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Moving at the Velocity of Money: Getting Up to Speed on Inflation and the Post-Crisis Economy

Since the 2008 Global Financial Crisis (GFC), the U.S. Federal Reserve (Fed) has moved aggressively to provide liquidity to the markets and to stimulate economic growth. The Fed's quantitative easing (QE) programs, launched in November 2008 and continuing today, are considered its boldest monetary policy procedures to date. These unprecedented actions have had mixed success in terms of their stated objectives. But the experiment is not over.

This *Investment Insight* applies the concept of the velocity of money to examine the implications and possible outcomes of the Fed's response to the crisis — and considers how investors might want to prepare.

The Equation of Exchange

One way to gauge the health of an economy is to analyze the amount of money in circulation and how quickly that money changes hands — that is, how many times a unit of currency flows through the economy and is used by businesses and consumers. To measure this, Segal Rogerscasey Canada uses the formula known as the “Equation of Exchange,” described in the box at right.

The left side of the equation focuses on how much money is moving through the system and how quickly; the right side focuses on price levels and the nation's total economic activity.

As with any formula containing an “equal” sign, the left side must have the same value as the right. Therefore, if M is increased, then V must either decrease, or P or Y, or a combination of P and Y, must increase. In the next sections, we will analyze each component of the formula using information from the Fed.

M = Money in Circulation

To analyze the amount of money the Fed has pumped into the system, we must first define “money” or money stock. This is not as simple as it may seem. In many cases, it may not be enough to define money as only the paper bills and coins in circulation for that does not

$$M \times V = P \times Y$$

where

M = Money in circulation

V = Velocity of money changing hands

P = Price of goods sold

Y = Gross domestic product (GDP)

Source: Irving Fisher, Yale University

encompass the opportunity cost¹ of “money.” Of the various definitions used by economists, we will outline two that are most commonly recognized as a gauge for cash in circulation:

- **M2** encompasses all currency held outside the vaults of depository institutions, Federal Reserve Banks² and the U.S. Treasury, travelers’ cheques, and demand and other chequeable deposits issued by financial institutions, minus cash items in process of collection and Federal Reserve float,³ plus savings deposits, small-denomination time deposits and balances in retail money market mutual funds.
- **MZM** (Money Zero Maturity) encompasses M2, minus small-denomination time deposits (under \$100,000 USD), plus institutional money market mutual funds.

The main difference between the two is the removal from MZM of small-denomination time deposits, which cannot be withdrawn before a set date, and the inclusion in MZM of institutional money market funds, which are highly liquid. In this article, we will primarily use MZM to measure the money supply. Why? Because MZM incorporates all types of financial instruments that can be easily converted to cash without penalty, it is viewed as a better measure of the money readily available for spending *now* (or in the very near future). This quality also makes it an ideal tool for gauging the opportunity cost of money — in other words, the cost of “staying in cash” versus investing in non-MZM assets, such as stocks and bonds. The Fed requires all banks to hold back a portion of MZM as required reserves, which cannot be lent out or circulated within the economy.

“Because MZM incorporates all types of financial instruments that can be easily converted to cash without penalty, it is viewed as a better measure of the money readily available for spending *now* (or in the very near future).”

As Graph 1 shows, the MZM money stock and the total required reserves of depository institutions (the levels mandated by the Fed) have both increased significantly since 2008. However, MZM has increased by a much greater extent.

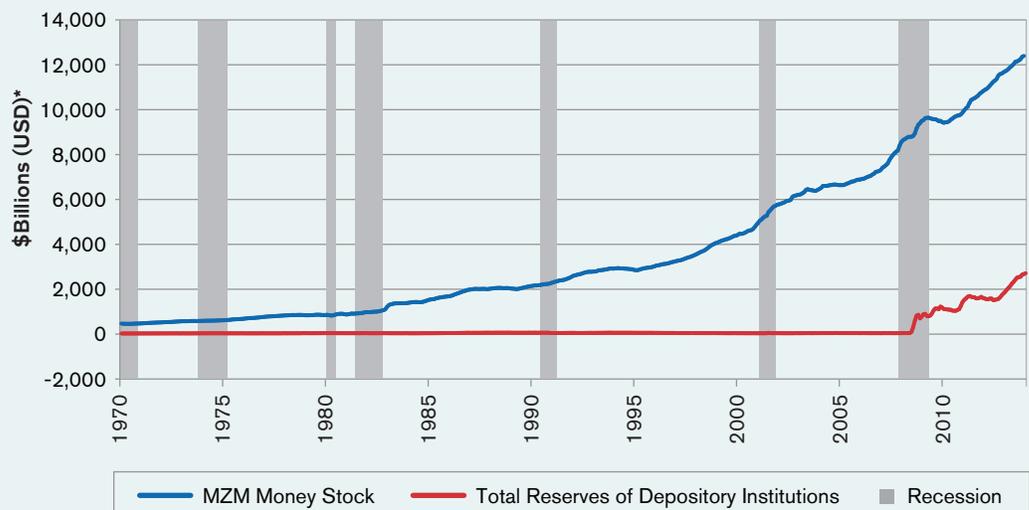
The gap between the two graph lines represents the amount of money that has been available to banks to lend to consumers and businesses. Over the past several decades, this gap has been

¹ In finance, opportunity cost can be viewed as the difference in return between the investment chosen and the investment(s) that must be foregone as a result.

² Federal Reserve Banks are the regional banks of the U.S. Federal Reserve System.

³ Federal reserve float is the money in the banking system that is counted twice, for a brief time, because of delays in processing cheques. Float distorts the measurement of the money supply and complicates the implementation of monetary policy, according to the Federal Reserve Bank of New York.

Graph 1: MZM Money Stock and Total Reserves of Depository Institutions



* Based on non-seasonally-adjusted monthly data.

Source: Federal Reserve Bank of St. Louis, as of March 2014

driven wider almost entirely by the increase in the MZM money stock. Over the same period, the level of required bank reserves has remained mostly flat, up until the middle of the GFC, when the level rose.

These long-term trends reflect a conscious decision by the Fed, since around 1980, to increase the money stock, which has led to periods of strong U.S. and global economic growth following recessions in the 1980s, 1990s and early 2000s. **Most recently, since the GFC, the Fed has significantly increased the money supply through three rounds of QE:**

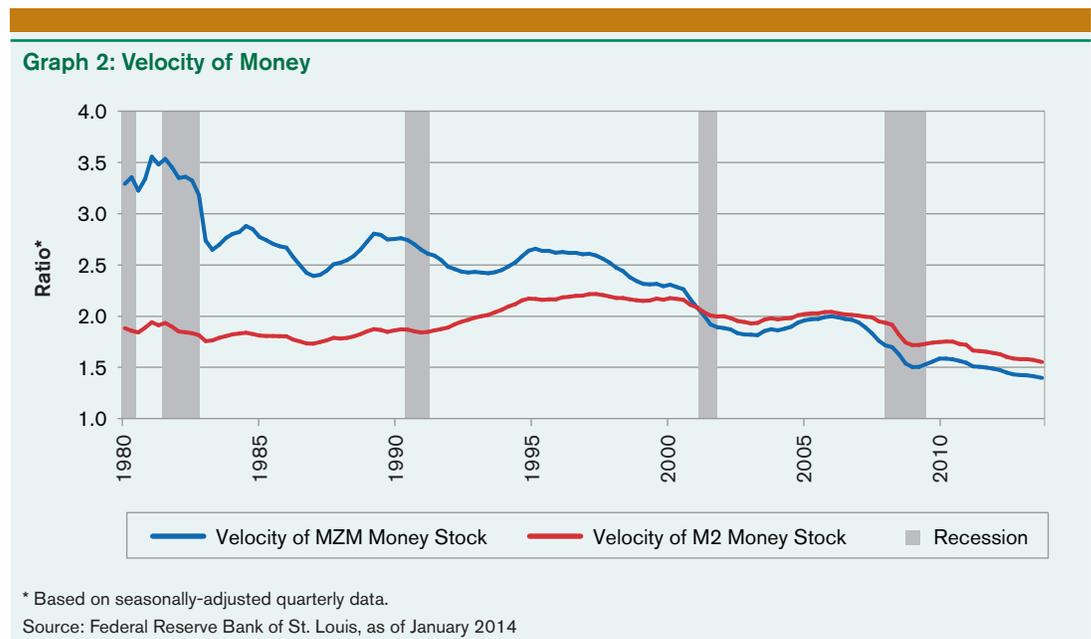
- **Round One:** A \$600 billion USD purchase of mortgage-backed securities beginning in November 2008.
- **Round Two:** A \$600 billion USD purchase of Treasury securities starting in November 2010.
- **Round Three:** A \$40 billion-per-month USD, open-ended bond-purchasing program that was launched in September 2012, upped to \$85 billion USD per month that December and is now being scaled back as part of a gradual taper.

These measures have pushed the total MZM to more than \$12 trillion USD. Active monetary policy, which began slowly and possibly as an economic experiment, has lately become the norm.

V = Velocity of Money Changing Hands

The velocity of money “can be thought of as the rate of turnover in the money supply — that is, the number of times one dollar is used to purchase final goods and services included in GDP,” according to the Federal Reserve Bank of St. Louis. If money velocity is increasing, more transactions will be occurring, which indicates a strengthening economy.

Graph 2 charts the velocity of both M2 and MZM in the U.S. since 1980. Velocity is calculated as the ratio of quarterly nominal GDP to the quarterly average of each type of money stock. As the graph shows, the velocity of M2 increased during the 1990s and remained above its



long-term average until falling sharply — and in tandem with MZM — during the GFC. The velocity of MZM, meanwhile, peaked in the early 1980s and has trended downward ever since, albeit with several temporary positive swings along the way.⁴ Of note is the fact that, even when MZM velocity has declined, as it did during much of the 1990s and part of the last decade, the U.S. economy has still prospered. How? With a larger money stock. **Of more interest is that, after a slight upswing in 2010, the velocity of money (both MZM and M2) has continued to decline, even as the Fed has provided trillions of stimulus dollars to the economy. It is also noteworthy that this latest downturn was quite unique in character, cause and impact.**

P = Price of Goods Sold

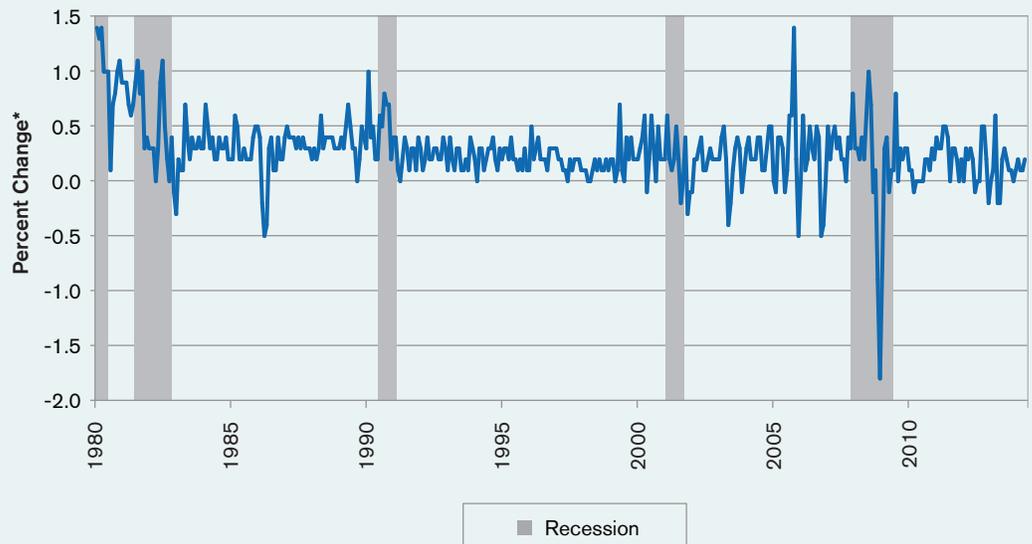
Moving to the right side of the formula, we have the consumer price index (CPI), a weighted average of prices on a basket of more than 200 goods, which is often used as a measure of inflation. A rising CPI indicates inflation is occurring, whereas a declining CPI points to deflation. Economists generally consider moderate inflation to be a positive sign, with increasing prices for goods indicating a robust economy and a healthy manufacturing sector. The thinking goes that, in such an environment, consumers would rather purchase an item today than tomorrow out of concern that the price may be higher in the future. Conversely, deflation is considered negative for an economy.

“In essence, inflation has barely entered the U.S. economy.”

Since the GFC, inflation has remained at the lower end of the Fed’s target range of 1 to 3 percent. In essence, inflation has barely entered the U.S. economy. As seen in Graph 3, prices declined sharply in late 2008 but rebounded almost as quickly in 2009. Since then, however, prices have remained relatively flat, with minor spikes in 2012 and 2013.

⁴If higher money velocity indicates a strengthening economy, one might ask why the velocity of MZM has declined during periods of prosperity, such as the mid- to late-1990s. The answer lies in one of the key traits distinguishing MZM from M2: the inclusion in MZM of institutional money market funds. In weighing the opportunity cost of money, institutional investors may either store financial assets in money market funds or invest in non-MZM assets, such as stocks and bonds. On the whole, institutions have tended to do the latter, resulting in a long-term shift away from MZM assets and into other securities. This trend can be seen in both the steady overall decline of MZM velocity seen in Graph 2 and the steady overall rise in stock-market benchmarks like the S&P 500® Index, which hit new highs during the 1990s.

Graph 3: Consumer Price Index for All Urban Consumers: All Items



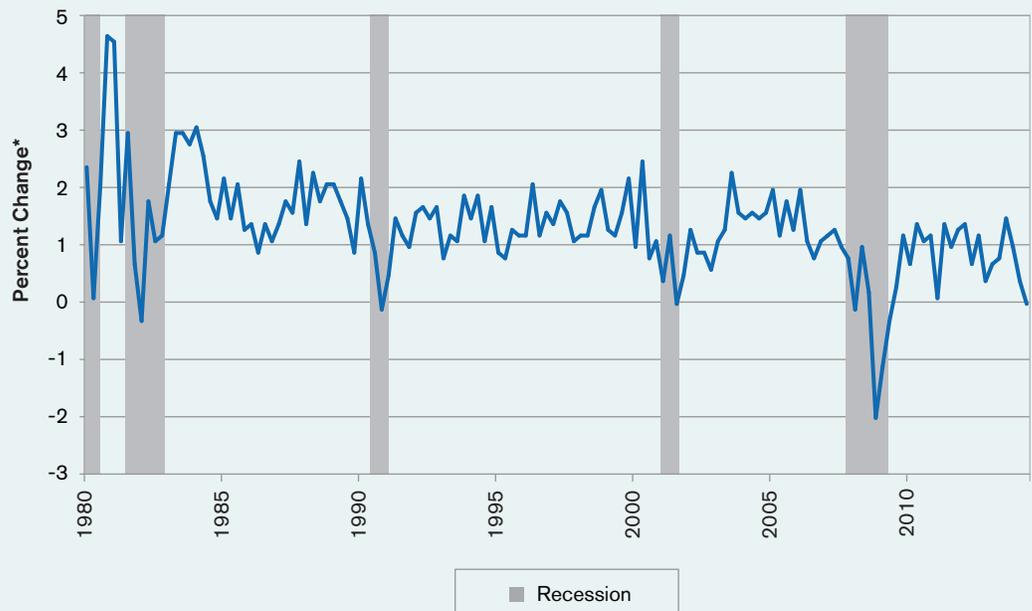
* Based on seasonally-adjusted monthly data.
Source: Bureau of Labor Statistics, as of March 2014

Y = Gross Domestic Product (GDP)

The final input in the formula is GDP. Similar to price, GDP growth is an indicator of how well an economy is doing. GDP growth for the U.S. has trended in the 1- to 2-percent range since the mid-1980s. Outside of two large spikes in the 1980s and four big dips during each of the past four U.S. recessions, GDP growth has not seen any significant change for decades.

As Graph 4 shows, GDP growth rebounded at the end of the GFC to a level just below its long-term average and has since remained relatively flat, despite the Fed's QE programs aimed at boosting economic activity. This begs the question of what might have occurred if the Fed had not stepped in aggressively to provide the various stimulus packages.

Graph 4: Gross Domestic Product



* Based on seasonally-adjusted quarterly data for the annual rate.
Source: Bureau of Economic Analysis, as of January 2014

How the Fed's QE Programs Have Impacted the Equation

Returning to the Equation of Exchange formula, $M \times V = P \times Y$, and taking into account what has occurred with the various inputs, we can see the impact of the Fed's QE programs.

In summary, since the Fed began implementing these extraordinary stimulus measures:

- M = ↑ Money stock has continued to rise,
- V = ↓ Velocity has continued to trend downward,
- P = ↔ CPI has remained flat and at its long-term average, and
- Y = ↔ GDP has been fairly flat (but below its long-term average).

Given that money stock has increased, the first question is where is all the money? Some of it has remained with banks, in the form of required reserves that cannot be circulated within the economy. But that is not the whole story. The continued rise in money stock indicates that banks have funds available to them to lend out and spur the economy.

So why are we not seeing more lending? Is 0.25 percent interest earned on reserves from the Fed a better alternative than providing a business or personal loan? When banks have loaned in the past, the U.S. economy has seen positive spikes in GDP. Is there a fear of another lending bubble like the one in the years leading up to the GFC? It must be that much of the money stock remains at U.S. banks, *waiting* to be lent out, particularly as these banks adapt to tighter lending rules and higher capital requirements enacted in the wake of the GFC. There are, of course, other influences at work. Consumers, having suffered substantial erosion of both their incomes, due to layoffs, and balance sheets, have been reluctant to increase their spending or borrowing. Remember, velocity increases as money is circulated through the system via a cycle of borrowing, spending and deposits. Low demand for goods and services will result in low levels of borrowing and, therefore, low levels of velocity.

At the same time, many firms have reduced their workforce and depleted their inventories. As these savings have returned to businesses, companies have held off on hiring more employees and kept inventories relatively low. Hence, like banks, businesses find themselves with excess cash reserves *waiting* to be utilized, and thus do not need bank loans. And under tighter lending requirements, banks can only issue loans to secure, stable businesses such as those with cash reserves. Bank lending activity under these circumstances has also been affected by an ever-growing and often inexpensive direct lending market.

Conclusion

If we assume that a rising money stock will *eventually* filter from banks to businesses and consumers, emboldening them to spend and consume more, we would expect CPI and GDP growth to increase and money velocity to also rise. It is also possible that the Fed may have to stop tapering and increase the money supply in the event growth or employment weaken, however. If inflation and GDP rise more than the increase in the money supply, then, by the formula as discussed, velocity will go up.

Consider, however, that if the Fed continues its gradual reduction in stimulus, while inflation and GDP growth remain modest, velocity rates would increase, which could then encourage a favorable cycle of sustainable moderate growth. This would seem to be the Fed's hoped-for outcome. Of course, all of this is influenced by the degree and source of change in the variables.

There are a couple of alternative scenarios to the Fed's base case:

- First, the Fed withdraws stimulus too quickly, velocity stays low due to continued slack borrowing, and the economy slows or prices deflate (or some of both); or,
- Second, economic activity picks up rapidly, as does velocity, without stimulus being removed at a fast enough pace, resulting in an increase in inflation, possibly to very high levels, then causing the Fed to feel the need to raise interest rates precipitously to curb those excesses.

Implications for Investors

Given some of the possible outcomes, investors might want to consider investment vehicles with inflation-protection properties, such as Treasury inflation-protected securities (TIPS), real return bonds and inflation-linked commodities. Such vehicles may hold particular appeal to investors with a high degree of sensitivity to inflation.

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Naturally, in the event of a successful conclusion to what has been characterized as a “great experiment” in monetary policy by the Fed, inflation may stay muted and risk assets could continue to perform well — at least in the near term. The Fed has stabilized the markets and helped curb the Great Recession. But only time will tell if it can wind down its ambitious QE programs without a significant shock to the system. ■

Questions? Contact Us.

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