Hoisington
INVESTMENT MANAGEMENT COMPANY

Quarterly Review and Outlook
Fourth Quarter 2022

A Theory of Interest Rate Cycles

Milton Friedman (1912-2006) was a truly outstanding economist. Winner of the Nobel prize in economics in 1976, he made important contributions to price theory as well as macro-economics. He gave us the permanent income hypothesis, a breakthrough in our understanding of the consumption function. His books *Free to Choose* (written with his wife Rose and originally a PBS TV series narrated by Friedman) and *Capitalism and Freedom* are outstanding introductions to economics. His *Essays in Positive Economics* is a must for those seeking a more comprehensive understanding of the field.

"V"

Although Friedman's monetary theory of inflation has justifiably drawn criticism, major components of his theory of interest rate cycles remain intact and the so-called flawed aspect can be overcome by converting money velocity (V) to an endogenous variable rather than assuming that V is stable. Once restated, the model applies very directly to the current interest rate outlook and suggests that even though the Fed is planning further increases in the federal funds rate in 2023, the direction of long-term U.S. Treasury rates is downward. In this letter, we will modify Friedman's theory to incorporate an endogenous V and then apply the new model to the situation at hand as well as to the tumultuous events of the past three years. The determinants of velocity to be identified serve to reinforce the view that the U.S. Treasury bond market's prospects are favorable even though conditions are very likely to remain volatile.

A Restructured Model

Friedman's theory was first presented in his December 1967 Presidential address to the American Economic Association and published in *The American Economic Review* of March 1968. Economics, although not precise like physics and chemistry, is a social science and nevertheless has the capability to test hypotheses which can result in theories changing with the passage of time. Quite reasonably, 55 years is sufficiently long that monetary theories would evolve just as have many other parts of economics.

Friedman's theory of interest rates starts with the equation of exchange, i.e., money (M) times velocity (V) equals nominal GDP. From this he derives three components, liquidity, income and Fisher (price) effects. The Fisher effect is named for economist Irving Fisher (1867-1947) who conceptualized both the equation of exchange (1909) and the Fisher equation (the long U.S. Treasury bond yield equals the real rate plus inflationary expectations, 1932).

The "liquidity effect" is consistent with the leading textbooks in economics, but even this effect, taught to generations of Econ 101 students, as well as the "income and Fisher effects" must take into consideration whether swings in money growth are augmented, neutralized or unaltered by swings in the velocity of money.

Here is Friedman's passage on the "liquidity effect" with the V adjustment in bold letters, "The initial impact of increasing the quantity of money at a faster rate than it has been increasing is to make interest rates lower for a time than they would otherwise have been, **provided the velocity of money does not surge rapidly**. But this is only the beginning of the process, not the end."

Friedman assumes the more rapid rate of monetary growth will stimulate income and spending, which will serve to reverse the initial downward pressure on interest rates. However, if the velocity of money were to fall sharply, this process would not materialize. Here is how the theory could be modified, "Rising income will raise the liquidity preference schedule and the demand for loans; it may also raise prices, **unless the velocity of money falls sharply**." With velocity stable, Friedman's income and liquidity effects serve to reduce the downward pressure on interest rates. For us, the question of whether velocity is shifting is just as germane as whether money growth is accelerating or decelerating.

This is Friedman's quote on the "Fisher effect," along with our allowance for velocity in bold letters: "Let the higher rate of monetary growth, **unchecked by velocity**, produce rising prices, and let the public come to expect that prices will continue to rise. Borrowers will then be willing to pay, and lenders will then demand higher interest rates—as Irving Fisher pointed out decades ago."

Empirical Support

The extreme cyclical and secular volatility in ODL (other deposit liabilities of the commercial banks) and M2 velocity and the strong correlation with the long-term U.S. Treasury bond yield since 1952 strongly supports the argument that velocity must be a major component of a monetary based theory of the interest rate cycle. Both measures of velocity should be examined since ODL V cannot
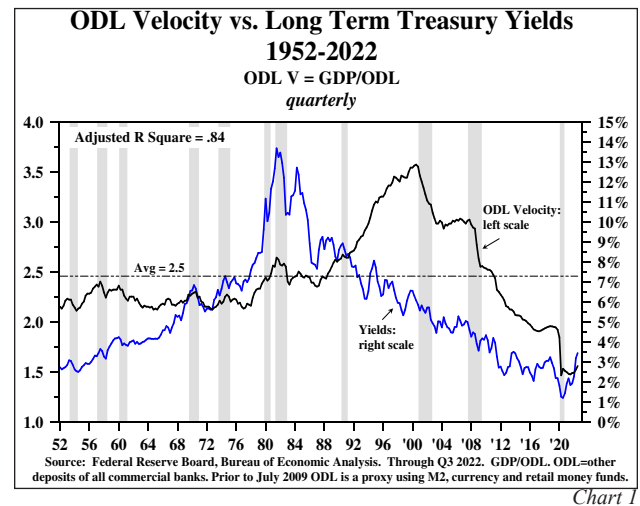

ODL Velocity vs. Long Term Treasury Yields 1952-2022
ODL V = GDP/ODL
quarterly

Chart 1

be computed back to 1910, but M2 V can.

ODL Velocity. In the past 70 years, each dollar increase of ODL generated an average $2.50 increase of GDP, but as the chart indicates ODL V spent little time at this level (Chart 1). The range was from about $1.40 to almost $3.50. Swings in ODL V have coincided positively with swings in the yield on long term U.S. Treasury bonds, with the rate rising with increasing ODL V and falling when ODL V fell. The adjusted R-Squared is an impressive 0.84 for 283 observations.

M2 Velocity. The relationship between M2 velocity and long-term U.S. Treasury bond yields, for the even longer sample since 1910, also indicates that velocity should be in the interest rate model (Chart 2). M2 V spent very little time over the past 122 years at the average of 1.69, with
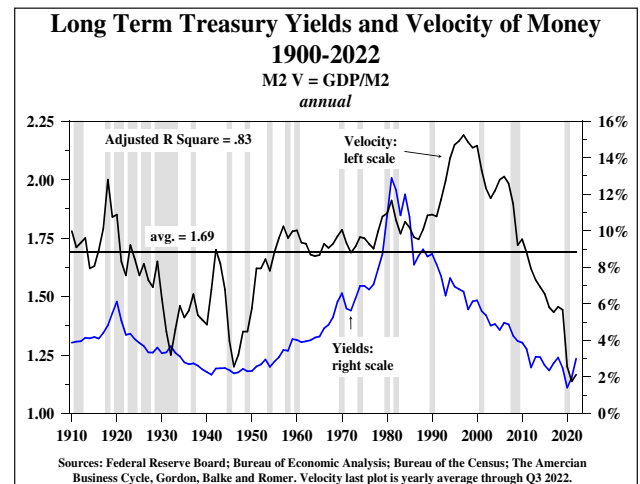

Long Term Treasury Yields and Velocity of Money 1900-2022
M2 V = GDP/M2
annual

Chart 2

the range from a high of 2.15 to a low of 1.13. The adjusted R-Squared for this sample based on annual data is strong at 0.83 and the correlation between M2 V and long-term U.S. Treasury bond yields is also positive.

The events of 2020-22. ODL surged at a record 19.5% average pace in 2020-2021. The velocity of money fell, but not enough to offset the inflationary repercussions of the liquidity increase and interest rate increases in an early-stage expansion, a highly unusual development. The inflationary dynamic supported a further rise in yields last year. ODL declined but insufficiently as velocity rose in 2022. The normal cyclical pattern is for money and bond yields to reach their cyclical trough several years into an expansion.

The recent pattern is consistent with Fisher's theories, which showed 90 years ago that velocity declines in extremely overleveraged economies. For Fisher, monetary policy doesn't work when potential borrowers do not have the balance sheet capacity to take on more debt. When borrowers are loaded with excess houses, office buildings, retail space, and plant capacity, no incentive exists to get even deeper in debt. Moreover, the prospect of rising foreclosures and delinquencies causes banks and other providers of credit a great rationale to not put additional risk onto their balance sheets by providing more funds to already over committed borrowers.

Money and Velocity

While ODL velocity is like that of M2, we consider the former to be a superior measure of money. The main difference between ODL and M2 is that ODL does not include currency or retail money market funds. Currency is accepted at an increasingly fewer number of business establishments and simply cannot be used for very large sized transactions. Retail money market funds never became an important medium of exchange. Both are becoming a far less used medium of exchange. ODL has the additional

advantage that it is the main source of funding for bank loans and investments, making ODL both a monetary and credit aggregate. Friedman would not be surprised that the need to change the best definition of what constitutes money would change over the years. He made this case in *Monetary Statistics of the United States: Estimates, Sources, Methods*, (Columbia University Press for the National Bureau of Economic Research, 1970), which he coauthored with Anna J. Schwartz (1915-2012). During Friedman's career he first argued that M1 was the superior money measure then M2 and late in life he experimented with other definitions on the assumption that the velocity problem could be solved if money could be properly quantified.

Determinants of Velocity

Velocity is affected by cyclical, fundamental and idiosyncratic forces. While all are constantly at work, the evidence shows that two fundamental forces – the marginal revenue product of debt and the commercial bank loan to deposit ratio – are dominant over time.

Idiosyncratic features can be very important for a quarter or two quite frequently, but these influences typically reverse themselves. There have been quarters when the two most volatile components of the economy – inventory investment and net exports have swung widely due to some aberrant reason. Inventory investment in the farm sector has produced large but short-lived swings due the weather patterns. But major inventory swings in the nonfarm sector have also occurred that were totally unrelated to the business cycle. In the third quarter of 2022, all the growth in real GDP was accounted for by a reduction in net exports. This contributed to the sharp rise in third quarter ODL velocity.

ODL growth is estimated to have declined at a record 7.9% annual rate in the fourth quarter, following decreases at 2.7% and 1% annual rates in the prior two quarters. From the last quarter of

2021 to the same quarter in 2022, nominal ODL is estimated to have declined at record 2.8% annual rate, the largest yearly drop in history. In real terms, ODL also contracted at a record pace (Chart 3). Based upon the Fed's monthly $96 billion balance sheet reduction and the monetary policy lags, the rate of ODL decline will accelerate in at least the first half of 2023. If the Fed sticks with its plan to raise the Federal Funds rate another 75 basis points, the rate of decrease in ODL will be sufficient to neutralize the money mountain of 2020/21 by the second quarter of 2023, when taking velocity into consideration.

Final Thoughts

The rise in velocity in 2022 is a stark example that V is determined by the actions of the private sector, not the Fed. This is the essential aspect of an endogenous variable. The uncontrollable velocity is an important reason why lags in monetary policy are both long and variable. If velocity had been stable in 2022, the Fed would very likely have come much closer to restoring their goal of a 2% rate of increase in core inflation. But the inability of the Fed to achieve their target quickly does not mean that they will be denied success. The planned actions are moving the Fed closer to realizing their inflation objective.

As the sharp deceleration in ODL growth intensifies in 2023 and its effects spread through

the economy and combines with the drag of poor business conditions from the rest world and corrosive effects of rapid inflation on modest and moderate-income households, the marginal revenue product of debt and the loan to deposit ratio will resume the declining trend that prevailed prior to the Pandemic and velocity will turn down. Additionally, U.S. debt will accelerate both due to recent increases in federal spending as well as loss of revenues as business conditions deteriorate.

Even if velocity is, contrary to our analysis, relatively stable, this will not be important for the economy or the U.S. Treasury bond market, since as Chart 1 indicates ODL V was still very depressed in the third quarter of 2022 at 1.561, just 0.09 above the all-time low reached in Q2 2020. The 2022 rise in V is not significantly different from the interim gains from 2003 to 2008, or from 2016 to 2020, neither of which had lasting economic consequences. Such weak V, even after the gain in 2022, is still consistent with low long-term U.S. Treasury bond yields to which V is positively correlated.

The better growth in real GDP experienced in the third quarter and early part of the fourth quarter will reverse. Poor consumer spending over the critical Christmas shopping period, slumping exports, sharp deterioration in residential construction, and contracting diffusion indices in both the manufacturing and service sectors will result in business conditions in the first quarter that should be dramatically weaker than the fourth quarter. The risks of recession will become much clearer as 2023 progresses. Headline inflation will recede further from the 1.9% pace in the CPI of the latest six months. These developments are aligned with interest rate cycle theory as well as the case for lower U.S. Treasury bond yields.
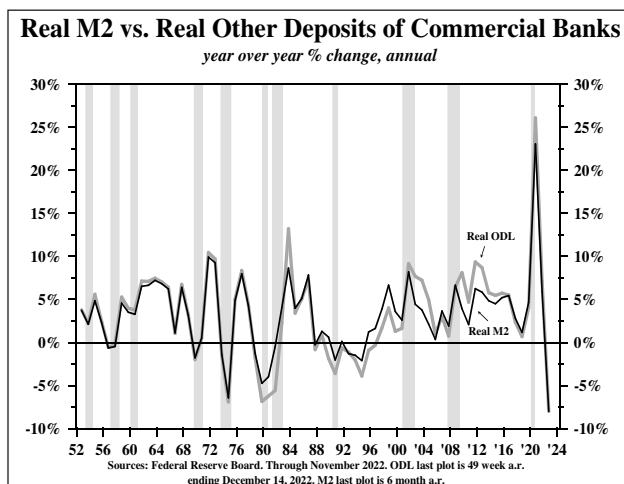
Hoisington Investment Management

Real M2 vs. Real Other Deposits of Commercial Banks
year over year % change, annual

Sources: Federal Reserve Board. Through November 2022. ODL last plot is 49 week a.r.
ending December 14, 2022. M2 last plot is 6 month a.r.

Chart 3

DISCLOSURES

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