History of Money & Inflation (2/8/2011)   Econ 310-008

Equations

- **M = PQ + C + S**   coining
- **M = S**   fiat money
- s = Eh   bailey curve
- E = ΔH/H   growth rate of H
- h = H/P   real money stock

Definitions

- *specie* - gold or silver
- *hyperinflation* – a rise in the price level exceeding 50% per month
- *Gresham's Law* – an artificially overvalued money tends to drive an artificially undervalued money out of circulation ("bad money drives out good")
- *parallel standard* – market exchange rate with two monies
- *bimetallic standard* – government fixed exchange rate of gold and silver
- *seigniorage* – profit that results from producing coins (difference between face value and metal value)
- *debasement* – lowering the value of the currency (usually commodity money)
- *Laffer curve* - there exists a tax rate (less than 100%) that will yield maximum government tax revenue
- *Bailey curve* - there exists a rate of monetary expansion (less than infinite) that will yield maximum government seigniorage revenue

Variable definitions

- $M \equiv$ nominal value assigned to coin
- $P \equiv$ nominal price paid per oz. of precious metal
- $Q \equiv$ number of oz. of precious metal in the coin
- $C \equiv$ cost of coining the metal ("brassage")
- $S \equiv$ nominal seigniorage
- $s \equiv$ real seigniorage
- $H \equiv$ high powered money (monetary base)
- $E \equiv$ growth rate of H ("tax rate")
- $h \equiv$ real money stock ("tax base")

Notes

- Through most of history, war and inflation were closely related.
- Rise in the price level results from the increase in the money stock, not from the fall in value of the coin.
- During the 16th century, Spain's price level increased 200-300% due to gold and silver imports.
- Colonial Americans generally used Spanish dollar coins rather than British pounds because England had a prohibition on the export of specie to the colonies.
- The purchasing power of the U.S. dollar has declined 95.5% since 1913.
- German hyperinflation (1921-1923) ended with a currency reform: cut 12 zeros. No wage and price controls or reversion to barter in Weimar Republic. In post WWII Germany there was fear of inflation, so wage and price controls were imposed, leading to rationing, black markets, and reversion to barter.
- Hyperinflation w/o wage and price controls better than wage and price controls w/o hyperinflation.
- Silver was good for small transactions and gold was good for large transactions.
- "Inflation is always and everywhere a monetary phenomenon." – Milton Friedman
- Inflation used to be synomous with monetary growth. Now it means a rise in the price level.
- Governments that find it hard to borrow or tax must rely more on seigniorage.

Inflation examples

- **Roman Denarius debased**
  - 54 AD 94% silver content
  - 218 AD 43% silver content
  - 268 AD 1% silver content
- **Revolutionary War continental**
  - 1775 3 to 1
  - 1778 5 to 1
  - 1779 30 to 1
  - 1780 76 to 1
  - 1781 167 to 1
  - later totally worthless
- **Confederate dollar in specie**
  - 1862 82.7¢
  - 1863 29.0¢
  - 1865 1.7¢
  - later totally worthless
- **German Mark (butter price)**
  - 1914 1.4 marks
  - 1918 3 marks
  - 1922 2400 marks
  - 1923 6 trillion marks
- **Zimbabwe inflation rate**
  - 2004 132.75%
  - 2005 585.84%
  - 2006 1,281.11%
  - 2007 66,212.3%
  - 2008 231,150,888.87%
  - 2009 6.5×10^{108}%

Civil war price level

- North 90.5%↑
- South 2076%↑

persistent inflation

- high money growth - yes
- fiscal policy alone - no
- supply-side phenomena - no

government revenue

- taxation
- borrowing
- seigniorage

Gresham's Law examples

- **Worn coins & new coins**
  - new coins undervalued
  - worn coins overvalued
  - ∴ worn coins drive out new coins
- **Silver to gold ratio 1792**
  - fixed: 15 to 1
  - market: 15.5 to 1
  - gold undervalued
  - silver overvalued
  - ∴ silver drives out gold
- **Silver to gold ratio 1835**
  - fixed: 16 to 1
  - market: 15.5 to 1
  - gold overvalued
  - silver undervalued
  - ∴ gold drives out silver
- **Silver to gold ratio 1866**
  - fixed: 16 to 1
  - market: 30 to 1
  - gold undervalued
  - silver overvalued
  - ∴ silver should drive out gold

Coining money

- **competition**
  - M = marginal cost of a coin = PQ + C
  - M = PQ + C means S = 0
- **government (royal mint)**
  - permanently seigniorage only if has legally protected monopoly
- **debasement requires deceit or compulsion**
  - no seigniorage if public notices
  - short run: disguise debasement
  - long run: use legal tender laws
- **debasement**
  - reduces Q for given M
  - replace silver with cheaper "base" metal (copper, zinc, tin)
  - each coin is cheaper (C↑, (PQ)↓)
- **seigniorage w/o debasement**
  - reduce P instead of Q
  - draw metal to mint w/ compulsion
- **fiat seigniorage**
  - Q = 0, C =aprox 0 (6¢/note)
  - M = PQ + C + S reduces to M = S

Email me your headshot picture for the seating chart by 2/14/2011. (+1 EC on quizzes.)