

IIMR Lecture  
for the  
MSc in Money, Banking and Central Banking students,  
University of Buckingham

12 May 2020

# The 'Quantity Theory'

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*“Money matters.”*

Milton Friedman

# The gold standard displaced by managed paper money

- My remit today is the evolution of the Quantity of Money Theory of prices.
- This is the historical framework of my lecture on the Quantity Theory:
  - Metallic money moved from weight to tale;
  - Bank money and paper money appeared;
  - This slowly lead to the gold exchange standard system;
  - Then the gold standard system as a whole lost its lustre at the hand of Quantity Theorists
  - In the 1930ies the gold exchange dispensed with the gold standard rules;
  - Then in the 1970ies gold was de-monetised;
  - We now live with the hope that a well managed *fiat* money is possible or even likely.
- If fiat money proves not to be manageable, as the monetary history of the 20<sup>th</sup> c. seems to show, what then?
- David Laidler in his *The Golden Age of the Quantity Theory* (1991) admirably tells the intellectual story of the move from metallic money to managed fiat money in the 19<sup>th</sup> c.
  - For Laidler the demise of the gold standard is not exclusively attributable to WWI but also to changes in monetary theory.
  - The traditional rough-and-ready ‘Gold Quantity Theory’ was refined away by the quantitativists

# MS and the price level

- Father Azpilcueta (1492-1586) noticed the effects of the gold and silver discoveries in the 1556 edition of his *Manual de confessors* (before Bodin)
- Azpilcueta and Tomas de Mercado (1525-1575) also dealt with the effects on the rate of exchange
- 16<sup>th</sup> c. gold and silver inflation in Spain lower than believed
  - Average rate in Seville: 1.86 percent. from 1503 to 1579. (Earl J. Hamilton's statistics)
  - The impression of continuous inflation was mainly due to excessive supply of *billon* or copper money by a chronically impecunious Royal Treasury.
- **Chevalier's parachute**: inflation lower until good money disappears (Laidler, pgs. 30-31)

‘Real de a ocho’: pieces of eight



# Conditions for a world currency?



A 1796 piece of eight of Charles IV over-stamped  
in Sudan

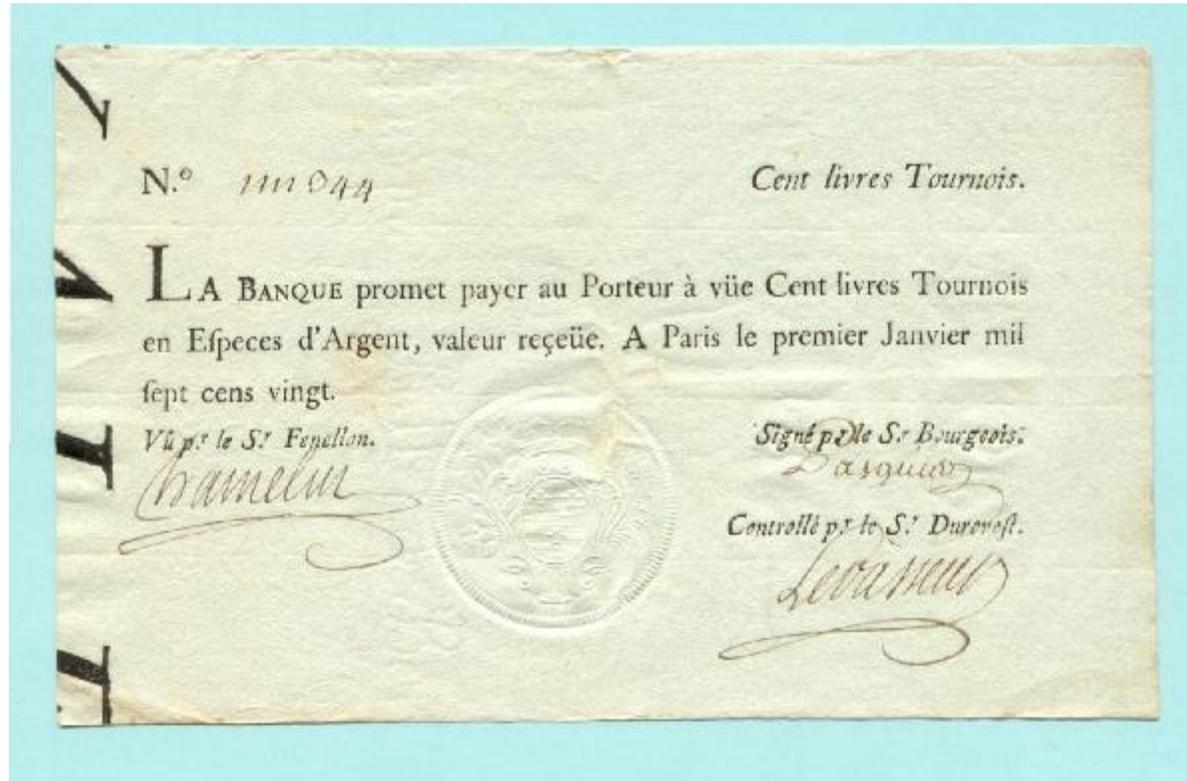
# Conditions for a world currency

- Start from a large economic area
  - The larger the monetary zone, the greater profit from *seignorage*
- Secure legal system
- Strong financial centre
  - Large savings
  - Abundant capital for company finance
  - Investment opportunities at home and abroad
- Monetary stability
- Conservative management of public debt
  - Little room for macroeconomic managing of currency
  - Separation of the investment currency from domestic fiscal management

# First attempts at *fiat* money

- John Law (1671-1729) was a Scottish financier who rose to be “Comptroleur des Finances” of France. His misadventures represent the progress and failure of a fiat monetary system.
  - His *Banque générale privée* (1716), later *Banque Royale de France* (1717), issued paper notes to relieve coin scarcity, on the basis of the fractional reserve principle
  - His Mississippi Company (1718), later “Compagnie des Indes” sold its shares for public bonds, to relieve the debt of the French Monarchy. went on to purchase the tobacco monopoly, tax farming, the whole national debt of the Kingdom! ...
  - After huge speculation, the *Law Système* (Bank, colonial companies, State debt) failed and Law died in poverty in Venice

# A note of the Banque Royale



# Cantillon's bet on gold and silver

- Richard Cantillon (1680-90?-1734) was a successful and less than honest banker, a symbol of the solidity of the metallist system that would last until its demise after WWI
  - Grew rich speculating against the Law system
  - Believed to have been murdered by his cook, but may have dissembled. Antoin Murphy (1986) presents evidence that he escapes to the Dutch West Indies after the murder
- Known for his outstanding *Essai sur la nature du commerce en général* (1750)
  - Starts with the economics of activity distribution in a territory; studies the role of the entrepreneur; and a theory of population
  - Credited with a theory of demand for money inclusive of velocity; and the self equilibrating specie flow mechanism in international trade
    - His theory of the uneven transmission mechanism between money and economic activity taken up by Hume and von Mises (as an explanation of business cycles)
    - Chided Isaac Newton his mistake when setting up the Gold Standard, for not taking account of the revaluation of silver

# Another botched attempt: the *assignats*

## Thiers' Law



# The birth of the gold standard

- As Robert Mundell has explained in his article on **Gresham's Law** (1998) England moved inadvertently to the Gold Standard, when **Newton in 1717** as master of the Mint undervalued silver coins with respect to gold (at 1: 15  $\frac{3}{4}$ , when on the market 1: 14  $\frac{1}{2}$ )
  - Under a bi-metallic system both silver and gold can run together – up to the point when the undervalued currency disappears totally - melted, sent abroad, hoarded or buried
  - Currencies fixed their value to gold because gold was overvalued!
- Fixing the exchange rate to coins of different metal will tend to set Gresham's Law in motion
  - The undervalued currency will tend to disappear
  - The overvalued currency will be current whatever the law says (as gold after Newton)
- As Cantillon told Newton Master of the Mint, in Exchange Alley *Essai* Part III, ch. iv)

# The Bullion Committee (1810)

- After the suspension or 'restriction' of sterling convertibility in 1797 the rate of notes to gold was pretty stable up to 1808, when the effects of the Napoleonic blockade started to be felt
- In 1809 a sharp devaluation of the pound note took place on the Amsterdam market
- The House of Commons set up a Committee to decide whether it was bad crops and remittances to allies in the Napoleonic wars, or excessive note issue by the BoE that explained the depreciation the pound note or high price of bullion
- Henry Thornton (*On Paper Credit*, 1802) was a member and David Ricardo cut his teeth on it with a number of newspaper articles on it. They both thought that it was excess issue that explained the depreciation after 1808
- Thornton accepted BoE monetary action in 'short-run temporary emergencies' but sustained 'long-run permanent policy' of a fixed exchange
- Thomas Tooke (1778-1854) on the contrary thought that the increase of paper money was a result, not a cause of price changes

# David Ricardo (1772-1823) on money

- How became he interested in economics
  - Read the *Wealth of Nations* while taking the waters
- His work on money started with the Bullion Committee
- *Proposals for an Economical and Secure Currency* (1816): gold exchange sys.
- *Plan for the Establishment of a National Bank* (1824)
  - Took the Quantity Theory as given
  - Wanted gold out of circulation
  - Gold kept as bullion bars at a given issuing public institution managed by commissioners
  - Convertibility of large notes in gold
  - The note issue of country bankers effectually nationalised and included within the new monetary institution

# The Currency and Banking Schools

- The currency school directly linked to Ricardo
  - The excessive issue of bank notes the causa of price inflation
  - Baron Overstone (1796-1883)
- The Banking School underlined the possible need to review the Quantity Theory given the invention of bank notes and deposits, which changed what we call the transmission mechanisms
  - Over-issue naturally restricted by 'reflux' of notes if there was convertibility
  - Thomas Tooke (1774-1858) and John Fullarton (1780?-1849)
- A fixed metallic standard not sufficient to keep financial system on an even keel
- Even so the 1844 Bank Charter Act in the line of David Ricardo and the Currency School (and the Scottish Banking Act of 1845)
  - Separation of the Issue Department and the Banking Department of the Bank of England
- But Lender of Last Resort, a late proposal of Bagehot's (preceded by Thornton in 1802)

# How the Gold Standard functioned in the UK

- In the UK the **Gold Standard rules** were strictly kept (1819-1914)
  - Free exchange at the gold window
  - Gold points when transport and insurance from overseas were added to the exchange
  - No sterilisation of gold inflows (that is, letting the price level rise with gold holdings of the country, due to BoP surpluses). This rule was flaunted by Germany and France, and especially by the US after WWI
  - Precautionary use of the Bank rate to speed adaptation to BoP surpluses or deficits
  - As London was the main financial centre, the price of gold determined there
  - Country Banks used Bank of England notes or calls on London correspondents as their reserve
  - Slowly the BoE accepted its role as Lender of Last Resort
  - Convertibility set by the 1844 Peel Bank Charter Act. Repeatedly suspended (1847, 1857, 1866, ...)
    - Bordo and Kydland (1995) have a table with the world-wide suspensions in panic and war

# An in-between John Stuart Mill (1806-1873)

- The 1825 financial crisis and the young Mill
  - In his early writings, gathered in his *Essays on Some Unsettled Questions of Political Economy* (1844) he included “On the Influence of Consumption upon Production” – a reformulation of Say’ Law when the accumulation of liquidity permitted people to sell without buying (for a time), but paid no attention to the securities market
- After 1844 he was happy with the suspension of the Peel Act when a financial crisis demanded it
- During his life Mill was faced, not only with the 1825 crisis but also those of 1836, 1839, 1847, 1857, 1866
- Psychological explanation of booms
  - Speculative fevers would abate when investors became more savvy
  - Paid no attention to the exit from slumps

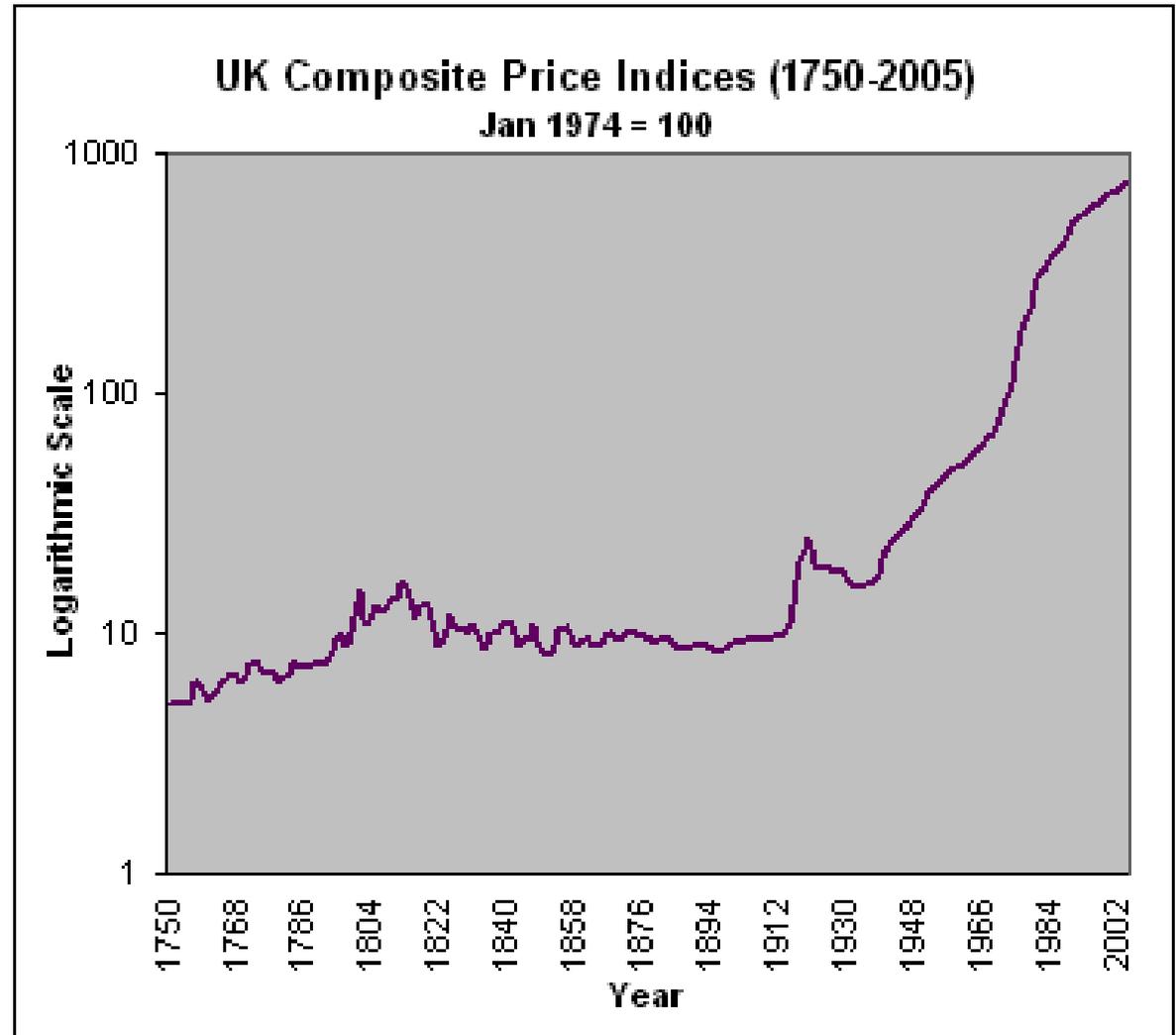
# Different gold standards by time and country

- Newton in 1717, unwittingly: silver shilling the official standard; *de facto* one gold ounce = £3/17s/10.5d.
- After the suspension from 1798 to 1819 of the convertibility of BoE notes, these became legal tender in 1817.
- Ricardo: gold exchange standard, and officially convertible at that same rate This lasted until 1931.
- From around 1875 many European countries also moved to the a Gold Exchange Standard up to 1914 (Ricardo, *An Economical and Secure Currency*, 1816).
  - Germany and France did not keep by the rules of tying note issue to gold in and outflow.
  - France had tried to launch the Latin Monetary Union (1865-73)
- The US dollar's value was fixed to gold after 1834, because silver was undervalued at 16:1 and had been leaving the country.
  - Period o 'greenback' inflation during the Civil War (1862-1879). In 1879 the dollar was again fixed on gold at \$20.67/troy ounce but for a time greenback notes and the gold dollar circulated together. Agitation for silver at the end of the century. In the '20ies the Fed applied real bills rule and misapplied LoLR. In 1933 gold holdings were nationalised and expropriated. This was accompanied by the devaluation to \$35per troy ounce. and a full fiat system installed.
- After WWII, Bretton Woods and the IMF. In 1971-73 dollar was devalued to \$42.22 and the connection with gold was severed. After 1973, *fiat* currencies and dirty float.

# Inflation and the cycle under the Gold Standard

Qty. Th. used to explain:

- the secular movement of prices  
(Jevons as a goldbug)
- the business or credit cycle  
(non-neutrality of money  
Cantillon-Hume-Mill 1829)



*The Golden Age of the Quantity Theory:  
The development of Neoclassical Monetary Theory, 1870-1914*

David Laidler (1991)

# Marshall and the Quantity Theory

- In his youthful “Essay on Money” (1871, published 1975) and in *The Economics of Industry* with his wife Mary Marshall (1879), he defined the Cambridge cash balance formulation of the QT, within a microeconomic demand and supply framework, in the tradition of Hume, Cantillon, Ricardo, Thornton and Jevons
- Five core propositions (Thomas M. Humphrey in *Elgar Companion to A. Marshall*, 2006)
  1. Equi-proportionality of money and prices
  2. Money-to-price causality
  3. Long-run neutrality and short-run non-neutrality of money
  4. Money-stock exogeneity
  5. Relative price /absolute price dichotomy, attributing equilibrium of the first to real causes and of the second to monetary causes
- Despite common opinion, Fisher version of QT was on the same lines as Marshall’s
  - Not Wicksell’s

# Bi-metallism

- Impossible fully to analyse the Qty.Th. in single currency models
- Marshall analysed different monetary policies and institutional schemes on the basis of his monetary theory he did not clearly incline for any of them
  - This was mainly due to his lack of confidence for any managed monetary policy
  - He proposed symmetallism as a politically neutral arrangement that would smoothe the effects of the price of either gold or silver. This was a standard similar to the electron of Ancient Greece
- In the US especially there was strong political resistance to the gold standard because of its deflationary effect when silver became more abundant at the turn of the century
  - William Jennings Bryan 'crown of thorns' and 'cross of gold speech' (1896) wanted some inflation through silver becoming legal tender
- *The Wonderful Wizard of Oz* as a skit on the gold standard by Frank Baum

# Irving Fisher

- Irving Fisher (1887-1947) came to the QT through mathematical economics
- *The Purchasing Power of Money* (1911)
  - Interest: a community's preference of a dollar of present income over a dollar of future income". His was an "impatience and opportunity theory. The value of capital is the present value of the flow of net income the asset generates. He was the first to distinguish clearly between nominal and real interest rates
  - Fisher on the QTh is misunderstood. As Laidler shows (pgs. 68-79), he was much nearer to the Cambridge (England) interpretation than is believed
  - He saw the "equation of exchange" as a **tautology**  
$$MV \equiv PT$$

within which he framed the **theory** that  $P = f(M)$ ,  
given that  $dV/dt < 0$ ; and  $dY/dt = 0$ , independently of changes in M
  - The determinants of the elements of this theory were what Laidler calls 'tastes, technology and endowments; and principally habits of the individual, apart from the systems of payments if the community and other general causes

# Velocity and expectations

- Velocity is a function of two variables
  - Secular decline as economies become increasingly monetised and bancarised
  - Short term increases due to loss of confidence in the currency
- Velocity and expectations
  - adaptive (Friedman)
  - rational (Muth, Lucas)
  - Rational expectations not only include those of the Authorities but also those of individuals in the market

# Irving Fisher on interest rates

- The real interest rate
  - The real interest rate was “an index of a community’s preference for a present dollar over a dollar of future income”
  - Equilibrium between the time preference and the investment opportunity principle
- The nominal or money interest rate
  - The real interest rate + the (expected) rate of inflation
  - The nominal interest rate only influenced the real economy in as far as individuals suffered from ‘money illusion’ (Fisher, 1928)
- Fisher was one of the initiators of index number theory. Index numbers were proposed as a basis of price level stability

# Knut Wicksell

- Wicksell: an 'interest rate' theory of inflation
  - With the bank credit rate above the natural rate of interest -> boom + inflation
  - With the bank credit rate below the natural rate of interest -> recession + deflation
- Thus, Wicksell (1889) rejected Jevons' and Fisher's explanation of price movements in the 19<sup>th</sup> c.
- A Keynesian and an ¡Austrian! explanation of the business cycle and corresponding inflations and deflations

# JM Keynes on the Quantity Theory

For Keynes, the Quantity Theory is only valid with full employment

- Keynes's version of the QT is fundamentally non-monetary
- With unemployment, the influence of money on prices is modified (*General Theory* (1936), ch. 21)
  - The elasticity of prices to a monetary expansion is unity, minus the capacity of the economy to increase production and employment, plus the induced increases in costs and wages due to the expansion

$$e = ed (1 - ee.eo + \{ee.eo\} ew)$$

# Friedman's demand for, and supply of, money

The demand for money is fundamentally stable

$$\frac{M^d}{P} = f\left( \underset{(+)}{Y_p}, \underset{(-)}{r_b - r_m}, \underset{(-)}{r_e - r_m}, \underset{(-)}{\pi^e - r_m} \right)$$

Real money demand is a function of...

- Permanent income ( $Y_p$ ), expected average income over the course of one's life. (+)
- The excess return on bonds over money (-)
- The excess return on equities over money (-)
- The rate at which money loses purchasing power. Can also be thought of as the excess return on goods over money. (-)

The supply of money is exogenous (in a closed economy or with flexible exchange rates)

# Theories of inflation

- Keynes's version of the QT is fundamentally non-monetary (1936, ch. 21)
  - The elasticity of prices to a monetary expansion is unity, minus the capacity of the economy to increase production and employment, plus the induced increases in costs and wages due to the expansion
  - While there are resources unemployed, an increase in MS will result in no price inflation
  - This 'cost based theory of inflation' is the favorite of central banks
- Friedman: "Inflation is always and everywhere a monetary phenomenon, in the sense that it can only be produced by a more rapid increase in the quantity of money than in output"
  - So there can be unemployment *and* inflation
  - Inflation not caused by  $AD > AS$
  - In the end *nominal* money is neutral with regard to real production and growth
  - Though, as Adam Smith saw, *real* money is a factor of production

# Transmission mechanism

Karl Brunner (1915-1989)

- A monetarist, in the sense that for him prices and inflation are a function of the growth of the MS
- Critic of the Fed for destabilizing the economy (Shadow Open Market Committee with Meltzer, 1971)
  - Lack of attention to steady growth of MS
  - Excessive reliance on manipulating short term interest rates
  - Rejected governments' reliance on tax and spending policies
- Study of transmission mechanisms (See Ireland, 2017)

# The classical dichotomy

“For a monetarist or classical economist, long-run neutrality of nominal impulses is an implication of rational behaviour. However, before impulses are fully absorbed, relative prices and real output respond to monetary impulses. The reason is that households and businesses fail to anticipate or perceive correctly all of the future implications of past and current actions. From a monetarist perspective, one principal reason for the **misperceptions** that give rise to relative price changes is that **time is required to distinguish permanent and transitory impulses and real and nominal impulses**. These delays in correctly perceiving the duration or type of change are part of the costs of acquiring information. Contracting in nominal terms is one response to these uncertainties.” (Meltzer 1995, pp.49-50).

# The importance of Central Banks in a Qty.Th. world

- In the 19<sup>th</sup> c.: Concentration of gold reserves, monopoly of note issue, especially after 1844-1845 Peel's Acts; Lender of Last Resort (Bagehot)
- In the 20<sup>th</sup> c.: Central Banks, especially the Fed, acquire all the powers of monetary policy
- This poses a 'public choice' problem in the governance of Central Banks
- With *fiat* money discretion is dangerous
- There is need for a rule of issue, either by
  - (a) Moving the Bank Rate is management by price
  - (b) Monetarism: management by quantity
- With (a): Taylor Rule
- With (b): Too little precision as to the short term effects of  $dM_s/dt$ 
  - Milton Friedman famously proposed a rule to maintain the increase of  $M_s$  at the same rate as long term GDP;
  - Tim Congdon has corrected Friedman's rule by defining  $M$  as  $M_3$  in the US and  $M_4$  in the UK

# Quantity Theory more timely than ever after Covid-19

- Today the Quantity Theory is more relevant than ever
- Inflation in Quantity Theory

$$P = (M \cdot V) / Y$$

- Federal deficit in the US in 2020 may reach \$4tn
- Money growth rate in Q2 2020 could reach 100%, Prof. Congdon calculates (*The Critic*, in course of publication)
- Though loss of confidence may reduce  $V$  and press interest downwards
- But the sharp fall in production  $Y$ , together with the forecast increase in  $M_s$  foretells of a sharp increase in  $P$

# Monetary competition?

- International monetary competition between world bankers
- Digital currencies
  - The special case of “*libra*” and its basket of currencies
  - The oligopoly of Central Bankers has objected alleging that *libra* would be an obstacle for the conduct of monetary policy
  - But, in a rule governed monetary world, would we need monetary policy?

# Quantity Theory building blocks

1.  $M_D$  independent of  $M_S$
2.  $dM_S/dt \rightarrow dP/dt$  (not from prices to money)
3. 'Definition' of money (Thornton, Mill, Fisher, Friedman & Congdon)
4. Exchange Equation really an identity:  $M \cdot V \equiv P \cdot Q$  (Fisher)
5. Quantity Theory:  $P = (M \cdot V) / Y$ , with separate functions for  $V$  and  $Y$
6. QyTh used to explain:
  - the secular movement of prices (Jevons as a goldbug)
  - the business or credit cycle (Cantillon-Hume-Mill 1829)
7. Elusive aim: to get rid of financial crises (Bagehot)
8. Gresham's Law; Thiers' Law; Chevalier's Parachute
9. Interest rate: real (productivity & thrift); monetary (loanable funds)
10. The growing role of Central Banks (and attention to 'public choice' problems)
11. Domestic price level *versus* rate of exchange (Keynes's *Tract* 1923)
12. Benefits and costs of a world currency

# Milton Friedman's license plate

