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NOBEL SYMPOSIA



# Nobel Symposium “Money and Banking”

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RIKSBANKENS  
JUBILEUMSFOND

THE SWEDISH FOUNDATION FOR  
HUMANITIES AND SOCIAL SCIENCES

Discussion of  
Monetary Policy: Conventional and  
Unconventional

Michael Woodford and Stephanie Schmitt-Grohe

Emi Nakamura  
Columbia University

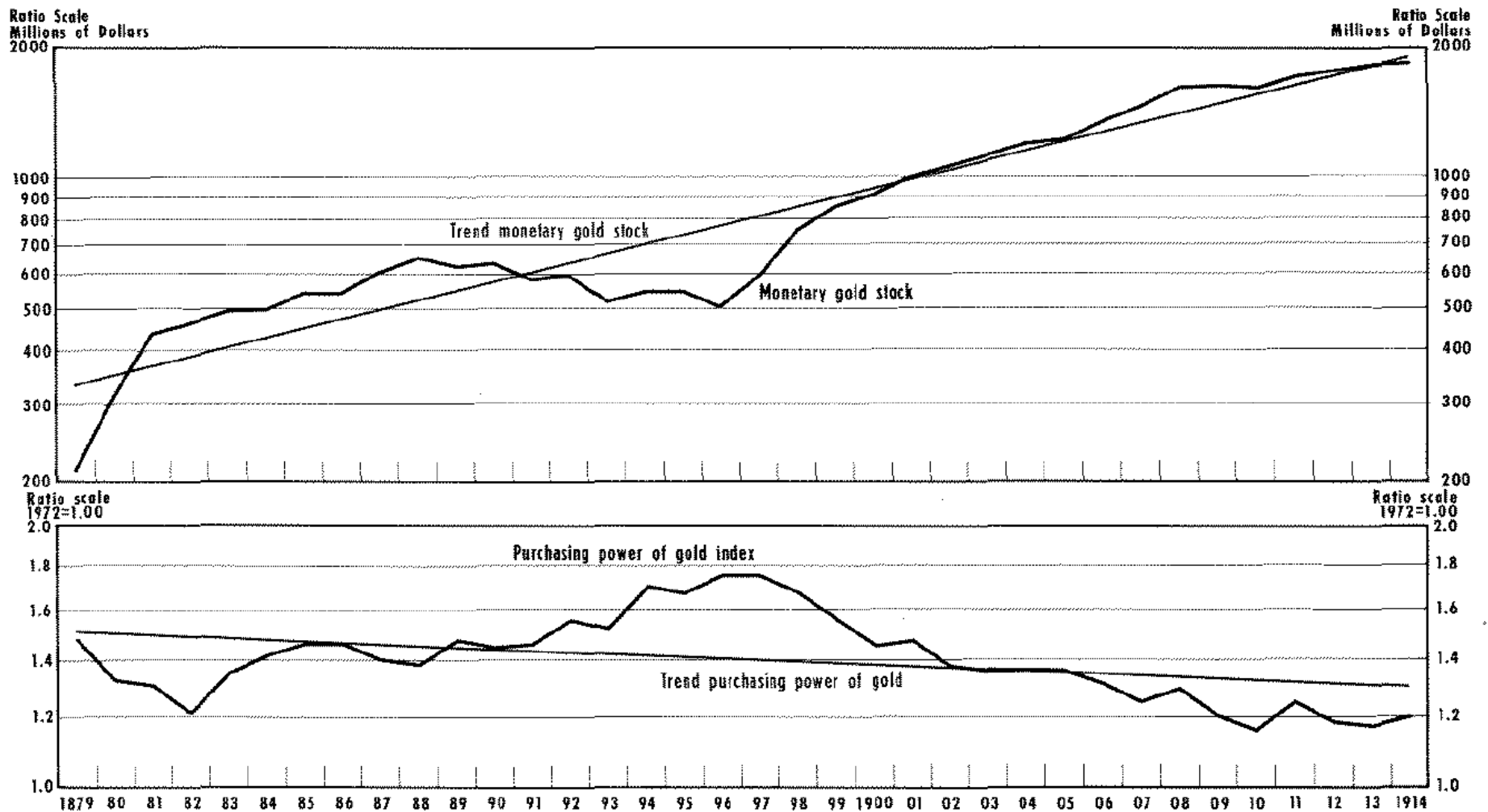
## Monetary Policy Since End of Bretton Woods

- Dramatic changes in monetary policy since end of Bretton Woods
  - Inflation targeting
  - ZLB, QE (and so on)

Perhaps less emphasized are dramatic changes in more basic ideas:

- Is monetary policy about money?
- Do interest rate rules work

# Classical Gold Standard



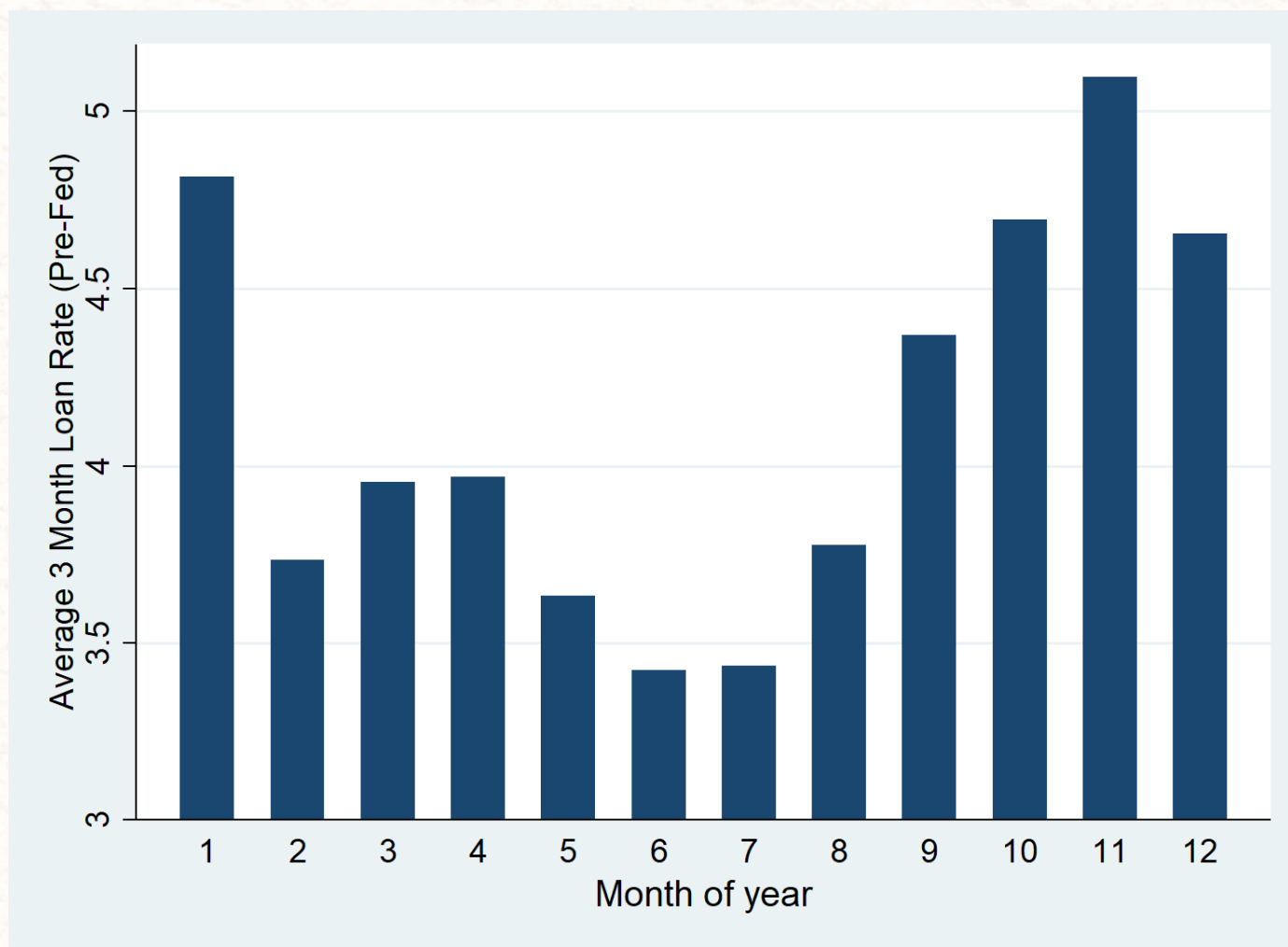
Source: Bordo (1981)

# Money Demand Shocks

- Money demand shocks are HUGE!
- Seasonality:
  - Money demand is high around Christmas
  - Money demand is high at the end of the month
  - Money demand is high in harvest/planting season (in an agricultural economy)
- Financial innovation: Credit cards vs. cash
- Suboptimal to have these factors influence interest rates

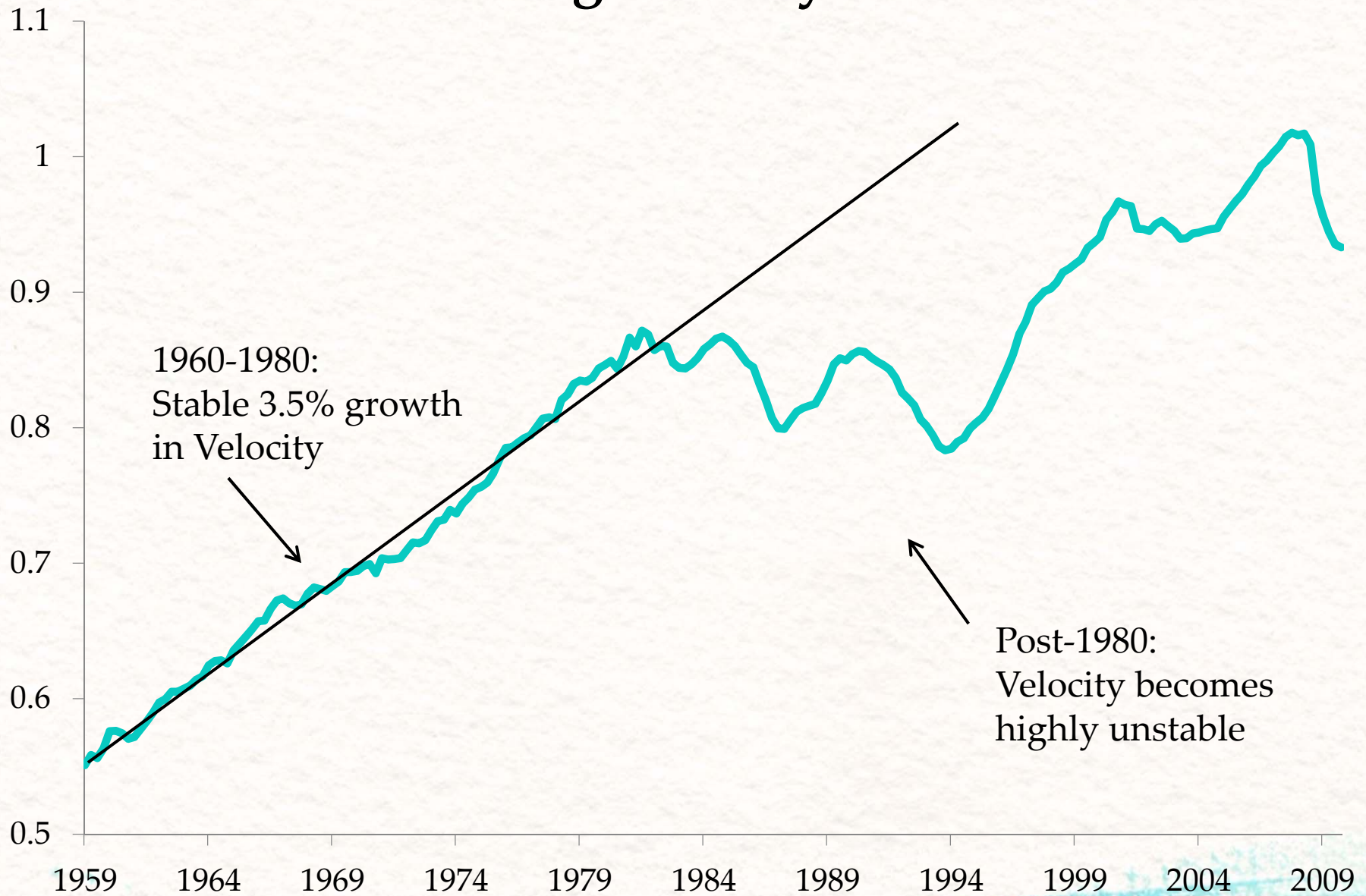
*Big practical issue*

# Seasonal Interest Rates during Gold Standard (1890-1910)



Source: Mankiw, Miron, and Weil (1987)

# U.S. Log Velocity of M1



1960-1980:  
Stable 3.5% growth  
in Velocity

Post-1980:  
Velocity becomes  
highly unstable

## Interest Rate Targeting

- Serious theoretical debate about whether targeting interest rates would wreak havoc on economy

Sargent and Wallace (1975) argued that targeting interest rates would lead to indeterminacy with rational expectations:

“We compare two alternative strategies ... One is to **peg the interest rate ... letting the money supply be whatever it must be to satisfy demand**. The other is to set the money supply period by period, accepting whatever interest rate equilibrates the system.”



## Cowboy Monetary Policy

- Canada and Australia switched to explicit interest rate targeting (channel/corridor system) in mid 1990's
- Eliminated reserve requirements (dramatic decline in money demand)
- Contrast vs. academic work (largely still focused on money)
- Much more explicit about  $i$  as policy instrument than earlier monetary policies

## IS-LM

- Monetary policy is about trade-off between interest-dominated *money* and interest-bearing bonds
- Central bank determines interest rates through *open market operations*
- Print money to buy bonds (so money and interest rates are negatively correlated)

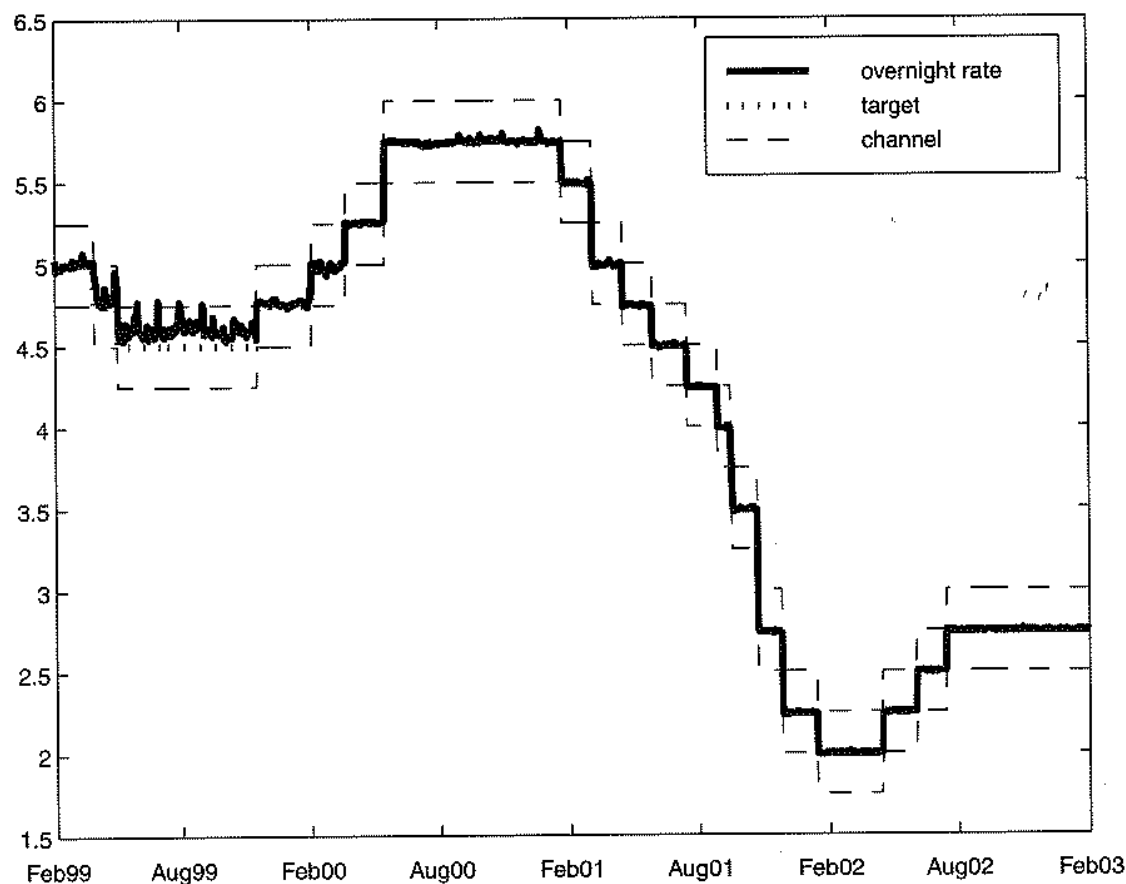
## Corridor system

- Central bank chooses a **narrow corridor** around target overnight interest rate  $i$
- Stands ready to supply an **arbitrary amount** of reserves at  $\bar{i}$  and to take arbitrary deposits at  $\underline{i}$
- “Open market operations” trading off “money” and “bonds” play at most a secondary role
  - Reserves now bear interest
  - Open market operations only serve to position interest rates within the (narrow) corridor
  - Central bank supplies cash to offset money demand shocks (Christmas, credit cards, etc.)

# Did it Work? Canada

3. Monetary Policy without Control of a Monetary Aggregate

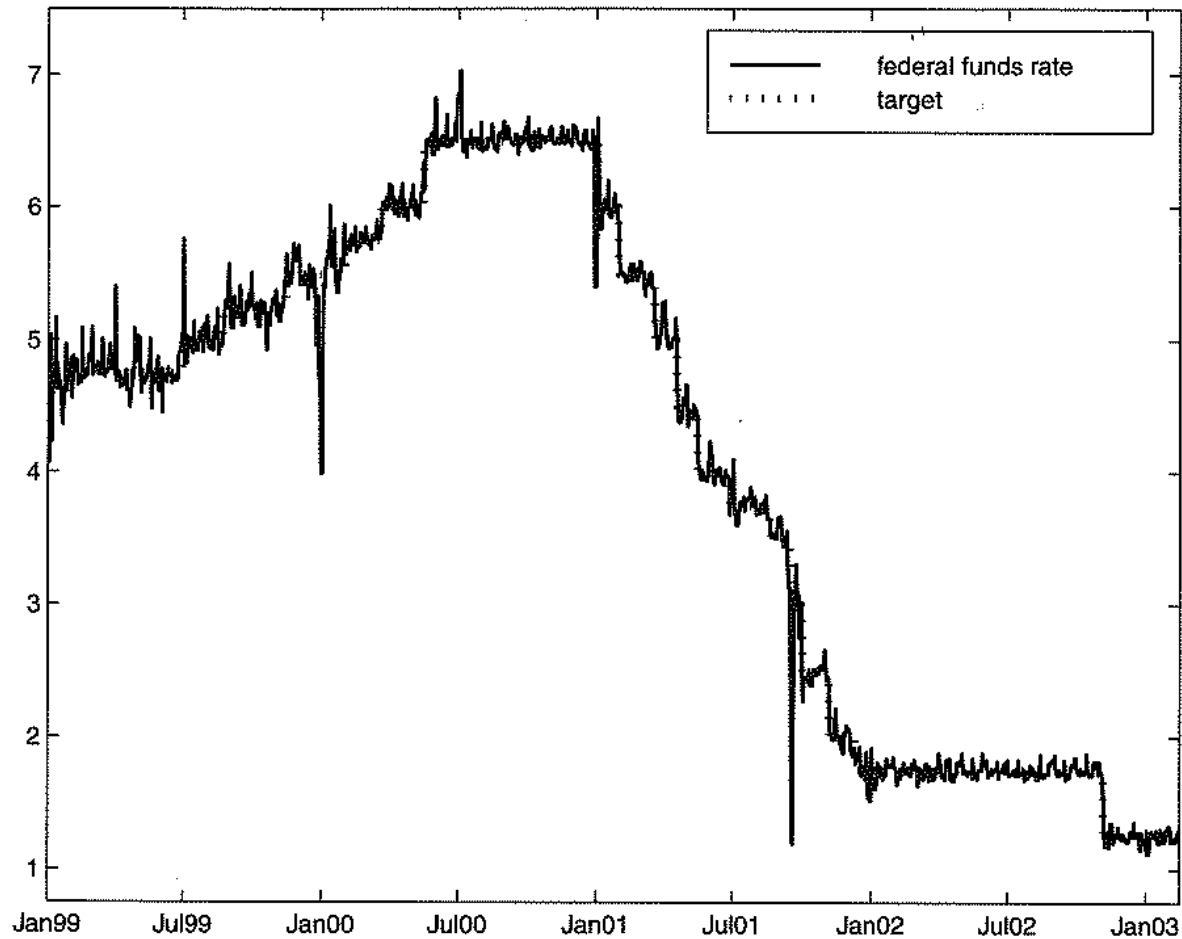
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*Figure 1.1 The channel or operating band and the market overnight rate since introduction of the LVTS system in Canada. Source: Bank of Canada.*

Source: Woodford (2003)

# Comparison to US

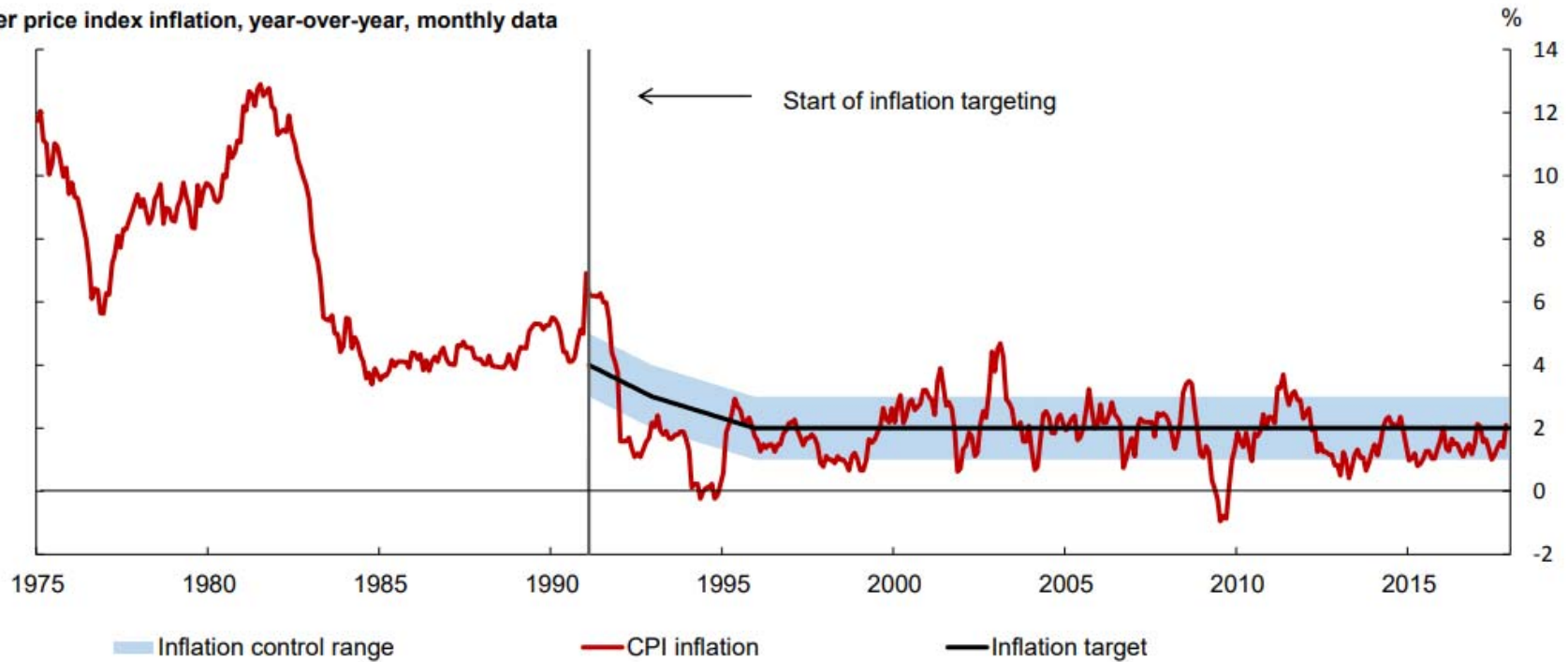


*Figure 1.2 The U.S. federal-funds rate and the Fed's operating target. Source: Federal Reserve Board.*

Source: Woodford (2003)

# Low and Stable Inflation (Canada)

Consumer price index inflation, year-over-year, monthly data



## No Longer Experimental

- This “cowboy” approach to central banking is now the industry standard
  - Canada and Australia followed by New Zealand, ECB, Bank of Japan, Bank of England, Bank of Korea, and so on...
- Fed: “Floor” system
  - Interest on reserves since late 2008
  - Enough reserves to push interest rate to the “floor” of the corridor

## Fortunately, Theory has Caught Up

- Cashless economy  
(Woodford 2000, 2001, 2003)
- Price level determinacy using interest rate rules
  - Taylor principle (McCallum, Woodford)
  - Commodity trigger rules (Obstfeld/Rogoff, Woodford)
  - Fiscal theory (Woodford, Cochrane, Sims)
  - Learning (Evans-Honkapohja)
  - K-level thinking (Garcia-Schmidt and Woodford)



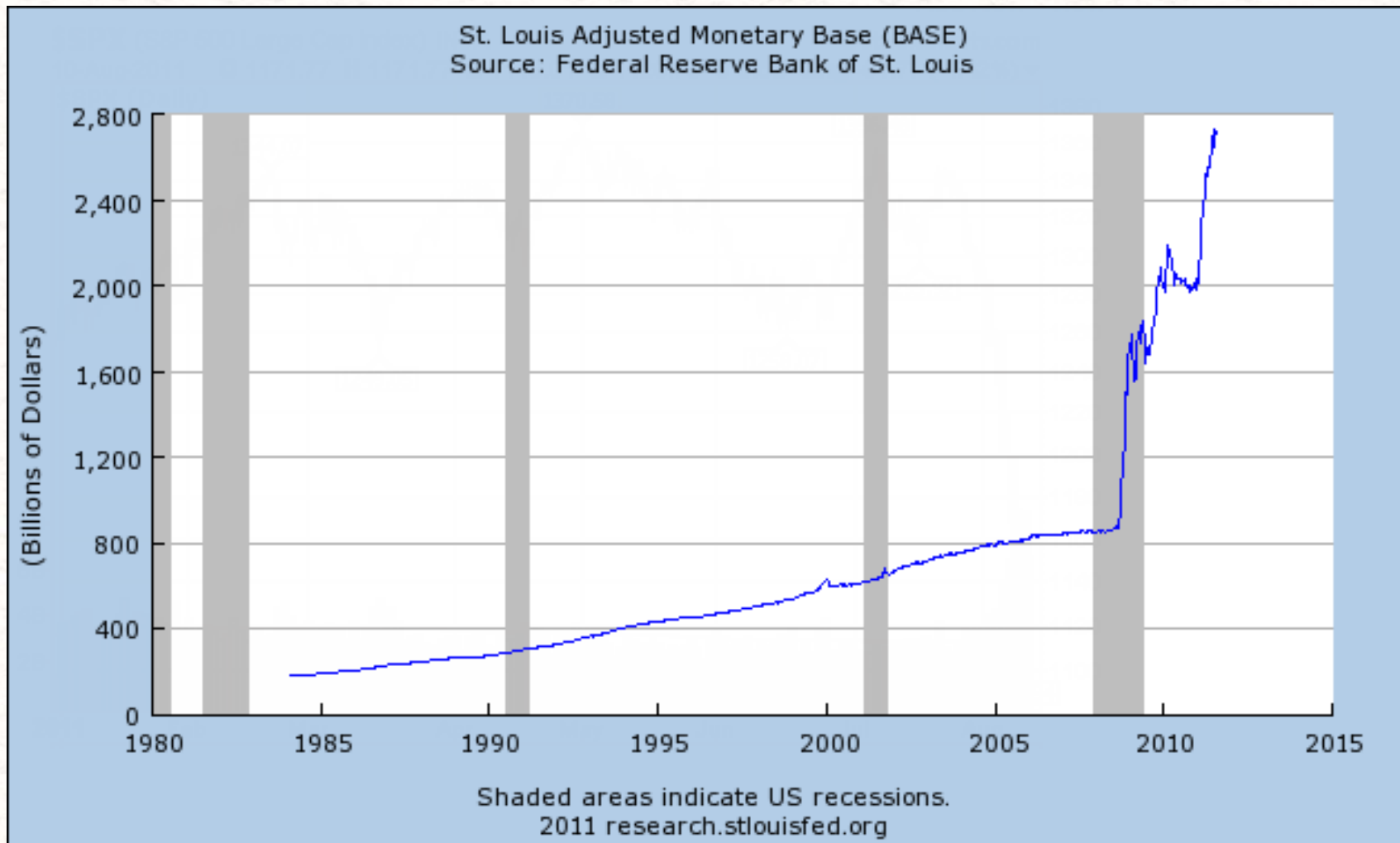
# Empirics: Money to interest rates

Barro (1977)	Money
Sims (1980)	Money
Bernanke (1986)	Money
Bernanke and Blinder (1992)	Interest rates
Sims (1992)	Money and Interest Rates
Eichenbaum and Evans (1995)	Money
Christiano, Eichenbaum and Evans (1999)	Money
Bernanke and Mihov (1998)	Money and Interest Rates
Romer and Romer (2004)	Interest Rates
Christiano, Eichenbaum and Evans (2005)	Money and Interest Rates
Bernanke, Boivin and Eliasziw (2005)	Interest Rates
Gurkaynak Sack and Swanson (2005)	Interest Rates
Gertler and Karadi (2015)	Interest Rates
Nakamura and Steinsson (2018)	Interest Rates

## Should we Call it Monetary Economics?

- What is special about the Fed, if not its unique ability to “print” money?
- Cashless theory says key power of Fed is to set interest rates in the “unit of account”
- Strong discontinuity-based evidence that:
  - Nominal exchange rates affect real rates  
(e.g., Mussa; Burstein, Eichengreen and Rebelo)
  - Nominal interest rates affect real rates  
(e.g. Hanson and Stein; Nakamura and Steinsson)
- This alone gives the Fed power  
(Woodford, 2003)

# Practical Implications during Great Recession



## Monetary Plumbing and the Great Recession

- Why didn't monetary economists fear a hyperinflation?
- Remember the plumbing
  - Fed started paying interest on reserves almost simultaneously with the dramatic increase in M0 (for the purpose of expanding credit facilities)
  - Interest on reserves / ZLB increased demand for money (bank reserves no longer interest dominated)
  - Not surprising that M0 skyrocketed
  - No reason to fear hyperinflation
- Monetary economists right for the right reasons