

# **HYSTERESIS AND UNEMPLOYMENT IN SOUTH AFRICA**

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## **ABSTRACT**

Unemployment is arguably the most important and vexing problem facing the South African economy and its governance. The main aim of this study is to consider the relationship between monetary policy in South Africa and the possible existence of a hysteresis effect in unemployment. To determine whether or not a hysteresis effect exists in South Africa, the paper uses the Hodrick-Prescott (HP) filter to estimate the natural unemployment rate. Unit root tests are applied to determine the stationarity of the actual unemployment rate. Non-stationarity serves as an indicator of the presence of a hysteresis effect. The study finds support for the hysteresis hypothesis. With these findings in mind, the paper also considers some alternative policies to combat unemployment.

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## **1. INTRODUCTION**

South Africa has one of the highest unemployment rates in the world and it is still rising. According to Mohr *et al.* (2000: 121), unemployment is arguably the most important and vexing problem facing the South African economy and its governance. As unemployment causes the unemployed to suffer mental and physical hardship, it poses a serious threat to social and political stability (Mohr *et al.*, 2000: 121). Thus, policies that would reduce unemployment in South Africa are a compelling need.

The main aim of this paper is to consider the relationship between monetary policy in South Africa and the possible existence of a hysteresis effect. Section 2 presents a brief overview of the existing literature on monetary policy, inflation and unemployment in South Africa. The section also considers the Phillips-curve relation and the hysteresis effect. Thereafter, section 3 presents the empirical part of the paper. In particular, it tests for the presence of a hysteresis effect in South Africa. Section 4 examines the availability of alternative monetary policy approaches. The final section concludes.

## **2. THEORETICAL BACKGROUND**

In this section, relevant literature regarding monetary policy in South Africa, inflation and unemployment is reviewed. This section also considers literature on the Phillips-curve relation and the hysteresis effect.

### **2.1 Monetary policy in South Africa**

According to De Wet (2002: 79), the monetary policy environment moved to an increasingly open economy over the previous ten years, characterised by a (relatively) low level of inflation and large and unpredictable movements in financial asset prices. Monetary policy is the responsibility of the South African Reserve Bank (SARB) (Fourie, 2001: 236). The primary goal of the SARB is to protect the value of the currency in the interest of balanced and sustainable economic growth (Van der Merwe, 2004: 3). This objective has become entrenched in the monetary policy formulation and implementation of the SARB. It has been articulated in both the Constitution of the Republic of South Africa, Act No. 108 of 1996 and in the South African Reserve Bank Act, Act No. 90 of 1989 (Smal & de Jager, 2001: 1). According to Smal and de Jager (2001: 1), most central bank policy initiatives throughout the world have been aimed at achieving and maintaining price stability. The SARB is no exception to the rule.

The De Kock Commission of Inquiry into the Monetary System and Monetary Policy in South Africa laid the foundation of monetary policy implementation during the 1980s (Smal & de Jager, 2001: 2). Already during that time, it was believed that maximum economic development could only be achieved and sustained in an environment in which the financial conditions were stable. According to Smal and de Jager (2001: 2), the De Kock report stated that higher rates of inflation would impede real growth and employment in the long-run. The report also stated that maintaining a climate of reasonable domestic price stability could support balance of payment objectives, economic growth and employment. The strategy recommended by the De Kock Commission was initially based on targeting the money supply (Smal & de Jager, 2001: 2).

During the Budget Speech on 23 February 2000, the Minister of Finance, Mr. Trevor Manuel, announced a 3 % to 6 % CPIX inflation target for 2002 (Van den Heever, 2001: 169). According to Van den Heever, the Governor of the Reserve Bank already indicated in March 1998 that the bank would strive to bring inflation down to a level more in line with inflation rates of the main trading partners of South Africa. The main trading partners of South Africa are developed countries with inflation rates that in general fluctuate between 1 % and 5 % a year (Van den Heever, 2001: 169).

According to Smal and de Jager (2001: 5), the main instrument for monetary policy is the repurchase (or repo) rate. This rate has direct effects on variables in the economy that affect the supply and demand of goods and services (Smal & de Jager, 2001: 5). Inflation is, amongst others, the result of pressures originating in the labour market and/or in the market for goods and services, as well as a result of imported inflation, which is influenced by exchange-rate movements (Smal & De Jager, 2001: 5). The acknowledgement of a short-run trade-off between inflation and economic growth led the Reserve Bank to adopt a flexible approach to target inflation (Van der Merwe, 2004: 12). The Reserve Bank attempts to reduce the inflation rate gradually, taking the effect of the reduction process on other economic variables into account (Van der Merwe, 2004: 12).

The SARB also assumes responsibility for the formulation and implementation of monetary policy in such a way that the primary goal of price stabilisation will be achieved in the interest of the whole community (Mohr *et al.*, 2000: 408). Price stability is achieved when changes in the general price level do not materially affect the economic decision-making processes (Mboweni, 2004).

According to Van der Merwe (2004: 12), the focus on the inflation target does not mean that the Reserve Bank is not concerned with economic growth and employment creation; they do take these variables into account. However, if the Reserve Bank is of the opinion that the attainment of the inflation target can only be achieved at high cost to the economy in the short-term, it is still obliged to attain the inflation target, as it is the primary objective of the Bank (Van der Merwe, 2004: 12). According to Van der Merwe (2004: 7), the SARB realises that exclusive emphasis on the inflation target could affect the economy negatively. The inflation-targeting framework makes allowance for the influence of exogenous shocks by means of an “explanation clause”, under which the SARB could not be expected to reach the inflation target. If severe exogenous shocks (i.e. rise in oil prices) affect the economy, extreme measures to reach the inflation target could have a very undesirable effect on output and employment (Van der Merwe, 2004: 7). In such cases, the SARB is allowed to use some discretion in the application of monetary policy.

According to Van der Merwe (2004: 4), the inflation targeting approach has the advantage that government can determine the pace of disinflation consistent with its objectives regarding sustainable high economic growth, employment creation and a more equal distribution of income.

## **2.2 Inflation in South Africa**

Fig. 1 below clearly indicates that CPI inflation reached a peak of 18.63 % in 1986. CPI inflation remained high up to 1992, where after it decreased. According to John Loos (2004: 1), senior economist at ABSA, the decrease of longer-term inflation during the 1990s compared to the 1980s can be attributed to the opening up of the economy to foreign competition.

High real interest rates also assisted the anti-inflationary cause during 1995 to 1998 (Loos, 2004: 1). The increase in inflation in 2002 can be attributed to exogenous factors such as the decline in the value of the rand (in both nominal and real terms) during the second half of 2001, the rise in the price of Brent crude oil and the increase in administered prices (Van der Merwe, 2004: 13).

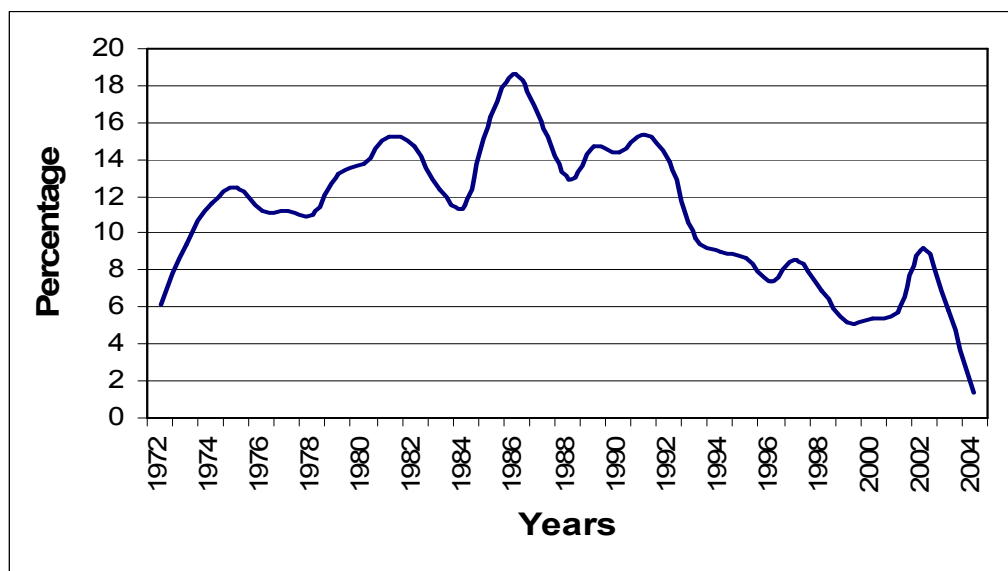


Fig. 1: Total consumer prices: Metropolitan areas (1972 – 2004)

Source: SARB, 2005

The current debate regarding the optimal inflation rate is not settled, but most central banks appear to be aiming for a low, but positive, inflation rate (Blanchard, 2003: 535). According to Kamin *et al.* (1998: 7), inflation targets in rapidly developing countries need to be somewhat higher than in developed countries. This can be ascribed to the fact that relative price adjustments might be more significant in economies where productivity gains are large (Kamin *et al.*, 1998: 7). Price liberalisation will increase measured inflation in situations where there is a downward rigidity of nominal prices. Developing economies also face additional problems regarding the limited development of financial markets, vulnerability to shocks, limited and uncertain access to international capital markets and rudimentary financial systems (Kamin *et al.*, 1998: 7). In addition, South Africa has a serious unemployment problem, which may put pressure on the labour- and goods markets.

### 2.3 Unemployment in South Africa

According to Kingdon and Knight (2003: 3), unemployment is a matter of serious concern in South Africa. Unemployment affects economic welfare and production. It also leads to erosion of human capital, social exclusion, crime and social instability (Kingdon & Knight, 2003: 3). According to Kingdon and Knight (2003: 3), some view unemployment and the rise in unemployment as the most serious threat facing South Africa and its governance.

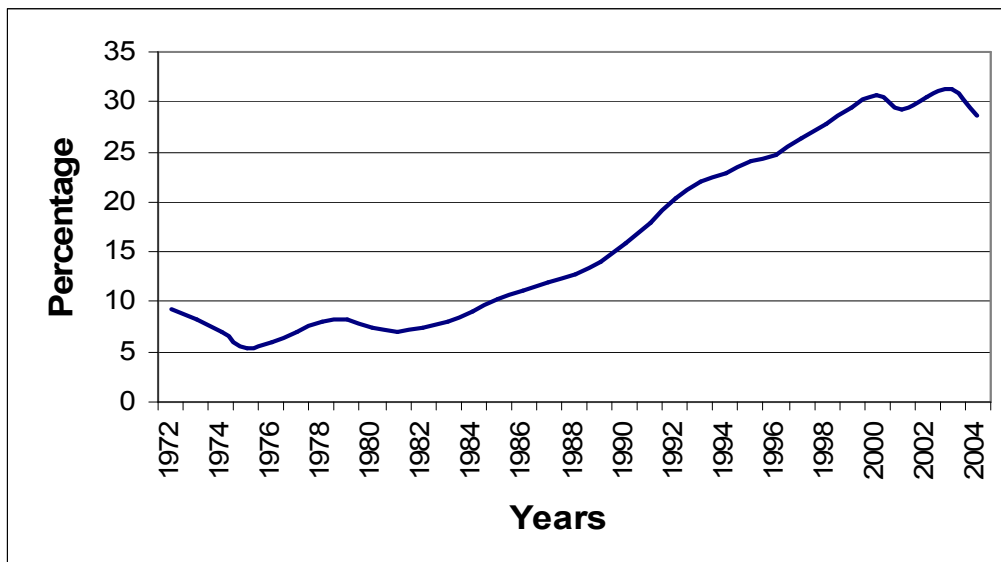


Fig. 2: Unemployment (strict definition) in South Africa (1972 – 2004)

Source: Human Development Report, 2004

Fig. 2 above clearly indicates that unemployment is remarkably high and rising. The above figure shows a significant increase in the unemployment rate from 9.18 % in 1972 to 30.51 % in 2002, though care should be taken of the reliability data of the 1970s. According to the South African Human Development Report (2003: 19), the unemployment rate has increased even further, reaching 31.2 % (strict definition) or 42.1 % (expanded definition) in March 2003. According to the Labour Force Survey of March 2003, the working age population (aged between 15 and 65) was estimated at 29.6 million. Using the official definition of unemployment, approximately 16.8 million was economically active, with 11.6 million employed and 5.2 million unemployed (UNDP, 2003: 20).

The unemployment rate declined to 26.2 % in September 2004 from 27.9 % in March 2004 (Labour Force Survey, March 2005). In March 2005, the unemployment rate increased to 26.5 %. The number of employed persons rose from 11.4 million in March 2004 to 11.6 million in September 2004 and 11.9 million in March 2005 (Labour Force Survey, March 2005).

According to Hodge (2002: 442), the high and rising rates of unemployment in South Africa during the 1990s appear to be the result of large increases in the NAIRU or natural rate of unemployment, the large increases in the economically active population and the shedding of jobs by the mining sector, particularly gold mining. According to Grant (2002: 98), the natural rate of unemployment is an equilibrium rate of unemployment, which depends critically on the institutional features of the economy and may vary depending on demographics and institutions. Unemployment may exist even when the economy is at full sustainable capacity due to difficulties in matching job seekers and job vacancies (frictional unemployment) or mismatches in job training, experience or education (structural unemployment) (Grant, 2002: 98). Mohr *et al.* (2000: 120) attributes the increase in unemployment to a decline in economic growth. According to Barker (2002: 7), high unemployment in South Africa can be attributed to a high population growth rate, a low economic growth rate and declining labour intensity in the economy.

The high unemployment rate is also a direct contributing factor to inequality and poverty in South Africa (Barker: 2002: 7). The need for policies that reduce the unemployment rate in South Africa is compelling (Kingdon & Knight, 2003: 408). Thus, it is important to determine whether the price stability objective of monetary policy leads to growth in employment, or worsens unemployment in South Africa.

#### **2.4 The Phillips-curve trade-off**

Due to the high unemployment rate in South Africa and the set inflation targets for monetary policy, the question of a Phillips-curve trade-off arises. During the 1950s and 1960s monetary policy options in developed countries were formulated in terms of a trade-off between unemployment and inflation (Chatterjee, 2002: 26). According to

Chatterjee (2002: 26), the trade-off meant that economic performance could be improved by engineering some inflation in order to reduce the unemployment rate. This will be due to the fact that as employment increase, labour costs will also increase, which will lead to a mark-up on goods prices. Also, according to supply and demand theory, an increase in prices will lead to higher production, which requires more labour.

In South Africa, the lack and inconsistency of unemployment data has made it difficult to obtain empirical evidence of the existence (or non-existence) of the Phillips-curve trade-off. Due to a lack of literature on the trade-off between inflation and unemployment in South Africa, the research for this paper has been limited to the article by Hodge (2002). Hodge focussed on the price inflation (as opposed to wage inflation) Phillips-curve. According to Hodge (2002), Krogh did a study of the relationship between growth (employment) and inflation in South Africa between 1946 and 1966. He found a slight positive correlation between the two at relatively low levels of inflation (2.0 % - 2.5 %), but a strong negative correlation at high rates of inflation (>2.5 %) (Hodge, 2002: 425). According to Hodge (2002: 428), the general conclusion of studies on the Phillips-curve is that a stable wage and price inflation Phillips-curve existed in South Africa for most of the post-war period until the late 1960s. Thereafter the relationship is much less stable with extended periods of stagflation evident during the 1970s and 1980s.

Hodge (2002: 439) found that between 1996 and 2000, the average growth rate in South Africa more than doubled (from 0.9 % to 2.5 % per annum), while the inflation rate almost halved (from 11.3 % to 6.7 % per annum) compared to the previous five-year period. Thus, the disinflationary monetary and fiscal policies criticised by opponents of GEAR do not appear to have permanently lowered economic growth during the latest period, which on average was higher than any other consecutive five year period since 1981 (Hodge, 2002: 439). However, it should be noted that this observation by Hodge (2002: 439) does not control for the negative effects of political variables on economic growth during the 1980s and early 1990s. In addition, Hodge (2002: 442) found that short-run changes in inflation and unemployment in South Africa occurred independently of each other, which is in line with the view of the SARB that there is also no long-run trade-off between unemployment and inflation (Mboweni, 2004).

Hodge (2002: 442), however, detected a significant positive relationship between inflation and growth in the short-run. Thus, a short-run trade-off between inflation and growth appears possible in South Africa, but not between growth and unemployment (Hodge, 2002: 442). According to Van der Merwe (2004: 11), most economists agree that high inflation is harmful to economic growth and employment creation. High inflation distorts the allocation of resources, discourages saving and results in higher consumption as well as induces the preference for debt financing by businesses and individuals (Van der Merwe, 2004: 12). All these factors may contribute to lower economic growth.

## **2.5 The hysteresis effect**

As mentioned above, there was, according to Hodge (2002: 420), a relationship between inflation and unemployment until the late 1960s. Thereafter the relationship seemed to break down, with stimulatory policies failing to bring down rising rates of unemployment (Hodge, 2002: 420). If unemployment trends are mainly due to structural changes in the economy, then it is quite possible that stimulatory policies could produce short-run increases in growth without any significant effect on the unemployment rate (Hodge, 2002: 439). In addition, stimulatory monetary policy may also contribute to inflation. However, in contrast to stimulatory monetary policy, restrictive monetary policy may have a permanent effect on unemployment if an increase in the actual unemployment rate gives rise to an increase in the natural rate of unemployment. In such a situation, actual unemployment may be influenced by the natural rate of unemployment, which in turn was influenced by the past actual unemployment rates.

The word, hysteresis, is used to describe any system of which the equilibrium position depends on the history of the system (Blanchard, 2000). According to Gordon (1990: 489), hysteresis implies that changes in both inflation and output are completely independent of the level of detrended output, and that an economy in a great depression can experience an acceleration of inflation, no matter how high the level of unemployment or low the level of detrended output, if excess nominal GDP exceeds the inflation rate of the previous period.

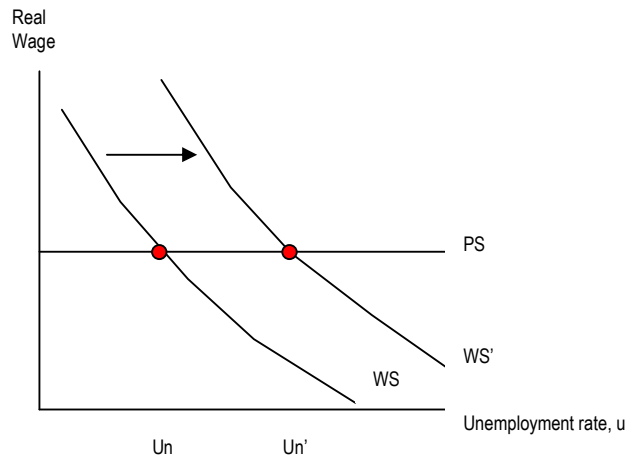


Fig. 3: The effect of hysteresis on unemployment

Hysteresis states that cyclical fluctuations have permanent effects on the level of unemployment (Camarero & Tamarit, 2004: 1). According to this effect, high persistent unemployment leads to an increase in the natural rate of unemployment. According to Blanchard (2000), two relations, the wage-setting relation (WS) and the price-setting relation (PS), determine the natural rate of unemployment. The wage-setting relation implies that real wages is a decreasing function of the unemployment rate ( $\mu$ ) and an increasing function of all other factors that affect wage setting ( $Z$ ) (Blanchard, 2000):

$$W_r = F(\mu; Z)$$

The price-setting relation is determined by the mark-up of prices over wages (Blanchard, 2000). According to Blanchard (2000), high persistent unemployment leads to an increase in long-term unemployment. If the increased number of the long-term unemployed plays no role in wage determination, there is less pressure on wages and the wage-setting relation will increase, shifting upward from WS to WS'. According to Blanchard (2000), this means that the increase in actual unemployment needed to decrease inflation may lead to an increase in the natural rate of unemployment (from  $U_n$  to  $U_n'$  in Fig. 3), and thus long-lasting unemployment costs. If the unemployed generally are unemployed for such a long time, they lose their skills and become unemployable. Thus, unemployment impacts economic growth, social stability, individual's self-worth, income distribution and individual morale negatively. Given the persistent anti-

inflationary policy of the SARB, it is important to determine if a hysteresis effect exists in South Africa.

According to Song and Wu (1998: 181), the natural rate of unemployment hypothesis states that the natural rate of unemployment is determined by labour market equilibrium. In the absence of hysteresis, fluctuations in demand and/or supply of labour cause deviations of the actual unemployment rate from the natural unemployment rate. In time, these deviations trigger changes in inflation, which lead the unemployment rate to eventually return to the natural rate (Song & Wu, 1998: 181). However, in recession hysteresis might permanently affect the unemployment rate if it changes the attitudes or characteristics of those people who become unemployed (Song & Wu, 1998: 182). A long period of unemployment may change attitudes toward work, reduce the desire of individuals to look for work and the skills of individuals may become outdated. According to Song and Wu (1998: 182), this suggests that a high level of unemployment, if left by itself, may persist and continue to be a serious problem in the economy even in the long-run. Hysteresis implies that recessions are much more costly than the natural-rate hypothesis would suggest and that it may leave more room for active government policies to fight recessions and manage the economy (Song & Wu, 1998: 182).

With this in mind, the study will examine the existence of a hysteresis effect in South Africa. The hysteresis effect states that the natural rate of unemployment may increase as a result of an increase in the actual unemployment rate. This effect will be examined in greater detail to determine the reason for the persistence of unemployment in South Africa. Depending on the outcome of the empirical study, the study will examine alternative monetary policy options for increased growth and employment in brief.

### **3. EMPIRICAL METHOD AND RESULTS**

The main aim of this section is to determine if a hysteresis effect exists in South Africa. The section uses annual data obtained from the Human Development Report of South Africa and the South African Reserve Bank (SARB). The time period of 1972 to 2004 is primarily dictated by data availability. The unemployment figures obtained follows the 'strict' definition of unemployment, where only those that "have taken active steps to

look for work”, is included (Barker, 2002: 172). The inflation figures obtained is total consumer prices in metropolitan areas, one-term change.

Hysteresis states that cyclical fluctuations have permanent effects on the level of unemployment (Camarero & Tamarit, 2004: 413), so that high persistent unemployment leads to an increase in the natural (long-term) unemployment. According to Grant (2002: 96), there is little agreement as to what the natural rate of unemployment is and how it is to be measured. For ease of calculation, the natural rate is often measured by univariate methods. These methods include taking a moving average of the actual unemployment series or passing the unemployment series through some type of filter to generate the trend component of unemployment (Grant, 2002: 99). To determine whether or not a hysteresis effect exists in South Africa, the paper uses the Hodrick-Prescott (HP) filter to estimate the natural unemployment rate. In addition, the analysis also includes unit root tests to determine the stationarity of the actual unemployment rate.

### **3.1 Hodrick-Prescott (HP) filter**

This filter decomposes a time series into two components: a long-term trend and a stationary cycle (Maravell & Del Rio, 2001: 3). One of the requirements of the HP filter is the specification of the parameter lambda ( $\lambda$ ), which tunes the smoothness of the trend. This parameter is usually chosen on the basis of the periodicity of data (Maravell & Del Rio, 2001: 3). For annual data, the general consensus on the value is  $\lambda = 100$ .

The use of the HP filter transforms the actual unemployment rate figures into long-term trend natural unemployment rate figures. Fig. 4 displays the results.

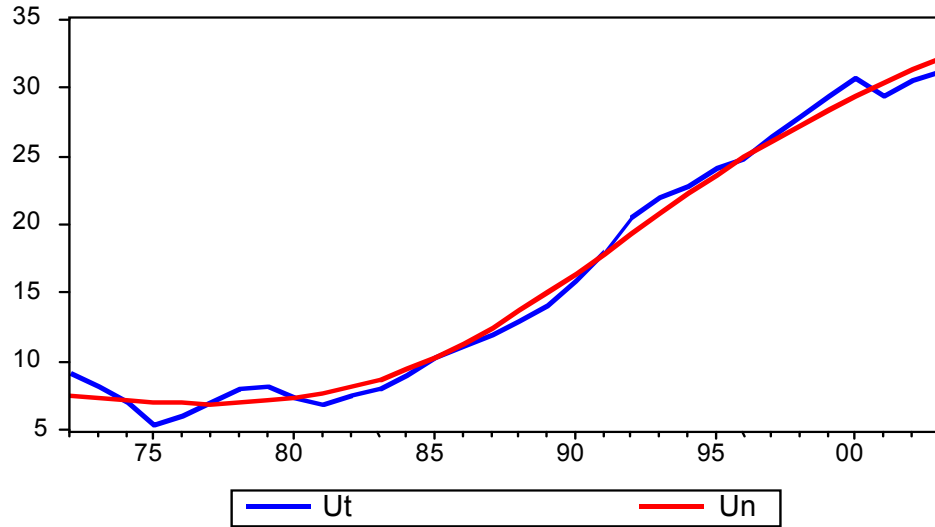


Fig. 4: Actual unemployment ( $U_t$ ) and natural unemployment ( $U_n$ )

The above graph clearly shows that unemployment (both actual and natural) increased substantially since the late 1970s and early 1980s. Since that period, the natural rate of unemployment did not decrease again.

To establish whether or not actual unemployment influence natural unemployment, a simple OLS regressions shows the effect of the actual unemployment rate on the natural unemployment rate.

$$\begin{aligned}
 Y &= b_1 + b_2 X_1 \\
 &= 0.267212 + 0.983266 \\
 \text{se} &= (0.301520) + (0.016486) \\
 t &= (0.886218) + (0.3825) \\
 \text{p value} &= (0.3825) + (0.0000)
 \end{aligned}$$

$R^2$	0.991637
Adjusted $R^2$	0.991358
Durbin-Watson $d$ statistic	0.768058

Where:

$Y$  = Actual rate of unemployment

$b_1$  = Intercept

$b_2$  = Slope

$X_1$  = Natural rate of unemployment

The regression can be accepted on *a priori* grounds (there is a positive relationship between the two variables) since it shows a very high  $R^2$ . The  $R^2$  measures the percentage of total variation in natural unemployment explained by the regression model. This result can be expected since the constructed natural unemployment rate is just a smooth version of the actual unemployment rate. The Durbin-Watson  $d$  statistic is a test used for detecting autocorrelation (Gujarati, 1999: 386). A computed  $d$  statistic lies between 0 and 4, a  $d$  statistic of 2 shows no signs of autocorrelation (Gujarati, 1999: 386). However, the computed  $d$  statistic is close to zero, which is a sign of positive autocorrelation. This means that the error terms of the variables might be correlated and renders the computed values unreliable. To test for the occurrence of hysteresis more accurately, the study next applies unit root tests.

### **3.2 Unit root tests**

The unit root tests are tests of nonstationarity (Gujarati, 1999: 459). The study follows previous literature (Song and Wu, 1998; Ruge-Murcia, 2004) and applies the Augmented Dickey Fuller and Phillips-Perron unit root tests to the unemployment data. In order to determine if the data show signs of hysteresis, the study must determine if the unemployment variables are stationary. If not, there are signs of hysteresis.

The Augmented Dickey Fuller (ADF) unit root test adds the lagged variables of the dependant variable ( $U_t$ ) and estimates the following regression (Song & Wu, 1998: 187):

$$\Delta U_t = \delta_0 + (\rho - 1)U_{t-1} + \sum_{j=1}^k \theta_j \Delta U_{t-j} + \varepsilon_t \text{ (without trend)}$$

or

$$\Delta U_t = \delta_0 + \delta_{1t} + (\rho - 1)U_{t-1} + \sum_{j=1}^k \theta_j \Delta U_{t-j} + \varepsilon_t \text{ (with trend)}$$

where  $\varepsilon_t$  is a pure white noise error term and where  $\Delta U_{t-1} = (U_{t-1} - U_{t-2})$ ,  $\Delta U_{t-2} = (U_{t-2} - U_{t-3})$ , etc. The number of lagged difference terms to be included is determined empirically, the idea being to include enough terms so that the error term ( $\varepsilon_t$ ) is serially uncorrelated (Gujarati, 2002: 816).

If the computed critical value (usually at a chosen level of 5 % significance) exceeds the computed ADF values, we reject the hypothesis of  $(\rho - 1) = 0$ , in which case the time series is nonstationary and there is evidence of hysteresis (Gujarati, 2002: 816; Song & Wu, 1998: 187).

The ADF unit root test is conducted with and without trend. In the choice of the appropriate lag length, Schwert (1989) recommends the use of long autoregressive lags to reduce the size distortion (Song & Wu, 1998: 186). This article uses the Schwarz criterion and the Akaike info criterion to determine the appropriate lag lengths. However, note that unit root tests have serious size distortion when the error term contains a moving average (MA) component with a large root (Blough, 1992). Blough argues that it may be impossible to discriminate between processes that contain a unit root and those that are stationary with a finite number of observations.

The ADF unit root tests without trend include up to four lags. Table 1 contains the results. The most favourable Akaike info criterion and Schwarz criterion is obtained using two lags. Irrespective of the quantity of lags chosen, the null hypothesis of hysteresis cannot be rejected even at the 10 % level of significance.

<b>Number of lags</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
ADF Statistic	0.2776	0.1239	0.5432	0.3870
1 % critical value	-3.6661	-3.6752	-3.6852	-3.6959
5 % critical value	-2.9627	-2.9665	-2.9705	-2.9750
10 % critical value	-2.6200	-2.6220	-2.6242	-2.6265
Akaike info crit	-0.2491	-0.2050	-0.3065	-0.2031
Schwarz crit	-0.1090	-0.0164	-0.0686	0.0849

Table 1: ADF unit root test (without trend) for South Africa unemployment rates (1972 – 2003)

The ADF unit root tests with trend include up to four lags. Table 2 contains the results.

<b>Number of lags</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
ADF Statistic	-2.7600	-2.3632	-1.8003	-2.2773
1 % critical value	-4.2949	-4.3082	-4.3226	-4.3382
5 % critical value	-3.5670	-3.5731	-3.5796	-3.5867
10 % critical value	-3.2169	-3.2203	-3.2239	-3.2279
Akaike info crit	-0.4804	-0.3687	-0.4158	-0.4106
Schwarz crit	-0.2936	-0.1329	-0.1303	-0.0746

Table 2: ADF unit root tests (with trend) for South Africa unemployment rates (1972 – 2003)

When including the trend, the ADF test statistic still does not reject the null hypothesis of hysteresis. Thus, whether including or excluding the trend, irrespective of the amount of lags chosen, the null hypothesis of hysteresis in South African unemployment rates for the period 1972 – 2003 can not be rejected using the ADF unit root tests.

The Phillips and Perron (PP) test for stationarity use nonparametric statistical methods to take care of the serial correlation in the error term, without lagged difference terms used in the ADF (Gujarati, 2002: 818). The asymptotic distribution of the PP test is the same as the ADF test statistic and can be calculated by the following regression (Song & Wu, 1998: 187):

$$\Delta U_t = \delta_0 + (\rho - 1)U_{t-1} + \varepsilon_t \text{ (without trend)}$$

or

$$\Delta U_t = \delta_0 + \delta_{1t} + (\rho - 1)U_{t-1} + \varepsilon U_t \text{ (with trend)}$$

The study calculates PP unit root tests with and without trend. Table 3 contains the results. The PP statistic calculated with and without trend cannot reject the hysteresis hypothesis even at the 10 % level of significance.

	<b>Without trend</b>	<b>With trend</b>
PP test statistic	1.0373	-3.1648
1 % critical value	-3.6576	-4.2826
5 % critical value	-2.9591	-3.5614
10 % critical value	-2.6181	-3.2138

Table 3: Phillips-Perron unit root test for South Africa unemployment rates (1972 – 2003)

Unit root tests have some limitations. These relate to the size and the power of the test:

*Size of the test:* The ADF test has three varieties: (1) a pure random walk; (2) a random walk with drift and (3) a random walk with drift and trend. According to Gujarati (2002: 819), if the true model is (1) and we estimate (2) and we conclude that on the 5 % level of significance the time series is stationary, the conclusion may be wrong because the true level of significance in this case is much larger than 5 %. This size distortion could also result from excluding moving average (MA) components from the model (Gujarati, 2002: 819).

*Power of the test:* According to Song & Wu (1998: 183), recent studies have found that standard tests for unit roots in time series such as ADF and PP have low power against testing stationarity in small samples. These tests tend to accept the null of the unit root more frequently than is warranted (Gujarati, 2002: 819).

These limitations must be kept in mind in the application of these tests. Although modifications of the tests exist, there is no uniformly powerful test of the unit root hypothesis (Gujarati, 2002: 820).

The findings report evidence in support of the hysteresis hypothesis using unemployment data for South Africa. Due to the limitations of the unit root tests discussed earlier, the results should be interpreted with caution. Nevertheless, it is observed in the empirical study that the unemployment rate of South Africa has a high degree of persistence. In the following section, some alternative policies to combat unemployment will be discussed.

#### **4. ALTERNATIVE MONETARY POLICY OPTIONS**

The question of whether monetary policy can have a permanent effect on real variables, such as unemployment and growth, has been very controversial and usually denied by mainstream opinion (Smithin, 1994: 94). Throughout the history of economic thought, the most popular answer has been that monetary policy can only have a transitory influence on such real variables and that ultimately central bank activities only affect inflation rates (Smithin, 1994: 91). According to Van der Merwe (2004: 11), the SARB can only affect inflation in the long-term and have no impact on economic growth and unemployment. Rather, high inflation is detrimental to economic growth and unemployment (Van der Merwe, 2004: 11).

It is the view of the SARB that although monetary policy can impact on cyclical unemployment and growth during the specific cycle, it cannot determine long-run real growth (SARB, 2004: 2). According to the SARB (2004: 2), real variables and other supply-side variables, individual government policies and the general macroeconomic environment to which monetary policy contributes, determine growth in the long-run. Monetary policy can drive up growth rates beyond potential by setting artificially low interest rates (SARB, 2004: 2). This may work in the short-run, but ultimately will result in high inflation, a weak currency and restrictive policies to repair the damage. According to the SARB (2004: 2), such attempts to stimulate growth will merely lead to higher inflation and lower growth.

It is also the view of Kamin *et al.* (1998: 6) that efforts to stimulate economic growth above its potential rate merely leads to higher inflation. According to Kamin *et al.* (1998: 7), this situation arises when inflationary psychology combines with a lack of central bank credibility generates immediate changes in inflation expectations and, in turn, actual prices. The presence of volatile financial markets, as in South Africa, may also undermine the ability of monetary policy to influence output in a predictable manner (Kamin *et al.*, 1998: 7). Accordingly, monetary policies in developing countries may be less able than industrialised countries to achieve goals other than price stability (Kamin *et al.*, 1998: 7). The SARB believes that the best contribution that monetary policy can make is to provide a low and stable inflation environment that is conducive to sustainable economic growth (SARB, 2004: 2).

One of the persistent themes of monetary economics has been the idea that inflation is a major social problem (Smithin, 1994: 151). According to Mboweni (2000: 2), apart from the fact that high inflation is generally associated with poor economic performance, inflation also has a number of negative social and economic effects. In addition to the disadvantages of inflation, inflation targeting as policy goal also have the advantages of increased policy credibility and accountability of the central bank to the public, coordination of monetary- and fiscal policy and it provides an anchor for expectations of future inflation, which should influence price- and wage setting (Buys & Keaton, 2001: 178; cf. Mboweni, 2000: 2). According to the SARB (2004: 2), a stable monetary policy will lead to a stable environment of low inflation and low interest rates. However, this in itself is not a guarantee of high growth, as growth is determined by other real factors in the economy. According to De Wet (2002: 80), stability in open economies, like South Africa, is best achieved by targeting long-run inflation.

In contrast to the above, Smithin (1994: 168) states that economists have failed to make a satisfactory case, in terms of theory, as to why inflation *per se* should be considered as serious a problem as many appear to believe. Smithin (1994: 168) also states that it is unlikely that money and monetary policy can be 'neutral' in either the short-run or the long-run. Experience has shown that the pain of the recessionary periods required for disinflation is severe, and certainly more long lasting than the expression 'short-term' would seem to indicate. In the presence of hysteresis, as was found in the study, the

actual damage done by restrictive monetary policy might lead to an unattainable previous employment rate. Furthermore, the experience of a recession itself may permanently reduce economic growth and unemployment (Smithin, 1994: 154).

The policy of monetary authorities affects real interest rates in general and, through real interest rates, both output and inflation. However, while the impact of real interest rates on output is direct, that of inflation is indirect, operating primarily through a distributional effect prompted by interest rate changes (Smithin, 1994: 155). Also, Thorbecke (2001: 64) found that in the United States' contractionary monetary policy increase overall unemployment and inappropriately burdens low-income workers who are already suffering economically. A decrease in the demand for labour due to a recession will not decrease employment among skilled workers much, but will decrease unemployment among unskilled workers substantially (Thorbecke, 1994: 52). Thus, low-skilled, low-income households will suffer more from disinflationary policy.

According to Thorbecke (2001: 65), stimulating the economy through expansionary monetary policy should also be a policy option. Stiglitz explained how expansionary monetary policy could exert hysteresis effects, by improving the job search skills of workers and thus reduce the natural rate of unemployment (Thorbecke, 2001: 65). These hysteresis effects of monetary policy could allow marginal workers to permanently lift their incomes above the poverty level (Thorbecke, 2001: 65).

In addition, it should also be determined whether or not stimulatory monetary policy will have the desired effect on output and unemployment. If the unemployment and employment trends are mainly due to structural changes in the economy, as suggested by Hodge (2002: 439), then it is possible that stimulatory policies could produce short-run increases in growth without any significant effect on unemployment. Short-run increases in growth can lead to an increase in aggregate demand and total production, which can reduce the natural rate of unemployment if the following additional policy measures are implemented to decrease structural rigidities:

- Reforms of the labour market to ensure that the natural rate of unemployment decreases in line with the actual rate. Further reform should take the form of a total reduction of employment costs, such as employment contracts and benefits (Blanchard, 2000).
- Re-enfranchising of the long-term unemployed through subsidies, further education and training programmes (Blanchard, 2000).
- According to Kingdon & Knight (2004: 18), government should also attempt to diminish labour market segmentation. The unemployed should not have obstacles in entering the productive formal sector.

## **5. Conclusion**

There is no simple way to reduce the unemployment rate in South Africa. The study showed that inflation declined significantly during the past few years, while unemployment showed a sharp upward trend. However, according to Hodge (2002), there is no Phillips-curve trade-off.

The study found hysteresis present in unemployment. Knowing that, the controversy regarding the long-term impact of monetary policy on unemployment and growth continues. In reducing structural unemployment, which is the major component of the high unemployment rate in South Africa, the natural rate of unemployment will also be reduced. If structural rigidities are eliminated, a short-run increase in growth may lead to an increase in actual employment and through the hysteresis effect, a decrease in the natural rate of unemployment.

Further studies regarding the impact of monetary policy on employment and the optimal interest rate should be conducted. The economy of South Africa has relative low interest rates, inflation rates and an acceptable economic growth rate. This might just be the right time to target employment.

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