

Velocity of Money

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The velocity of money is a key concept in monetary theory and its behavior is an important macroeconomic issue for Central Banks. In the monetarist tradition of Irving Fisher, we illustrate the relationship between money and economic activity according to the equation of exchange. Based on the quantity theory of money, the main objective of our study is to highlight the importance of the behavior of the velocity of money in conducting monetary policy in Lebanon. For this purpose, the first part lays out the theoretical approach of the quantity theory of money. The velocity of money in Lebanon is then calculated and monitored over the last twenty years. Finally, the main results of the study are pointed out.

Keywords: monetary aggregates, economic growth, inflation

Introduction

The velocity of money is a key concept in monetary theory and its behavior is an important macroeconomic issue for Central Banks. In the monetarist tradition of Irving Fisher, we illustrate the relationship between money and economic activity according to the equation of exchange:

$MV = PY$. Based on the quantity theory of money, the main objective of our study is to highlight the importance of the behavior of the velocity of money in conducting monetary policy in Lebanon. For this purpose, the first part lays out the theoretical approach of the quantity theory of money. The velocity of money in Lebanon for the three monetary aggregates (M1, M2 and M3) is then calculated and monitored over the last twenty years. Finally, the main results of the study are pointed out.

1-Theoretical approach: the quantity theory of money from Fisher to Friedman

Velocity of money, also called velocity of circulation, is the turnover of the money in the economy in a given period. It is measured as the ratio of nominal GDP to a given stock of money. It could be extracted from the Irving Fisher equation of exchange:

$$MV = PY \quad \text{where } M = \text{money stock};$$

$V = \text{velocity of circulation};$
 $P = \text{price};$
 $Y = \text{real income}$

Economic schools diverge concerning the views of behavior of the velocity of money. The Monetarists (Irving Fisher, Milton Friedman) consider that velocity is rather stable and predictable while the neo-Keynesian economists assume that the velocity of money is positively correlated with nominal interest rates.

In fact, Irving Fisher (1911) believed that velocity is constant in the short-run due to the institutional and technological features of the economy affecting velocity, slightly over time. In addition Fisher considered that the Demand for Money is purely a function of income, and interest rates have no effect on the Demand for Money. M is controlled exogenously by the monetary authority. Money supply would be the exclusive determinant of the level of nominal GDP.

However, there are many factors that cause velocity to change. Since velocity is the ratio of nominal GDP to stock of money, any factor that causes money stock to change relative to nominal GDP, or vice-versa will cause velocity to change. Factors that cause people to hold less money relative to their income, increase velocity and vice-versa. The increase in the use of credit cards, for example, could reduce household's desires to hold money balances and thus increase velocity. Additionally, velocity tends to rise during periods of expansion and to fall during periods of recession. Finally interest rates could affect velocity and have similar trends.

For these reasons, Keynes(1936) abandoned the classical view that velocity was constant, and focused on the importance of interest rates. He postulated that there are three motives behind the demand for money: the transaction motive, the precautionary motive and the speculative motive. For Keynes, Money Demand is negatively correlated to the level of interest rates (i) and positively correlated to real income (Y):

$$\frac{Md}{P} = f(i, Y); \quad \frac{P}{Md} = \frac{1}{f(i, Y)}; \quad V = \frac{PY}{M} = \frac{Y}{f(i(-), Y(+))}$$

Unlike the Keynesian theory, Friedman’s modern quantity theory (1956) suggests that changes in interest rates should have little effect on the demand for money. Friedman believed that velocity is predictable and the demand for money is stable and insensitive to interest rate movements in the long run.

Based on these three approaches, the main objective of this study is to assess their reliability by monitoring money velocity over the last twenty years, and its relationship with nominal GDP and Money supply.

2-Equation of exchange and the velocity of money: 1993-2014

2.1-The behavior of the three measures of velocity

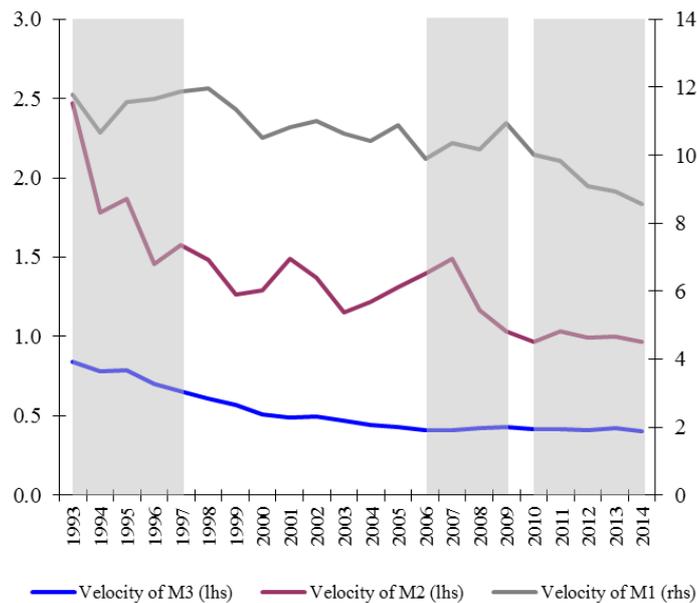
This part examines the link between Lebanon’s stocks of money to nominal GDP. The multiplier linking the money stock to nominal GDP is the velocity of money:

$$V = \frac{PY}{M}, \quad \text{Nominal GDP} = V \times \text{Money Stock}$$

Based on Fisher assumptions, when velocity is constant the money supply would be the only determinant of the level of the nation’s nominal GDP. By controlling and targeting money supply, Central Banks could support economic growth. If velocity is not predictable, changes in money supply would have no expected impact on nominal GDP.

As a first step of analysis, we calculate the velocity of the three monetary aggregates from the narrowest to the largest (M1, M2 and M3) over the sample period 1993-2013. Chart 1 shows the behavior of the three measures of velocity since 1993.

Chart 1. Velocity of M1, M2 and M3



We notice a significant discrepancy among the three measures. The velocity of broad money M3 is consistently lower than that of narrow money M2 and M1.

Moreover, the velocity is much more stable for M3 than for M2 and M1 particularly since 2001. Prior to 2001, the velocity of M3 exhibited a downward trend and declined by 42% between 1993 and 2000. It became much more stable after 2001, registering an average ratio of 0.4 over the period 2001-2013.

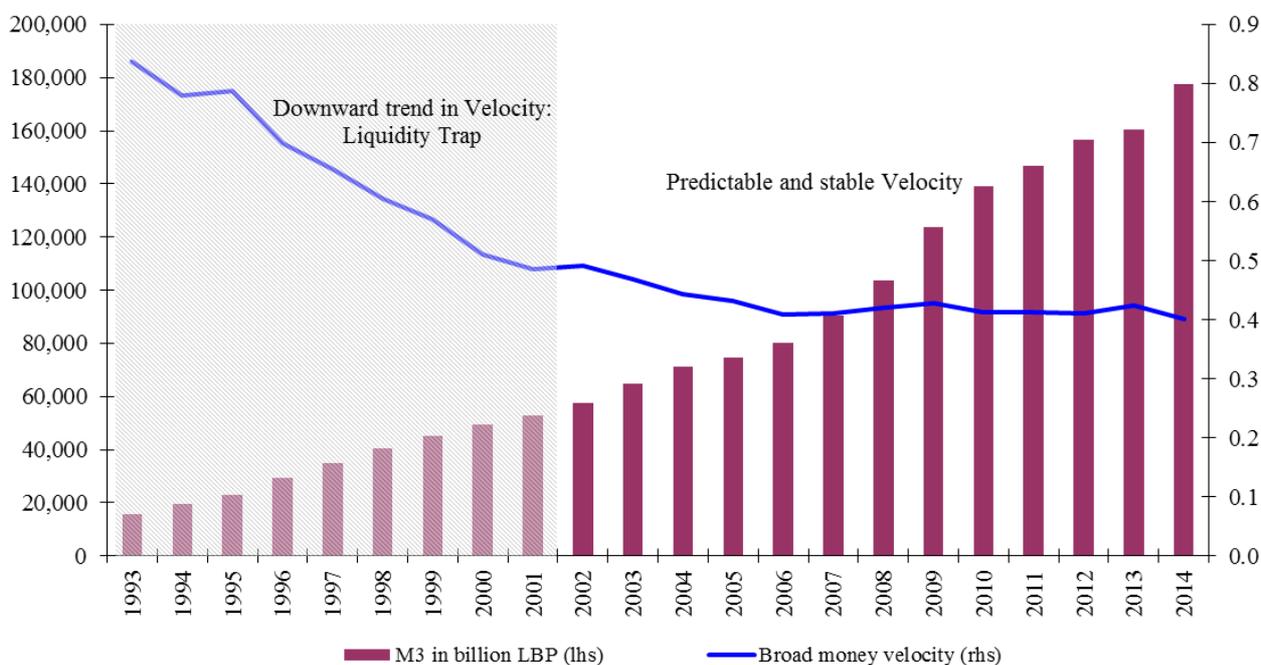
Taking into consideration the counter-cyclical nature of the money supply with economic growth, velocity must drop during recessions and increase during expansion periods.

In fact, in periods of recessions, money supply increases to overcome the effects of the recession. If velocity falls then money supply must rise for nominal GDP to grow.

This pro-cyclical nature of the velocity is clearly reproduced in chart 1 for the three aggregates: in the recession period between 1993 and 1997, velocity dropped considerably; whereas between 2006 and 2009 velocity rose in tandem with a recovery and expansion period. Since mid-2010, velocity fell along with a sharp slowdown in the Lebanese economic activity.

Based on the velocity of M3, our studied period could be divided into two different phases: before and after 2001.

Chart 2. The evolution of Money Stock M3 and its Velocity



As shown in chart 2, from 1993 till 2001, the downward trend in velocity is attributable to the liquidity trap that has increased the demand for money over time. Keynesian economics describe the liquidity trap as such: *“a situation in which injections of cash into the private banking system by a central bank fail to lower interest rates and hence fail to stimulate economic growth. A liquidity trap is caused when people hoard cash because they expect an adverse event such as deflation, insufficient aggregate demand, or war.”*

In fact, between 1993 and 2001, the Lebanese economy entered into the Keynesian liquidity trap. The decrease in the velocity of money led to a liquidity trap which increased saving and caused a slowdown in

the economy. Banks, corporations and individuals in this period chose to hold cash instead of investing, and money growth had no effect on the real economy. Moreover, in this periods, the crowding out effect on private loans by credit to the public sector had negative impact on private investment and consequently on economic growth.

Since 2001, the neoclassic Friedman theory prevails: velocity is almost stable, and the monetary policy is more effective, velocity is predictable and the impact of money supply on growth could be more or less efficient. This shift in the velocity trend is mainly due to the progressive return of confidence in the Lebanese pound and trust of investors enhanced by the monetary policy adopted by the BDL.

2.2-Relationship between velocity, inflation, real GDP and money growth

To validate our main conclusion that *the behavior of the velocity of M3 reflects a liquidity trap before 2001 and became relatively stable after 2002 leading to a more effective monetary policy*, we convert the equation of exchange in terms of growth rates as follows:

$$\frac{\Delta M}{M} + \frac{\Delta V}{V} = \frac{\Delta P}{P} + \frac{\Delta Y}{Y}$$

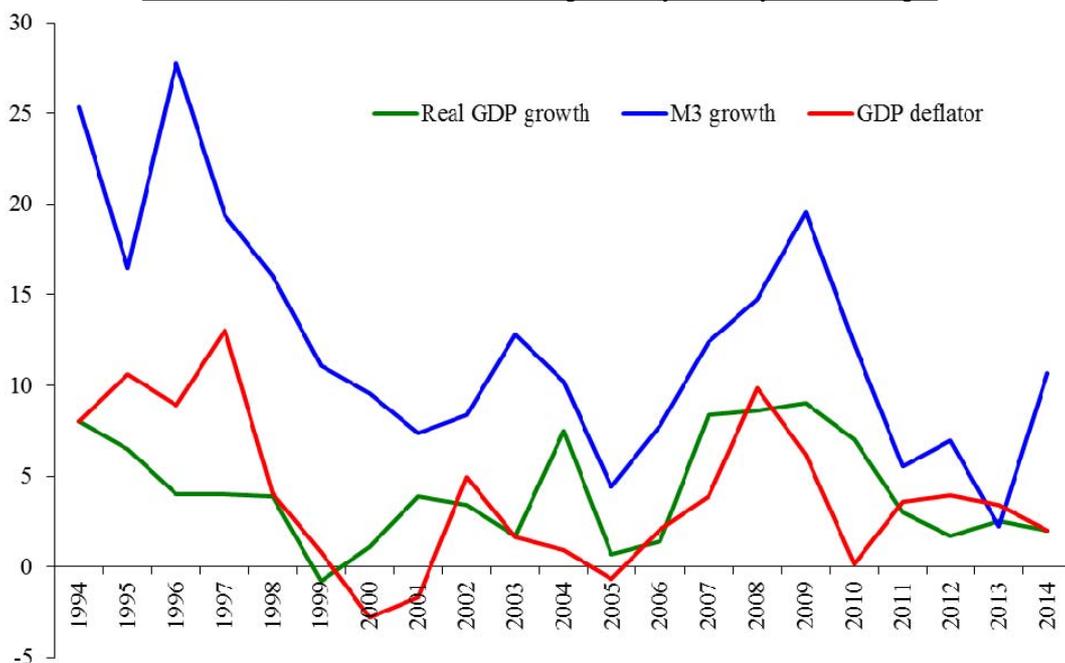
Therefore,
$$\frac{\Delta M}{M} = \frac{\Delta P}{P} + \frac{\Delta Y}{Y} - \frac{\Delta V}{V}$$

According to this identity, the change in the Money Stock in an economy equals the change in real GDP plus the change in the price level or inflation minus the change in velocity. The whole debate rests on whether the Central Bank can accurately forecast velocity.

If for example, the Central Bank seeks to achieve a 3% real output growth with an inflation rate of 5%, the appropriate growth rate of the Money supply will depend on the change in the velocity of money. The more volatile is the velocity, the less predictable and efficient it is to monetary policy.

The stimulus package of LBP 2,200 billions launched by BDL in 2013 to avoid the risk of an economic recession is an appropriate example of the impact of money supply on real growth. It enhanced real growth instead of causing inflation. In general, when central banks pump money into the economy, banks would usually take that money and multiply it, by lending it out, increasing velocity and economic growth.

Chart 3. M3, inflation and real GDP growth (year-on-year % change)



By plotting the annual growth rates of each component of the equation of exchange, we validate the main conclusion of our study.

Prior 2001, the Lebanese economy experienced the Keynesian liquidity trap: monetary policy was ineffective; money growth did not affect real economic growth and was accompanied by a disinflation process. After 2002, monetary policy became much more efficient because velocity became much more stable and predictable. It's noticed that before 2002 there is no relationship between money and economic growth. Between 2002 and 2005, the approximate time lag is one year; it takes 12 months for a change in monetary policy to affect output. After 2005, M3 and Real GDP growth coincide and the monetary policy has direct effect on economic growth. In fact, when the economy exhibits strong growth, such as in 2008 and 2009, money injection will be directly absorbed and will have immediate impact on economic growth.

Friedman's theory, which is a restatement of the quantity theory of money, triumphed in the recent years, while the liquidity trap stated by Keynes dominated between 1993 and 2002.

Conclusion

The main results of this study could be summarized as follows.

From 1993 till 2001, the velocity of the broad money M3 exhibited a downward trend; since 2001, it became much more stable registering an average ratio of 0.4. This shift is mainly due to the return of confidence in the Lebanese Pound.

Between 1993 and 2001, the Lebanese economy entered the Keynesian liquidity trap. Banks, corporations and individuals choose to hold cash instead of investing and money growth have no effect on the real economy.

Velocity in Lebanon turns out to be predictable since 2002, which supports monetarist proposition and strengthen the link between money, growth and inflation.

The relative stability of M3 velocity since 2001 contributed to confidence of monetary policymakers that money growth would be a valuable guide to the Central Bank policy. The key question is whether this is a temporary stability or a permanent shift in velocity.

When Lebanon exhibited strong growth, such as in 2008 and 2009, the flow of capital (BOP recorded a surplus of USD 7,899.1 million in 2009) has been directly absorbed with immediate impact on economic growth. Otherwise, the average time lag is one year for money to affect output.

The long run downward trend observed in the velocity of the broad money M3 is mainly due to the pro-cyclical nature of velocity with interest rates that exhibit also a similar downward trend since 1993.

The main limitation of this study is the short sample period. A longer series would be more efficient to monitor the trend of the velocity.

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