https://damaacademia.com/fme/ May 2020 Pages: 16-19 Volume 2 | Issue 6

Multiplier Effect: How Fractional Reserve Banking Creates Money

William Bransah

School of finance & Financial Management | *Business University of Costa Rica*

Abstract

The modern banking system is considerably different from what the average person believes it to be. Banks are not institutional moneylenders. They do not simply collect money from people and lend them to others. Instead, banks in the modern world have the power to create money when they lend it out. The process by which this happens is called fractional reserve banking. Under a fractional reserve banking system, banks can expand the total money supply of the system by several times. This expansion of money supply is called the "multiplier effect" and we will study it in detail in this article.

Keywords: Multiplier Effect, Fractional Reserve, Banking Creates Money

1.0 INTRODUCTION

In monetary economics, a money multiplier is one of various closely related ratios of commercial bank money to central bank money (also called the monetary base) under a fractional-reserve banking system. It relates to the *maximum* amount of commercial bank money that can be created, given a certain amount of central bank money. In a fractional-reserve banking system that has legal reserve requirements, the total amount of loans that commercial banks are allowed to extend (the commercial bank money that they can legally create) is equal to a multiple of the amount of reserves. This multiple is the reciprocal of the reserve ratio minus one, and it is an economic multiplier. The actual ratio of money to central bank money, also called the money multiplier, is lower because some funds are held by the non-bank public as currency. Also, in the United States most banks hold excess reserves (reserves above the amount required by the US central bank, the Federal Reserve).

Although the money multiplier concept is a traditional portrayal of fractional reserve banking, it has been criticized as being misleading. The Bank of England, Deutsche Bundesbank, and the Standard & Poor's rating agency have issued refutations of the concept together with factual descriptions of banking operations. Several countries (such as Canada, the UK, Australia and Sweden) set no legal reserve requirements. Even in those countries that do, the reserve requirement is as a ratio to deposits held, not a ratio to loans that can be extended. Basel III does stipulate a liquidity requirement to cover 30 days net cash outflow expected under a modeled stressed scenario (note this is not a ratio to loans that can be extended); however, liquidity coverage does not need to be held as reserves but rather as any high-quality liquid assets If banks lend out close to the maximum allowed by their reserves, then the inequality becomes an approximate equality, and commercial bank money is central bank money times the multiplier. If banks instead lend less than the maximum, accumulating excess reserves, then commercial bank money will be *less* than central bank money times the theoretical multiplier.

The money multiplier is defined in various ways. Most simply, it can be defined either as the statistic of "commercial bank money"/"central bank money", based on the actual observed quantities of various empirical measures of money supply, such as M2 (broad money) over M0 (base money), or it can be the theoretical "maximum commercial bank money/central bank money" ratio, defined as the reciprocal of the reserve ratio. The multiplier in the first (statistic) sense fluctuates continuously based on changes in commercial bank money and central bank money (though it is *at most* the theoretical multiplier), while the multiplier in the second (legal) sense depends only on the reserve ratio, and thus does not change unless the law changes.

For purposes of monetary policy, what is of most interest is the *predicted impact* of changes in central bank money on commercial bank money, and in various models of monetary creation, the associated multiple (the ratio of these two changes) is called the money multiplier (associated to that model). These concepts are not generally distinguished by different names; if one wishes to distinguish

https://damaacademia.com/fme/ May 2020 Pages: 16-19 Volume 2 | Issue 6

them, one may gloss them by names such as empirical (or observed) multiplier, legal (or theoretical) multiplier, or model multiplier, but these are not standard usages.

Similarly, one may distinguish the *observed* reserve–deposit ratio from the legal (minimum) reserve ratio, and the *observed* currency–deposit ratio from an assumed model one. Note that in this case the reserve–deposit ratio and currency–deposit ratio are *outputs* of observations, and fluctuate over time. If one then uses these observed ratios as model parameters (*inputs*) for the predictions of effects of monetary policy and assumes that they remain constant, computing a constant multiplier, the resulting predictions are valid only if these ratios do not in fact change. Sometimes this holds, and sometimes it does not; for example, increases in central bank money may result in increases in commercial bank money – and will, if these ratios (and thus multiplier) stay constant – or may result in increases in excess reserves but little or no change in commercial bank money, in which case the reserve–deposit ratio will grow and the multiplier will fall.

The multiplier effect refers to the proportional amount of increase, or decrease, in final income that results from an injection, or withdrawal, of spending. The multiplier effect refers to the proportional amount of increase, or decrease, in final income that results from an injection, or withdrawal, of spending. The most basic multiplier used in gauging the multiplier effect is calculated as change in income / change in spending and is used by companies to asses' investment efficiency. The money supply multiplier is also another variation of a standard multiplier, using a money multiplier to analyze effects on the money supply. The process begins with a certain amount of base money. In old times, this base money used to be gold pieces. However, in the modern times, reserves kept at the central bank form this base money. This is often referred to as M0 by the economists. This is also the amount of money that exists in the form of physical bank notes and coins. Therefore, at any given point in time, this is the money that has actual physical existence.

2.0 UNDERSTANDING MULTIPLIER EFFECT

Generally, economists are usually the most interested in how capital infusions positively affect income. Most economists believe that capital infusions of any kind, whether it be at the governmental or corporate level, will have a broad snowball effect on various aspects of economic activity. Like its name suggests, the multiplier effect provides a numerical value or estimate of a magnified expected increase in income per dollar of investment. In general, the multiplier used in gauging the multiplier effect is calculated as follows: Multiplier = Change in Income ÷ Change in Spending

The multiplier effect can be seen in several different types of scenarios and used by a variety of different analysts when analyzing and estimating expectations for new capital investments. For example, assume a company makes a $100,000 investment of capital to expand its manufacturing facilities in order to produce more and sell more. After a year of production with the new facilities operating at maximum capacity, the company's income increases by $200,000. This means that the multiplier effect was 2 ($200,000/$100,000). Simply put, every $1 of investment produced an extra $2 of income.

Many economists believe that new investments can go far beyond just the effects of a company's income. Thus, depending on the type of investment, it may have widespread effects on the economy at large. A key tenet of Keynesian economic theory is the notion that economic activity can be easily influenced by investments causing more income for companies, more income for workers, more supply, and ultimately greater aggregate demand. Therefore, on a macro level, different types of economic multipliers can be used to help measure the impact that changes in investment have on the economy.

When looking at the economy at large, the multiplier would be the change in real GDP divided by the change in investments. Investments can include government spending, private investments, taxes, interest rates, and more.

When estimating the effects of $100,000 by the manufacturing company on the economy overall, the multiplier would be much smaller. For example, if GDP grew by $1 million, the multiplier effect of this investment would be 10 cents per dollar.

Some economists also like to factor in estimates for savings and consumption. This involves a slightly different type of multiplier. When looking at savings and consumption, economists might measure how much of the added economic income consumers are saving versus spending. If consumers save 20% of new income and spend 80% of new income then their marginal propensity to consume (MPC) is 0.8.

https://damaacademia.com/fme/ May 2020 Pages: 16-19 Volume 2 | Issue 6

Using an MPC multiplier, the equation would be: MPC Multiplier = 1 ÷ (1-MPC) = 1 ÷ (1-0.8) = 5. Therefore in this example, every new production dollar creates extra spending of $5.

3.0 MONEY SUPPLY MULTIPLIER EFFECT

Economists and bankers often look at a multiplier effect from the perspective of banking and money supply. This multiplier is called the money supply multiplier or just the money multiplier. The money multiplier involves the reserve requirement set by the board of governors of the Federal Reserve System and it varies based on the total amount of liabilities held by a particular depository institution. The most recent Federal Reserve reserve requirements prior to the COVID-19 pandemic mandated that institutions with more than $124.2 million have reserves of 10%. This changed as the FED responded to the COVID-19 pandemic by eliminating these requirements to free up liquidity.[1]

In general, there are multiple levels of money supply across the entire U.S. economy. The most familiar ones to the general public are:

- The first level, dubbed M1, refers to all of the physical currency in circulation within an economy.
- The next level, called M2, adds the balances of short-term deposit accounts for a summation.

When a customer makes a deposit into a short-term deposit account, the banking institution can lend one minus the reserve requirement to someone else. While the original depositor maintains ownership of their initial deposit, the funds created through lending are generated based on those funds. If a second borrower subsequently deposits funds received from the lending institution, this raises the value of money supply even though no additional physical currency actually exists to support the new amount.

The money supply multiplier effect can be seen in a country's banking system. An increase in bank lending should translate to an expansion of a country's money supply. The size of the multiplier depends on the percentage of deposits that banks are required to hold as reserves. When the reserve requirement decreases the money supply reserve multiplier increases and vice versa. Most economists view the money multiplier in terms of reserve dollars and that is what the money multiplier formula is based on. Theoretically, this leads to a money (supply) reserve multiplier formula of: Money Supply Reserve Multiplier = 1 ÷ Reserve Requirement Ratio

For example, when looking at banks with the highest required reserve requirement ratio, which was 10% prior to COVID-19, their money supply reserve multiplier would be 10 (1/.10). This means every one dollar of reserves should have $10 in money supply deposits.

If the reserve requirement is 10%, then the money supply reserve multiplier is 10 and the money supply should be 10 times reserves. When a reserve requirement is 10%, this also means that a bank can lend 90% of its deposits.

4.0 MONEY SUPPLY MULTIPLIER EXAMPLE.

Looking at the money multiplier in terms of reserves helps one to understand the amount of expected money supply. In this example, $651 equates to reserves of $65.13. If banks are efficiently using all of their deposits, lending out 90%, then reserves of $65 should result in money supply of $651. If banks are lending more than their reserve requirement allows then their multiplier will be higher creating more money supply. If banks are lending less, then their multiplier will be lower and the money supply will also be lower. Moreover, when 10 banks were involved in creating total deposits of $651.32, these banks generated new money supply of $586.19 for a money supply increase of 90% of the deposits.

4.1 How Much Money Can Be Created?

The central banks all over the world have a reserve requirement. This means that at every step of the process, they have to deposit let's say 10% of their deposits with the central bank whereas the rest can be used to create bank loans. When the remaining 90% of the money is loaned out, new money is created. This money exists in addition to the already existing deposits on the bank ledgers. However, in reality it does not exist. Therefore, if a bank had $100 in deposits, they kept $10 in reserves and lent out $90 dollars, the total money supply in the system went up to $190 dollars. Also, the $90 is a new deposit. It can once again be used by the banks wherein they keep $9 in reserves and lend out $81. Once again, the $81 will be a new addition to the total money supply. Hence, the total money supply would now increase from the original $100 to the new $271.

https://damaacademia.com/fme/ May 2020 Pages: 16-19 Volume 2 | Issue 6

Notice that the amount of base money i.e. the money that has physical existence remains the same i.e. $100 whereas the amount of money in the checking accounts of people is increasing. This amount of money that people have in their checking accounts is what the economists call M1. Now, that it has been ascertained that fractional reserve banking allows banks to create more money while they make loans, the question arises as to how much money can be created in the system at any given time. This is determined by the reserve requirements that are set by the central bank. For instance, if the reserve requirement is 10%, then the total amount of money that can possibly be created is given by the concept of money multiplier. The reserve ratio can be used to compute the money multiplier by using the following formula.

Money Multiplier = 100/Reserve Ratio

In this case, the money multiplier is 10. If the reserve ratio was 8%, then the money multiplier would have been 12.5 Now, to determine the total amount of money that can possibly be created, we need to multiply the base money with the money multiplier. Hence, when the reserve ratio is 10, the original $100 of base money can be multiplied to $1000. On the other hand, if the reserve ratio changes to 8%, the original $100 of base money can create $1250 in M1.

5.0 CONCLUSION

The multiplier effect is probably the characteristic feature which defines fractional reserve banking. It is also the feature which faces the most criticism. This is because many people believe that the multiplier effect allows banks to artificially create deposits and collect interest on money which they do not have! This allows them to siphon larger and larger sums of money from the general population into their own pockets. Hence, even though the money that they create is extinguished when the loan is repaid, they get to collect interest on the money that they did not have in the first place!

Secondly, the money multiplier effect creates a massive amount of inflation. When the money supply of any economy goes up by 10 to 15 times over a given period of time, obviously the prices tend to rise as well. Hence, the multiplier effect if against the basic goal of financial stability that is pivotal for the existence of central banks.

Also, fractional reserve banking creates a perpetual danger of a bank run. The banks only have 10% of the amount of money for which they have issued IOU's. The only reason why banks survive is because depositors do not show up at the same time to demand their funds. If they did, the entire banking system would collapse.

The fractional reserve system and the multiplier effect are extremely important for anyone trying to understand modern banking. This system has undergone massive change in the past century. Banks used to maintain as much as 60% of their deposits in reserves. However, nowadays banks hold close to 6% in reserves. Thus the amount of money being created has reached unprecedented heights in the recent years.

Reference

- *Kydland, Finn E.; Prescott, Edward C., "Business Cycles: Real Facts and a Monetary Myth", Federal Reserve Bank of Minneapolis Quarterly Review, 14 (2): 3–18*
- *Krugman, Paul; Wells, Robin (2009), Macroeconomics, ISBN 978-0-7167-7161-6; a mainstream introductory text in macroeconomics.*
- *Mankiw, N. Gregory (2008), Principles of Macroeconomics (5th ed.), ISBN 978-0-324-58999-3; a mainstream general introductory text to economics.*
- *Mankiw, N. Gregory (2002), Macroeconomics (5th ed.), Worth Publishers, ISBN 978-0-7167-5237-0; a mainstream intermediate text in macroeconomics.*
- *Samuelson, Paul (1948), Economics*