

## CHAPTER FOUR

### MONETARY AGGREGATES: ENDOGENOUS AND EXOGENOUS MONEY SUPPLY

#### 4.1 INTRODUCTION

The purpose of this chapter is specifically to give a brief overview of the different views on money supply advanced by structuralists and neo-liberal economists, in addition to describing the overall differences around monetary policy. Also specifically covered will be inflation targeting, which relates to the inflation arguments stated above and depict the similarity to *money supply targeting* by monetary authorities in South Africa. Money supply targeting is empirically tested in chapter nine. According to structuralists, money supply is *exogenous*, thus uncontrollable by monetary authorities of a small and open economy, like South Africa. This will be tested as one of the hypotheses in chapter eight. Because of this, it is further argued that any serious and thorough economic analysis cannot be conducted merely by considering economic factors, to the exclusion of the socio-political ones. On the contrary, neo-liberal or orthodox economists consider money supply to be *endogenous*, and controllable by such monetary authorities. The next section deals with the difference between endogenous and exogenous money supply.

#### 4.2 ENDOGENOUS AND EXOGENOUS MONEY SUPPLY

As stated above, the controversy between structuralists and neo-liberals or orthodox economists, particularly monetarists, pivots around the different views on money supply held by these two contending schools of thought. The structuralist view is that money supply is *exogenous*, whereas monetarists view it as *endogenous*. A variable is designated endogenous if it is determined within or by the model, and when it is changed it, in turn, causes changes in output and employment. In contrast, an exogenous variable is determined outside the model by external forces beyond the control of the monetary authorities. In the terminology frequently used, output, employment and the real wage are designated as endogenous variables in the neo-

classical sense (Froyen 1996:408-415). *Endogenous* variables are those values we wish to determine, like output; and *exogenous* variables are those variables whose values are determined outside the model by external forces, beyond the control of the monetary authorities. The exogenous variables are used to explain the endogenous variables, but are not themselves explained in the model (Dornbusch, Fischer, Mohr & Rogers, 1996:93).

Bayes and Jansen (1995:476) define money supply ( $M^s$ ) as follows:

$$M^s = \left[ \frac{1 + c^d}{r + e^d + c^d} \right] \times MB,$$

Where:

- $c^d$  = desired currency to deposit ratio
- $r$  = required reserve to deposit ratio
- $e^d$  = desired excess ratio
- MB = monetary base, and

$$\left[ \frac{1 + c^d}{r + e^d + c^d} \right] = \text{money-multiplier}$$

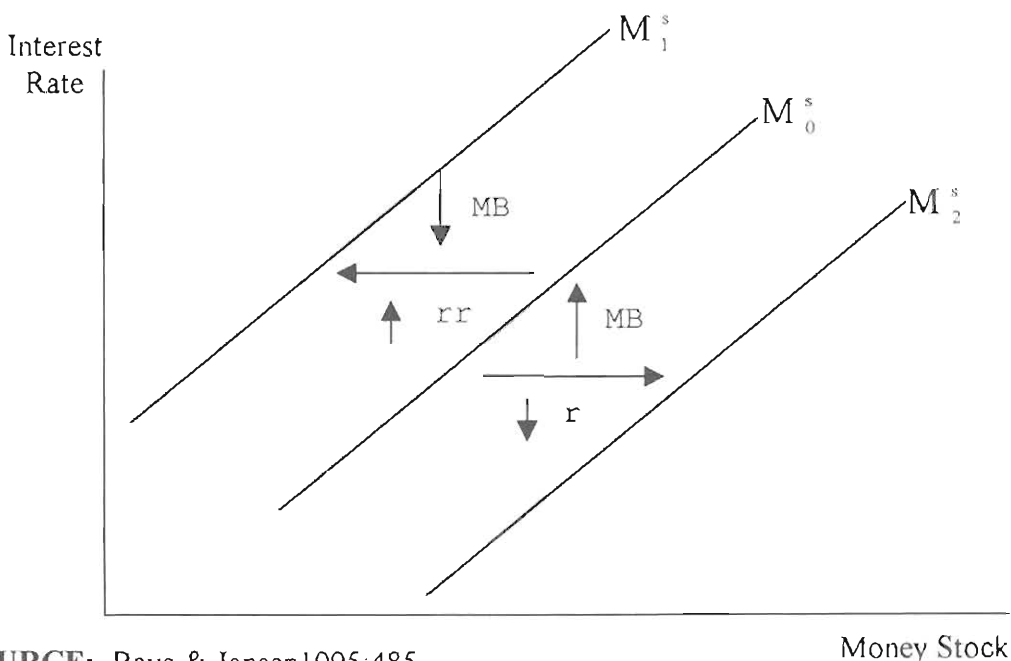
It is said that there is disagreement between economists, in our case, structuralists and monetarists (neo-liberals or the orthodox school), on the impact of interest rate on the determinants of the money supply, represented by equation C above. Structuralists argue that these determinants are exogenous, determined by outside forces and not by the interest rate. In line with this structuralist view, the currency to deposit ratio,  $c^d$ ,

or the desired excess reserve ratio,  $e^d$ , do not change as the interest rate is altered. Monetarists' view is that these determinants are endogenous, dependent on economic variables like interest rates.

#### 4.2.1 Endogenous money supply curve

For structuralists money supply is endogenous, so that  $c^d$  and  $e^d$  do not remain constant, but vary with economic conditions. For example, there is said to be an inverse relationship between interest rates, and on the one hand, and  $e^d$  and  $c^d$ , on the other. Banks are said to decrease their excess reserves with increases in the interest rates, and to be able to lend out additional funds at the higher rates. Similarly, many depositors are said to hold less currency and more interest-bearing instruments to earn greater interest income. Thus, the money multiplier is said to be an increasing function of interest rates and not a constant. This gives rise to a money supply curve ( $M^s$ ), which is endogenous and *upward sloping* (Bayes & Jansen, 1995:485), depicted by Figure 3:

**FIGURE 4. 3: ENDOGENOUS MONEY SUPPLY**



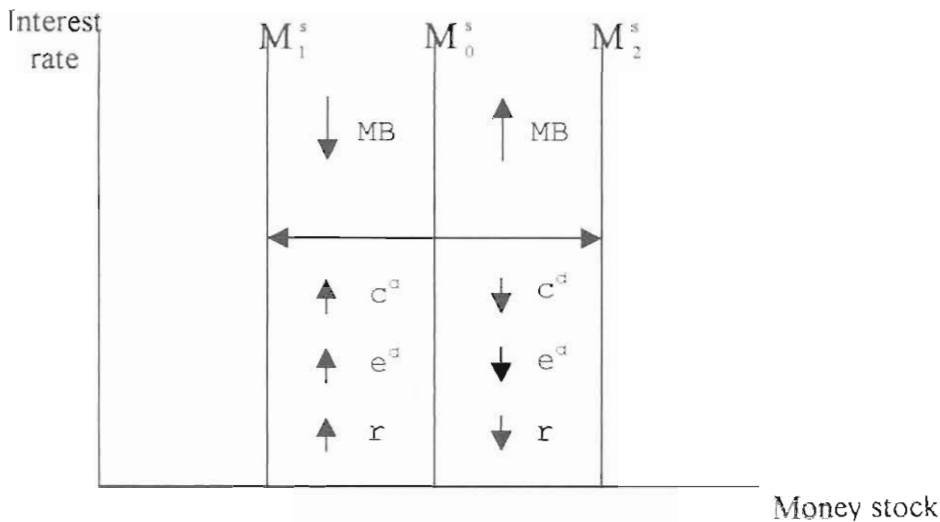
SOURCE: Baye & Jansen 1995:485.

The money supply curve slopes upwards because as interest rates rise, excess reserves fall and the amount of money in the economy increases – the money multiplier effect. This effect also takes place via the currency to deposit ratio,  $c^d$ , which drops as interest rates rise. Thus, higher interest rates lead to higher money supply, when money supply is endogenous. This is the basis of the structuralist argument against neo-liberal economists, that it is inappropriate to consider the effect of exogenous changes in  $c^d$  or  $e^d$  on the money supply, since they are functions of the interest rate graphed on the vertical axis of figure 4.4. Whereas the functional relationship between interest rates, on the one hand, and  $c^d$  and  $e^d$ , on the other, gives an upward money supply curve, changes in required reserves,  $rr$ , or the monetary base,  $MB$ , shift the money supply curve, just as in the case of an exogenous money supply curve and in the same direction. An increase in  $rr$  shifts the money supply curve to the left, while decreases in  $rr$ , lead to rightward shifts, as reflected by figure 4.3. Also changes in  $MB$  lead to an opposite effect compared to those in  $rr$ . Increases in  $MB$  shift the money supply curve to the right, resulting in a higher stock of money at each interest rate; while decreases in  $MB$  shift the money curve to the left, thereby reducing the money stock at each interest rate (Bayes & Jansen, 1995:484-485). More detailed coverage of this topic will be given in chapter seven on money supply and monetary policy in South Africa, the empirical testing of the determinants of the money supply and the impact of changes in the repo rate will be discussed in chapters eight and nine.

#### **4.2.2 Exogenous money supply curve**

When the money supply in the economy is exogenous, it is said to be determined by the banks' preferences for excess reserves,  $e^d$ , and the depositors' preferences for holding cash, and these preferences are not affected by economic variables like interest rates. Consequently, the money multiplier is constant and the amount of money supplied,  $M^s$ , does not vary with changes in interest rates (Baye & Jansen, 1995:483). This gives rise to the vertical exogenous money supply curve reflected in Figure 4.4:

**FIGURE 4.4: EXOGENOUS MONEY SUPPLY CURVE**



**SOURCE:** Baye & Jansen 1995:483

Increases in  $c^d$ ,  $d^c$  and  $r$  shift the money supply curve to the left, from  $M^s$  to  $M_1^s$ , since such increases reduce the money multiplier and thus the money supply. Decreases in any of these variables have the opposite effect, shifting  $M_0^s$  to  $M_2^s$ . The effect of  $MB$  is a direct one, shifting the money supply curve to the right or left with increases or decreases, respectively, in  $MB$ . This aspect of the South African money supply will be discussed in more detail in chapter six. The next sections briefly outlines the debate on inflation by structuralists and orthodox economists.

### 4.3 INFLATION

One of the core structuralist arguments is that inflation is imported from countries with which a small and open economy is engaged in trade, it is maintained that there is no relationship between the domestic rate of inflation and economic growth. This structuralist contention has been empirically tested by this study. Because monetary authorities in South Africa replaced the use of money supply targeting by inflation targeting in 2000, before conducting this empirical testing, it not only necessary, but crucial, to give a brief overview of inflation targeting, because the “main objective of a system of inflation targeting is to provide a stable ‘anchor’ for price and wage

adjustments in the economy, thereby stabilising and containing the inflation rate” (Fourie 2001: 246).

### 4.3.1 Introduction

This section gives a brief overview of inflation as a prelude to the discussion of the structuralist argument over the relationship between economic growth and inflation, with application to the South Africa economy. Inflation is a continuous increase in the price of good and services and is a major macroeconomic problem, adversely impacting upon economic growth. Usually, the growth rate of the economy is taken to be the rate at which the real Gross Domestic Product, GDP, the total value of final goods and services produced in the economy during a given time period (usually a year), is increasing. There are two measures of GDP, namely nominal GDP or current rand GDP, and real or constant rand GDP. The output tends to fluctuate around a trend in a cyclical fashion. The pattern of economic activity around a growth trend is called the *business cycle*. It reflects a more or less regular pattern of expansion (recovery) and contraction (recession) in economic activity around a growth trend. At a cyclical peak, economic activity is high relative to the trend, while in a cyclical trough economic activity is low relative to the trend. During an expansion (or recovery), the employment of factors of production increases, which is a source of increased production. Conversely, during a recession or contraction, unemployment develops or increases and less output is produced with existing resources and technology. The unemployment rate is that fraction of the labour force that cannot find jobs. The relationship between unemployment and inflation is reflected in what economists call the Phillips curve, suggesting a trade-off between the two. This curve showed that high rates of unemployment were accompanied by low rates of inflation and vice versa (Dornbush, Fisher, Mohr & Rogers 1996:328-340), although the stability of this relationship is strongly disputed nowadays. The Phillips curve is further discussed in chapter seven.

This trade-off between inflation and unemployment creates a dilemma for economic policy makers, in that they should decide to choose between sustained high-growth strategy, which would increase the inflation rate, and slow-growth recovery that reduces inflation, but at the cost of a high unemployment rate. As indicated above

structuralists argue that inflation is explained by structural factors, alleged to be ignored by orthodox economists. This structuralist view finds currency and support in South Africa, as reflected by, the increasing challenge of the official macroeconomic policy of South Africa, GEAR, by the labour movement and the blame directed to the SARB by the proponents of GEAR. There are two views on how policy makers handle the dilemma. One is to assume that they act in the interests of society, pursuing the policy that minimizes the total cost of economic stabilisation. The other view is that in a democracy, policy makers respond to the electorate, choosing policies that will maximise their chances of being kept in office. It is implied by this view that this sensitivity to the views of the electorate may or may not result in choosing the optimal policy. This has given rise to what is called the *political business cycle* hypothesis.

According to this hypothesis, politicians will use restraint immediately after an election, raising unemployment but reducing inflation. When the next election approaches, expansion takes over to reduce unemployment to gain votes at the expense of inflation. Consequently, a systematic cycle is created, with fiscal policy tightened to create stock and disinflation and then relaxed to reduce unemployment through expansionary policies (Dornbusch, Fisher, Mohr & Rogers 1996:293-296). However, the central bank, in championing monetary policy, is supposed to be independent and a-political. This then creates a tension between fiscal authorities, the ministry of finance, and the monetary authorities, the central bank. In South Africa, the official GEAR strategy is under attack, even if fiscal deficit targets have been accomplished and inflation has fallen to lower levels than predicted by the GEAR document of 1996. The basis of this sharp criticism of and attack on GEAR is that reducing the deficit too quickly was not accompanied by lower interest rates, instead the real bank rate rose sharply, and private investment policies of GEAR are said to have harmed rather than stimulated growth. This COSATU argument is in line with an evaluative International Labour Office (ILO) report on the labour market in South Africa (Standing, Sender & Weeks 1999:33).

The reaction of GEAR proponents is that poor performance should not be blamed on fiscal policy, but rather on unnecessarily tight monetary policy. This reflected the

tension between the ministry of finance, which objected to the growing interest burden that high interest rates placed on the budget and the central bank (SARB), which was more concerned about the exchange rate and inflation than about short-term growth concerns, especially job creation. Although GEAR did not meet its projected target, it is possible that the reason is that the vision of a more flexible labour-market outlined in GEAR was not consistently implemented. Furthermore, enacted legislation increased the employment costs of labour, thus discouraging investment. For instance, the Basic Conditions of Employment Act increases vacation or leave and reduces working hours, thereby increasing hourly fixed costs. This has reduced the potential of investors to set up businesses in South Africa and create jobs. However, while the labour movement criticises GEAR for not creating jobs, it is against the creation of economic opportunities at the expense of lower wages. The notion that wage restraint or wage flexibility is necessary for job creation is rejected. It is said, therefore, that GEAR, instead of generating jobs, has presided over significant job losses. To address these problems, the South African authorities opted for *inflation targeting*, which is discussed next (Natrass 2000:125-127).

#### 4.3.2 Inflation targeting

Superficially, inflation targeting is similar to money supply targeting, except that the target variable is the inflation rate itself rather than money supply growth. The main objective of inflation targeting is to reduce inflationary expectations by providing a credible anchor for price adjustment throughout the economy. Inflation targeting has both advantages and disadvantages. The first potential advantage of inflation targeting is that it makes intuitive sense to use inflation targets rather than some intermediary target, and that inflation targeting is more easily understood and more transparent. Also, it provides a yardstick for assessing the SARB's performance and its accountability in conducting monetary policy. This in turn could boost or build up the credibility of monetary authorities and thereby help the public to form more accurate expectations about inflation. Furthermore, the tight framework may help the SARB to maintain its independence and encourage restraint in government spending, thereby improving the co-ordination between fiscal and monetary policies (Natrass 2000:233-236).



The implementation of inflation targeting may present a number of problems. In the first place, it is not easy to control inflation precisely. Secondly, there is a time lag between the emergence of inflationary pressures and the implementation of corrective the measure, namely interest rate hikes. Thus for this corrective measure to be effective in curbing inflation, requires a reliable model for forecasting inflation, which is notoriously difficult. Furthermore, concentrating on inflation may cause economists to overlook other economic factors such as output stability and exchange rate stability. The first step in inflation targeting is to choose a target rate or range for inflation, together with a time horizon within which the target is to be achieved. Then, sufficient flexibility must be built in to absorb unforeseen exogenous shocks. Otherwise, *ad hoc* accommodation of shocks can undermine the credibility of the target. Because the Consumer Price Index (CPI) is sensitive to shocks that are not directly related to the inflationary process, the SARB adopted a new index in February 2000, known as CPIX. This is the CPI excluding the effect of interest payments on home loans. In South Africa, the target is set by the Minister of Finance, in consultation with the Governor of the SARB (Nattrass 2000:235).

Based on theory and international experience, the success of inflation targeting is predicated upon a number of prerequisites. The Reserve Bank should have a clear mandate and be assured of its independence. There should also be mutual commitment on the part of both monetary and fiscal authorities, as well as cooperation between them. Also required is a high degree of nominal exchange rate flexibility, to avoid conflict with inflation targeting. Another requirement for successful implementation of inflation targeting is a well-developed financial market and the existence of a low existing inflation rate. While these prerequisites are fairly met in South Africa, fierce opposition to inflation targeting remains. The Labour movement, rightly or wrongly, perceives a trade-off between inflation and unemployment, hence the negative attitude towards strict attention to inflation through explicit targeting. The SARB argues that it impacts on the demand side of the economy and is thus unable to address structural problems on the supply side such as unemployment (Nattrass 2000:236).

#### 4.4 CONCLUSION

This chapter briefly dealt with the theoretical aspects of the latest view on monetary policy, namely, exogenous and endogenous money supply, the axis on which the debate between structuralists and neo-liberal or orthodox economists is turns, and inflation targeting. For the monetary policy of an open and small economy to be successful in stimulating growth, structuralists argue that money supply must be endogenous. Their view is that money supply is endogenous, in that monetary authorities cannot control it and, in turn, monetary policy cannot stimulate economic growth. Instead, structural social economic factors are said to play an important role, a fact which orthodox economists overlook. Orthodox economists, on the other hand, consider money supply to be exogenous and therefore controllable by monetary authorities. Inflation, according to structuralist, as opposed to orthodox economists, is not caused by an expansion of money supply. Instead, it is said to be imported from the large developed countries with which a small and open economy trades. Thus, this chapter sets the stage for the empirical analysis of money supply and monetary policy application in South Africa, a topic covered in chapter six.