign Exchange Rates

Under fixed foreign exchange rates, the A good price of B good can be expressed the following way:

$$\frac{A \text{ goods}}{B \text{ good}} = \frac{B \text{ Money} / B \text{ Good}}{A \text{ Money} / A \text{ Good}} \frac{A \text{ Money}}{B \text{ Money}}$$

if A terms of trades improve (ie LHS goes up), then a fixed  $\frac{A \text{ money}}{B \text{ money}}$  forces inflation in country A or deflation in Country B.

In practice, this hurts smaller trading partners because it encumbers their monetary policy.

Like the gold standard, fixed foreign exchange rates were widely abandoned since the 1970s.

# The Model

Consider an economy populated by households that follow these rules:

- Households live for two periods:  $t_1$  and  $t_2$
- Households maximize lifetime utility given an ex ante interest rate 'r' at which they can lend or borrow with certainty
- $\rho > 0$  is the psychological rate of time preference (households prefer to consume in  $t_1$  all else equal)
- $u(c) = \log(c)$ , so that  $u'(c) = \frac{1}{c}$

# Present Aggregate Demand

- Households will maximize lifetime utility by equating the marginal utility of present consumption ( $\frac{1}{C_1}$ ) and future consumption ( $(\frac{1+r}{1+\rho})\frac{1}{C_2}$ )  $\Rightarrow \frac{C_2}{C_1} = \frac{1+r}{1+\rho}$
- Future income prospects are denoted as  $\frac{a_2}{1+\mu_2^*}$  where  $a_2$  is future labor productivity,  $\frac{1}{1+\mu_2^*}$  is future hours worked, and  $\mu_2^*$  captures future taxes, regulations, or other distortions that reduce equilibrium hours worked.
- Substituting future income prospects for future consumption in the Euler equation yields present aggregate demand:  $C_1^D = \frac{1+\rho}{1+r}(\frac{a_2}{1+\mu_2^*})$
- Present potential output is then:  $Y_1^P = \frac{a_1}{1+\mu_1^*}$



# Natural Rate of Interest

Setting  $Y_1^P = C_1^D$ , taking the log and solving for  $r$  yields:

$$r^N = \rho + g + \mu_1^* - \mu_2^*$$

The natural interest rate is the interest rate that make desired aggregate lifetime consumption plans conform to present and expected future potential output.

- Suppose  $g, \mu_1^*, \mu_2^*$  are all expected to be zero. Then  $r^N = \rho$  and consumption plan is flat!
- Suppose  $g, \mu_1^*$  are expected to be high, or  $\mu_2^*$  is expected to be low. Then  $r^N > \rho$  and households will wish to borrow from their bright futures. Vice versa for the opposite signs.

# There's the Rub

Let

- Nominal policy rate be  $R$
- Expected Inflation be  $E[\pi]$
- Real policy rate be  $r^P = R - E[\pi]$

If the nominal rate is at a low level and expected inflation is low, the real policy rate might be unable to shadow the natural interest rate. This inability creates a spread ( $r^P - r^N > 0$ ) that leads to a deficiency of aggregate demand relative to potential output.

# Factors Depressing Intertemporal Terms of Trade

Goodfriend identifies pessimism from public debt overhang and expectation of higher future taxes/distortions and less hours worked as factors depressing intertemporal terms of trade.

These factors are caused in part by:

- Rising income inequality
- Falling population growth
- Greater share of global GDP is coming from less developed countries with less property rights
- Less support for liberalization of international trade
- Decreasing productivity growth
- Growing awareness of looming downside risks due to incapacitation of monetary and fiscal stabilization policies

# Decline in Long Term Market Interest Rates

Goodfriend identifies a secular decline in long term market interest rates as another factor depressing intertemporal terms of trade.

Interest rates on 10 year TIPS decreased from 4% in 1985 to around 2% from 2002-2008 to around 0% today.

If we are in a regime of low long term nominal interest rates, then monetary policy will be effectively useless in the presence of a zero bound.

# The Urgency of Encumbering Interest Rates From the Zero Bound

Given historically low interest rates, conducting monetary policy (lowering interest rates) might be impossible in the next economic downturn.

Goodfriend is highly skeptical of central bank balance sheet expansion, such as that undertaken after the great recession, warning the reader of 'destructive inflationary finance'

Better alternative: implement policy to remove the zero bound for interest rates

# Abolish Paper Currency

- Abolishing paper currency would unencumber interest rate policy completely at the zero bound.
- If no one could withdraw paper money, central bank could easily charge or pay interest on electronic funds.
- Practical?

# Flexible Market-Determined Deposit Price of Paper Currency

Basic idea of this proposal is to allow a floating deposit price between paper dollars and bank dollars.

Similarities to abolishing gold standard and fixed foreign exchange rates: allow fluctuations in the deposit demand of paper to be reflected in the deposit price of paper, not the general price level.

General process:

- Negative interest rates put upward pressure on deposit price of paper
- Deposit price is expected to fall back toward par at a rate equal to the negative nominal interest rate
- Along this price path, public becomes indifferent between holding negative yielding deposits and depreciating currency.
- Practical?

# Provide Electronic Currency at Par with Deposits

This proposal blends the first two.

General idea:

- Central bank offers electronic accounts for public
- Electronic currency deposit price maintained at par
- Charge or pay interest on electronic funds
- Paper currency exists with a flexible deposit price
- Practical?



# Conclusion

- Goodfriend's model identifies the 'natural rate of interest'
- The current world is in a place that could benefit from negative rates
- Removing zero bound could enable the public to enjoy the benefits of a fully stable purchasing power of money
- Would be difficult to implement