Inaugural Lecture:
From Gold to Paper Money and Back Again
Gresham College

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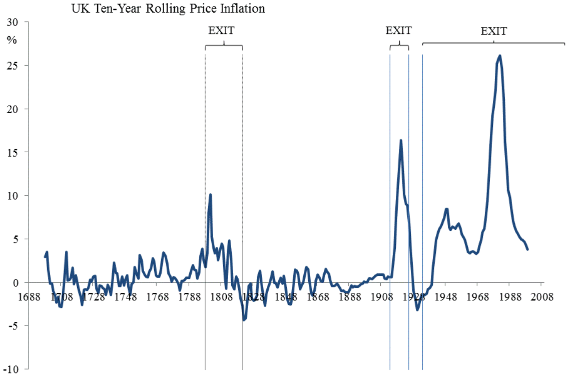
Outline of Arguments

- Development of Paper Money - Units of Account, Mean of Exchange and Store of Value
- Why the Fascination with Gold
- Decimalisation in 1971 and the end of the gold standard in 1971
- Gresham's Law
- The role of trust and that of the state in providing the public good, money
- Money to help the old trade with the young
- Search for Monetary Standards.

Gresham's Law

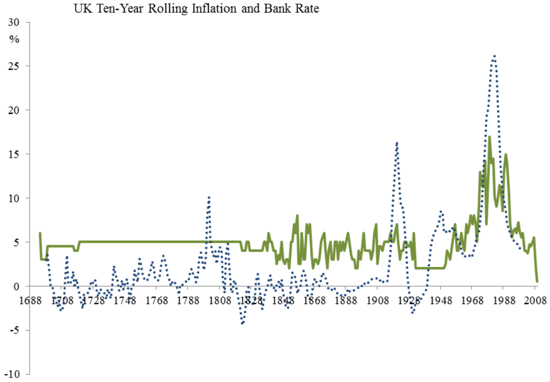
- If two currencies are both legal tender, if they have the same face value, the one with the biggest discount in terms of actual precious metal it represents will force the other out of circulation.
- 'Bad Money drives out Good' is a story about arbitrage and common learning.

Prices, Money and Interest Rates



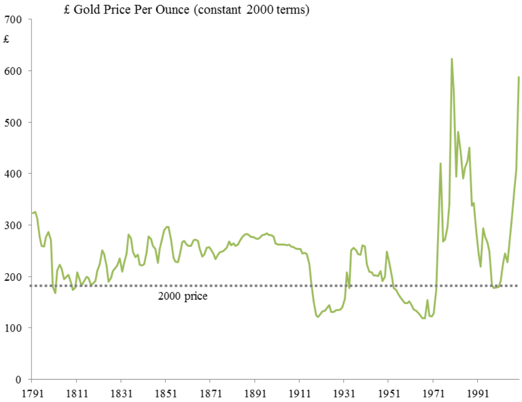
- Stable long run inflation in commodity standards - as Keynes noted.

Inflation and Interest Rates



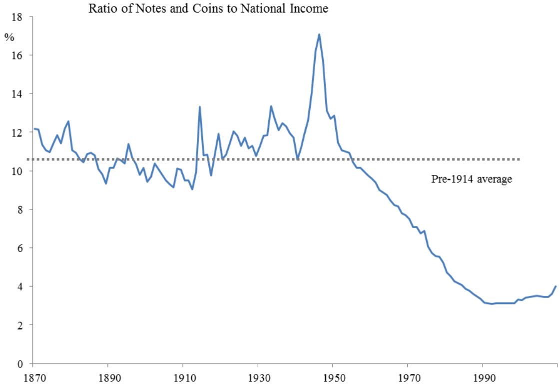
- Positive real interest rates in expectation

The Gold Price



- Stable gold prices on the standard - volatile off.

Money Demand



- Stable demand for Notes and Coin relative to income.

Some Positive Lessons of History

- G. E. P. Box said: ‘all models are wrong, but some are useful’.
- first standard coins in Ancient Lydia and note the power that this gave to the issuer.
- Mesopotamian credit evolved to help communities deal with shocks.
- Song dynasty China, where notes replaced cash and allowed trade to expand.
- Standards returned in 18th century England but rather by Newtonian accident
- Temporary tamper with monetary standards: get away with it but promote greater prosperity that would otherwise have obtained.
- Even when money disappears and trade is nearly extinguished, for example in a prisoner-of-war camp, commodities can spring up and become money.
- And so we find that economic and political unions require a common currency in the form of the Act of Union in 1707.

Croesus, c550BC

- Endowment of electrum plus technology to separate $->$ first reserve currency.
- Problem of valuation moved from trader to ruler.

- An early solution to a command economy under uncertainty - lending.

Babylonian Loan Contracts II

- Babylonian loan contracts in Sumerian cuneiform from 3200 to 1600BC
- Temples then Palaces were central to redistribution through rationing e.g. monthly barley rations of 60 litres per month per man or 30 litres per month per woman
- Loans to meet production donations or for current consumption
- Debt forgiveness with Royal Decrees annulling people's but not merchants' debts
- Interest (măŝ) of 20% for silver and 33.3% for barley
- By c800BC Greeks are also lending at interest of $\frac{1}{100}$ per month.

China and Paper Money

- c300BC money had become fundamental but was of bronze rather than a 'gold standard'
- Fiat money appeared in $C11^{th}$ with ruler's stamp conferring value
- Song dynasty from 960 absorbed other kingdoms but with a chronic shortage of metallic currency and merchants' paper bills (*jiaozi*) began to circulate
- But proliferation led to chaos and Zhang Yong insisted on restricting supply to 16 merchant houses and standardisation
- Liquidity of merchant houses was low and counterfeits rife
- So state-run currency bureau, restricted denomination and limited life!

Midas, transmuting all, into paper

- Bullionist controversy (Ricardo vs Thornton vs Attwood)
- 'Inflationary Finance' (Bordo and Schwartz) or 'Business as usual' (Chadha and Newby)

Bank of England Option's 1797

1. Let the currency exhaust the gold supply and declare bankruptcy
2. Protect the gold reserves with suspension of cash payments

- Note that low levels of bullion and low circulation of money caused different set of problems
- 'It is the unanimous opinion of the Board, that it is indispensably necessary for the public service, that the directors of the Bank of England should forbear issuing any cash in payment until the sense of Parliament can be taken on that subject and the proper measures adopted thereupon for maintaining the means of circulation and supporting the public and commercial credit of the kingdom at this important conjuncture.'

'The Message from the King' 26 February 1797

The Crisis of 1797

- In 1790's the economy volatile: the Canal Mania, war, high government expenditure, bad harvests, sightings of French fleets and public/country banks hoarded gold
- Bank runs in the North-East on 18 February 1797
- Panic after landing of a handful of French soldiers at Fishguard on 22 February 1797

Result: the Bank's gold reserve and the circulating money stock fell rapidly

- Saturday 25 February: emergency Privy Council meeting called for Sunday
- Sunday 26 February: GIII+PC+Pitt met in Whitehall –> Order of Privy Council
- GIII sent message to House on Monday AND Bank issued noted of suspension on Monday morning

(i) PC/H/C tied Bank's hands but also indemnified Bank; (ii) PC acted at Bank's suggestion and communicated to all simultaneously; and (iii) concordance across money markets, merchants etc.

Suspension as a 'social' contract

Newton, Cigarettes and Scotland

- Newton's gaffe in 1717. Set the gold price at £3 17s $10\frac{1}{2}$d and drover silver out of circulation so that by 1774 it had been demonitised.

The 21s Gold Guinea had become a prominent unit of value or account.

- Prisoner of War camps had endowment economies in which preferences would allow trade

Prices were set in terms of cigarettes

- The Scottish Pound: The Act of Union 'agreed by two Parliaments to merge as one economy, one polity and...one society'

The Equivalent was agreed as a payment to Scotland for future taxes of around 0.5% of GDP. The English pound was legal tender.

A Simple Model of Money

- Essential feature is **medium of exchange** and solves some friction that prevents instantaneous trade
- Overlapping generations model, Samuelson (1958) which facilitate trade between people who could not meet to trade and are dynamic
- Individuals live for 2 periods, as **young** then **old**. There are initial old , N_0 and future generations born in period $1, 2, 3$ etc.
- Economy starts in period 1 and $\forall\ t \geq 1$, N_t.individuals are born in each period
- In each period t there are N_t young and N_{t-1} old.
- Endowment economy with not storable output, y, given at birth but nothing in old age

Problem

- Given preferences set by utility function, $U(c_1, c_2)$, how do individuals consume over the two periods of their lives given they are given a one-period endowment when young?
- Assume standard indifference curves with diminishing marginal rate of substitution and property of **transitivity**
- Note initial old, N_0, maximise consumption in period 1 only as they only live for this period - all other agents solve forward
- Two solutions: (i) benevolent planner allocates consumption or (ii) decentralised solution with agents trading endowment for money

Social Planning Problem

$$\text{total amount of endowment} = N_t y_t$$

- If planner can allocate endowment across two periods then

$$\text{total cons. by young} = N_t c_{1,t} \textit{ and } \text{total cons. by old} = N_{t-1} c_{2,t}$$

$$N_t c_{1,t} + N_{t-1} c_{2,t} \leq N_t y_t$$

- if $N_t = N$ i.e. constant population then,

$$c_{1,t} + c_{2,t} \leq y_t$$

- **stationary allocation**

$$c_1 + c_2 \leq y$$

Golden Rule Allocation and Equilibria

- The golden rule (c_1^*, c_2^*) is the stationary, feasible allocation of consumption that maximises the welfare of future generations
- Note though that the initial old would choose a point where $c_2 = y$ and $c_1 = 0 \Rightarrow$ and so distort the golden rule
- Decentralised solution requires:

individuals make mutually beneficial trades to attain highest feasible utility level
actions have no impact on prices and there is no collusion to fix prices or quantities
supply equals demand and so markets clear

- With no money the young cannot trade their endowment with the old because they cannot get back anything from the old that can be used in the next period, so there is **autarky**

Equilibrium with Money

- Imagine **fiat money** which is costless, non-productive or able to be counterfeited, its value is then if it can be used to trade
- Monetary Equilibrium requires a valued quantity of money i.e. money can be traded for the consumption good $(v_t > 0)$
- Assume initial old, have a fixed stock of money, M, which opens up **trade** in endowments for money
- Money is assumed to have value, v_t, in the future so it is accepted by the young
- Value of money is the inverse of the price level, $v_t = \frac{1}{p_t}$.

Concluding Remarks

- The job of getting money to work is the job of the state.
- How to get people to follow common rules that are in their interest - money is a good answer.
- Samuelson compares the Golden Rule to Kant's Categorical Imperative
- If the answer is price stability, perhaps it is because it can be learnt and observed so easily?
- Is money the ultimate public good?
- But what happens when the state starts play with nature and takes responsibility?