

Business Cycle Basics, Part 5 Velocity and the Transmission Mechanism

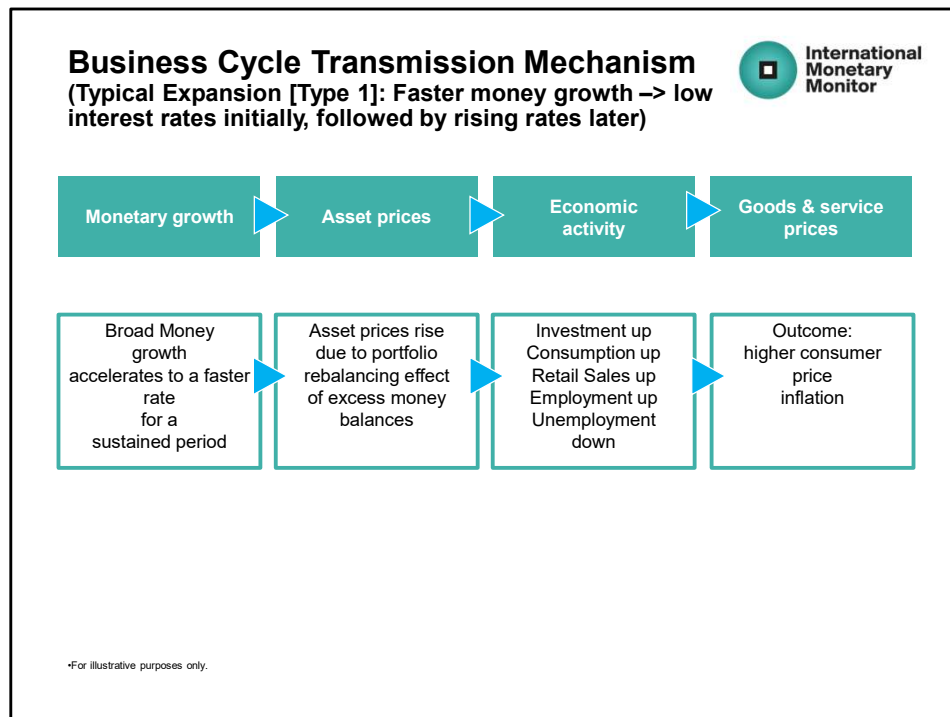
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“Monetary policy is not about interest rates. It is about the rate of growth of the quantity of money.” Milton Friedman, interviewed on NBC’s Meet the Press, October 24, 1976.

Outline of the Series



- Part 1: Business Cycle Basics – The Monetary Framework
- Part 2: Business Cycle Basics – Money Drives Asset Prices
- Part 3: Business Cycle Basics – Money Drives (Nominal) Spending
- Part 4: Business Cycle Basics – Money Drives Inflation
- **Part 5: Business Cycle Basics – Velocity and the Transmission Mechanism**
- Part 6: Business Cycle Basics – Money versus Credit
- Financial Bubbles & Busts; Solving Financial Crises with QE
- Counterparts or Drivers of Money Growth -- Exchange Rate Regime, Shadow Banks, Counterparts of Money

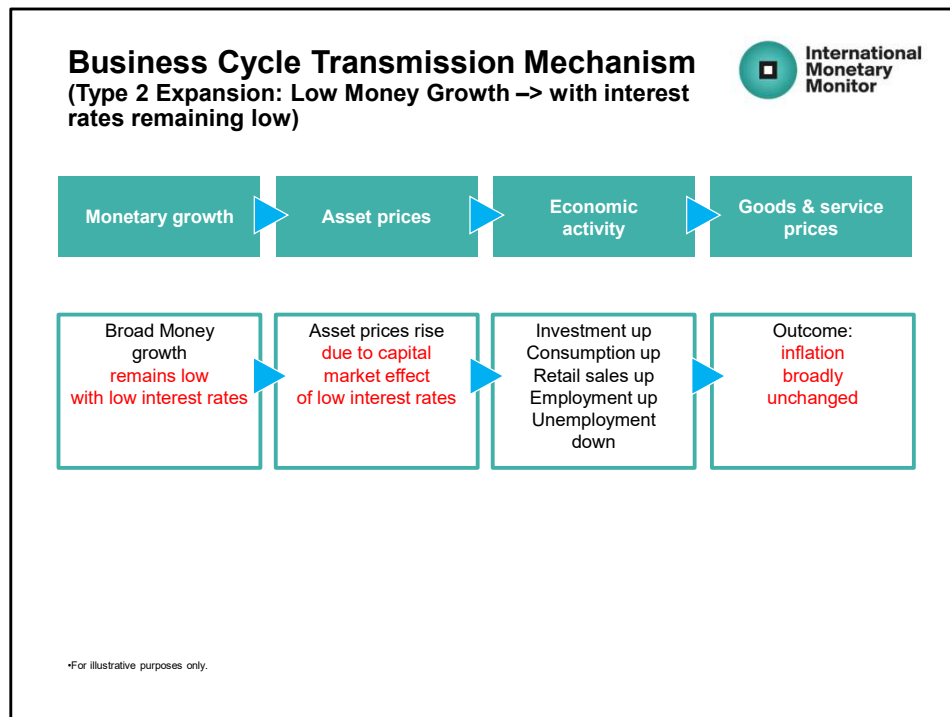


Part 1 of Business Cycle Basics presented a flow chart that represented the transmission mechanism of business cycles.

I emphasized that it required a **substantial and sustained** increase in broad money growth or a **substantial and sustained** decrease in broad money growth to generate changes in the direction of the business cycle respectively from contraction to expansion or from expansion to contraction.

An example of a **substantial and sustained** increase in the rate of growth of broad money would be from 5% to 10% which was sustained at 10% for a year. Then we would typically expect to see asset prices rising as portfolios were rebalanced and as people deployed the money to different kinds of assets. After a while, economic activity would pick up, investment would also increase, as would consumption, retail sales, and employment, while unemployment would normally decline. Finally, after the requisite time lag, we would typically see higher consumer price inflation.

All the effects discussed here depend on a stable, medium-term relation between money and spending. This topic is discussed from p.8 onwards.



But what if the acceleration in money growth is not **substantial or sustained**?
What happens then?

Well, a good example of this is what happened after the global financial crisis (GFC) of 2008-09. After that episode, because banks' balance sheets were impaired and banks were required to increase their capital ratios, broad money did **not** grow rapidly, even though interest rates remained very low.

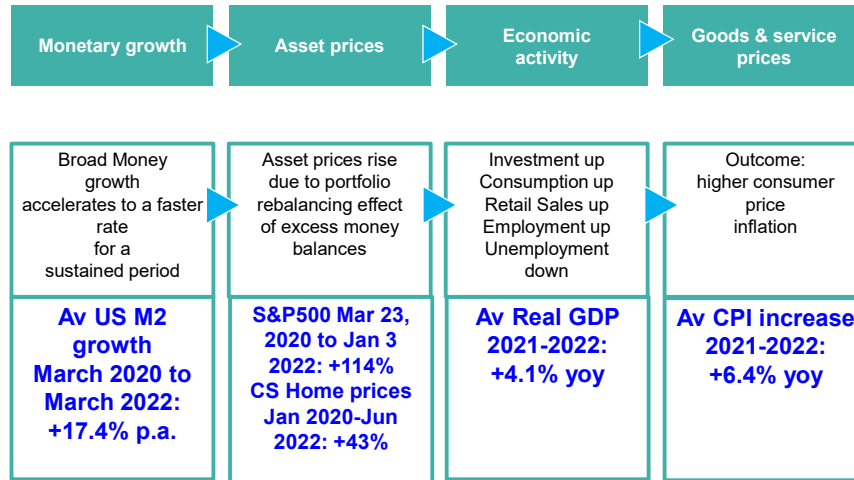
During these years asset prices did rise, but rather more slowly than under a typical monetary acceleration, and a good deal of the rise in asset prices was due to what we may call a "capital market effect" -- the effect of low interest rates on asset prices. Gradually after about 2011 or 2012, investments started to pick up, consumption improved, retail sales started to look better and employment gradually improved. But it all took much longer than was widely expected and the net outcome at the end of the entire process was that inflation remained very subdued.

In other words, unless there is a **substantial and sustained** acceleration of money growth, there will not necessarily be any increase in inflation at the end of the process. So not all business cycles are alike; they are very dependent on the rate of change and the quantity of money.

Business Cycle Transmission Mechanism



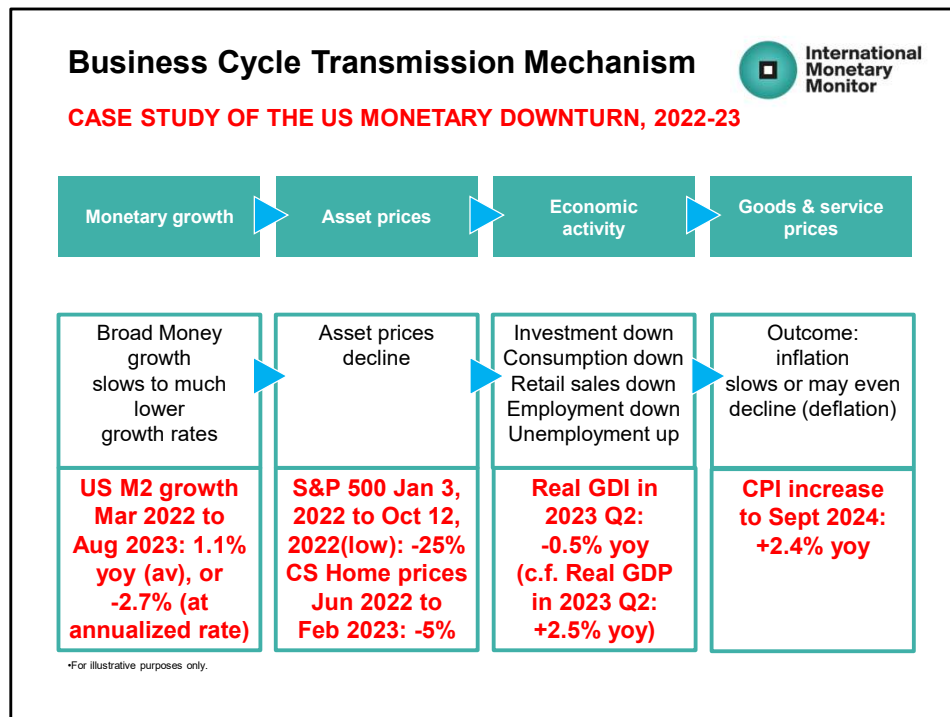
CASE STUDY OF THE US MONETARY EXPANSION, 2020-21



*For illustrative purposes only.

Let's turn now to what happened after the onset of the Covid-19 pandemic in March-April 2020. The reaction of policymakers was to boost stimulus measures. While governments embarked on fiscal support measures for firms and households, many central banks engaged in large-scale Quantitative Expansion (QE) measures, usually on the basis that Treasury or debt market functioning was impaired by the flight to cash in March 2020. The result, in terms of the quantity of broad money, was a huge acceleration in money growth which continued in most cases until 2022.

The data for the US expansion are shown in blue in the panels above. The tripling of M2 growth (from about 5% p.a. to 17.4% p.a.) led to all the effects outlined by the flow chart in the upper part of the chart: higher stock prices, higher home prices, a surge in real GDP growth, and a big increase in the inflation rate.



We can also look at the effects of the withdrawal of monetary stimulus in 2022-23, again using US data.

While governments wound down their fiscal support measures for firms and households, central banks initially raised interest rates (mostly from early 2022) and later began to reverse Quantitative Expansion (QE) by doing Quantitative Tightening (QT) – i.e. reducing the size of the central bank’s balance sheet by allowing assets previously purchased to mature and run off the balance sheet. The effect was to curtail sharply monetary growth, and in some cases to create a contraction in money growth. These effects dominated from March or April 2022 until mid-2023.

In the US case, the abrupt slowing of money growth was accompanied by a sharp decline in stock market values, a decline in home prices, a slowdown in real GDP or real GDI (Gross Domestic Income) and a rapid decline in the rate of consumer price inflation. The data for the US are shown in red in the lower panels of the chart above.

The 2020-21 Surge in Money Growth: “A Rat Passing through a Snake”



	Δ		ΔREAL					
	ΔM2	VELOCITY	GDP	ΔCPI	ΔIPD	ΔM+ΔV	Δy+ΔCPI	Δy+ΔIPD
	ΔM	ΔV	Δy	ΔP	ΔP			
2015	5.8	-1.9	2.7	0.1	1.0	3.8	2.8	3.7
2016	6.8	-3.8	1.7	1.3	1.0	2.9	2.9	2.7
2017	5.7	-1.4	2.2	2.1	1.9	4.3	4.4	4.1
2018	3.8	1.6	2.9	2.4	2.4	5.4	5.4	5.4
2019	5.1	-0.9	2.3	1.8	1.8	4.2	4.1	4.1
2020	19.1	-17.3	-2.8	1.2	1.3	1.8	-1.5	-1.5
2021	16.3	-4.8	5.9	4.7	4.5	11.5	10.6	10.4
2022	5.1	3.9	2.1	8.0	7.0	9.6	10.5	9.6
2023	-3.4%	10.4	2.9	4.1	3.6	7.0	7.0	6.5
2024	2.0	1.0	3	3	3	3.0	6.0	6.0
2025	5.7	-1.3	2	0	0	4.4	2.0	2.0 ⁷

As a summary of the previous discussion, we can set out the actual rates of change of the key variables for the US in the period 2015-2025.

Notice that in the pre-Covid period, 2015-2019, low money (M2) growth was accompanied by a gently declining velocity (ΔV) in most years, rates of growth of real GDP varying from +1.7% to +2.9%, and inflation as measured by the Implicit Price Deflator (IPD) for the GDP varying between 1.0% and 2.4%.

With the onset of the Covid pandemic in 2020, M2 surged, but initially its main effect was not on real GDP (which declined due to lockdowns) or on prices (which increased only by just over 1%), but on velocity. ΔV , the change in velocity, declined steeply by 17.3%, meaning that holdings of money by households and firms **increased** by about 17%. At the same time, although not shown in the table of data above, asset prices were increasing strongly (see p. 5). It was only in 2021 that real GDP recovered and grew at a rapid 5.9%, slowing in 2022 to 2.1%. Inflation took longer to emerge, rising by 4.7% (CPI basis) or 4.5% (IPD basis) in 2021 and by 8.0% and 7.0% respectively in 2022. These time lags illustrate the lag in effect of monetary growth summarized on p. 4 of Business Cycle Basics Part 1 The Monetary Framework.

Relation Between Money, Asset Prices & Spending: Quantity Theory of Money (or QTM)



- **Traditional form:** $MV = PT$
- **Modern (Cambridge) form:** $MV = Py$
- **In rate of change form:** $\dot{M} + \dot{V} = \dot{P} + \dot{y}$

- **Applied to asset markets and spending in rate of change form:**

$$\dot{M} + \dot{V} = (\dot{P}' + \dot{a}) + (\dot{P}'' + \dot{y})$$

Money Growth : Exogenous or endogenous?

NB In the formulation above Money is exogenous, not endogenous.

This is because (1) central banks and banks together create money and their activity can be managed, and (2) velocity is a behavioural variable – that is, Individuals and firms choose the amount of (real) money balances they wish to hold, and this varies in a systematic way that can be modelled and predicted.

The relation between money, output and prices is generally examined by means of the Quantity Theory of Money (QTM). This theory has a tradition going back to the 16th century, but it was generally only discussed in theoretical form in previous centuries due to the absence of data. However, since the middle of the 20th century, we have been able to apply data to this relationship, and the theory has therefore become much more tractable and concrete.

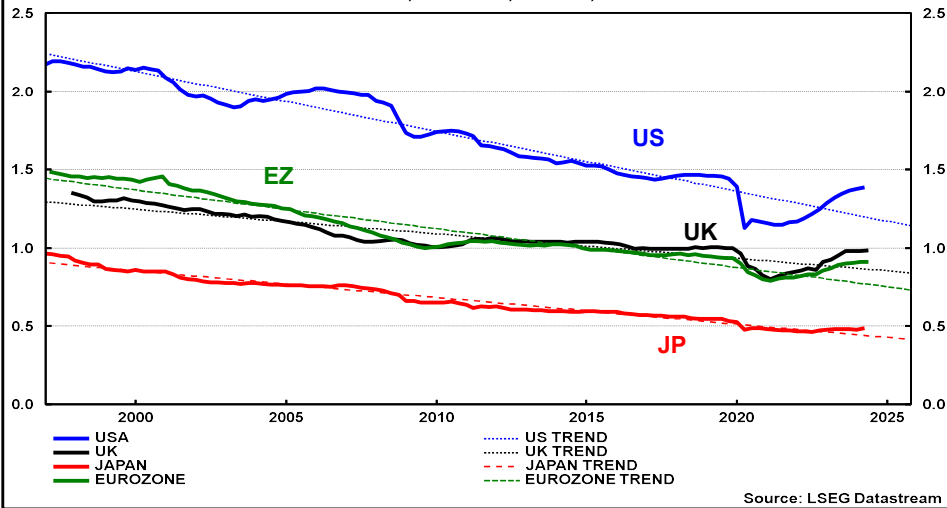
The traditional form of the relationship is the equation or identity shown at the top, $MV = PT$. In this equation, **M** stands for the *total* quantity of money, **V** stands for velocity or spending per unit of money, **P** stands for a price index representing the price level for the economy as a whole (including asset prices), and **T** originally stood for transactions. But without data for transactions, money, or output, that form of the theory was not very useful. In the early 20th century, the $MV = PT$ format was amended by Cambridge economists (in England) to $MV = Py$, where **y** refers to real income. The price level times the real income or output of the economy is equivalent to nominal GDP.

An extension can be made to asset markets, but there are significant problems obtaining adequate or suitable data. We will therefore confine ourselves to $MV = Py$.

**Trend of Velocity is Downward-Sloping
in most Developed Economies, close
to -2% p.a.**

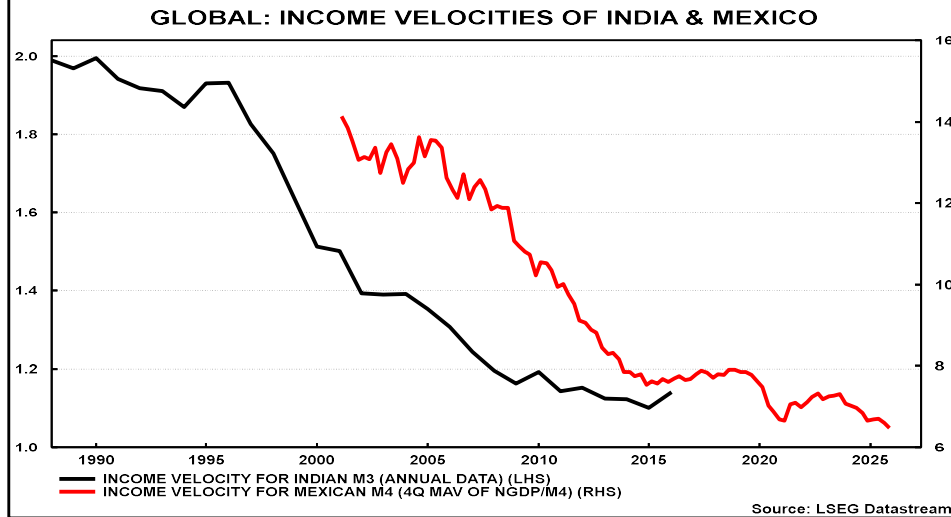


**INCOME VELOCITY FOR US, JAPAN, EUROZONE & UK
USING US M2, UK M4x, JP M2, & EZ M3.**



In most major economies we find that the trend of velocity, usually called income velocity of circulation, is downward-sloping. For most developed economies, it's around *minus*1.5%-2% p.a. This implies there is something about the behavior of people in relation to their money, which is consistent across all these economies. Each economy has a different payment system, so their populations will tend to hold a different amount of money, and they also have slightly different institutional arrangements: different types of banks, different types of savings institutions. So again, the amounts of money held by different groups of people will vary. But by and large, that minus one and a half to minus 2% is verified across a wide range of economies.

In Emerging Economies, the Downward Trend of Velocity is Typically Greater than in Developed



In emerging economies, the annual decline tends to be greater than in developed economies. For example, in the chart, the annual decline in Indian velocity for M3 was -1.92% p.a. between 1988 and 2016. In Mexico, the average annual decline for M4 income velocity between 2001 and 2025 was -2.87% p.a.

What does this mean? To understand it, I think it's easier to invert velocity.

Reverting to slide 8, and the second equation, $MV = Py$, we can re-write this as $1/V = M/Py$, which gives us the amount of money (M) held per unit of income (Py). As the inverse of V , this figure is generally rising. People seem to want to hold a certain amount of money relative to their income, and that amount rises gradually with income. In practical terms, as people get richer, they want to hold more financial assets including money. In emerging economies, real income growth is generally faster than in developed economies (and hence we should expect a higher absolute figure for V), but in addition the usage of banking facilities (including money) is on a steeper trajectory as participation in the financial system widens. This process is sometimes called financialization.

The relative stability of the trend of these money holdings relative to income in the medium term is what provides the basis for maintaining stable rates of broad money growth in all economies – developed and emerging.