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## Reliability of the Exchange Rate as a Monetary Target in an Unoptimal Currency Area - Macedonian Case

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**Gligor Bishev, Ph.D.**

**RELIABILITY OF THE EXCHANGE RATE AS A MONETARY TARGET  
IN AN UNOPTIMAL CURRENCY AREA - MACEDONIAN CASE**

**Vienna, December, 1997**

## **ABSTRACT**

The main topic of the research work is, whether the exchange rate targeting is an efficient strategy for maintaining price stability without decelerating the economic growth below the potential one in a situation when national currency area is not an optimum currency area with the anchor currency country in the Mundell-McKinnon style. The research work is divided into six chapters. In the first introductory chapter the set up of the Macedonian monetary order is presented, together with the outline what is following in next five chapters. The main topic of investigation in the second chapter is, if there is an alternative efficient strategy, except exchange rate targeting, for maintaining price stability in a small and open economy that is highly integrated into the international trade and financial flows. The research topic in third chapter is what are preconditions for a national currency area to be an optimum currency area. In the fourth chapter the benefits and costs of exchange rate targeting strategy in Macedonia are presented regarding the monetary policy (money supply growth and interest rates), domestic prices, international competitiveness and employment and output. In the fifth chapter, the regime of the exchange rate that is appropriate for intermediate monetary target and viable on long-run is analyzed from the point of view of eight factors: openness and integration into the world economy, the scope of concentration of trade towards particular regions or countries, the level of currency substitution in the domestic economy, the depth of financial and foreign exchange market, the level of wage elasticity and labour mobility, the degree of capital mobility, the stability/instability of money demand, the scope of product and export diversification and the level of economic development and expected future potential growth. The concluding remarks are presented in the sixth chapter.

The econometric technique is widely used in the assessment of the relationships between some economic variables. It is especially used in testing the stability of money demand, the assessment of the volatility of the real exchange rate, and assessment of the elasticity of nominal wages with respect to prices and unemployment. The research period is January - June 1997 and it is constrained by two factors. First, the monetary order in Macedonia was set up at the end of April 1992, when Macedonia came out from the Yugoslav dinar zone. Second, the period before January 1994 is not included in the research work, because of the disrupted data and relations due to the very high inflation (near to hyperinflation) in the period before and immediately after the monetary independence (April 1992 - December 1993). Furthermore, taking in mind the research topics, the period April 1992 - December 1993 is not relevant, and even can lead to wrong conclusions. In some cases the research period is extended to September 1997, in order effects of devaluation that occurred on July 9<sup>th</sup>, 1997 to be analyzed.

# **RELIABILITY OF THE EXCHANGE RATE AS A MONETARY TARGET IN AN UNOPTIMAL CURRENCY AREA - MACEDONIAN CASE**

## **CONTENTS**

1. Introduction
2. Monetary Strategies for Maintaining Price Stability
  - 2.1. Monetary Targeting
  - 2.2. Inflation Targeting
  - 2.3. Exchange Rate Targeting
3. Optimum Currency Area as a Precondition for Absolutely Fixed Exchange Rate Targeting - Theoretical Basis
  - 3.1. High Degree of Factor Mobility
    - 3.1.1. Labor Mobility and Flexibility of Wages
    - 3.1.2. Capital Mobility
  - 3.2. Openness of the Economy
  - 3.3. Sound Fiscal Policy
  - 3.4. Product and Trade Diversification
  - 3.5. Similar Monetary Sensitiveness Among Countries
  - 3.6. Long Term Growth
4. Effects of the Macedonian Exchange Rate Targeting Strategy
  - 4.1. Monetary Policy Effects
    - 4.1.1. Money Supply Effects
    - 4.1.2. Interest Rate Effects
  - 4.2. Price Effects
  - 4.3. International Competitiveness Effects
  - 4.4. Employment and Output Effects
5. Is the Fixed Exchange Rate Targeting Aviable Strategy for Macedonia?
  - 5.1. Degree of Convergence of Macedonian to German Economy
  - 5.2. Possibility for Sterilization of Asymmetric Demand and Supply Shocks by Higher Factor Mobility
    - 5.2.1. Labor Mobility and Wage Flexibility
    - 5.2.2. Capital Mobility
  - 5.3. Effectiveness of the Exchange Rate Targeting Strategy in a country with Different Potential Growth
  - 5.4. Long-term Effectiveness of the Exchange Rate Changes as Means of Balance of Payments Adjustment
6. Conclusion

# **RELIABILITY OF THE EXCHANGE RATE AS A MONETARY TARGET IN AN UNOPTIMAL CURRENCY AREA - MACEDONIAN CASE**

## **1. INTRODUCTION**

The monetary order in the Republic of Macedonia was set up on April 26, 1992, when the Act for the Macedonian currency unit, the Act for the usage of the Macedonian currency unit and the Act for the National Bank of the Republic of Macedonia (the Central Bank) were adopted by the Parliament. Until, April 26, 1992, the Republic of Macedonia was part of the Yugoslav currency area where Yugoslav dinar was used as legal tender.

In accordance to these acts, in the period 28-30 of April 1992, total amount of currency in circulation denominated in Yugoslav Dinars was replaced by the new Macedonian currency - Denar. In the period of three days, the two currencies - Yugoslav Dinar and Macedonian Denar had been in parallel used as legal tender. On April 30, 1992 at 8 p.m. the Yugoslav Dinar stopped to be a legal tender in Macedonia.

The Macedonian currency was issued in the form of coupons in the following denominations: 10, 25, 50, 100, 500, 1,000, 5,000 and 10,000 Denars. The rate of exchange of Yugoslav Dinars for Macedonian Denars was 1:1. The Macedonian currency - Denar, was born in an hyperinflationary environment emanating from the money overhang and monetization of federal government deficit of former Yugoslavia. Furthermore, the Denar was born as a pure paper currency that was not backed either by gold or foreign exchange reserves. The international reserves in Former Yugoslavia were centralized on the federal level, concentrated at the National Bank of Former Yugoslavia.

On the anniversary of the monetary independence (April 27, 1993), the definite paper money were introduced in circulation. Simultaneously, the denomination (reduction of the value of money) by 100 times was executed.

The main goal of the National bank of Macedonia is maintaining price stability through the manipulation of money supply and interest rates. The Central Bank is also responsible for the stability of the financial system, that determines the National Bank of Macedonia to perform supervisory and settlement functions. The Central Bank is fully independent in achieving its main functions, which means it is independent in selecting the monetary strategy for maintaining price stability and it can unlimitedly use monetary policy instruments in order to achieve the final goal.

This research work is concentrated mainly on four topics and each is investigated in separate chapter. The main research topics are: what is the most appropriate monetary strategy for maintaining price stability (second chapter), what are preconditions for a

national currency area to be an optimum currency area or few national currency areas to be an optimum currency area (third chapter), what are benefits and costs of exchange rate targeting strategy (fourth chapter), and whether the exchange rate targeting strategy is viable on long run and does it leads to convergence of Macedonia to the level of economic development of Germany (fifth chapter). Concluding remarks are presented in sixth chapter. All these topics are analyzed from the point of view of the Macedonian case.

The research period is January 1994 - June 1997. In some cases the research period is extended to September 1997 in order to be analyzed the effects of devaluation that occurred on July 9, 1997. The period before January 1994 is not included in the research work, because of the disrupted data and relationships due to the very high inflation (near to hyperinflation) in the period before and immediately after the monetary independence (April 1992 - December 1993). Furthermore, taking in mind the research topics, the period April 1992-December 1993 is not relevant, and even can lead to wrong conclusions.

## 2. MONETARY STRATEGIES FOR MAINTAINING PRICE STABILITY

A general rule in economics is that the basic objective of the macroeconomic policy in a long run is an increase in the society's prosperity, represented through an increase in the employment and the living standard. Accordingly, the monetary policy, as one of the major instruments of the economic policy, has to contribute in achieving the objective of increasing the society's prosperity.

In the contemporary monetary theory and policy dominates the view that in a long run the price stability creates the best conditions for an increase in the production and employment. Nowadays, this view is accepted by almost all the Central Banks in the world. There is a consensus that in conducting the monetary policy the Central Banks should rely on the following six principles:<sup>1</sup>

1. In a long run there is no "trade-off" between the inflation and the unemployment, so that one can not choose the combination between the rate of inflation and the employment. The inflation unavoidably leads to an increase in the unemployment. An increase in the money supply is neutral in the medium to long run, i. e., a monetary expansion has lasting effects only on the price level, not on output or unemployment.

2. The depreciation of the exchange rate improves the competitiveness only temporarily and illusionarily.

3. The business community invests only if it expects permanent economic development and stable economic environment. Inflation is costly, either in terms of resource allocation (efficiency costs) or in terms of long-run economic growth.

4. Money is not neutral in the short run, i.e., monetary policy has important transitory effects on a number of real variables such as output and unemployment. There is, however, at best an imperfect understanding of the nature and/or size of these effects, of the horizon over which they manifest themselves and of the mechanism through which monetary impulses are transmitted to the rest of the economy.

5. Monetary policy affects the rate of inflation with lags of uncertain duration and with variable strength, which undermine the Central Bank's ability to control inflation on a period-by-period basis. The interest rates are the primary instrument in fighting the inflation and they can be reduced after the inflationary pressure declines. Low interest rates lead to an increase in the inflation, and positive real interest rates are an indicator of a "healthy" growing economy.

6. There is no acceptable level of inflation. Once the monetary policy is relaxed or the objective of price stability is discredited, the inflation accelerates again.

These principles in conducting the monetary policy are based on the Friedman (1968) - Phelps (1967) model for the natural rate of unemployment. In a long run, the

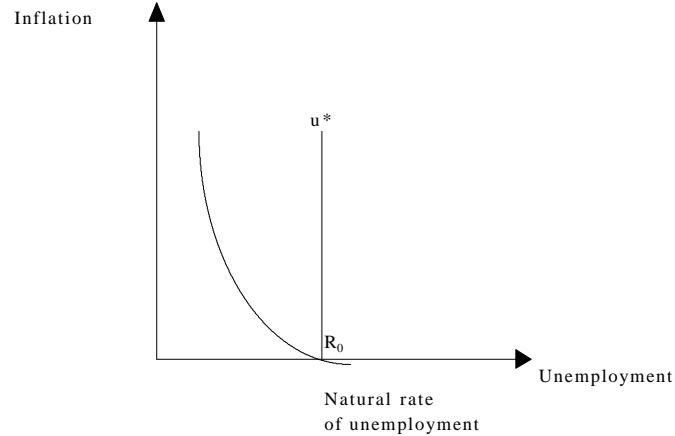
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<sup>1</sup> Mr. Leigh - Pemberton, BIS Review, No. 185/1991, p.5, Paul R. Masson, Miguel A. Savastano, and Sunil Sharma, The Scope for Inflation Targeting in Developing Countries, IMF Working Paper, WP/97/130, October 1997, pp. 5-6.

economy has to face the natural rate of unemployment which can not be reduced by increasing the inflation.

**Chart 1**

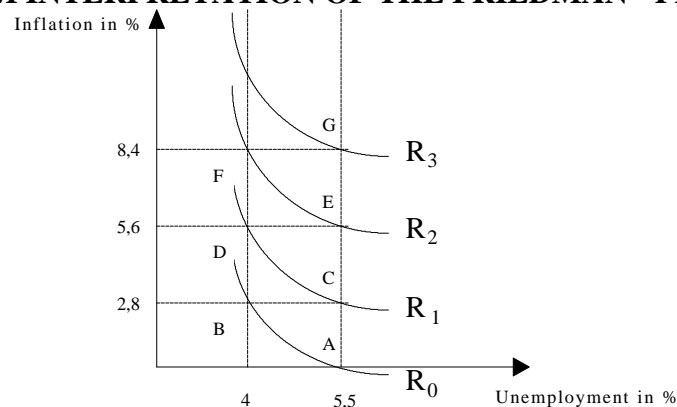
**LONG TERM TRADE OFF BETWEEN THE INFLATION  
AND THE UNEMPLOYMENT**



At the level of the natural rate of unemployment there is established a long term equilibrium rate of inflation which has no tendency to increase or decrease on a permanent basis. However, due to the adaptive expectations built in the Friedman - Phelps's model for the interdependence between the inflation and the unemployment, a trade-off between the inflation and the unemployment is possible in a short run. The money illusion lasts very shortly, because the inflationary expectations are revised quickly and are adjusted to the true values of the inflation. Consequently, the attempt to use the Philips curve in a long run produces an increase in the inflation, while at the same time the rate of unemployment (the natural rate of unemployment) remains unchanged in a long run.

**Chart 2**

**SHORT TERM INTERPRETATION OF THE FRIEDMAN - PHELPS CURVE**



At point A the natural rate of unemployment (5.5%) is at a 0% level of inflation. The attempt to reduce the unemployment to 4% increases the rate of inflation to 2.8%. However, this is possible only in a short run, because there occurs a revision of the inflationary expectations. This shifts the curve  $R_0$  to  $R_1$ . The unemployment returns back to a level of 5.5% (the natural rate of unemployment), but there is an inflation of 2.8%. The attempt to reduce the unemployment shifts the economy from the point C to the point F, associated with a short term rate of unemployment of 4% and inflation of 5.6%. After the



revision of the inflationary expectations short term Philips curve -  $R_1$  shifts to  $R_2$ . The unemployment returns back to the natural rate of unemployment (5.5% point E) at a 5.6% rate of inflation. Thus, in spite of the existing short term Philips curves, the economy can not free from the natural rate of unemployment, so that the long run Philips curve transforms itself into a vertical line at the level of the natural rate of unemployment. Accordingly, only a temporary decline of the unemployment below the natural rate of unemployment is possible, and only with an accelerating inflation.

To achieve the price stability objective the Central Banks do not implement unified monetary strategy. Depending on the structural characteristics and performances of the national economy, the price stability is achieved by using: a strategy of monetary targeting, a strategy of exchange rate targeting, and a strategy of direct inflation targeting. The strategy of targeting the interest rates is abandoned as a long term concept for achieving the price stability by all Central Banks. However, in conducting the monetary policy in a short run, on operative basis, regardless of the applied concept, a substantial importance is given to the interest rates.

The choice of the monetary strategy is not a theoretical issue, it is determined empirically. It is also a dynamic category, not given forever. As a criteria in selecting the monetary strategy are used: the stability of the money demand, the openness of the country to the world and the liberalization of the financial flows with the rest of the world, the short term and the long term objectives of the monetary policy, the elasticity/rigidity of the prices vis a vis the elasticity/rigidity of the production, the elasticity/rigidity of the wages and the length of the time-lag by which the monetary policy affects the prices and the production.

The main goal of the National bank of the Republic of Macedonia (the Central Bank of the Republic of Macedonia) is maintaining the price stability. This objective is explicitly stipulated as the entire responsibility of the Central Bank in the National Bank of the Republic of Macedonia Act and in the Constitution of the Republic of Macedonia.<sup>2</sup> Thus, the National Bank of Macedonia can be ranked among the Central Banks that can not select their final goal. The final goal is stipulated by the law - to maintain price stability. The Central Bank can only select the degree of price stability as its ultimate goal and the strategy for achieving and maintaining price stability. The Central Bank also performs supervisory and settlement function, in accordance with its responsibility for the stability of the financial system.

The National bank of Macedonia can design and implement its monetary policy with a high degree of independence. The Central Bank dispose with full institutional and functional independence for conducting monetary policy.

The institutional independence of the Central Bank can be observed through the institutional arrangements for electing the governor of the Bank, the term of office of the governor, and the relations of a Bank with the Government, the Ministry of Finance and the Parliament.

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<sup>2</sup> "The National Bank of the Republic of Macedonia is independent and responsible for the stability of the domestic currency (denar) for the monetary policy and for the global liquidity of external payments." - Act for the National Bank of the Republic of Macedonia, Official Gazette No. 26/1996, Article 3.

In order to secure institutional independence of The National Bank of Macedonia from the Government, there is precise election procedure for the governor that prohibits the government's influence in this process. The governor is nominated by the President of the Republic of Macedonia, and elected by the Parliament. In order to avoid the myopia of the Central Bank and overlapping between the monetary and political election cycle the governor's term of office is seven years with a possibility for reelection. But cumulative governor's term of office can be fourteen years. The Deputy Governor and three Vice Governors are elected in the same procedure and for the same term of office. The only difference is that the Deputy Governor and Vice Governors are nominated by the Governor.

In accordance to the election process, the Governor is responsible only to the Parliament, and at least biannually, he is submitting Reports for his work. He cannot be changed before his term of office expires except some crime scandal is in question. The same is valid for Deputy Governor and Vice Governors.

In order to prevent fiscal dominance over monetary policy, there are legal bands for government borrowing from the Central Bank. In principal government cannot monetize its fiscal deficits. The exception from this principal is possible only in short run if the government deficits are of seasonal nature. Even in that case Government borrowing from the Central Bank can be only short-term and not more than 5% of the scope of the Central Government Budget and can not overcome the monetary capacity of reserve money issuance determined by the monetary projection of the National Bank of Macedonia. The final maturity of such borrowing cannot be longer than the end of the current fiscal year. Strict compliance with this principles is a guarantee for non-accommodative monetary policy that can not be subordinated to fiscal requirements.

The functional independence of the National Bank of Macedonia means that it is fully independent in selecting the monetary strategy for maintaining price stability (monetary targeting strategy, exchange rate targeting strategy, or inflation targeting strategy), in setting up the intermediate target and in unlimited usage of the instruments of monetary policy, including the changes of interest rates.

At the end of each current year, the Board of the Central Bank is announcing the monetary strategy for next year, the intermediate target and monetary projection that is consistent with the selected intermediate target. This announcement of the Central Bank Board is a debate topic in the Parliament. After the Parliament debate the Central Bank's monetary strategy, the intermediate target and monetary projection consistent with the intermediate target is enacted and become self-constrained goals for the Central Bank.

The National Bank of Macedonia is fully independent in making decisions for implementing the adopted monetary policy by the Parliament. It is fully independent in using particular monetary policy instruments in order to achieve the announced intermediate target. In accordance to Article 9 of the National Bank of the Republic of Macedonia Act, the Central Bank can use the following instruments in conducting monetary policy:

- 1) Reserve requirement,
- 2) Buying and selling securities of the National Bank of Macedonia,

- 3) Buying and selling domestic, or foreign short-term transferable securities,
- 4) Buying and selling deposits to banks (credit auctions of the Central Bank),
- 5) Extending short-term loans to banks backed by domestic or foreign transferable short-term securities, endorsed by banks (discount window),
- 6) Extending credits with maturity up to three months, backed by government or Central Bank securities (Lombard credits),
- 7) Setting up borrowing and lending rates of the National Bank of Macedonia,
- 8) Issuing or withdrawing reserve money by buying or selling foreign exchange,
- 9) Introducing credit ceilings for limited time period (without the approval of Parliament not more than three months).

From the point of view of its institutional and functional independence, the National Bank of Macedonia disposes with capacity to implement any monetary strategy (monetary targeting, exchange rate targeting and inflation targeting) in order efficiently to achieve its ultimate goal - price stability. The selection of appropriate monetary strategy mainly depends on the structure of the economy, stability of the money demand, price elasticity, output elasticity and wage elasticity, openness of the country and its integration in to the world economy.

In the following text I will investigate which monetary strategy is the most effective for maintaining the price stability in Macedonia.

## 2.1. Monetary Targeting

The strategy of monetary targeting is using money supply as an instrument to maintain price stability. The Quantity Theory of Money provides an analytical framework for practical implementation of this strategy. The simple Quantity Theory's equation of exchange is:

$$P = M (V/Y) \quad (1)$$

where:  $P$  denotes the price level,  $M$  is the domestic stock of money,  $Y$  is real output and  $V$  is the velocity of money. Following the Quantity theory, they assume that  $V$  and  $Y$  are determined independently, and, more importantly, that both are independent of the money stock. The real output ( $Y$ ) is determined by the supply side of the economy - the amount and productivity of the labor force, capital equipment, land and technology - and velocity  $V$  is stable. Then the theory implies that changes in the money supply will be fully reflected in changes in prices. In a dynamic context, this means that changes in domestic monetary growth will be fully reflected in changes in the inflation rate (money is neutral in its affect on real output).

The long-run neutrality of money on output is installed in Phillips curve and it is transformed into expectations-augmented Phillips curve:

$$p_t = p_t^e - a (U_t - U_t^n) \quad (2)$$

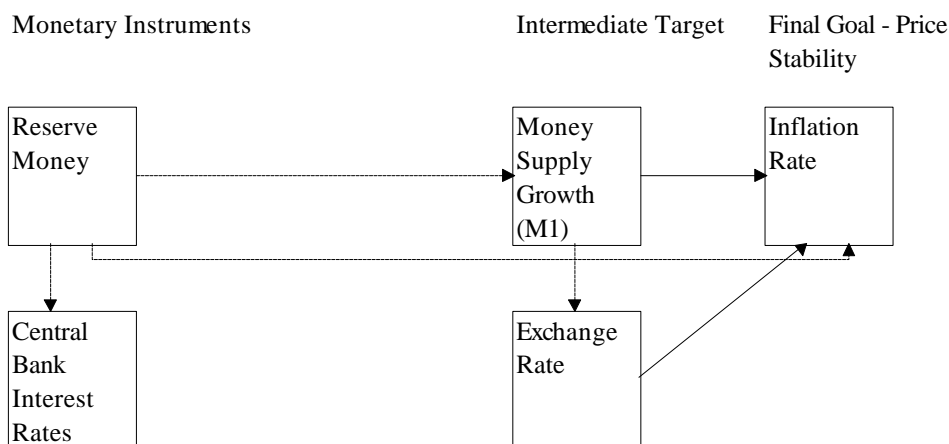
where:  $p_t$  is inflation at time  $t$ ,  $p_t^e$  is the expected rate of inflation in period  $t$ ,  $a$  is the slope of the Philips curve, i.e., how much inflation changes for a given change in  $U_t - U_t^n$ ,  $U_t$  is unemployment rate at time  $t$ ,  $U_t^n$  is natural rate of unemployment at time  $t$ , the rate of unemployment consistent with full employment at which the demand for labor equals the supply of labor. The expected rate of inflation depends on two factors: a) the gap between the current and potential growth (unemployment) and b) the gap between the equilibrium (demand for money) and current growth of money. The higher the gap between the equilibrium and current growth of money the higher is the expected rate of inflation in period  $t$ . The workers and firms, therefore, when setting their wages and prices, take into account not only the current inflation ( $p_t$ ) but also expected inflation ( $p_t^e$ ).

$$p_t^e = a (m - m^*)_{t-1} + d(y - y^*)_{t-1} \quad (3)$$

where:  $m$  is growth rate of money supply,  $m^*$  is the growth rate of money demand i.e., growth rate of the equilibrium money supply,  $y$  is growth rate of output,  $y^*$  growth rate of potential output,  $t-1$  is previous period.

Although there is no room for long run trade-off between inflation and unemployment, in accordance with the expectations-augmented Phillips curve (equation 2), depending on the kind of expectations - adaptive or rational, there may be a room for short run trade off. Adaptive expectations (Friedman) allow possibility for short run trade off between inflation and unemployment. Rational or forward looking expectations (Lucas and Sargent) do not allow possibility for trade off between inflation and unemployment on long-run as well as on short-run.

Existence of stable and predictable money demand is a key assumption for practical implementation of monetary targeting strategy. The existence of stable and predictable money demand mainly depends on the fact if national currency area is simultaneously an optimal currency area. If a country is an optimum currency area itself, in that case there is no currency substitution that disrupts the stability of money demand. That allows properly determination of the growth path of domestic money supply directly, and the growth rate of inflation indirectly. There is a strong and predictable relationship between money supply and price level which allows through the perception of the money supply movement the future inflation to be predicted. If the national currency area is not an optimum currency area than there is a high currency substitution and unstable money demand as a consequence. This unable the calculation of the optimum growth path of money supply, and the growth rates of money supply can not be used as a key instrument for predicting future inflation. The money supply can not be used as a key nominal anchor for maintaining price stability and a frame that determines the behavior of the economic agents (enterprises and workers).

**Chart 3****Transmission Mechanism in the Monetary Targeting Strategy**

The Central Banks of the major most industrialized countries switched to a policy of a monetary targeting from the mid-1970s onward. This change of a monetary policy regime was launched for the first time by the German Bundesbank in 1974, as a response to the acceleration of inflation in early 1970s, announcing its permanent orientation to cope and control inflation. Through the monetary targeting strategy a rule based policy was inaugurated. As an intermediate target usually broader monetary aggregate has been chosen (M2 or M3). The monetary targets have been published for each year either as a unique figure either as a range of targeted monetary growth. But, after its widespread implementation in the seventies the most of the Central Banks of the industrialized countries left the monetary targeting strategy in the eighties. This was in line with the empirical findings that the demand for money in many countries is unstable. As main causes for money demand instability have been emphasized: financial innovations, securitization and globalization of economies and currency substitution. Especially, currency substitution was a main factor for demand for money instability in countries where national currency area was not an optimum currency area. The recent research work (Fase, 1993) is showing that money demand in United States, Germany and Japan can be assessed as highly stable. That means that there is no high currency substitution in these countries and their national currency areas can be evaluated as optimum currency areas. Relatively high money demand stability also exists in the United Kingdom, Canada, France and Italy. The money demand is especially unstable in the small and open economies. The average interest elasticity of money demand in Netherlands, Belgium, Denmark, Austria, and Ireland is 0.27 with an average *t* statistics of 2.7. The main factor for money demand instability is the currency substitution in these countries, which means that their national currency areas are not optimum currency areas in the Mundell-McKinnon style.

Currently in the pure form the monetary targeting strategy is implemented only in Germany and Switzerland. The time horizon of intermediate monetary target is medium term, instead of annual in seventies and eighties. In the case of Germany it is three year period and in the case of Switzerland it is five year period. This allows flexible implementation of the monetary targeting strategy and within rule based strategy to introduce some discretion in certain years. A two stage implementation procedure is in place, in which the control of short term key money market rates and bank reserves serve to achieve annual monetary objectives and medium term monetary targets as means for

achieving final policy goal of price stability. Although the monetary targeting strategy is implemented in an environment of flexible exchange rate regime, exchange rate usually is taken as short-run policy indicator.

The Republic of Macedonia is small and open economy of 2 million citizens. The total gross domestic product in 1996 was USD 3,689 million at current exchange rate which accounts for 0.012% of total World Gross Domestic Product. The GDP per head was 3,125 at purchasing power parity of the exchange rate of the Denar. In accordance to the theory and empirical evidence in the most developed countries it can be expected that in such an economy there is unstable money demand and currency substitution. The empirical research work for the stability of the money demand in Macedonia fully proved these expectations.

Although the period of existence of Macedonian currency area is very short (6.5 years since April 1992) and not sufficient to test and predict the long-run stability of money demand, an error correction model has been used to estimate the stability of money demand in the period 1994 :01 1997 :06. In order to get a sufficient number of observations, monthly data have been used. The long-run equilibrium equation for money demand is expressed in equation (4), while the short term adjustment to desired levels is measured as in equation (5) which includes an error correction term:

$$\text{Long run: } (m-p)^*_t = a_0^* + a_1^* y_t - a_2^* p_t + a_3 REX_t + u_t \quad (4)$$

$$\text{Short run: } D(m-p)_t = b_0 - b_1 r_t - b_2 p_t + b_3 DREX_t + b_4 D(m-p)^*_{t-1} - b_5 ((m-p) - (m-p)^*)_{t-1} + e_t \quad (5)$$

With substitution of the equation (4) into (5) we get the error correction equation for real money demand:

$$D(m-p)_t = g_0 + g_1 D y_t - g_2 r_t - g_3 p_t + g_4 DREX_t + g_5 y_{t-1} - g_6 p_{t-1} + g_7 REX_{t-1} - g_8 (m-p)_{t-1} + e_t \quad (6)$$

where:  $m-p$  is real money demand,  $y$  is real income,  $p$  is price level,  $r$  is interest rate,  $p$  is inflation rate,  $REX$  is real exchange rate,  $t$  is current period,  $t-1$  is previous period,  $a$ ,  $b$  and  $g$  are parameters of the equations,  $D$  is the first difference,  $u$ ,  $e$  and  $e$  are disturbance terms, and  $*$  is an sign for equilibrium (steady state) condition.

The equation (6) was tested in logarithmic form taking into account narrowest and broader definition of money (M1 and M2) and industrial production and real wages as measure for real income. The best results were achieved when broader definition of money supply (M2) was taken as an endogenous variable and real wages were taken as a measure for real income as an explanatory variable. Results are presented in the Table 1.

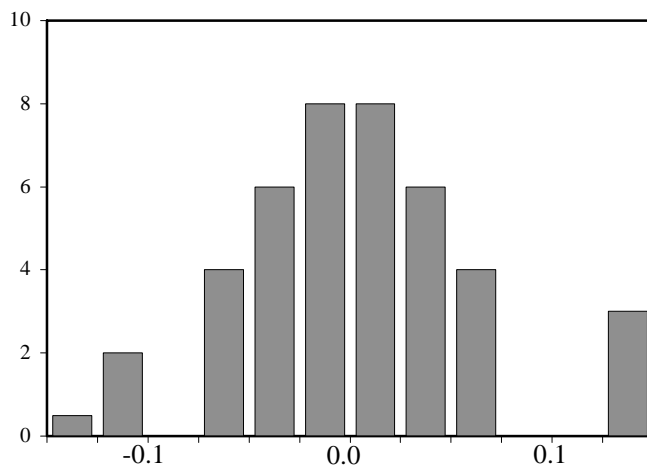
The coefficient of determination (R-squared) is 0.7667 which means relatively unstable money demand for the monetary aggregate M2.<sup>3</sup> There almost do not exist interest elasticity of money demand. But this coefficient is statistically insignificant. The main

<sup>3</sup> The same outcome for the stability of money demand got Matakova in her research work, Slobodanka Matakova, The Conduct of Monetary Policy and Demand for Money in the Former Yugoslav Republic of Macedonia, Research paper, November 15, 1995.

destabilizing factors of money demand for M2 were: transition shocks and currency substitution effects. The transition shocks can be divided in two groups. The first group include: the sharp deceleration of inflation rate and stabilization of the price level. The second group include: the institution building such as sound financial system that includes banks, saving houses, investment funds, stock exchange, money market and privatization of enterprises. The effects of the first shock are captured by the coefficients  $C(4)$  and  $C(7)$ . The effects of the second transition shock were impossible to be captured because they are mainly of qualitative character.

**Table 1**

LS // Dependent Variable is DLM2DRL Date: 10/26/97 Time: 12:37 Sample: 1994:01 1997:06 Included observations: 42 DLM2DRL=C(1) + C(2)*DLRW + C(3)*STBR2 + C(4)*DLCPI + C(5)*DLRDEM + C(6)*LRW(-1) + C(7)*LCPI(-1) + C(8)*LRDEM(-1) + C(9)*LM2DRL(-1)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	13.02071	11.00927	1.182704	0.2454
C(2)	0.148905	0.153009	0.973179	0.3375
C(3)	-0.000188	0.000462	-0.407783	0.6861
C(4)	0.042916	0.151858	0.282609	0.7792
C(5)	0.379692	0.154838	2.452183	0.0197
C(6)	-0.756336	0.330449	-2.288812	0.0286
C(7)	-0.849054	0.861932	-0.985060	0.3318
C(8)	-0.417448	0.890626	-0.468713	0.6424
C(9)	-0.266464	0.393514	-0.677141	0.5030
R-squared	0.766708	Mean dependent var		0.052439
Adjusted R-squared	0.710153	S.D. dependent var		0.121560
S.E. of regression	0.065445	Akaike info criterion		-5.265691
Sum squared resid	0.141339	Schwarz criterion		-4.893333
Log likelihood	59.98408	F- statistic		13.55672
Durbin-Watson stat	1.294496	Prob (F-statistic)		0.000000



Series: Residuals	
Sample 1994:01 1997:06	
Observations 42	
Mean	8.83E-16
Median	-0.000211
Maximum	0.144534
Minimum	-0.130595
Std.Dev.	0.058714
Skewness	0.216022
Kurtosis	3.456516
Jarque-Bera	0.691371
Probability	0.707735

where: DLM2DRL is first difference of the logarithm of deflated money stock level of M2 which includes only financial instruments denominated in Denars, DLRW is first difference of the logarithm of the level of real wages, STBR2 is short term borrowing rate on deposit with maturity of 12 months, DLCPI is the first difference of the logarithm of the level of consumer price index, DLRDEM is the first difference of the logarithm of the level of the real exchange rate of the Denar against the Deutsche mark, LRW(-1) is logarithm of the level of real wages with one period time lag (one month), LCPI(-1) is logarithm of the consumer price index with one period time lag (one month), LRDEM(-1) is logarithm of the level of the real exchange rate of the Denar against Deutsche mark with one period time lag (one month), LM2DRL(-1) is logarithm of deflated money stock level of M2 which includes only financial instruments denominated in Denars with one period time lag (one month), C(1), C(2), C(3), C(4), C(5), C(6), C(7), C(8) and C(9) are parameters.



The high level of money demand instability is coming from the changes in the real exchange rate that serves as a measure for currency substitution. There are two kind of effects on the money demand stability steaming from the exchange rate. The first one is that the stability of the nominal exchange rate is securing decrease of the inflation rate because of the stability of import prices which have weight in consumer price index of 0.41. This in combination with high interest yield on Denars deposits in comparison to foreign denominated deposits is leading to increase in real money demand. The second one is going through the real exchange rate. Real exchange rate is indicator of the future nominal exchange rate movement, and crucial for creating expectations of the economic units. If real exchange rate is stable, that means that there is no difference between the changes in domestic and foreign prices. If the real exchange rate is stable then economic units are not expecting changes in nominal exchange rate. That in an environment of high real interest rates on Denars deposits leads to increase in money demand. Opposite, if the real exchange rate is appreciating, then that is signal that in the future there will be depreciation of the nominal exchange rate, due to the difference in domestic and foreign price changes. In that case the expected rate of depreciation is compared with the interest rates on Denar deposits and if the former is bigger than the latter than there is decrease in money demand. The currency substitution effect is captured by the coefficients C(5) and C(8). In accordance to the t-statistic (-0.4687) the C(8) coefficient is insignificant. But coefficient C(5) is significant (t-statistic is 2.4522) and high (0.3797) which means the money demand is strongly destabilized by currency substitution.

**Table 2****CURRENCY SUBSTITUTION**

	<b>FD/M1</b>	<b>FD/M2DN</b>	<b>DER</b>	<b>M1/GDP</b>	<b>M2DN/GDP</b>
1994	0.589	0.375	26.614	0.058	0.090
1995	0.403	0.293	26.550	0.076	0.103
1996	0.336	0.258	26.592	0.080	0.104
1997 01-06	0.349	0.261	26.644	n.a.	n.a.

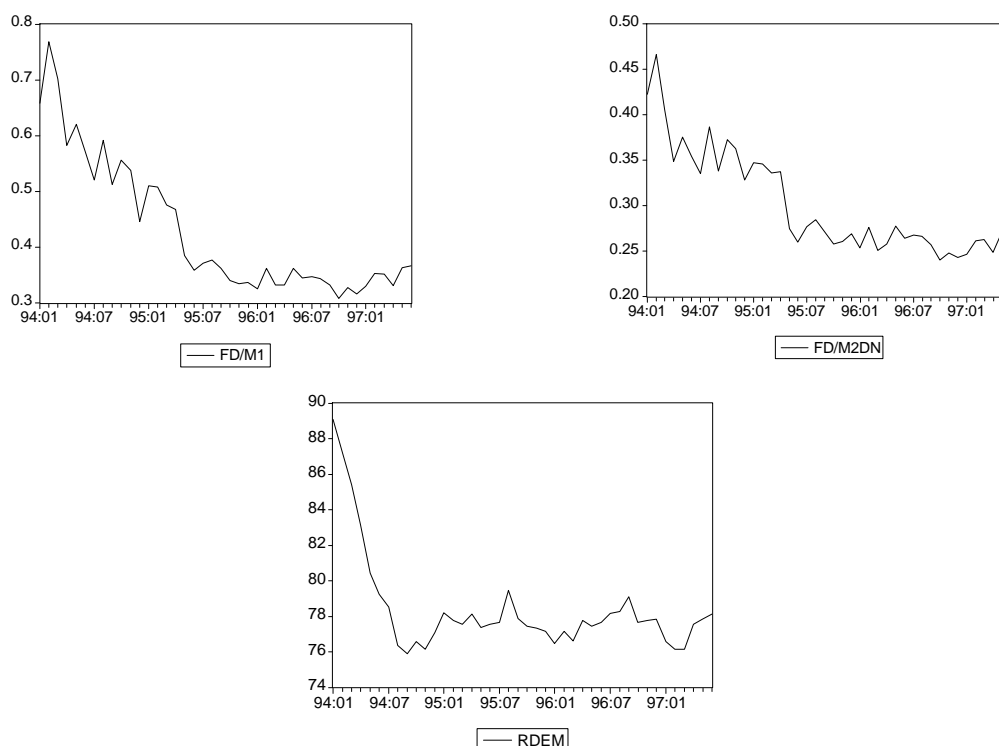
FD is foreign currency deposits within banking system, M1 is the narrowest definition of money supply, M2DN is broader definition of money supply which includes only financial instruments denominated in domestic currency (Denars), DER is Deutsche mark exchange rate, GDP is Gross Domestic Product.

The level of currency substitution can be measured through two indicators: the coefficient of foreign currency deposits to domestic money stock aggregates and the liquidity coefficient. The coefficient of foreign currency deposits to domestic money aggregates is calculated for foreign currency deposits (FD) and narrowest (M1) and broader (M2) definitions of money supply. The coefficients are showing that as a consequence of the stability of the Denar exchange rate against the Deutsche mark (in nominal and in real terms) in the period 1994:01 - 1997:06 the share of foreign currency deposits in money supply M1 and M2 is decreasing. The share of foreign currency deposits in M1 decreased from 58.9% in 1994 to 34.5% in the first six months in 1997. Simultaneously, the share of foreign deposits in M2 Denar, decreased from 37.5% in 1994 to 26.1% in the period January - June 1997. The liquidity coefficients, calculated as share of money supply in GDP also indicate high currency substitution in the Macedonian economy, although low liquidity coefficients are also result of the high speed of the settlement system which allows during the same day few payments to be made with the same quantity of money (net settlement system for large and small volume). Thus, as a consequence of the stability of the exchange rate on one side, and higher interest yield on Denar deposits in comparison to foreign exchange deposits, on the other side, the M1/GDP coefficient in the

period 1994-1996 increased by 37.9% and the M2/GDP liquidity coefficient in the same period increased by 15.5%.

**Chart 4**

**CURRENCY SUBSTITUTION AND REAL EXCHANGE RATE**



FD/M1 = coefficient of foreign currency deposits to narrowest definition of money supply (M1); FD/M2DN = coefficient of foreign currency deposits to broader definition of money supply; RDEM = real exchange rate of Denar against Deutsche mark.

The transformation shocks expressed in high and variable inflation rate in the period 1991- June 1994, undermined the money demand stability and mainly emanate from the hyperinflationary environment in the process of the dissolution of former Yugoslavia into the independent states (its republics), are considered as a transitory shocks which will not have permanent influence on the long run stability of the money demand. The institution building, which will be medium term process is expected to have one period shift in the money demand and after that the stability of money demand will remain at a new higher level. Currency substitution, financial innovations and securitization will remain the factors that will influence money demand function stability on long run. The high level of currency substitution and unstable money demand are evidence that Denar currency area itself is not an optimum currency area. This creates unfavorable environment for using the monetary targeting strategy in Macedonia. That means that the money supply is not the key nominal anchor and money supply growth can not be used as a main indicator for predicting future inflation.

Although the Central Bank of the Republic of Macedonia formally from its establishment (26 April 1992) to the end of the third quarter 1995 was implementing monetary targeting strategy, de facto that was the strategy of decelerating of the growth rates of money supply. Thus, the growth rate of money supply M1 was reduced from 12.3% monthly in May 1992 to 0.7% monthly in September 1995. Simultaneously, the pace of growth of the monetary aggregate M2 was reduced from 14.2% monthly in May 1992 to 0.5% monthly in September 1995. In October 1995 the function of money supply as nominal anchor was substituted by the exchange rate of the Denar against the Deutsche mark. Thus, since October 1995 the National Bank of Macedonia started to implement

exchange rate targeting strategy. Although the strategy has been changed the Central Bank continue to publish the aims for inflation and intermediate targets for the growth rate of money supply M1.

**Table 3**

**PROJECTED AND ACHIEVED GROWTH RATES OF INFLATION AND  
MONEY SUPPLY M1**

(in percent on annual level)

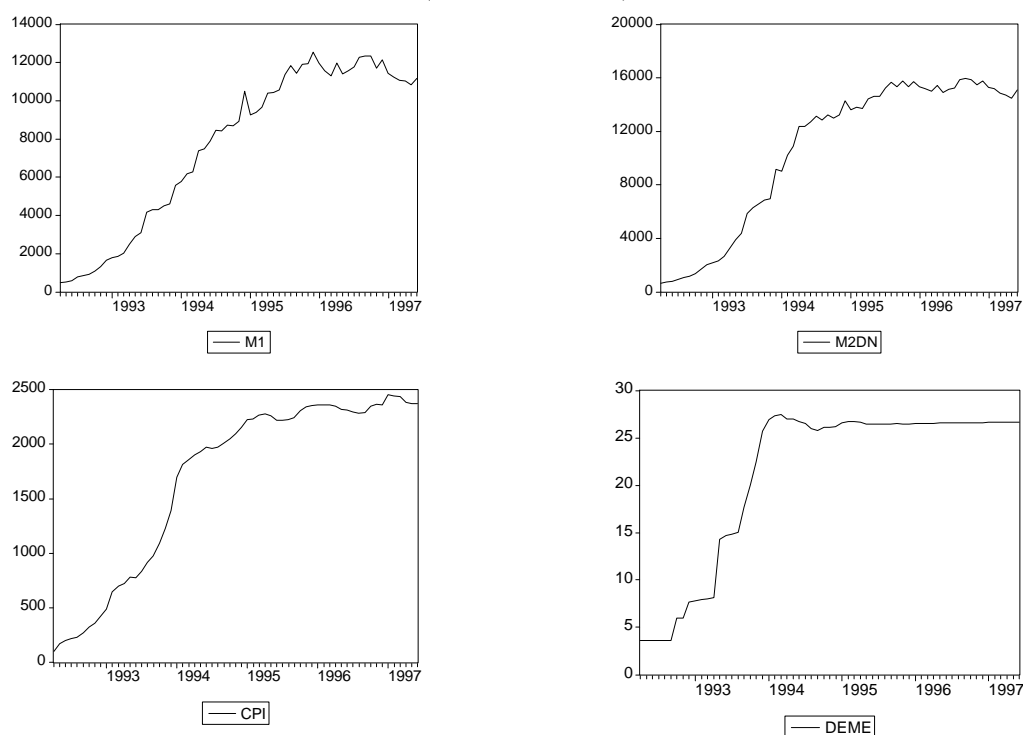
Year	Intermedi- ate target	Achieved growth	Difference (3-2)	Inflationa- ry goal	Achieved growth	Difference (6-5)
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
1992	755.1	704.5	-50.6	2,408.4	1,925.2	-483.2
1993	268.3	239.7	-28.6	434.2	229.6	-204.6
1994	80.7	83.2	2.5	70.0	55.4	-14.6
1995	23.0	25.3	2.3	8.0	9.2	1.2
1996	8.3	-1.7	-10.0	2.0	0.2	-1.8

Source: Annual Reports of the National bank of the Republic of Macedonia, Different years.

**Chart 5**

**MONEY SUPPLY, PRICE LEVEL AND EXCHANGE RATE OF THE DENAR**

(in million Denars)



M1 = narrowest definition of money supply; M2DN = Denar component of broader definition of money supply; CPI = consumer price index; DEME = Denar exchange rate against Deutsche mark.

From table 3 it is evident that in the period 1992 - 1994, when the strategy of monetary targeting was in place, because of the unstable money demand it was impossible through the monetary management to achieve the projected final goals for inflation. The inflation rate was an outcome of the money stock that was growing by decelerating rates.

## 2.2. Inflation Targeting

The strategy of inflation targeting implies inflation forecast targeting: the Central Bank's inflation forecast becomes an intermediate target. Instead of using the money supply or exchange rate as intermediate target the inflation targeting strategy as intermediate target is using the inflation forecast of the Central Bank. "The use of an inflation target does not mean that there is no intermediate target. Rather, the intermediate target is the expected level of inflation at some future date chosen to allow for the lag between changes in interest rates and the resulting changes in inflation. In practice we use a forecasting horizon of two years." (King, 1994, p. 118).

The inflation targeting as a strategy for maintaining price stability is used when the money growth or exchange rate changes cannot be reliable predictors for future inflation. If money growth or exchange rate changes are reliable indicators for future inflation, than the inflation targeting strategy is equivalent to monetary targeting or exchange rate targeting strategy. The main assumption in the case of the inflation targeting strategy is that the inflation is determined by many factors not only be the money supply changes or exchange rate changes. As a consequence in predicting for future inflation the Central Bank should take a lot of indicators such as: unit labor costs, deviation of the current output from the potential, the money supply growth, exchange rate changes, interest rates etc.

The inflation targeting strategy can be expressed by the following simple model (Svensson,1996):

$$p_{t+1} = p_t + a_1 y_t + a_2 x_t + \epsilon_{t+1} \quad (1)$$

$$y_{t+1} = b_1 y_t - b_2 (i_t - p_t) + b_3 x_t + h_{t+1} \quad (2)$$

$$x_{t+1} = g x_t + q_{t+1} \quad (3)$$

where:  $p_t = p_t - p_{t-1}$  is the inflation rate in year  $t$ ,  $p_t$  is the logarithm of price level,  $y_t$  is an endogenous variable - logarithm of output relative to potential output,  $x_t$  is an exogenous variable, it is the monetary instrument - the inter-bank interest rate or repo rate, and  $\epsilon_t$ ,  $h_t$  and  $q_t$  are disturbance terms (i.i.d. shocks) in year  $t$  that are not known in year  $y_{t-1}$ . The coefficients  $a_1$  and  $b_2$  are assumed to be positive, the other coefficients are assumed to be nonnegative,  $b_1$  and  $g$  in addition fulfill  $b_1 < 1$ ,  $g < 1$ . The change in inflation is increasing in lagged output and the lagged exogenous variable. Output is serially correlated, decreasing in the lagged real inter bank interest (repo) rate,  $i_t - p_t$ , and increasing in the lagged exogenous variable. The long run natural output level is normalized to equal zero. The inter-bank interest (repo) rate affects output with one year lag, and hence inflation with two year lag, the control lag in the model. That, the instrument (interest rate) affects inflation with a longer lag than it affects output is the crucial property of the model.

Let assume now that the inflation target for the Central Bank (the forecast of the inflation rate two years from the current period) is  $p^*$  (say 2 percent per year). Than the Central Bank's objective in period  $t$  is to choose a sequence of current and future interest

rates (repo rate)  $\{i_t\}_{t=t}^{\infty}$  so as to minimize

$$E_t \sum_{t=t}^{\infty} d^{t-t} L(p_t) \quad (4)$$

where:  $E_t$  denotes expectations conditional upon (the Central Bank's) information available in year  $t$ , the discount factor  $d$  fulfills  $0 < d < 1$ , and the period loss function  $L(p_t)$  is

$$L(p_t) = 1/2(p_t - p^*)^2 \quad (5)$$

That is, the Central Bank wishes to minimize the expected sum of discounted squared future deviations of inflation from the target (forecasted inflation).

It is crucial here that inflation targeting is interpreted as implying a single final goal, that is, the inflation rate is the only variable in the period loss function (equation 5). The Central Bank cannot prevent deviations from the inflation target caused by disturbances occurring within the control lag. At best it can only control the deviations of the two-year forecast from the target. It can therefore be argued that the Central Bank should be held accountable for the forecast deviations from the target rather than the realized inflation deviations, if the forecast deviations can be observed.

Inflation targeting implies a simple rule for its implementation. The Central Bank's inflation forecast for the horizon corresponding to the control lag (2 years in the presented model) becomes an intermediate target, and the instrument - the interest rate should hence be set so as to make the inflation forecast equal to the inflation target. Thus, if the inflation forecast is above (below) the target, the interest (repo) rate should be increased (decreased). This simple rule results in the optimal reaction function for the Central Bank. Since the inflation forecast depends on all relevant information, the instrument - the interest rate will be a function of all relevant information.

Adjusting the instrument - interest (repo) rate so the inflation forecast equals the target is the best the Central Bank can do. (Svensson, 1996). Ex post inflation will differ from the target, because of forecast and control errors for instance due to disturbances that occur within the control lag. If the Central Bank is competent, the mean forecast errors will be zero, and the variance of the forecast errors minimized. Ideally, if the inflation forecast could be verified, the Central Bank should be accountable for deviations of the inflation forecast from the target, but not for the unavoidable deviations of realized inflation from the target.

In the real world, how can the public monitor and evaluate monetary policy with an inflation target? How can the Central Bank's inflation forecast become observable to the public, so the public can detect deviations from the explicit inflation target? The best way to make the Central Bank's inflation forecast observable to the public and to allow the most thorough monitoring of monetary policy, is for the Central Bank to reveal details of its forecast to the public. This involves revealing the Central Bank's model, information, assumptions, and judgments in order to allow public scrutiny and discussion of these forecasts and analysis. An example of this is the increasing occurrence, and increasing quality, of Inflation Reports by inflation targeting Central Banks. (Bowen, 1997).

Most inflation targeting regimes have an explicit band for inflation, either in the form of a target band without an explicit inflation point target or in the form of a band around non-explicit inflation (point) target. Announced bands are typically 2 percentage points wide. It seems natural to interpret the bands as a confidence interval, proportional to the unconditional standard deviation of inflation, the square root of the sum of the variance of the conditional expectation and the variance of the inflation forecast errors.

The operative procedure of the inflation targeting strategy includes four essential elements (P. R. Masson, M. A. Savastano, and S. Sharma, 1997): a) explicit quantitative targets for the rate of inflation some period(s) ahead, b) clear and unambiguous indications that the attainment of the inflation target constitutes the overriding objective of monetary policy in the sense that it takes precedence over all other objectives, c) a methodology ("model") for producing inflation forecast that uses a number of variables and indicators containing information on future inflation, and d) a forward-looking operating procedure in which the setting of policy instruments depends on the assessment of inflationary pressures and where the inflation forecasts are used as the main intermediate target. This implicitly involves compliance with two other basic requirements, that the country's monetary authorities possess the technical and institutional capacity to model and forecast domestic inflation, have some knowledge or estimate of the time it takes for the "inflation determinants" to have their full effect on the inflation rate, and have a well informed view of the way in which monetary impulses affect the main macroeconomic variables as well as of the relative effectiveness of the various policy instruments at their disposal.

In practice, the Central Banks of the countries that adopted inflation targeting strategy use short-term interest rates as their main operating instrument, and rely on well developed financial markets to transmit the effects of changes in the instrument (repo rate) to aggregate demand and inflation. The inflation targeting strategy has been mainly implemented by the Central Banks in the traditional market economies (New Zealand since 1990, Canada since 1991, Great Britain since 1992, Finland since 1993, Sweden since 1993, Australia since 1993, and Spain since 1995).

**Table 4**

**COUNTRIES WITH INFLATION TARGETING STRATEGY**

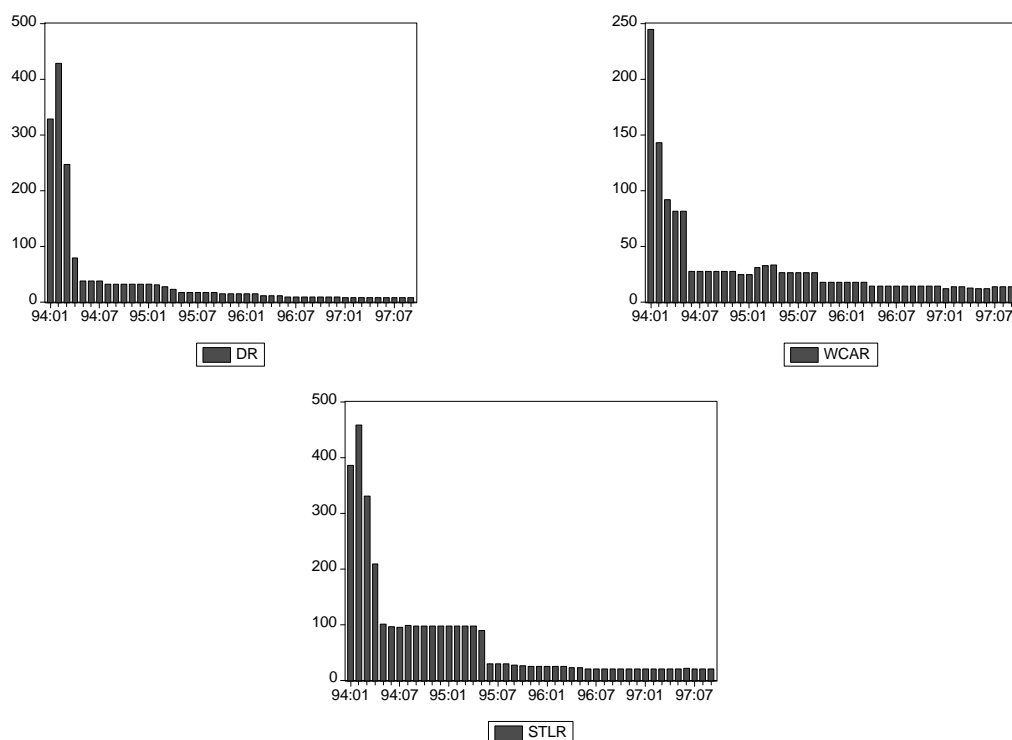
Country	Date of introduction	Inflation rate in the period of introduction	Inflation target	Average inflation rate in 1980-ies	Average inflation rate in the period 1990-1995
Australia	1993	1.8	2% - 3%	8.4	3.3
Canada	1991	6.2	1% - 3% since 1995	6.5	2.7
Finland	1993	2.6	2% since 1995	7.3	2.7
Israel	1991	18.0	8%-11% for 1995	n.a.	n.a.
New Zealand	1990	7.0	0% - 2%	11.9	2.7
Spain	1995	4.4	below 3% to 1997	10.3	5.3
Sweden	1993	4.8	2% +/-1% since 1995	7.9	5.0
Great Britain	1992	4.2	2.5% or below	6.9	4.6

Source: Economic Review, The Federal Reserve Bank of Kansas City, Vol.81, No. 4/1996

Although the National Bank of the Republic of Macedonia has full institutional and functional independence which means independence from the government and independence in setting the target and unlimitedly to use monetary policy instruments including the changes in interest rates, and although there is wide consensus within society that the price stability should be the only goal of the Central Bank, it is very dubious that the inflation targeting strategy can be used for maintaining price stability in Macedonia. Main reasons are: no existence of prerequisites for inflation targeting strategy. Due to transition shocks the parameters of the variables that are closely connected with inflation are unstable. The possibility to assess the growth potential of the economy do not exist. Also the Central Bank do not possess the technical capacity to model and forecast domestic inflation. The financial markets are very shallow (M2/GDP ratio is just 0.10, seven times lower than the average in the developed market economies) and can not be used for effective transmission of the effects of changes in instrument (repo rate) to aggregate demand and inflation, although the Central Bank measures have strong long run influence on bank's interest rate, which is evident by the strong link between the bank's lending rate and Central Bank repo and discount rate. But, the stability of interest elasticity of domestic demand and especially investment demand is unknown. All these reasons are determining that inflation targeting strategy can not be implemented in Macedonia.

Chart 6

## DISCOUNT RATE, REPO RATE AND BANK'S LENDING RATE



DR = discount rate; WCAR = weighted credit auction rate; STLR = short time lending rate.

### 2.3. Exchange Rate Targeting

The monetary strategy in which the exchange rate is used as an intermediate target is called the exchange rate targeting strategy. The main precondition for the exchange rate targeting is that nominal changes in the exchange rate are reliable indicators for future price movement. That means that the domestic economy is an open economy in which import prices are dictating the overall price movement.

$$P = b P_{nt} + (1 - b)P_t \quad (1)$$

$$P_t = b (w - p) + (1 - b)P_m^* e \quad (2)$$

where:  $P_{nt}$  is price of nontradable goods,  $P_t$  is price of tradable goods,  $b$  and  $1-b$  is the share of tradable and nontradable goods prices in total price level,  $w-p$  is real wage costs,  $P_m^*$  is international price of import goods,  $e$  is the nominal exchange rate.

From equations (1) and (2) it is evident that if a country is open than the share of tradable goods is higher in comparison to the share of nontradable goods,  $(1-b) > b$ . In that case the domestic inflation depends on the international price movement and the changes in the nominal exchange rate. If the nominal exchange rate is stable than domestic prices are internationally determined.

The monetary approach to the analysis of exchange rate determination is a direct application of the monetary approach to the balance of payment which gives a useful



framework for a simple exchange rate targeting model. (For a collection of the seminal papers in this area, see Frenkel and Johnson 1978). The key characteristics and assumptions of the monetary approach are retained as follows: first, asset market equilibrium lies at the center of the model, where the asset in question is money and where the demand for money function at least in the anchor country is stable and the supply of money is determined by the monetary authorities. Thus, adopting a log-linear form, we can write:

$$m = l y + p - r r \quad (3)$$

where:  $m$  is nominal money demand,  $y$  is real income,  $r$  is interest rate, and  $l$  and  $r$  are parameters.

Second, international goods markets are sufficiently competitive for the domestic and world price level to be equal when expressed in a common currency. Thus, we can write:

$$p = e + p^* \quad (4)$$

which may be rewritten as:

$$e = p - p^* \quad (5)$$

where:  $p$  is domestic price level,  $p^*$  is world price level,  $e$  is the exchange rate. The exchange rate matches the difference in own currency price levels between the domestic country and the rest of the world, and thus equates the two price levels in terms of either currency. This is in accordance to purchasing power parity (PPP).

The law of one price in asset markets is presented in the equation bellow, where the domestic interest rate is tied to the world interest rate. Thus we have:

$$r = r^* \quad (6)$$

This equation is the exact equivalent of the perfect capital mobility case in Fleming-Mundell model.

By substituting equation (3) into (5), we obtain:

$$e = m - p^* - l y + r r \quad (7)$$

Furthermore, assuming a demand for money function in the rest of the world that is analogous to the domestic demand for money function, we can write:

$$m^* = l^* y^* + p^* - r^* r^* \quad (8)$$

$$p^* = m^* - l^* y^* + r^* r^* \quad (9)$$

where world variables are denoted by  $*$ . Substituting (9) into (7) we obtain:

$$e = m - m^* - l y + l y^* - r^* r^* + r r \quad (10)$$

The central feature of the above model is that the exchange rate is determined in the money market in the two economies, and in particular by the relative money supplies, the exchange rate being the relative price of two monies.

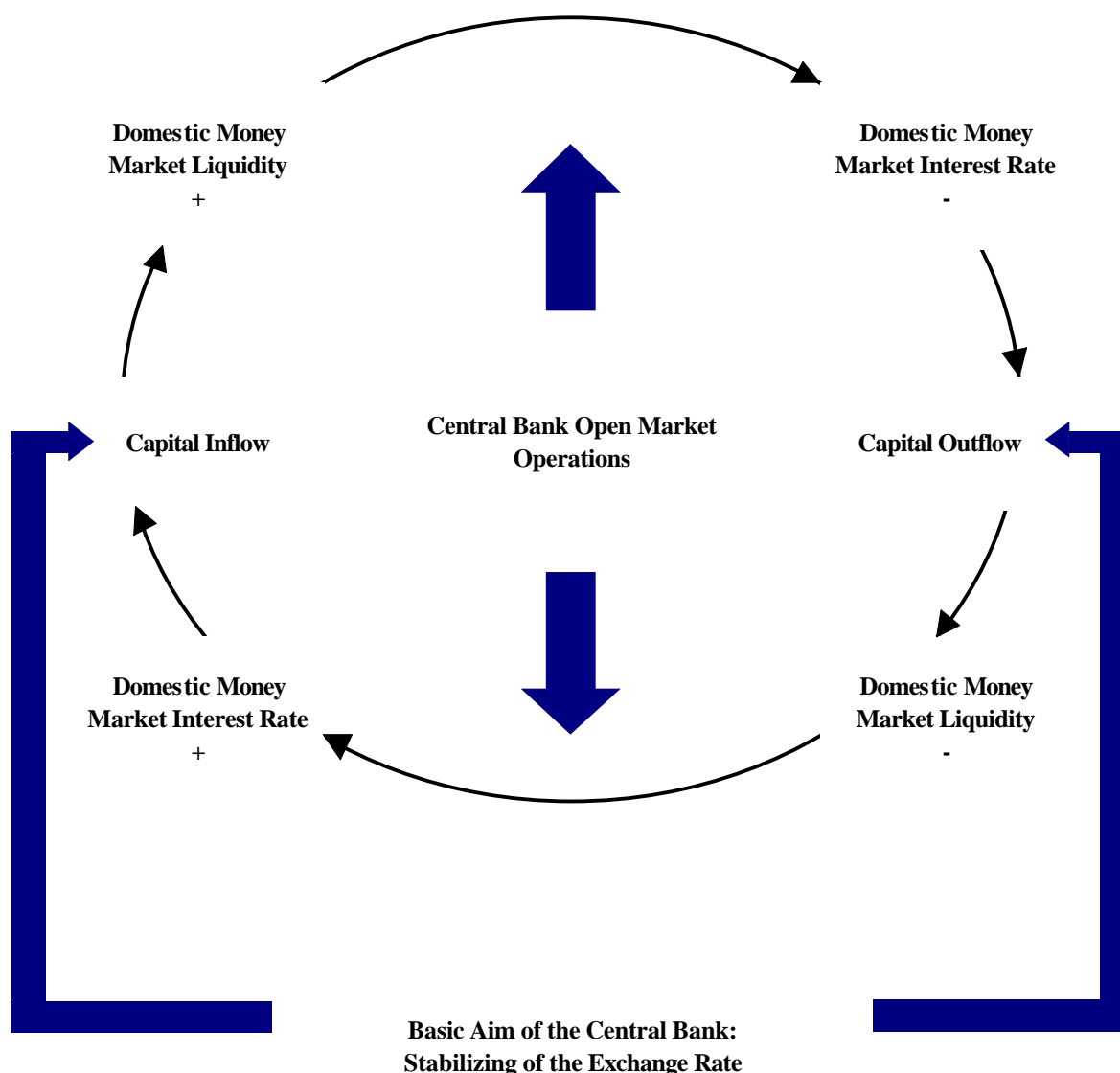
The Central Bank in an exchange rate targeting strategy by accepting that the exchange rate is intermediate target, simultaneously accepts that will not implement monetary policy that is independent from the anchor currency country. That means that the money supply in the domestic country becomes endogenous variable determined by the money supply in the anchor currency country in order to keep the stability of the exchange rate. Thus, the price stability (inflation) in domestic country is determined by the money supply growth in anchor currency country. (Kool, Tatom, 1994).

A country that chooses a fixed exchange rate system subordinates its monetary policy to the exchange rate objective and is unable to target any other nominal variable on a lasting basis, especially in the presence of capital mobility. (P. R. Masson, M. A. Savastano, and S. Sharma, 1997). Variants of fixed exchange rate system - e. g., crawling pegs or target zones - relax these strictures somewhat and allow the authorities to gear monetary policy at some other nominal objective in addition to the exchange rate including, in principle, the rate of monetary growth. Then, a nominal (non-fixed) exchange rate target could coexist with an monetary target as long as it is clear that the exchange rate target has priority if a conflict arises.

The basic mechanism through which the stability of the exchange rate is maintained is the capital inflow and outflow that is determined by the interest rate changes on the domestic money market. The interest rates are regulating the contribution of domestic credits to the money supply growth. But, because of the interest elasticity of money demand in the home country (the money demand in home country is unstable), by a relatively small changes in interest rates, the domestic money demand can be equalized to the money demand in the anchor currency country that is stable.

Thus, when there is a pressure for appreciation of the exchange rate, the Central Bank is increasing the liquidity on the domestic money market. This leads to decrease of the money market interest rates which destimulates the capital inflow. Contrary, capital outflow is stimulated. That has to eliminate the pressure for foreign exchange appreciation. Simultaneously, reduced interest rates are increasing the contribution of domestic credits in the money supply creation, from one side, and they lead to an increase of money demand, because of the interest elasticity, on the other side.

Chart 7

**EXCHANGE RATE TARGETING MECHANISM**

The reaction of the Central Bank is opposite if there are pressures for exchange rate depreciation. In that case the Central Bank is reducing the liquidity on the domestic money market, which leads to increase of the interest rates. This stimulates the foreign capital inflow and destimulates capital outflow which equilibrates the foreign exchange market and leads to disappearance of the pressures for depreciation of the exchange rate. Simultaneously, increased interest rates, due to interest sensitivity are reducing the real money demand in domestic country and the contribution of domestic credits in money supply growth. Hence the variability of the exchange rate is automatically reduced, and this goes towards reducing of inflation variability. The monetary authorities are obliged to follow policy rule which ensures exchange rate stability (in the regime of float within a band the outcome for the exchange rate lies within desired range). Shocks to the economy cannot therefore put pressure on exchange rate, but will automatically be translated into variations in net foreign holdings of the Central Bank, and hence will influence money aggregates (money supply growth). (Whitley, 1994, pp. 252-253).

Thus, in order to be efficient strategy for maintaining price stability, the exchange rate targeting requires fulfillment of following preconditions:

1. The country to be open and not to have decisive influence on world commodity prices,
2. Unstable domestic money demand, especially due to the currency substitution that is indicator that national currency area is not an optimum currency area,
3. Exchange rate changes to be highly linked with the inflation rate,
4. The country is willing to give up from pursuing independent monetary policy,
5. The country is willing to give up from the usage of the exchange rate as a main instrument for balance of payments adjustment.

The strategy of exchange rate targeting since 1970-ies successfully has been implemented by the Austria, Belgium, Denmark, Luxembourg and Netherlands. In 1990-ies this monetary strategy became very popular and mainly all European Union member countries except Great Britain and Germany are pursuing exchange rate targeting strategy in which the Deutsche Mark is selected as anchor currency. This strategy is also preferred by some transition economies (Czech Republic, Slovak Republic, Hungary, Poland) in the process of bringing down the inflation.

Although the exchange rate was used as main indicator for the stance of monetary policy since 1994, officially the exchange rate targeting strategy in Macedonia has been implemented since the fourth quarter of 1995. The anchor currency is the German Deutsche Mark, due to the high markization of the economy, the long tradition prices and wages informally to be expressed in Deutsche marks, and high trade links between Macedonian and German economy.

In the period of introduction, all basic preconditions for successful implementation of the exchange rate targeting strategy were fulfilled.

Macedonia is small and open country. The average share of trade of goods and services in Gross Domestic Product in the period 1993-1996 was 88.4% which is 7.8 percentage points less than the average share in five European countries (Austria, Belgium, Denmark, Luxembourg, and Netherlands) that since 1970-eis are successfully implementing the exchange rate targeting strategy. Compared only with Austria and Denmark the openness of the Macedonian economy measured by this figure is higher by 10.4 percentage points and 18.8 percentage points, respectively.

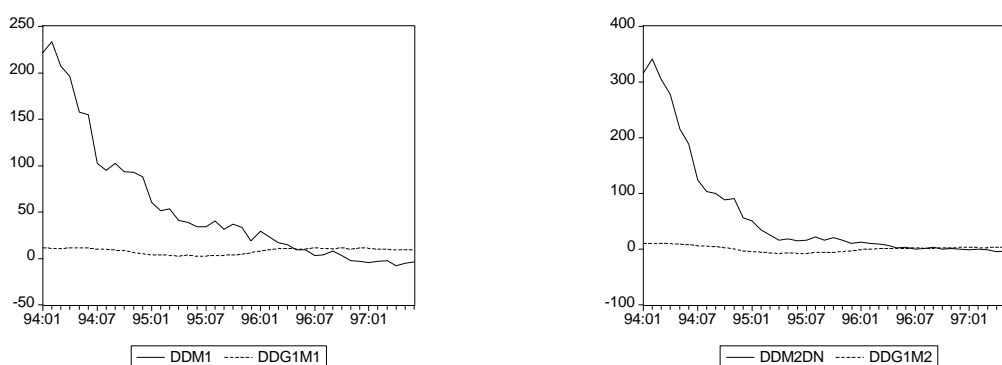
In accordance with the econometric testing, that was presented under the topic of monetary targeting strategy, the money demand in Macedonia is highly unstable mainly due to currency substitution that leads to conclusion that Macedonian Denar Currency Area is not an optimum currency area. The outcome from this fact is that the Macedonian Central Bank (The National Bank of the Republic of Macedonia) can not pursue independent monetary policy. Money supply and interest rates has to become endogenous and dependent

variables that are determined by the anchor currency country policy which means the Bundesbank monetary policy.

By accepting a stable exchange rate of the Denar against Deutsche mark as intermediate monetary target the monetary authority gave up from the usage of the exchange rate as a main instrument for balance of payments adjustment. The international competitiveness, was designed, mainly to be achieved through the reduction of unit labor costs. That means that the exchange rate adjustment can be used very rarely, in a case of realization of unexpected demand or supply shocks that can not be neutralized by wage flexibility and labor mobility. The key assumption was that the exchange rate of 26.7 Denars for a Deutsche mark is an equilibrium exchange rate. That was the central parity and it was allowed the exchange rate to float within a band of  $\pm 2.5\%$  of the central parity.

**Chart 8**

### ANNUAL GROWTH RATES OF MONEY SUPPLY IN MACEDONIA AND GERMANY



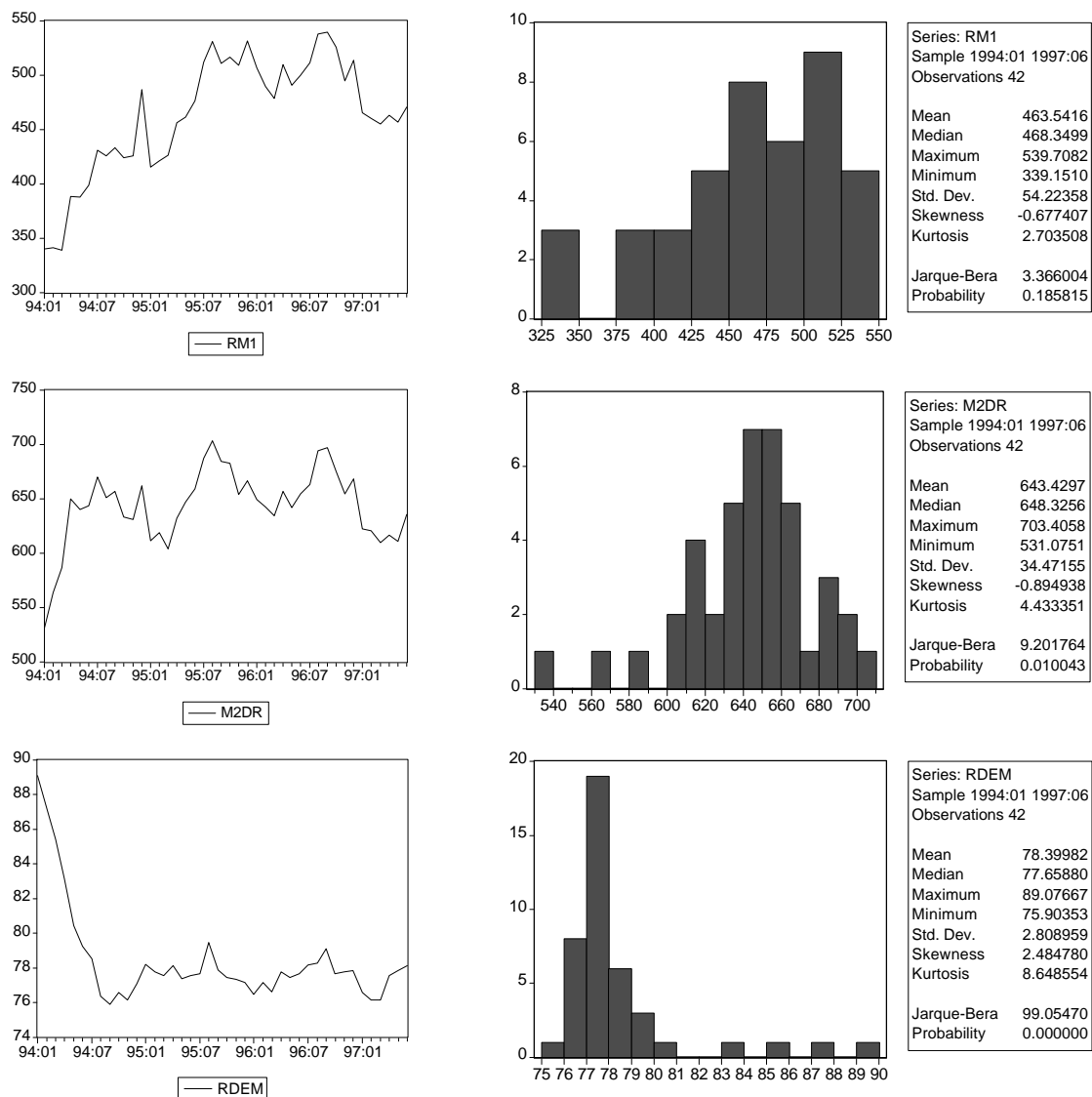
DDM1 = annual growth rates of M1 in Macedonia; DDG1M1 = annual growth rates of M1 in Germany; DDM2DN = annual growth rates of M2 Denar in Macedonia; DDG1M2 = annual growth rates of M2 in Germany

In the period of introduction of the exchange rate as intermediate target of monetary policy there was high deviation of the money supply growth in Macedonia from the money supply growth in Germany. In October 1995 the growth rate of monetary aggregate M1 was 36.9% on annual level, and the growth rate of monetary aggregate M2 was 21.3% on annual level. Simultaneously growth rates of monetary aggregates M1 and M2 in Germany were 3.9% and -5.4%, respectively. The convergence towards German growth rates of money supply occurred in May 1996. But, excessive monetary growth in the period January 1994 - May 1996 created pressure for the nominal depreciation of the exchange rate. In order to alleviate the pressures, the National Bank of Macedonia started to drain liquidity, and since November 1996 growth rates of money supply became negative. Such deflationary monetary policy was unsustainable on a long run, and in order to normalize the growth rates of money supply and to reach German monetary growth rates on July 9, 1997, after 42 months of stable exchange rate, the exchange rate of the Denar against Deutsche mark was devalued by 16.1% percent. The new central parity was established at 31 Denars for a Deutsche mark and the floating margins remained the same ( $\pm 2.5\%$ ).

In the period January 1994 - June 1997, the real exchange rate expressed higher stability than the real money demand for M1 and M2, which means that the exchange rate targeting strategy, potentially is more effective in controlling the inflation than the monetary targeting strategy as an alternative. Stability has been assessed to the degree of the variability of the variables. The standard deviation of the monetary aggregate real M1 was 54.2236, and for monetary aggregate real M2 was 34.4715. The standard deviation for the real Denar exchange rate against Deutsche mark was 2.8089.

**Chart 9**

**REAL DEMAND FOR M1, M2 DENAR AND REAL EXCHANGE RATE**



RM1 = real demand for M1; M2DR = real demand for M2 - Denar; RDEM = real exchange rate of Denar against the Deutsche mark.

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### 3. OPTIMUM CURRENCY AREA AS A PRECONDITION FOR ABSOLUTELY FIXED EXCHANGE RATE TARGETING - THEORETICAL BASIS

The analysis in second chapter give firm evidence that exchange rate targeting is the best strategy for maintaining price stability in Macedonia. The question that we approach is what exchange rate regime to use as a exchange rate target. The fixed exchange rate regime is more efficient in inflation fighting than the flexible one. Exchange rate fixity is, as David Hume described in 1752, a way of importing another country's monetary policy.<sup>1</sup> In the case of Macedonia, the German Deutsche mark has been served as the anchor currency, and German low inflation rate is supposed to spread throughout the Macedonia. Moreover, there is belief that the Bundesbank's reputation would provide some credibility to the anti-inflation commitment of the National bank of Macedonia, and therefore, reduce the costs of lowering inflation. A second advantage of the fixed exchange rate regime is the speed of the adjustment process. Under the fixed regime the speed of the convergence of Macedonian to German economy should be the highest. That means the length of time needed to fulfill the criteria for joining the European Union will be the shortest. A third advantage of fixed exchange rate regime is that economic performance - growth, inflation or any other important measure - is better under a fixed exchange rate regime.<sup>2</sup>

Selecting the irrevocably fixed exchange rate as intermediate monetary target means that the exchange rate can not be used as instrument for balance of payments adjustment. In that case the policymakers should dispose with alternative devices that can be used for balance of payments adjustment and for neutralizing asymmetric demand and supply shocks. Is it possible Macedonia to give up from the usage of the exchange rate as instrument for balance of payments adjustment and of its usage as instrument to neutralize asymmetric demand and supply shocks. Does Macedonia dispose alternative devices for balance of payments adjustment. Ultimately, can irrevocably fixed exchange rate be intermediate monetary target.

I recall the theory of optimum currency area in order to answer these questions. In this research work it is mainly used as a criteria, to select the exchange rate regime that will serve as intermediate target in Macedonia. The core of optimum currency area theory and its critique is presented in this chapter. In next chapters (four and five) it is practically applied in the Macedonian case - in determining exchange rate regime as monetary policy intermediate target.

The traditional theory of optimum currency areas, as developed by Mundell (1961) and McKinnon (1963), has identified the conditions under which a monetary union or irrevocably fixed exchange rates between regions or countries will work smoothly. When regions or countries are hit by different disturbances (asymmetric shocks), the adjustment process will require either that real exchange rates adjust or that factors of production

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<sup>1</sup> See Hume (1970, pp. 60-77).

<sup>2</sup> This was an important motivation for Britain's return to the gold standard in 1925, for example.

move, or a combination of both. In the absence of real exchange rate flexibility and factor mobility, regional or national concentrations of unemployment will be inevitable.

The theory of optimum currency areas has also established a presumption that in a monetary union or under the regime of irrevocably fixed exchange rate, the adjustment mechanism will rely more on factor mobility than on real exchange rate flexibility. The opposite holds for countries with flexible exchange rate regimes, where more of the adjustment to asymmetric shocks will take the form of real exchange rate changes than of labor mobility.

The optimum currency area theory is based on the Keynesian paradigm, prices and wages are sticky and there is a room for money illusion. The exchange rate adjustments are effective in restoring balance of payment equilibrium (M. Rentsch, 1994, pp. 1-5). A monetary unification or irrevocably fixed exchange rate regime, which implies the loss of the exchange rate instrument and autonomous monetary policy, can be justified only if real divergence in output and unemployment growth between these states is small and international mobility of production factors is high. In accordance to their approach an optimum currency area was defined as an economic unit composed of regions affected symmetrically by disturbances and with free mobility of labor and production factors (Eichengreen, 1991). In spite of its strong Keynesian touch this approach has been widely used in the last few years. It seems to be almost generally accepted as the main touchstone of the advantages of single currency and irrevocably fixed exchange rates within member countries of European Union.

An optimum currency area is "a domain within which exchange rates are fixed" (Mundell, 1961). A national currency area is not necessarily an optimum currency area. If such a country adopts flexible exchange rate regime it can face particular problems such as price and wage indexation in accordance with the exchange rate changes. Hence, allowing the exchange rate to fluctuate may not eliminate unemployment throughout the currency area. Within a "single currency area (optimum currency area) monetary-fiscal policy and flexible external exchange rates can be used to give the best resolution of three (sometimes conflicting) objectives" (McKinnon, 1963). The three objectives are: full employment, price stability and external balance.

Mundell was concerned with the cost, mainly in terms of unemployment, that a common currency area can cause when the economy is confronted with a shock. McKinnon's focus was especially on price stability objective. This assumes "that any capitalist economy requires a stable-valued liquid currency to insure efficient resource allocation" (McKinnon, 1963).

Mundell stresses the functions of money as a unit of account and medium of exchange, which become more valuable the wider a currency is accepted: "Money is a convenience and this restricts the optimum number of currencies. In terms of this argument alone the optimum currency area is the world, regardless of the number of regions of which it is composed" (Mundell, 1961).

The theory of international trade that was developed on the Ricardian assumption that factors of production are mobile internally but immobile internationally is used to define the boundaries of optimum currency area. The argument for flexible exchange rates based

on national currencies is only as valid as the Ricardian assumption about factor mobility. If factor mobility is high internally and low internationally a system of flexible exchange rates based on national currencies might work effectively enough. But if regions cut across national boundaries or if countries are multiregional then the argument for flexible exchange rates is only valid if currencies are reorganized on a regional basis. (Mundell, 1961, p. 661).

The essential ingredient of a common currency, or a single currency area, is a high degree of factor mobility. This works best if each nation (and currency) has internal factor mobility and external factor immobility. But if labor and capital are insufficiently mobile within a country then flexibility of the external price of the national currency cannot be expected to perform the stabilization function attributed to it, and one could expect varying rates of unemployment or inflation in the different regions. Similarly, if factors are mobile across national boundaries then a flexible exchange system becomes unnecessary, and may even be positively harmful (Mundell, 1961, p. 664).

In accordance with Mundell's and McKinnon's optimum currency area theory, seven factors have been identified as relevant for exchange rate regime choice. They are considered as prerequisites for countries to be a member of an optimum currency area. All these factors (conditions) aim at the symmetry, mentioned above, making exchange rate adjustments unnecessary. These factors (conditions) are: Labor mobility and flexibility of wages, capital mobility, openness of the economy, sound fiscal policy, product and trade diversification, similar monetary sensitiveness among countries, long term growth. The consequence of this is that the fixed exchange rate regime works best if shocks originate primarily in money demand (Fischer, 1997, p. 39).

**Table 1**

**CHARACTERISTICS OF COUNTRIES WITH FIXED  
EXCHANGE RATE REGIMES**

	<b>Theory</b>	<b>Heller</b>	<b>Holden et al.</b>	<b>Savvides</b>
Capital Mobility	Indeterminate	Low	-	High
Inflation Rate Differentials	Low	Low	Low	-
Export Product Concentration	High	-	High	High
Relative Size of Trade Sector	Large	Large	-	-
Geographic Concentration of Trade	High	High	-	-
Size of Economy	Small	Small	-	-
Level of Economic Development	Low	-	Low	Low

Taking in mind these seven factors, a table is constructed from the point of view what prerequisites should exist in order to adopt a fixed exchange rate regime. The Table 1 is constructed on the basis of the empirical analyses of optimum currency area theory by Heller (1978); Holden, Holden and Suss (1979); and Savvides (1990) and is undertaken from McKay and Hopkins, (McKay and Hopkins, p. 5).

The monetarist revolution in the late seventies and early eighties affected the traditional Keynesian view on the output effects of a devaluation and thus also the original optimum currency area theory. In the monetarist view nominal exchange rate adjustments have only temporary effects on the competitiveness of countries. Over time the nominal devaluation leads to domestic cost and price increases which tend to restore the initial competitiveness (De Grauwe, 1992, pp. 30-60). The monetarist raise the question whether

the exchange rate changes are effective in making balance of payment adjustment. Put differently, the question that arises is whether nominal exchange rate changes can permanently alter the real exchange rates of the country. There will be no cost in irrevocably fixing the exchange rate if it is not efficient device for balance of payments adjustment and for neutralization of asymmetric shocks.

In accordance to the monetarist view, nominal devaluation only lead to temporary real devaluation that affect output and unemployment. In the long run nominal exchange rate changes do not affect the real exchange rate of a country. The reason is that the devaluation raises the price of imported goods. This raises the cost of production directly. It also will increase the nominal wage level as workers are likely to be compensated for the loss of purchasing power. Thus, prices increase and output declines. These price increases feed back again into the wage-formation process and lead to further decline in output. The initial favorable effects of the devaluation tend to disappear over time. It is not possible to assess whether these favorable effects of the devaluation on output will disappear completely. This depends on openness of the economy, on the degree to which wage-earners will adjust their wage claims to correct for the loss of purchasing power. However, "there is a lot of empirical evidence that for most of the European countries this withering away of the initially favorable effects of devaluation will be strong" (De Grauwe, 1992, p. 39).

The monetarist conclusion about the long-run ineffectiveness of the exchange rate changes on the balance of payment, do not mean that the exchange rate can not be appropriate measure for short-run balance of payment correction and that irrevocably fixed exchange rate regime can be chosen without any cost if a country is not an optimum currency area with the anchor currency country.

The correction of disequilibria in the balance of payment on short run can be either through changes in the exchange rate either through expenditure reducing policies, although on long run only expenditure reducing policies are the effective measure for balance of payment adjustment. In the long run the exchange rate will not solve problems that arise from differences between countries that originate in the goods markets. This result is also in the tradition of the classical economists. They stressed that money is veil. Structural differences should be tackled with structural policies. Manipulating money (its quantity or its price) cannot change these real differences. Through domestic demand effects (increased import prices) and through substitution effect the exchange rate changes on short run corrects disequilibria in the balance of payment without recessionary effects. The expenditure reducing policies correct disequilibria in the balance of payment only through the reduction of aggregate demand for domestic goods (there is no substitution effect). The economy will go through a deflationary process, which reduces output. With sufficient wage and price flexibility, the decline in prices will lead to lower nominal wages and increased international competitiveness. If wages and prices are not very flexible, this will require considerable time and considerable duration of recession. This will be the cost from the monetarist point of view from giving up of the exchange rate flexibility and accepting irrevocably fixed exchange rate regime when a country is not an optimum currency area with the anchor currency country.

In accordance to the monetarist view, the difference between devaluation and expenditure reducing policies is in their short term dynamics. When a country devalues, it avoids the severe deflationary effects on domestic output during the transition. The cost of this policy is that there will be inflation. With the expenditure reducing policies, inflation is avoided. However, the cost is the reduction of the output in the transition period. In addition, the second policy may take a long time to be successful if the degree of wage and price flexibility is limited (De Grauwe, 1992, p. 42).

Definitely, as a conclusion we can say, that the costs from accepting irrevocably fixed exchange rate regime are higher under the Keynesian paradigm than under the monetarist paradigm if a country is not an optimum currency area with anchor currency country. Under the monetarist view, however, the costs are rapidly increasing and approaching to those stipulated of Keynesian paradigm if wages and prices are inflexible and the process of transition is very long. Ultimately, it becomes practical and not theoretical topic.

**Table 2**  
**CONSIDERATIONS IN THE CHOICE OF EXCHANGE RATE REGIME**

Characteristics of Economy	Implication for the Desired Degree of Exchange Rate Flexibility
Size of economy	The larger the economy, the stronger is the case for a flexible rate.
Openness	The more open the economy, the less attractive is a flexible exchange rate.
Diversified production/export structure	The more diversified the economy, the more feasible is a flexible exchange rate.
Geographic concentration of trade	The larger the proportion of an economy's trade with one large country, the greater is the incentive to peg to the currency of that country.
Divergence of domestic inflation from world inflation	The more divergent a country's inflation rate from that of its main trading partners, the greater is the need for frequent exchange rate adjustments. (But for a country with extremely high inflation, a fixed exchange rate may provide greater policy discipline and credibility to a stabilization program.)
Degree of economic/financial development	The greater the degree of economic and financial development, the more feasible is a flexible exchange rate regime.
Labor mobility	The greater the degree of labor mobility, when wages and prices are sticky to downward, the less difficult (and costly) is the adjustment to external shocks with a fixed exchange rate.
Capital mobility	The higher the degree of capital mobility, the more difficult it is to sustain a pegged-but -adjustable exchange rate regime.
Foreign nominal shocks	The more prevalent are foreign nominal shocks, the more desirable is a flexible exchange rate.
Domestic nominal shocks	The more prevalent are domestic nominal shocks, the more attractive is a fixed exchange rate.
Real shocks	The greater an economy's susceptibility to real shocks, whether foreign or domestic, the more advantageous is a flexible exchange rate
Credibility of policymakers	The lower the anti-inflation credibility of policymakers, the greater is the attractiveness of a fixed exchange rate as nominal anchor.

Source: International Monetary Fund, Exchange Rate Arrangements and Economic Performance in Developing Countries, World Economic Outlook, October 1997, p. 83.

### **3.1. High Degree of Factor Mobility**

High mobility of labor and capital within the countries or regions that create an optimum currency area is key prerequisite for irrevocably fixed exchange rates or single currency through the currency area. If labor and capital are insufficiently mobile within a

country then flexibility of the external price of the national currency cannot be expected to perform the stabilization function attributed to it, and one could expect varying rates of unemployment or inflation in the different regions. Similarly, if factors are mobile across national boundaries then a flexible exchange system becomes unnecessary, and may even be positively harmful (Mundell, 1961, p. 664).

### **3.1.1. Labor Mobility and Flexibility of Wages**

The internal labor mobility in comparison with international labor immobility was already discussed above. Labor mobility as a means of absorbing asymmetrical shocks is widely accepted in the literature. Considering the wage flexibility it depends on national trade unions policies and systems of wage indexation. With absence of money illusion, the complete sensitivity of nominal wages to price changes of imported goods is meant here. Suppose for example, that due to a depreciation of the exchange rate, prices of imported goods increase. If negotiations between trade unions and employers are based on a price index excluding imported goods, then a real wage decrease will be the consequence (money illusion). This leads to higher international competitiveness of the domestic industry whereas the negative consequence of the depreciation, namely an inflation tendency, is limited. Therefore, a flexible exchange rate regime can be interesting for nations with money illusion. However, the more realistic case is that trade unions and residents don't accept real wage changes (absence of money illusion), and as a consequence exchange rate variations become a less effective instrument in correcting external imbalances.

The second point concerns the flexibility of real wages over the business cycle. Experience shows that wages adjust more rapidly to positive output shifts and inflation than to a decline of production and stagnation. The less real wages are flexible to negative shocks the less the country in question is able to absorb common shocks.

### **3.1.2. Capital Mobility**

Mundell (1961) suggests that capital mobility, which is indicative of the openness of capital markets, is influential in the choice of exchange rate regime. In the very short run, a floating exchange rate is not tied by purchasing parity and fluctuates according to the capital constraints on foreign exchange dealers and their views of future domestic monetary policy (McKinnon, 1979, p. 195). In the medium to long term, concerning capital mobility can be state that a high financial integration reduces the ability of monetary authorities to run independent monetary policies. Hence, a country's attempt to depart significantly from the international structure of interest rates will generate large and possibly volatile capital flows. This is especially valid for smaller countries that have only limited foreign exchange markets. The cost of abandoning an autonomous monetary policy is therefore smaller, when financial markets are highly integrated. This means that the fixed exchange rate is the most appropriate policy regime.

The assumed ability of capital mobility as a shock absorber may however be questioned. The same factor that causes deterioration in an area's balance of payments position may also lower the return on real investment, leading to a worsening of the direct



investment component of the area's capital account and impairing the ease with which extensive external financing may be secured (Tower and Willett, 1976).

### **3.2. Openness of the Economy**

This factor is based on two arguments. First, it would be quite ineffective to bring together nations with little mutual trade as, for example, the benefits of reducing transaction cost would be negligible. The geographical concentration of trade is viewed as strongly influencing both a country's decision to peg, as well as its choice of marker (anchor currency). Where a country has a dominant trading partner, there is an advantage to pegging to that country's currency. On this basis there is a direct relationship between concentration of trade and suitability to a fixed exchange rate regime. Secondly, the more open an economy is, the less effective flexible exchange rates are as a control device for external balance. The more appropriate is a fixed rate regime. Furthermore, as openness increases, a flexible exchange rate undermines domestic price level stability through the increase of import prices which weight in total prices is very high. Economies that are highly integrated in commodity trade might show lesser variance in money-market conditions and in short-term exchange-rate fluctuations. But, apart from the degree of integration in commodity trade, economies that produce largely primary products (tradables II) would find that domestic prices respond quickly to exchange-rate movements (McKinnon, 1979, p. 194).

Openness is expected to be greater, the smaller the economy. Small countries are more likely to be price takers and suffer price level shocks as a result of price changes for its major export commodity. To contain the resultant exchange rate variability, a fixed exchange rate regime may be more suitable. Moreover, larger countries are likely to have more diversified economies and consequently experience little exchange rate volatility, obviating the need for a fixed exchange rate regime.

### **3.3. Sound Fiscal Policy**

In the irrevocably fixed exchange rate regime fiscal policy becomes more important as an adjustment instrument and instrument for domestic demand management. Therefore, countries should preferably have low national debt and moderate current fiscal deficits, as this allows them to respond more flexibly to asymmetric shocks. Moreover, there is no scope for fiscal subordination of monetary policy. High inflation countries should be able to replace their seigniorage incomes by other resources through a more efficient tax system. The inflation tax revenues will decrease.

### **3.4. Product and trade diversification**

This condition is based upon the theory of Kenen (1969), who concludes that for nations with a low degree of product diversification it might be preferable to maintain flexible exchange rate regime, whereas nations having high product diversification could form a common currency area and adopt irrevocably fixed exchange rate regime. The more diverse a country's exports are, the more stable its foreign exchange earnings are likely to be

and hence also its foreign exchange rate. The advantage of a high product diversification is that shocks, provided they are independent across industries, tend to cancel out in the aggregate and do not constitute an important source of disturbance to the entire economy.

### **3.5. Similar Monetary Sensitiveness Among Countries**

It is important that in the regime of irrevocably fixed exchange rate regime the monetary policy is imported from the anchor currency country. Such monetary policy has to have stabilizing impact on domestic economy. Furthermore, the imported monetary policy from the anchor country has to be more effective than the alternative independent domestic monetary policy which rely on the flexible exchange rate regime.

Both Central Banks will have several instruments at its disposal, especially repo operations, interest rates and minimum reserve requirements. In the case of a big difference in the sensitiveness of the economies to these instruments, an active monetary policy of the anchor currency country will be inappropriate and would have destabilizing impact on domestic economy. For example, if domestic interest elasticity of investment is much higher than in the anchor currency country, increase in interest rates may produce severe recession in domestic country which is not the case in the anchor currency country. On the contrary, if domestic interest elasticity of investment is much lower than in the anchor currency country, increase in interest rates may not sufficiently reduce the inflation rate in domestic country, which will require further interest rate increase that is not acceptable for anchor currency country. Therefore, countries in the optimum currency area should not deviate significantly from the average sensitiveness to a monetary policy of anchor currency country.

### **3.6. Long Term Growth**

Exchange rate fluctuations cannot only be explained by short term changes in economic activity, but also by more general phenomena such as differences in long-term growth potential. Thus, potential members of common currency area should have similar growth tendencies in the longer run. The recent theory of endogenous growth suggests that population growth, levels of education and research, infrastructure, etc. are important determinants of long term economic growth. Namely, fast-growing countries experience fast-growing imports. In order to allow exports to increase at the same rate, these countries will have to make their exports more competitive by real depreciation of their currencies. Their destiny is flexible exchange rate regime in order to preserve fast economic growth. If they join monetary union, or opted for fixed exchange rate regime, these countries will be constrained in their growth. The costs for adopting fixed exchange rate regime will be very high.

Contrary, the so-called Balassa-Samuelson hypothesis connects long-run fast economic growth with fixed nominal exchange rate regime and real appreciation of the exchange rate. Namely, fast economic growth is based on the change in industrial structure, gradually moving up a technological ladder. In many countries, economic development changed the structure from low value-added-goods sectors, such as primary goods and textiles, to high value-added-goods sectors, such as manufacturing and machinery, sectors. Moreover, each sector changes its trade status from a net importer to domestically self-

sufficient, to a net exporter. The Balassa-Samuelson hypothesis conjectures that economic development leads to change in industrial structure which enables productivity increases in the tradable sector (T-sector) to be higher than those in the nontradable sector (N-sector), so that the conventionally constructed real exchange rate will move reflecting cross-country differences in the relative speed of productivity increases between the T-sector and N-sector.

The empirical evidence supports equally both hypothesis. High growth was connected with real exchange rate depreciation in countries where changes in industrial structure didn't take place. Contrary, in countries where high economic growth was based on changes in industrial structure, it was followed by real appreciation of the foreign exchange rate.

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#### 4. EFFECTS OF THE MACEDONIAN EXCHANGE RATE TARGETING STRATEGY

Since January 1994 the monetary authorities in Macedonia have been conducted exchange rate based stabilization program. In the period January 1994 - September 1995, the nominal exchange rate serve as a main indicator for the stance of monetary policy. Since October 1995 the nominal exchange rate has been selected as intermediate target for monetary policy. The desire to "borrow" the credibility and the low inflation reputation of the Bundesbank was the main criteria for selecting a fixed exchange rate regime. Other criteria were not taken in consideration.<sup>1</sup> The idea was through clear and transparent nominal anchor to establish credibility of the stabilization program and to discipline other macroeconomic policies, especially fiscal policy.

Bringing down the inflation has to be done through two channels. The first is the direct one - the fixed exchange rate stabilizes import prices which in Macedonian total price level participate with a weight of 0.4. The second is the indirect one - through the monetary policy. The monetary policy lost its accommodative and independent character. It became endogenous variable that was determined by a need to keep the stability of the exchange rate. Thus, non-accommodative monetary policy became constraint for upward nontradable goods and services price movement.

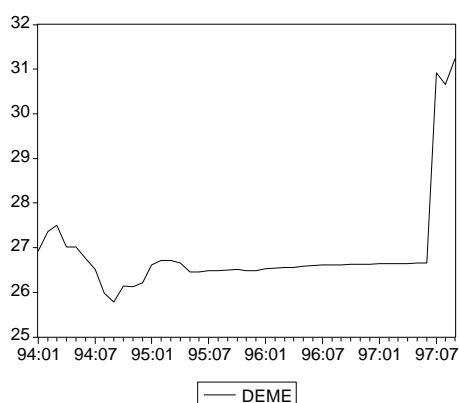
This kind of strategy for bringing down and controlling inflation together with currency boards has been widely accepted by transition countries. Beside the credibility effect<sup>2</sup>, they also rely on unstable money demand and announcement effect as criteria for selecting exchange rate based stabilization programs. In August 1997, 12 transition economies, out of 27, used exchange rate based stabilization programs (Table 1).

The exchange rate based stabilization in Macedonia has been taking place since January 1994. When it started the nominal exchange rate of the Denar against Deutsche mark was perceived as market determined equilibrium exchange rate. After 42 months of unchanged fixed exchange rate against the Deutsche mark, on July 9, 1997, the exchange rate was devalued by 16.1% and the new level of 31.4 Macedonian Denars per Deutsche mark became new intermediate foreign exchange rate target. Thus the exchange rate targeting strategy continue with higher nominal anchor.

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<sup>1</sup> "The optimal exchange rate regime is the one that stabilizes macroeconomic performances, that is, minimizes fluctuations in output, real consumption, the domestic price level, or some other macroeconomic variable. The ranking of fixed and flexible exchange rate regimes depends on the nature and source of the shocks to the economy, policymakers' preferences (i.e., the type of costs they wish to minimize), and the structural characteristics of the economy." (IMF, World Economic Outlook, October 1997, p. 83).

<sup>2</sup> "Credibility in this context is defined as the conformity between the inflation rate expected by private market participants and the (low) inflation rate announced by a Central Bank. Thus, for Central Banks with a low credibility the output and employment costs of disinflation policies are relatively high. These costs could, however, be reduced if a Central Bank were able to improve its credibility by the introduction of an adequate "commitment technology". In other words, it has to find a mechanism by which it can make its announcement of a low inflation rate more credible." (Bofinger, 1994, pp. 20-21).

**Chart 1****NOMINAL DENAR EXCHANGE RATE AGAINST DEUTSCHE MARK**

DEME = nominal exchange rate of the Denar against the Deutsche mark

**Table 1** (part 1)

**COUNTRIES IN TRANSITION: EXCHANGE RATE REGIME  
AND MONETARY POLICY INSTRUMENTS, AUGUST 1997**

EXCHANGE RATE REGIME	FOCUS OF EXCHANGE RATE POLICY	MONETARY FRAMEWORK	MONETARY POLICY INSTRUMENTS
<b>Currency board</b>			
Bosnia and Herzegovina	Deutsche mark	Currency board	Reserve and liquidity requirements
Bulgaria	Deutsche mark	Currency board	Reserve requirements
Estonia	Deutsche mark	Currency board	Certificates of deposit
Lithuania	Dollar	Currency board	Uniform reserve requirement
<b>Targeted exchange rate</b>			
Croatia	De facto target band vis-à-vis Deutsche mark	Exchange rate target	Central Bank bill auctions
Hungary	Crawling band vis-à-vis Dollar-Deutsche mark basket, $\pm 2.25\%$	Exchange rate target	Repurchase, open market operations
Latvia	Peg to SDR	Exchange rate target	Exchange rate window
Macedonia	De facto peg to Deutsche mark	Exchange rate target	Reserve requirements, credit ceilings, Central Bank deposit auctions
Poland	Crawling band vis-à-vis currency basket, $\pm 7\%$	Exchange rate target, monitoring credit and money expansion	Repurchase, open market operations, reserve requirements
Russia	Crawling band vis-à-vis dollar, $\pm 5\%$	Exchange rate target	Credit and deposit auctions, primary and secondary treasury bill markets
Slovak Republic	Target band vis-à-vis Dollar-Deutsche mark basket, $\pm 7\%$	Exchange rate target	Repurchase operations, reserve requirements, suasion
Ukraine	Target band of 1.7 to 1.9 <b>hryvnia</b> vis-à-vis the Dollar	Exchange rate target	Credit auctions, repurchase operations, foreign exchange sales



**Table 1** (part 2)

**COUNTRIES IN TRANSITION: EXCHANGE RATE REGIME  
AND MONETARY POLICY INSTRUMENTS, AUGUST 1997**

EXCHANGE RATE REGIME	FOCUS OF EXCHANGE RATE POLICY	MONETARY FRAMEWORK	MONETARY POLICY INSTRUMENTS
<b>Managed floating rate</b>			
Belarus	Ad hoc pegs to various currencies	Monitoring inflation and exchange rates	Credit auctions, treasury bill market
Czech Republic	Ad hoc intervention to limit fluctuations against the Deutsche mark	Money growth target	Open market operations, reserve requirements
Georgia	Broad stability vis-à-vis Dollar	Monitoring of credit growth	Credit to government, credit auctions, foreign exchange sales
Kyrgyz Republic	Ad hoc peg to the Dollar	Monitoring of money growth	Treasury bill auctions, foreign exchange auctions
Slovenia	Ad hoc intervention	Reserve money target	Repurchase operations, window financing, central bank bills, foreign exchange operations
Turkmenistan	Multiple rates	Liquidity targets	Credit auctions
Uzbekistan	Multiple rates	Monitoring of money growth	Credit and CD auctions
<b>Floating rate</b>			
Albania	. . .	Money growth target	Reserve and liquidity requirements, treasury bill auctions
Armenia	. . .	Money growth target	Credit and deposit auctions, repos and reverse repos
Azerbaijan	. . .	Money growth target	Credit auctions, directed credits, foreign exchange sales
Kazakhstan	. . .	Reserve money target	Open market operations, foreign exchange sale
Moldova	. . .	Reserve money target	Credit auctions, small treasury operations
Mongolia	. . .	Real interest rate target	Credit auctions
Romania	. . .	Money growth target	Credit auctions
Tajikistan	. . .	Bank credit ceilings	No market-based instruments.

Source: International Monetary Fund, Monetary and Financial Sector Policies in Transition Countries, World Economic Outlook, October 1997, p. 99.

In the Macedonian case, the duration of the fixity of the exchange rate overcame the average duration of pegs in Latin America in the period 1957-90 (10 months) by three times. But, duration was a half of that in Mexico (1987-1994). Exchange rate based stabilization programs typically have been short-lived, the duration of pegs has differed across countries. The probability of a peg being abandoned was directly affected by the rate of real exchange rate appreciation and the degree of openness of the economy. Among 87

episodes of pegged regimes in Latin America and Jamaica in the period 1957-90, the exit rate from a peg was high. The median duration of a peg was about ten months, but about one-third of the pegs were abandoned by the seventh months and more than half by the end of first year (IMF, October 1997, p. 91).

Medium term duration of a peg in Macedonian case is an evidence of an appropriate support of economic policies to the peg. The fixed exchange rate was maintained under the conditions of existing surplus on foreign exchange market. The exceptions were 1996 and the first half of 1997. In 1996 the market was balanced, and in first six months of 1997 there was a market deficit of 11.9 million US dollars. Together with high trade and current account deficit and unsustainable squeeze of monetary growth (negative growth rates of money supply) that was a consequence of the need to maintain unequilibrium exchange rate, were the main reasons for the devaluation of the exchange rate on July 9, 1997. After the devaluation the market situation was reversed. In the period July-September 1997 a surplus of US Dollars 48.6 million was achieved. Thus, for the first nine months of 1997, a total surplus of USD 36.7 million was realized.

**Table 2**

**SURPLUS ON FOREX MARKET  
AND SOME BALANCE OF PAYMENTS ITEMS**

(In million US Dollars)

Year	Forex Market Surplus	Current account	Trade account	Direct investment	Commercial credits
1994	38.5	-161.0	-340.0	24.0	189.2
1995	60.5	-221.0	-420.0	9.5	141.6
1996	0.7	-288.0	-472.0	11.2	78.7
1997 I-IX.	36.7	-218.0	-288.0	6.0	217.0
<b>As share of GDP in %:</b>					
1994	1.2	-5.1	-10.8	0.8	6.0
1995	1.6	-5.8	-11.1	0.3	3.7
1996	0.0	-7.8	-12.9	0.3	2.1
1997 I-IX.	n.a.	n.a.	n.a.	n.a.	n.a.

From Table 2 it is evident that the surplus on the foreign exchange market is not a result of sound fundamental factors such as: high domestic saving, current account surplus or strong inflow of capital in the form of direct investment. The surplus was due to short term factors such as huge short term capital inflow registered in the balance of payment under the item commercial credits, mainly caused by high domestic interest rates.<sup>3</sup> Such situation, although not different from that in other countries in transition,<sup>4</sup> except in the case of direct investment capital inflow, is not sustainable even in the medium term.

<sup>3</sup> "As the relative price of money, the exchange rate is determined by market "fundamentals", that is, output, price levels, money supplies and interest rates. In the short run, a relation called uncovered interest parity (UIP) is thought to control exchange rates. In the long run, theory suggests that the relative price of goods determine exchange rates through a relation called purchasing power parity". (C. J. Neely, 1994, p. 24).

<sup>4</sup> "Transition economies as a rule (Russia being the most notable exception) run significant or high trade or current account deficits. The developments of these deficits indicate that they are sensitive to exchange rate changes, but their existence appears to be resistant to differences in exchange rate policies and regimes. As transition economies have tried practically all possible exchange rate regimes and policies (currency boards, fixed pegs, crawling pegs, narrow and wide bands, managed float, float), the persistence of external sector deficits indicates that there are some longer-term disequilibria in the fundamentals that policy choices cannot adequately address (here Slovenia seems to be a partial exception)." (Gligorov and Sundstrom, 1997, p. 27).

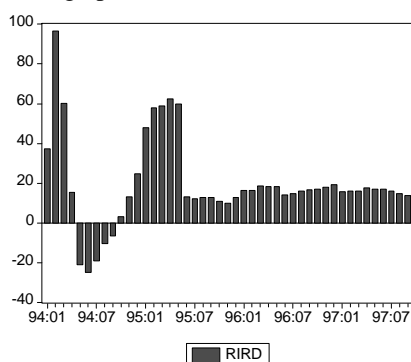
The cumulative surplus on foreign exchange market in the period January 1994 - September 1997 was USD 136.4 million. This surplus was achieved in an environment of cumulative current account deficit of USD 888 million, and cumulative trade account deficit of USD 1,520 million. Simultaneously, the cumulative inflow of capital in the form of direct investment, in the same period, was USD 50.7 million and cumulative short term borrowing in the form of commercial credits was USD 626.5 million.

At the end of 1996 the current account deficit in the balance of payment reached 7.8% of GDP, and the trade deficit reached 12.9% of GDP. Simultaneously, real exchange rate of Denar against Deutsche mark appreciated by 21.87% in comparison with the level of November 1993, that was thought to be an equilibrium exchange rate. Such situation was assessed as unsustainable and on July 9, 1997 the Denar exchange rate against Deutsche mark devalued by 16.1%.

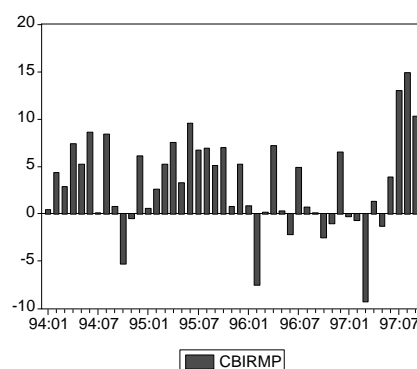
**Chart 2**

**REAL INTEREST RATE DIFFERENTIAL AND SURPLUS ON  
FOREIGN EXCHANGE MARKET**

(in percentage points)



(in million USD)



RIRD = real interest rate differential; CBRIMP = Central Bank interventions on the foreign exchange market

The main driving force of foreign exchange surpluses were relative high domestic interest rates in comparison to those in Germany and increased real money demand after the reduction of inflation and reduction of inflationary expectations. The domestic nominal inter bank interest rates in 1994 were 20 times higher than in Germany, resulting in positive real interest rate differential of 14.1 percentage points. In 1995 domestic nominal inter bank interest rates were higher by 6.8 times, but the real interest rate differential increased to 30.9 percentage points. In 1996 domestic nominal inter bank interest rates were higher by 6.2 times, and the real interest rate differential was reduced to 16.9 percentage points. In the first nine months of 1997 the domestic nominal inter bank interest rates were by 5.9 times higher than that in Germany, which resulted in real interest rate differential of 15.9 percentage points. For the whole period (January 1994 - September 1997) the domestic nominal inter bank interest rates were by 9.7 times higher than that in Germany which resulted in an average real interest rate differential of 19.4 percentage points.

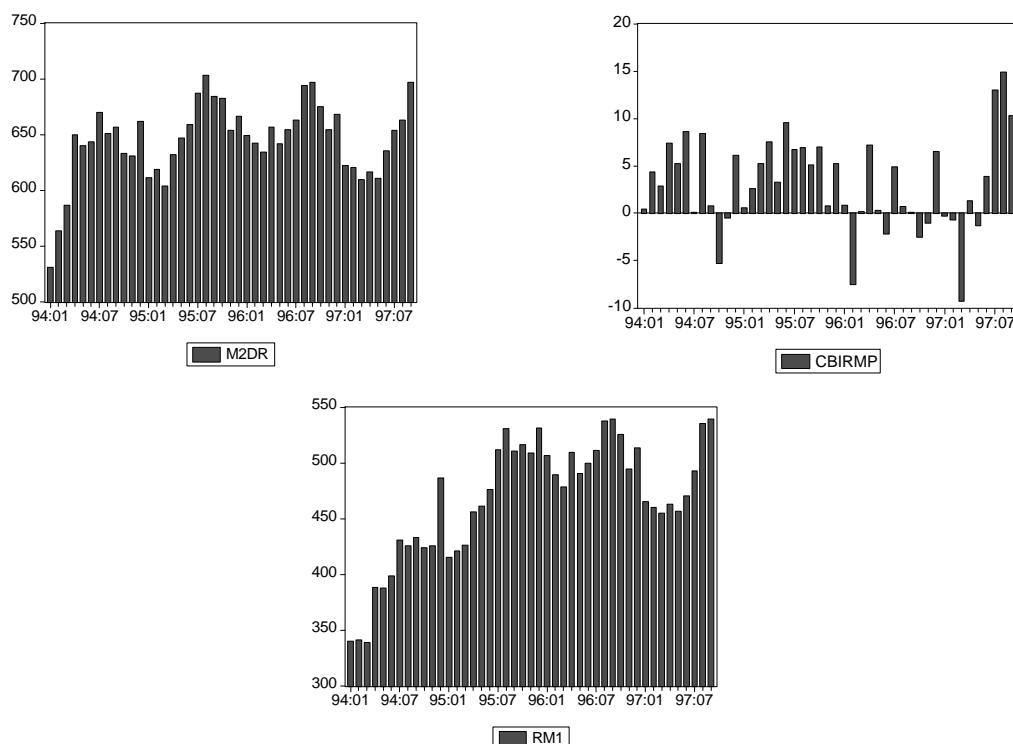
**Table 3**

**FOREIGN EXCHANGE SURPLUS, INTEREST RATE DIFFERENTIAL  
AND REAL MONEY DEMAND STRENGTHENING**

Period	Annual average interest rate differential in percentage points	Increase in real money demand in percent		Foreign exchange market surplus in million US dollars
		M1	M2	
1994	14.1	22.0	15.2	38.5
1995	30.9	9.0	0.7	60.5
1996	16.9	-3.2	0.1	0.7
1997 I-IX.	15.9	0.0	0.0	36.7
Total:	19.4	28.7	16.1	136.4

The second cause of surplus on the foreign exchange market was permanent increase in the real money demand. In the period January 1994 - September 1997, the real demand for the narrowest definition of money (M1) increased cumulatively by 28.7% by the following pattern: in 1994 an increase by 22.0%, in 1995 by 9.0%, in 1996 decrease by 3.2%, and in the first nine months of 1997, real demand for the monetary aggregate M1 remained unchanged. Simultaneously, real demand for Denar component of the broader monetary aggregate M2 in the period January 1994 - September 1997, cumulatively increased by 16.1%. The pace in particular years was the following: in 1994 it increased by 15.2%, in 1995 by 0.7%, and in 1996 and in the first nine months of 1997 real demand for M2 Denar component was flat. As a consequence, this increased the coefficient of domestic liquidity (money supply/GDP). Thus, liquidity coefficient measured as a ratio between M1 and GDP increased from 0.056 in 1994 to 0.080. In the same time the liquidity coefficient measured as a ratio between M2 - Denar part and GDP increased from 0.09 in 1994 to 0.104 in 1996. Although there was significant increase, both coefficients remained considerably below the ones prevailing in developed market economies and the ones in most advanced countries in transition.

Chart 3

**REAL MONEY DEMAND AND FOREIGN EXCHANGE SURPLUS**

M2DR = real demand for M2 - Denar; CBRIMP = Central Bank interventions on the foreign exchange market; RM1 = real demand for M1

Foreign exchange market has been very shallow. The average annual turnover, for the period 1994-1996, was USD 1,057 million, that accounts for 29.9% of GDP. Compared with total turnover in developed economies, it is lower by 40 times.<sup>5</sup> In comparison with the turnover in most advanced transition economies, Macedonian turnover is lagging behind by 16.9 times.<sup>6</sup> Almost the total turnover on the foreign exchange market is connected with the transactions of the current account of the balance of payment. Actually there is no convertibility of the Denar for capital transactions. Furthermore, the foreign exchange transactions are of spot nature (forward foreign exchange market does not exist). Enterprises are dominating the foreign exchange market. In the analyzed period transactions between enterprises account for 28.3% of total foreign exchange turnover. In addition, trade between enterprises and banks accounts for 56.1% of total turnover. The Central Bank participate in total turnover with 13.5%. The turnover between banks was very small and it accounts for 2.1% of total turnover in the period 1994-96.

<sup>5</sup> An average annual turnover on the foreign exchange markets in the most developed economies is equal to 1200% of GDP. For more details see in Norbert Funke and Mike Kennedy, International Implications of European Economic and Monetary Union, Economic Department Working Papers, OECD/GD, No. 174/1997, p. 20.

<sup>6</sup> An average annual turnover on the foreign exchange markets in the most advanced transition economies account for 504% of GDP. In Hungary the share is 572.4% of GDP, in Poland it is 157.8% of GDP and in the Czech Republic the share is 782.3% of GDP. For more details see in Elmar B. Koch, Exchange Rates and Monetary Policy in Central Europe - A Survey of Some Issues, Oesterreichische Nationalbank, Working Paper No. 24/1997, p. 16.

**Table 4****FOREIGN EXCHANGE MARKET DEVELOPMENT**

(On annual base in million US Dollars)

Year	Total annual turnover	Turnover between firms	Turnover between banks and firms	Turnover between banks	Turnover between C. Bank and banks	Share of total turnover in GDP in percent
1994	976	249	543	11	172	31.0
1995	1,079	344	614	24	95	28.6
1996	1,116	307	621	31	156	30.2
1997 I.-VI.	474	137	253	13	71	n.a.
Structure in percent						
1994	100.0	25.5	55.7	1.2	17.6	-
1995	100.0	31.9	56.9	2.3	8.9	-
1996	100.0	27.6	55.6	2.8	14.0	-
1997 I.-VI.	100.0	28.9	53.4	2.7	15.0	-

**4.1. Monetary Policy Effects**

The exchange rate constraint in a fixed exchange rate system determines the equilibrium domestic price level for a small country as:

$$Pd^* = EPf^*/ER^* \quad (1)$$

where:  $E$  is the fixed nominal exchange rate, equal to the number of **equilibrium** domestic currency units per unit of foreign currency, and  $ER^*$  is the corresponding equilibrium real exchange rate.<sup>7</sup> With the domestic price level determined by equation (1), the domestic money stock must adjust to bring about equilibrium in the domestic money market. The exchange rate is determined in the money market of two economies, and in particular by relative money supplies and by relative difference between real interest rates.

A country that chooses a fixed exchange rate system subordinates its monetary policy to the exchange rate objective and is unable to target any other nominal variable on a lasting basis. The Central Bank that adopts the fixed exchange rate regime, simultaneously accepts that it will not conduct monetary policy that is independent from the anchor currency country. This means that the domestic country money supply becomes endogenous variable determined by the money supply in the anchor currency country, in order to keep the stability of the exchange rate. Thus, the price stability (inflation) in domestic country is determined by the money supply growth in anchor currency country (Kool, Tatom, 1994, p. 11).

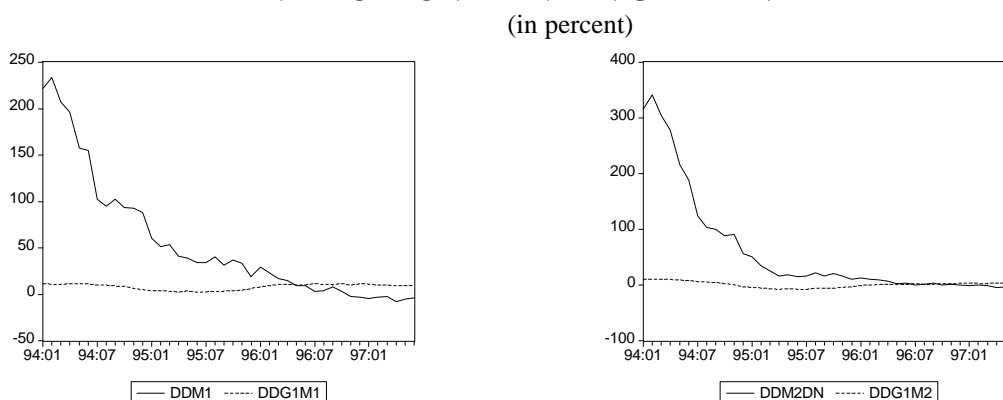
<sup>7</sup> In the traditional pure monetary approach to the balance of payments, the real exchange rate is assumed to be a constant and may be deleted from the analysis.

### 4.1.1. Money Supply Effects

With the adoption of exchange rate based stabilization, the monetary policy in Macedonia lost its accommodative and independent stance. In order to maintain the stability of the exchange rate at 26.5 Denars per Deutsche mark, established in December 1993, swift convergence of domestic money supply growth rates to those in Germany started to occur. The annual growth rate of the narrowest definition of money supply M1 was reduced from 221.6% in January 1994, to 9.3% in May 1996, that was similar to the growth rate of the same monetary aggregate in Germany at that period (10.4%). In the same time, the annual growth rate of the broader definition of money supply M2-denar was reduced from 315.6% in January 1994, to 1.9% in May 1996. The achieved growth rate of this monetary aggregate in May 1996 was similar to the growth rate of the same monetary aggregate in Germany (1.0%).

**Chart 4**

#### ANNUAL GROWTH RATES OF MONEY SUPPLY M1 AN M2 IN MACEDONIA AND IN GERMANY



DDM1 = annual growth rates of M1 in Macedonia; DDG1M1 = annual growth rates of M1 in Germany; DDM2DN = annual growth rates of M2 - Denar in Macedonia; DDG1M2 = annual growth rates of M2 in Germany

The need to defend the peg of 26.5 Denars per Deutsche mark since June 1996 led to further sharp deceleration of the growth rates of domestic money supply, that were considerably below those in Germany. Since December 1996, domestic money supply growth rates became negative and in April 1997 they were reduced to -4.7% for M2-denar and -7.8% for M1, whereas at the same time German growth rates of money supply were 3.4% and 9.3% respectively. It was evident that the level of exchange rate was dictating unsustainable liquidity squeeze and sharp deviations between monetary conditions in Germany and Macedonia. Such a level of the exchange rate was assessed as inappropriate, and on July 9<sup>th</sup>, 1997, the exchange rate was boosted from 26.65 Denars to 30.97 Denars per Deutsche mark.

The money supply had to defend the new exchange rate target. The new exchange rate anchor accelerated domestic growth rates of money supply, and at the end of September 1997 they became positive and started to converge to the growth rates of the money supply in Germany. At the end of the third quarter of 1997, annual growth rate of the narrowest definition of money supply M1 was 0.6%, whereas annual growth rate of the broader monetary aggregate M2-denar was 1.9%. The annual growth rates of money supply M1 and M2 in same period in Germany were 6.7% and 4.8%, respectively. At the end of

1997, the growth rates of M1 and M2 in Macedonia approached 12,7% and 8,5%, respectively.

In order to keep domestic monetary growth in line with that in Germany and maintain the fixed exchange rate, the Central Bank had to sterilize monetary effects of surplus purchases on the foreign exchange market. The need and scope of sterilization depend on the causes that created foreign exchange market surpluses.

**Table 5**

**FOREIGN EXCHANGE SURPLUSES, CAUSES, AND WAYS OF  
STERILIZATION OF THE CENTRAL BANK INTERVENTIONS**

Period	Market purchases in USD million	Market purchases in MKD million	Real money demand increase in percent		Ways of sterilization of Central Bank interventions in million Denars		
			M1	M2-denar	Purchased bank deposits	Central Bank bills	Government deposits
1994	38.5	1,580	22.0	15.2	0	0	0
1995	60.5	2,360	9.0	0.7	-480	-510	-1,411
1996	0.7	29	-3.2	0.1	+480	+480	-1,200
1997I-IX.	36.7	2,055	0.0	0.0	0	-510	-892
Total:	136.5	6,024	28.7	16.1	0	-540	-3,503

"+" means issuance of reserve money; "-" means withdrawal of reserve money.

The causes for foreign exchange market surpluses determined the need and the scope of sterilization of the monetary effects of Central Bank interventions. In 1994, the Central Bank bought a foreign exchange surplus of USD 38.5 million. This led to reserve money creation of Denar 1,580 million. There was no need to sterilize this effects, because the main cause for foreign exchange surplus was considerable increase in real money demand (by 22.0 for M1 and by 15.2% for M2-denar). Thus, in 1994 the monetary effects of Central Bank interventions on the foreign exchange market were automatically neutralized by increase in real money demand, that was simultaneously the main cause for foreign exchange surplus. The real money demand in the period January 1995 - September 1997 remained almost unchanged. The main causes for foreign exchange surplus in that period were relatively high domestic real interest rates in comparison to that in the most developed countries and huge short term capital inflow in the form of commercial credits. This created a need for sterilization of the monetary effects of Central Bank interventions on foreign exchange market. The sterilization has been done by combination of monetary and fiscal measures. Thus, in 1995 the sterilization was partly realized through withdrawal of reserve money by monetary policy instruments such as purchase of bank deposits, selling of Central Bank bills and partly by transfer of government deposits at the Central Bank. Through the monetary policy instruments an amount of Denars 990 million of reserve money was withdrawn, and through the transfer of government deposits at the Central Bank additional amount of Denar 1,411 was sterilized. In 1996 there was no foreign exchange surplus. But, because of government transfer of deposits at Central Bank in amount of Denar 1,200 million, there was high issuance activity of the Central Bank through domestic open market type instruments. On the cumulative base, in the first nine months of 1997 there was foreign exchange market surplus of USD 36.7 million. The total surplus was achieved in the third quarter of 1997, after the devaluation of the exchange rate against the



Deutsche mark by 16.1%. In the first half of 1997 there was foreign exchange market deficit of USD 11.9 million. The sterilization was done partly through the increased real money demand after devaluation, partly through the withdrawal of reserve money by monetary policy instruments - Denar 510 million, and partly through an increase of government deposits at the Central Bank - Denar 892 million.

The non-accommodative stance of the monetary policy was reflected also in the Central Bank seigniorage and the inflation tax. Simultaneously, fixed exchange rate regime disciplined fiscal policy and put clear bands on the scope of fiscal deficits.

**Table 6**

**SEIGNIORAGE, INFLATION TAX AND FISCAL DEFICIT**

Year	Seigniorage to GDP		Inflation tax rate	Fiscal deficit to GDP
	Measure I	Measure II		
1993	3.9	3.8	69.6	13.6
1994	1.6	1.4	35.5	3.2
1995	0.5	0.4	8.4	3.2
1996	0.6	0.01	0.2	2.5

Measure I defined as: Annual change in monetary base divided by nominal GDP.

Measure II defined as: Annual monetary base multiplied by the inflation tax rate and divided by nominal GDP.

Inflation tax rate defined as:  $\text{CPI Inflation} / (100 + \text{CPI})$ , a bounded measure of the real losses on holdings of money balances.

The reliance on seigniorage was considerably reduced. The level of seigniorage in 1993, that was characteristic for developing countries, in 1995 and 1996 was reduced to the developed countries level.<sup>8</sup> The Central Bank seigniorage measured by measure I was reduced from 3.9 in 1993 to 0.5 and 0.6 in 1995 and in 1996, respectively. Measured by measure II the Central Bank seigniorage was reduced from 3.8 in 1993 to 0.4 and 0.01 in 1995 and 1996, respectively. This shows that total National bank of Macedonia policy was subordinated to maintaining fixed exchange rate target and by this to achieve its ultimate goal - the price stability.

The same pattern of behavior presents the inflation tax. In 1993 and 1994 policy makers heavily rely on the inflation tax. The inflation tax rate was 69.6% and 35.5% respectively. In 1995 and in 1996 inflation tax rate was reduced to 8.4% and 0.2%,

<sup>8</sup> The average Central Bank seigniorage measured by measure I in the developing countries is 2.93. By particular countries the seigniorage is the following: Nigeria 2.1, Tanzania 3.01, Kenya 1.71, Egypt 5.66, Peru 5.70, Mexico 2.96, Turkey 3.02, Brazil 5.13 and Argentina 3.66. The Central Bank average seigniorage measured by measure II in the developing countries is 2.61. By particular countries the seigniorage is the following: Nigeria 2.19, Tanzania 3.00, Kenya 1.31, Egypt 5.10, Peru 5.57, Mexico 3.22, Turkey 2.98, Brazil 5.26 and Argentina 3.66. The average Central Bank seigniorage measured by measure I in the most developed economies is 0.37. By particular countries the seigniorage is the following: Denmark 0.50, Germany 0.44, United States 0.37, Canada 0.19, Norway 0.28, Sweden 0.65, United Kingdom 0.20 and France 0.25. The Central Bank average seigniorage measured by measure II in the most developed economies is 0.30. By particular countries the seigniorage is the following: Denmark 0.22, Germany 0.29, United States 0.26, Canada 0.22, Norway 0.36, Sweden 0.47, United Kingdom 0.25 and France 0.31. For more details see in Paul R. Masson, Miguel A. Savastano, and Sunil Sharma, The Scope for Inflation Targeting in Developing Countries, IMF Working Paper, WP/97/130, October 1997, 26-28.

respectively, which is in accordance to the inflation tax rate in the most developed countries.<sup>9</sup>

Fiscal policy was also subordinated to the need of maintaining fixed exchange rate. Huge fiscal deficit (13.6% of GDP in 1993) became negligible (3.2% of GDP in 1994 and 1995 and 2.5% in 1996) after the implementation of exchange rate based stabilization. Furthermore, in the analyzed period there was no government borrowing from the Central Bank. On the contrary, in order to enable sterilization of Central Bank interventions on the foreign exchange market, there were considerable transfers of deposits by the government at the Central Bank.

Thus, since January 1994, when the exchange rate based stabilization started in Macedonia, through clear and transparent rule, the monetary and fiscal policy were swiftly disciplined. The monetary policy lost its accommodative and independent stance and since May 1996, growth rates of money supply in Macedonia on long term basis converged to those in Germany as the anchor currency country. The fiscal deficit in 1996 was reduced below the Maastricht criteria level, while in 1995 and 1994 it was insignificantly above this level. The fiscal policy definitely gave up from relying on Central Bank seigniorage and inflation tax. Furthermore, there was no government borrowing from the Central Bank. On the contrary, in order to sterilize monetary effects of Central Bank interventions on foreign exchange market, the Government transferred considerable amount of deposits in the stabilization fund at the Central Bank. Thus, the Government became net lender to the Central Bank. All this created sound environment for very low long term inflation rate.

#### 4.1.2. Interest Rate Effects

Same as the money supply, domestic interest rates became endogenous variables that were determined by a need to maintain the exchange rate target. In the first two years of exchange rate based stabilization that led to very high increase of real domestic interest rates. Risk premium also played a significant role in the increase of real interest rates. But, due to the lack of methodological tool for calculating the risk premium, it is not considered in this research work. After the inflation had been coped, and the inflationary expectations were phased out, as the credibility of stabilization policy was increased the domestic real interest rates began to fall and moderately to converge to German ones. However, real interest rate differentials were very high even in the first half of 1997, when the Macedonian economy was faced with deflation.<sup>10</sup>

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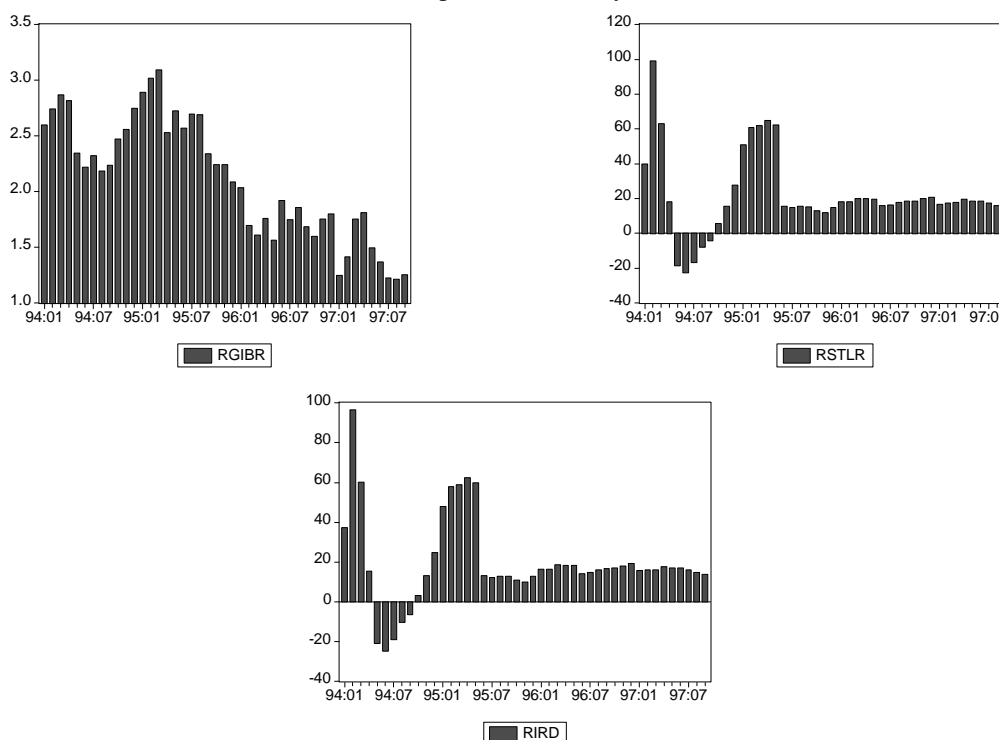
<sup>9</sup> For comparison between inflation tax rates in Macedonia and inflation tax rates in the developing and in the most developed economies one can see in Paul R. Masson, Miguel A. Savastano, and Sunil Sharma, *The Scope for Inflation Targeting in Developing Countries*, IMF Working Paper, WP/97/130, October 1997, p. 26-28.

<sup>10</sup> Stabilization on the basis of a fixed exchange rate will sooner or later call for a parity adjustment if it is not possible to stop inflation completely. A delayed adjustment would result in an overvaluation, the expectation of a devaluation and the need to keep real interest rates high to ward off a potential speculative attack. In the end, an exchange rate crisis could lead to a collapse of the exchange rate arrangement. So one of the main questions at this point in time appears to be: for how long is the current exchange rate arrangement credible, if at all? (Koch, 1997, p. 12).

Chart 5

### GERMAN AND MACEDONIAN REAL INTERBANK INTEREST RATES AND REAL INTEREST RATE DIFFERENTIAL

(In percent, annually)



RGIBR = real interbank interest rate in Germany; RSTLR = real interbank interest rate in Macedonia; RIRD = real interest rate differential

The existence of high real interest rate differentials is an evidence that the fixed exchange rate was mainly kept by short term factors as are monetary conditions. The long term factors as are fundamentals (savings, investment, output, relative prices, and current account balance in the balance of payment) played minor role in maintaining the stability of the exchange rate. That determined the burden of fixed exchange rate mainly to be borne by relatively high domestic real interest rates.

The average real inter bank interest rate in Macedonia in the analyzed period (January 1994 - September 1997) was 21.5%. The same rate in Germany was 2.1%. That created an average real inter bank interest rate differential of 19.4 percentage points. Domestic real inter bank interest rates achieved its peak in 1995 (33.5%, with real interest rate differential of 30.9 percentage points). Since 1996 domestic real interest rates began slowly to fall which led to reduction in real interest rate differential. In 1996 average domestic real inter bank interest rate was reduced to 18.7% and in the first nine months of 1997 further to 17.4%. As a consequence, the real interest rate differential was reduced to 16.9 percentage points and 15.9 percentage points, respectively.

Although domestic real interest rates were high, that created high real interest rate differentials in comparison to those in Germany, the Central Bank nominal interest rates were in accordance to Taylor rule for interest rate setting given by the following equation (Taylor, 1995, p. 409):

$$R = p + b(Y - Y^*) + d(p - p^*) + p^* \quad (2)$$

where:  $R$  is the short term nominal interest rate set by Central Bank (discount rate, repo rate or federal fund rate). The  $b$  and  $d$  are Central Bank reaction coefficients to the difference between actual and potential growth and actual and targeted inflation rate. Thus, by changing the coefficients the Central Bank can get various combinations of interest rates depending on whether the Central Bank gives more weight to low inflation or to growth. The Taylor rule gives the same weight to the coefficients  $b$  and  $d$  of 0.5, meaning that the Central Bank is setting interest rate to achieve long run low inflation consistent with the potential growth (NAIRU - Non Accelerating Inflation Rate of Unemployment). The  $Y$  is current growth,  $Y^*$  is potential growth,  $p$  is current inflation, and  $p^*$  is the targeted inflation rate at the level of potential growth. By explicit introduction of coefficients  $b$  and  $d$  to be equal to 0.5 in equation (2) we get:

$$R = p + 0.5(Y - Y^*) + 0.5(p - p^*) + p^* \quad (3)$$

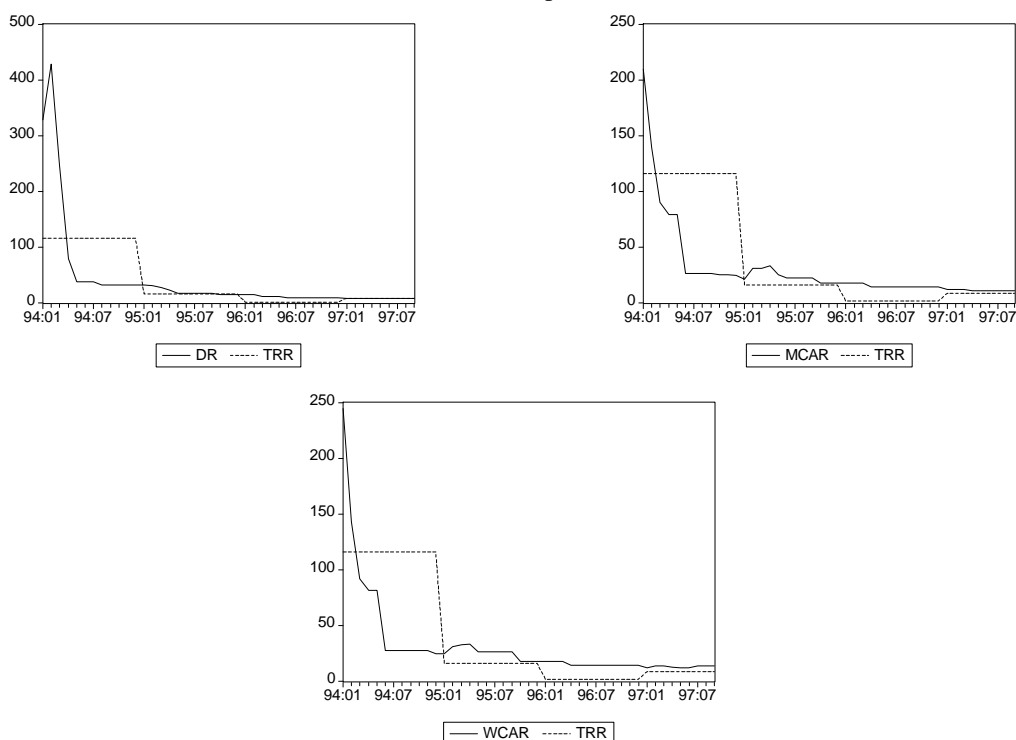
Thus, if real GDP rises above potential GDP by 1 percentage point, the policy rule says that the Central Bank will raise the short-term interest rate by 0.5 percent. On the other hand, if real GDP falls below potential GDP, as it would in a recession, the Central Bank will cut the interest rate according to the given policy rule. Changes in inflation also cause the Central Bank to change interest rates. If the inflation rate rises by 1 percentage point, then the Central Bank raises the interest rate by more than the inflation rate, because the Central Bank tries to raise the real interest rate when inflation rises in order to slow down the economy and reduce inflationary pressures.

The equation (3) is used to calculate nominal Central Bank rate in Macedonia in accordance to the Taylor rule. In order to calculate the interest rate, for potential GDP growth and targeted inflation rate the projected growth rates for the corresponding years are used. The results are presented in the Table 7 and Chart 6.

Chart 6

### CENTRAL BANK INTEREST RATES AND TAYLOR RULE INTEREST RATES

(In percent)



DR = Discount Rate; MCAR = Minimum Credit Auction Rate; WCAR = Weighted Average Credit Auction Rate; TRR = Taylor Rule Rate

Table 7

### DOMESTIC INTEREST RATES

(In percent, end of December)

Year	Discount rate	Minimum credit auction rate	Weighted average credit auction rate	Inter bank rate	Taylor rule rate
1994	33.0	24.6	25.1	97.8	116.2
1995	15.0	18.1	18.6	25.4	16.2
1996	9.2	14.4	14.5	21.2	1.9
1997 IX.	8.9	11.0	14.1	19.7	8.9

In 1994 all Central Bank rates (discount rate 33.0%, minimum credit auction rate 24.6 and weighted average credit auction rate 25.1%) were below the Taylor rule rate (116.2%). In 1995 Taylor rule rate was between discount rate (15.0%) and weighted average auction rate (18.6%). In 1996 all Central Bank rates (discount rate 9.2%, minimum credit auction rate 14.4% and weighted average credit auction rate 14.5%) were considerably above Taylor rule rate. At the end of third quarter of 1997, discount rate was exactly equal to Taylor rule rate (8.9%) and weighted average credit auction rate was 5.2 percentage points higher than the Taylor rule rate. For whole period (January 1994 - September 1997), the Central Bank interest rates mainly were in line with setting the interest rates in accordance to the Taylor rule. In one case (1994) they were below the Taylor rule rate, in two cases (1995 and first nine months of 1997) Central Bank interest rates were in accordance to Taylor rule rate, and in one case (1996) Central Bank interest rates were above Taylor rule rate.

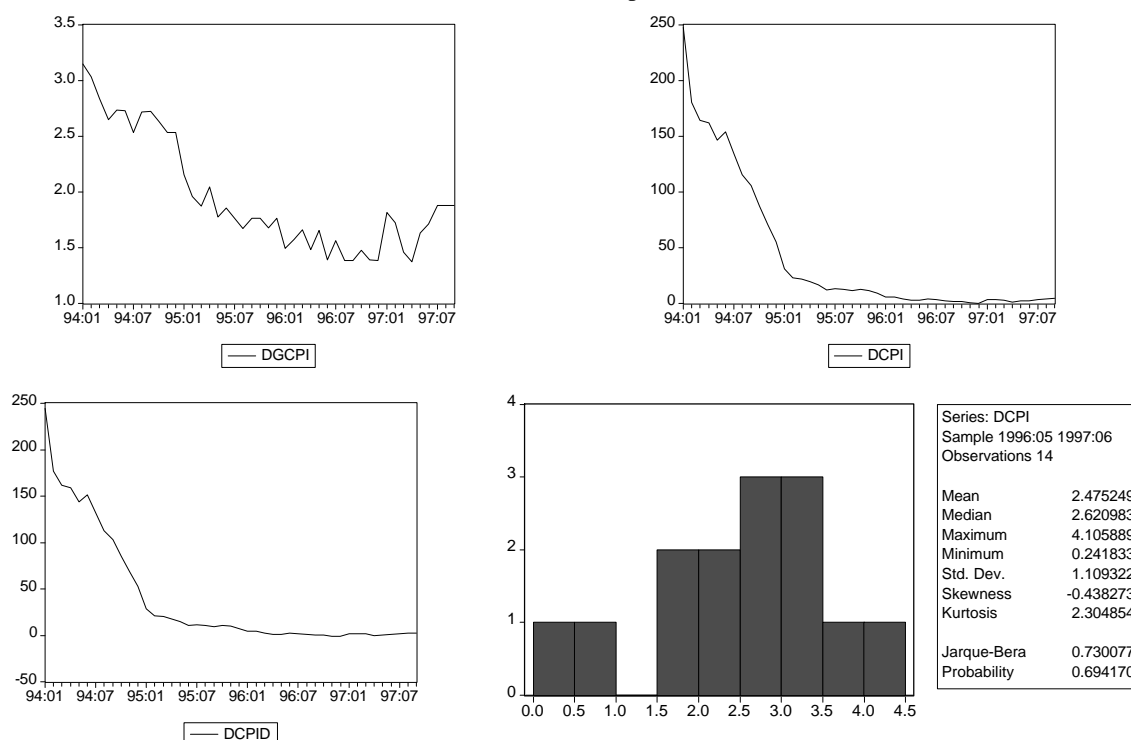
## 4.2. Price Effects

The exchange rate based stabilization was extremely effective in bringing down and maintaining low inflation. The rate of inflation, measured by consumer price index was brought down from 229.5% at the end of 1993, to 55.0% in 1994, and further to 9.2% and 0.2% in 1995 and 1996, respectively. The rate of inflation in Macedonia, converged to inflation rate in Germany in May 1996 (2.7% in Macedonia and 1.6% in Germany) and the inflation rate differential was reduced to 1.1 percentage points. From May 1996 to June 1997, Macedonia was importing the German inflation rate due to the fixed exchange rate regime and nonaccommodative stance of monetary policy that was oriented to maintain the pegged exchange rate of 26.5 Denars per Deutsche mark. The average annual domestic inflation rate in a period May 1996 - June 1997 was 2.4%, which resulted in inflation rate differential to Germany of only 0.9 percentage points. Furthermore, the volatility of inflation has been reduced. The median rate of inflation at that period was 2.6%, and standard deviation from the mean was 1.109, whereas the minimum and maximum rates of inflation were 0.24% and 4.10%, respectively. Price stability was not undermined even after the devaluation of the exchange rate of Denar against Deutsche mark by 16.1% on July 9<sup>th</sup>, 1997. Domestic inflation rate temporarily increased to 4.8% at the end of September 1997, whereas the German inflation rate in the same period was 1.9%. It is expected that until the end of 1997, the devaluation effect on inflation will be exhausted and since the beginning of 1998, the Macedonian economy will be faced with German rates of inflation on permanent base.

**Chart 7**

### CONSUMER PRICE RATE OF INFLATION

(On annual level, in percent)

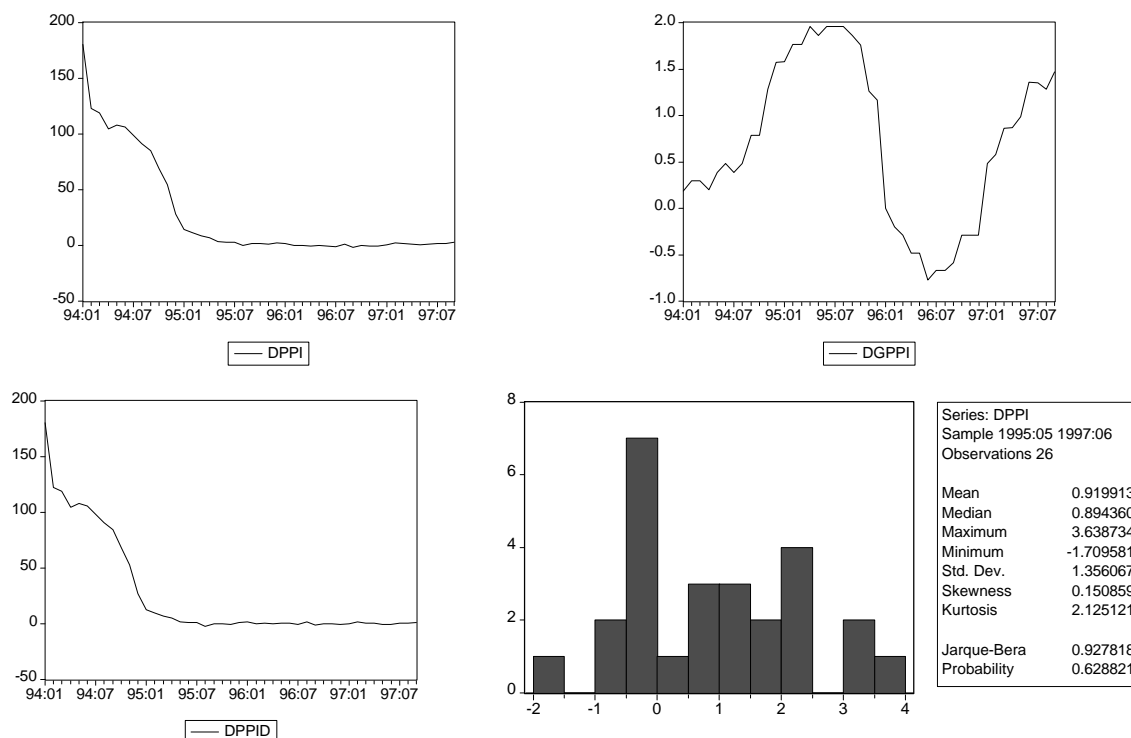


DCPI = Consumer price inflation rate in Macedonia, DGCPI = Consumer price inflation rate in Germany, DCPID = Consumer price inflation rate differential (DCPI - DGCPI).

Chart 8

**PRODUCER PRICE INFLATION RATE**

(On annual level, in percent)



DPPI = Producer price inflation rate in Macedonia, DGPPI = producer price inflation rate in Germany, DPPID = Producer price inflation rate differential (DPPI - DGPPI).

Inflation rate, measured by producer price index, converged to the same German rate for 16 months. From 177.8% in 1993, producer price rate of inflation was reduced to 3.6% in May 1995 with inflation rate differential to Germany of 1.8 percentage points. The average domestic producer price inflation rate, in the period May 1995 - June 1997 was 0.9%, which resulted in inflation rate differential to Germany of only 0.5 percentage points. The volatility of producer price inflation rate also has been reduced. The median rate of inflation in that period was 0.9%, and the standard deviation from the mean was 1.356, whereas the minimum and maximum of the producer price inflation rate were -1.7% and 3.6%, respectively. The producer price inflation rate reacted very weakly on the devaluation of the exchange rate in July 1997. In September 1997, on annual basis (September to September) the domestic producer price inflation rate was 2.9% which was higher by 1.2 percentage points than same rate in August 1997. The achieved producer price inflation rate in September 1997, was by 1.4 percentage points higher than the same inflation rate in Germany, meaning that after the devaluation, the convergence of Macedonian producer price inflation rate to that in Germany was not distorted. Taking in mind that the implementation of fixed exchange rate regime after devaluation continues, it can be concluded that the domestic inflation rate convergence to German one is permanent.

**Table 8****ANNUAL RATE OF INFLATION**

(December to December, in percent)

Period	Domestic consumer price rate of inflation	Consumer price rate of inflation in Germany	Inflation rate differential (2-3)	Domestic producer price rate of inflation	Producer price rate of inflation in Germany	Inflation rate differential (5-6)
1	2	3	4	5	6	7
1993	229.5	4.2	225.3	177.8	0.0	177.8
1994	55.0	2.5	52.5	28.6	1.6	27.0
1995	9.2	1.8	7.8	2.2	1.2	1.0
1996	0.2	1.4	-1.2	-0.6	-0.3	-0.3
1997 IX.	4.8	1.9	2.9	2.9	1.5	1.4

**4.3. International Competitiveness Effect**

Fixed exchange rate regimes, in countries where domestic price increase of tradable goods do not converge to price increases in the anchor currency country, can be associated with worsening of international competitiveness. By definition, a nominal anchor exchange rate policy entails real appreciation of the currency, thus it is clear that an "exit policy" is necessary if a long run successful outcome is to be achieved (Krueger, 1997, p. 5). As the real exchange rate rises, especially if inflation is not reduced sufficiently fast, the conflict between authorities' objectives of reducing inflation and maintaining competitiveness becomes increasingly apparent, raising the probability of a speculative attack. More often than not, the end of a peg comes about with disruptions to the economy. While it is important to exit before the real appreciation becomes too large, the transitional exit arrangement to a new parity within a fixed exchange rate regime or to shift to a floating exchange rate regime has to happen before it is too late and to prevent the balance of payments crisis.

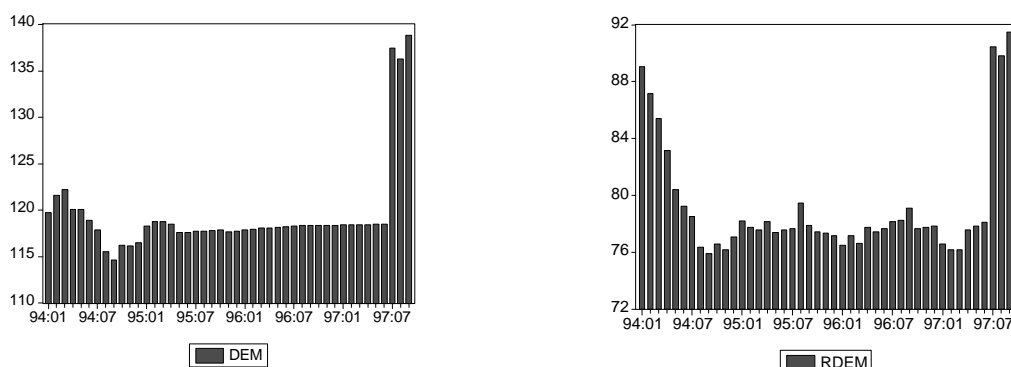
Although changes of domestic prices of tradable goods, that here are measured by producer price index, converged to the German ones within a period of sixteen months, there was considerable producer price inflation in Macedonia. In comparison to November 1993 the domestic producer prices until May 1995 increased by 55.5%, whereas in Germany, they increased by 2.5%. Simultaneously the exchange rate depreciated by 14.2%. This led to real appreciation and weakening the international competitiveness by 22.6%. The international competitiveness remained almost unchanged after May 1995 because of the changes in domestic tradable goods prices were associated with changes of the same prices in Germany. Thus, at the end of June 1997 the real exchange rate of the Denar against Deutsche mark in comparison to November 1993 appreciated by 22.4%.



**Chart 9**

### NOMINAL AND REAL EXCHANGE RATE OF THE DENAR AGAINST DEUTSCHE MARK

(November 1993 = 100)

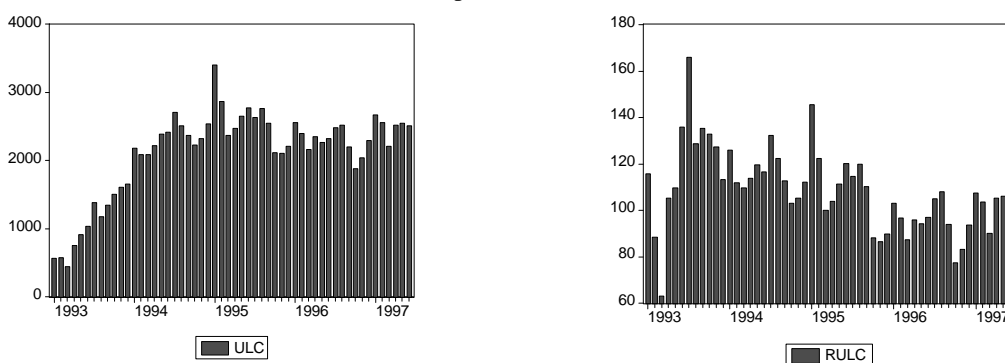


DEM = Index of the nominal exchange rate of Denar against Deutsche mark, November 1993 = 100, RDEM = Index of the real exchange rate of Denar against Deutsche mark, November 1993 = 100.

**Chart 10**

### NOMINAL AND REAL UNIT LABOUR COSTS

(April 1992=100)



ULC = Nominal unit labor costs, April 1992 = 100; RULC = Real unit labor costs, April 1992 = 100

Deteriorated international price competitiveness was not alleviated through lower pace of increase of domestic unit labor costs than in Germany. Contrary, relative higher growth of domestic unit labor costs than that in Germany led to further deterioration of Macedonian international competitiveness. Until the end of 1996, domestic unit labor costs increased by 111.9% in comparison to 1993. In the same time, unit labor costs in Germany decreased by 8.1%. Thus, measured by the unit labor costs differential, real exchange rate of the Denar against Deutsche mark appreciated by 50.5% in the period January 1994 - December 1996. Furthermore, in the first nine months of 1997, in comparison with the average level of 1996, domestic unit labor costs (ULC) increased by 9.4%. This leads to conclusion that although fixed exchange rate regime brought down the inflation to level that prevails in Germany, real sector variables, especially wages (unit labor costs) did not supported exchange rate peg. Domestic macroeconomic policies were inefficient in constraining domestic wage increase and making domestic unit labor costs changes compatible to that in Germany.

**Table 9****UNIT LABOUR COSTS**

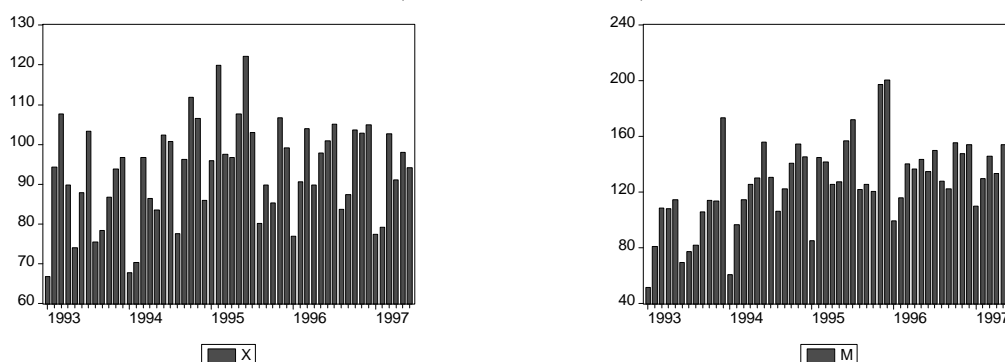
Period	Unit labor costs in Macedonia		Unit labor costs in Germany	
	1993 = 100	Percent change to previous year	1993 = 100	Percent change to previous year
1993	100.0	382.7	100.0	3.4
1994	216.6	116.6	93.6	-6.4
1995	238.8	10.2	92.8	-0.9
1996	211.9	-11.3	91.9	-1.0
1997 I-IX.	231.8	9.4	n.a.	n.a.

The devaluation of Denar exchange rate on July 9<sup>th</sup> 1997 by 16.1% partly compensated the lost of international price competitiveness. It was lower by 6.3 percentage points than real foreign exchange rate appreciation measured by relative producer price index, and lower by 34.4 percentage points than the real foreign exchange rate appreciation measured by relative unit labor costs index. Policy makers are expecting the rest to be done by structural reforms and adjustments in real variables, especially by downward movement of unit labor costs as a consequence of expected high productivity growth and moderate decrease in nominal wages. Otherwise, the new devaluation or switch to flexible exchange rate regime will be unavoidable.

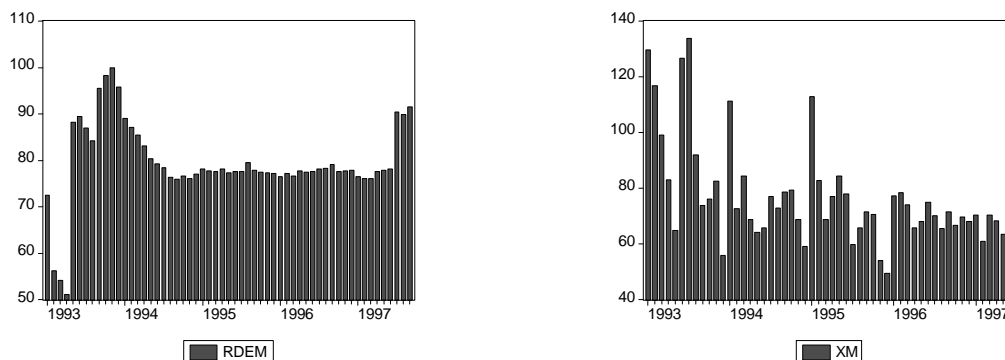
**Chart 11**

**EXPORT, IMPORT, REAL EXCHANGE RATE AND  
EXPORT TO IMPORT COVERAGE**

(In million US Dollars)



(November 1993 = 100, In percent)



X = Export of goods in million US dollars, M = Import of goods in million US dollars; RDEM = Index of the real exchange rate of the Denar against Deutsche mark; November 1993 = 100, XM = Export to import coverage ratio

Weakened international competitiveness in the period January 1994 - June 1997 led to deterioration in export to import coverage ratio and unsustainable high deficit in trade and current account in the balance of payment. In accordance to the pace of real exchange rate appreciation, export to import coverage rate decreased from 94.5% in 1993 to 75.3% in 1994 and further to 70.8% in 1996. In the first half of 1997, before the exchange rate devaluation, export to import coverage rate was 72.5%. In the third quarter of 1997, after devaluation, export to import coverage rate increased to 79.4%. Simultaneously, trade deficit and current account in the balance of payment explode as a consequence of deteriorated international competitiveness. From current account surplus in the balance of payment of USD 15 million or 0.6% of GDP in 1993, current account turned to deficit which in 1996 reached USD 288 million or 7.8% of GDP. Similar were the movements in trade account. Trade deficit increased from USD 111 million or 4.4% of GDP to USD 472 million or 12.8% of GDP in 1996. After devaluation and improved international competitiveness, there was a significant improvement in the current account of the balance of payments. Export of goods in the third quarter of 1997 in comparison to the same quarter of the previous year increased by 16.3%, whereas import of goods in the same period increased by 8.6%. This increased export to import coverage rate in the third quarter of 1997 to 79.4%. This lead to lower deficit in the current account of the balance of payment. Thus, in third quarter 1997, current account deficit was USD 16 million, that is by USD 73 million lower than the deficit in previous quarter of the same year, or by USD 49 million lower than the deficit in same quarter of 1996. The longevity of balance of payment improvement will depend on the support of the real sector variables such as unit labor costs, domestic saving, producer price changes and output. If the support from real sector variables is weak, than balance of payments effects of improved international competitiveness will be exhausted very soon and will have only short run impact.

**Table 10**

**REAL EXCHANGE RATE, EXPORT TO IMPORT COVERAGE AND  
BALANCE IN THE TRADE AND CURRENT ACCOUNT  
OF THE BALANCE OF PAYMENT**

Period	Average real exchange rate against DM, Index XI.1993=100	Export to import coverage ratio, in percent	Trade account balance In percent of GDP		Current account balance	
			In million US dollar	In percent of GDP	In million US dollar	In percent of GDP
1993	81.1	94.5	-111.0	-4.4	15.0	0.6
1994	80.4	75.3	-340.0	-10.8	-161.0	-5.1
1995	77.8	72.9	-420.0	-11.1	-221.0	-5.9
1996	77.6	70.8	-472.0	-12.8	-288.0	-7.8
1997 I-IX.	81.6	74.9	-288.0	n.a.	-218.0	n.a.

#### 4.4. Employment and Output Effects

It is very difficult to assess the employment and output effects of exchange rate targeting strategy from three reasons: 1) the period is overlapping with the transformational recession, 2) there is only short term evidence, 3) there were considerable supply shocks emanating from three sources: a) breakdown of former Yugoslavia and shrinkage of the domestic market from 22 million citizens to 2 million citizens, b) UN embargo towards Yugoslavia (Serbia and Montenegro) the north neighboring country of Macedonia in the period 1992-1995, and c) informal Greek embargo (south neighboring country) on the flow of goods and services to and from Macedonia through Greece in the period 1993-1995.

The international evidence do not present a clear relationship between exchange rate regime and output growth over the past two decades as a whole. During the 1990s. however, the median growth rate in countries with flexible exchange rate arrangements appears to have been higher than in countries with pegged exchange rates, but this reflects, in part, inclusion of rapidly growing Asian economies in the flexible exchange rate category. When these economies are excluded, growth performance does not appear to have diverged significantly between the two sets of exchange rate arrangements (IMF, World Economic Outlook, October 1997, p. 86).

**Table 11**

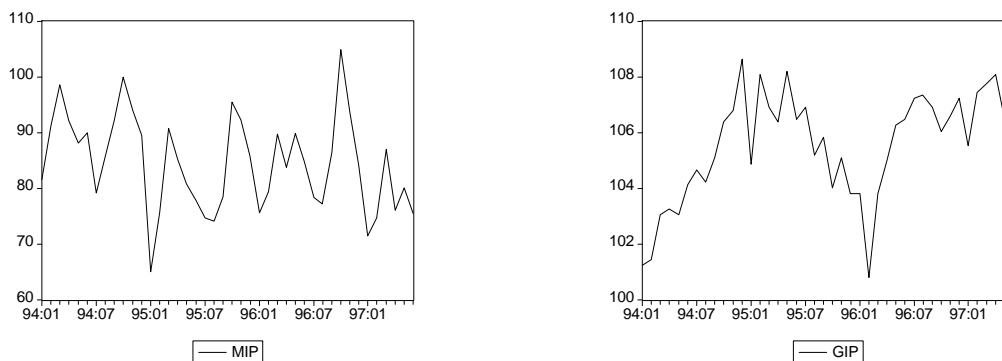
#### GDP GROWTH AND UNEMPLOYMENT IN MACEDONIA AND GERMANY

Period	Macedonia GDP growth rate	GDP potential growth	Unemployment rate	Germany GDP growth rate	GDP potential growth	Unemployment rate
1993	-9.1	0.0	19.2	-1.2	2.5	9.8
1994	-1.8	2.0	20.3	2.9	2.6	10.6
1995	-1.2	2.0	23.7	1.9	2.2	10.4
1996	0.7	3.0	26.0	1.3	1.9	11.5

Mainly as a result of high inflation and supply shocks, GDP in 1993 decreased by 9.1%. In 1994 and 1995 GDP decreased on average by 1.5%. The decrease was due to disinflationary policy (disinflationary costs), transformation recession and external supply shocks. 1996 was the first post-transformational year in which Macedonia faced a moderate GDP growth (0.7%). In 1997 GDP growth is expected to be 1.5%. Total growth in 1997 will be result of achieved growth of GDP in the second half of 1997. Due to a need to keep fixed exchange rate, the liquidity squeeze in first half of 1997 stalled the growth. This is clear evidence where the fixed exchange rate regime on short run decelerate the economic growth.

Chart 12

### INDUSTRIAL PRODUCTION GROWTH RATES IN MACEDONIA AND GERMANY



MIP = index of industrial production in Macedonia; GIP = index of industrial production in Germany

The largest decrease in output was realized in industry. In the period January 1994 - June 1997, domestic industrial production was reduced by 19.5%. In same time, industrial production in Germany increased by 33.0%. Taking in mind that even in an unoptimum currency area domestic growth rate at least should be equal to the anchor currency country, it is evident that exchange rate targeting strategy was not a cause for drop of industrial production in Macedonia. Causes were mainly emanating from external and domestic supply and demand shocks that were not possible to be neutralized either by fixed or by flexible exchange rate regime.

Due to recessionary movements and real sector adjustment policies the domestic unemployment rate increased sharply and reached unprecedently high levels. In 1996 it reached 26% and was by 2.3 times higher than that in Germany.

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## 5. IS THE FIXED EXCHANGE RATE TARGETING A VIABLE STRATEGY FOR MACEDONIA?

In chapter three a crucial factors have been identified as criteria for selecting the exchange rate regime. In this chapter I am applying these criteria in order to define what is the best exchange rate regime for Macedonia and is the current fixed exchange rate targeting strategy viable on long run. The empirical evidence for other countries has not give a unique answer whether there is in general a preferable exchange rate regime.<sup>1</sup> The answer depends on case by case country. But what is generally accepted is that if a country makes wrong selection of the exchange rate regime than there are long run consequences for its economic performance. For the countries that are not an optimum currency areas with other countries, the optimal choice will be flexible exchange rate regime. On the contrary, for the countries that are an optimum currency areas with other countries, the optimal exchange rate regime will be fixed exchange rate. In an era when countries are becoming increasingly linked to one another through trade and capital flows, the functioning of a country's exchange rate regime is a critical factor in economic policymaking. At issue is the extend to which a country's economic performance and the way in which monetary and fiscal policies affect inflation and growth depend on the exchange rate regime.

Macedonian national currency area itself is an unoptimum currency area. By all standards it is very small currency area. The total population is 2 million and total GDP in 1996 was USD 3.7 billion (at current market exchange rate) which accounts for 0.012% of the value of world output. Total export of goods to the world in 1996 was USD 1,147 million whereas the import of goods from the world was USD 1,465 million. The share in world trade (Macedonian export + import/world export + import) was 0.024%. With such a small size, the Macedonian economy is a price taker in the world trade.

On the other side, it is very open economy. Export and import of goods in 1996 account for 70.8% of GDP that is by 34.6 percentage points higher share than the average world one (36.2%). The average share of export and import of goods and services to GDP (94.5%) in the period 1992-1995 was equal to the average level of the four small EU countries that are successfully implementing the exchange rate targeting strategy against the Deutsche mark on long run in the environment of fixed exchange rate regime (Austria, Belgium, Denmark and Netherlands).

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<sup>1</sup> These observations do not imply any necessary relationship between the exchange rate arrangement and economic performance. In particular, it is not the case that flexible exchange rates are necessarily associated with higher inflation, as there are a number of countries with flexible exchange rate arrangements that have had relatively low inflation (and robust growth). Nor are pegged exchange rates necessarily associated with lower growth. Economic growth can be satisfactorily high, and inflation deserbably low, under either pegged or flexible exchange arrangements provided that appropriate policies and other conditions for good economic performance are in place. (IMF, October 1997, p. 87).

**Table 1****SHARE OF TRADE OF GOODS AND SERVICES IN GDP**

(in percent)

Country	1992	1993	1994	1995	Ø90-95
Austria	76.8	73.7	74.8	84.8	77.5
Belgium-Luxembourg	103.7	127.7	137.5	136.9	126.4
Denmark	69.7	66.1	70.0	69.4	68.8
Netherlands	105.9	101.6	105.0	107.2	104.9
Average	89.0	92.3	96.8	99.6	94.4
Macedonia	107.6	95.1	90.6	84.7	94.5

This two factors undoubtedly support the selection of fixed exchange rate regime as an intermediate monetary target. The country is price taker, fully integrated in international trade flows and its monetary and fiscal policy, on long run can not deviate from the ones of its main trading partners. Furthermore, the attempt to conduct independent monetary policy, from this regard, can create more damage for the domestic economy (higher inflation, lower growth, higher unemployment) than the benefits. For an open economy, the exchange rate is not an appropriate instrument of macroeconomic policy. Not only is it not very effective in correcting external imbalances, but it also endangers the stability of the price level (Maes, 1992, p.143).

**Table 2****VOLUME OF MACEDONIAN FOREIGN TRADE**

(in percent)

	1992	1993	1994	1995	1996	Ø92-96
Share of trade of goods and services in GDP	107.6	95.1	90.6	84.7	83.4	92.3
Regional distribution of foreign trade (export + import of goods):						
Total	100.0	100.0	100.0	100.0	100.0	100.0
1.Developed Countries	57.7	46.5	46.5	47.4	54.7	50.6
1.1. Germany	20.5	13.7	15.5	14.9	16.4	16.2
1.2. EU Countries	45.9	32.6	33.3	37.6	40.4	38.0
1.3. EFTA Countries	5.2	4.5	2.2	1.9	1.9	3.1
1.4. Other countries	6.6	9.4	11.0	7.9	12.4	9.5
2. Central and East European Countries	14.5	27.4	28.5	30.1	17.3	23.6
3. Developing Countries	6.9	4.6	4.8	4.5	4.0	5.0
4. Independent states of Former SFRY Republics	20.9	21.5	20.2	18.0	24.0	20.8

The foreign trade concentration of Macedonia towards one major trading partner is not so high as in the case of four successful small countries of EU that on long run basis are implementing fixed exchange rate targeting strategy against the Deutsche mark (Austria, Belgium, Denmark and Netherlands). The average share of trade of goods of these countries with Germany is 55.4% in the period 1990-1995. Among these countries the highest share of trade concentration with Germany has Austria (81.1% of total trade of goods). Belgium has the lowest share of concentration (44.1% of total trade of goods) of the foreign trade with Germany. Macedonia has a concentration rate of trade of goods with Germany of 16.2%. This is by 39.3 percentage points lower share of concentration than the average concentration of four small EU countries and by 27.9 percentage points lower than



the one of Belgium as the country with the lowest concentration of trade towards Germany. The main message is that German economy is not so important for Macedonia as for the four small EU countries. That means that although pegging the exchange rate is an appropriate monetary strategy, may be the Deutsche mark is not the proper anchor currency as it is the case with the four small EU countries. From that point of view the question is, whether to peg the exchange rate to only one currency or to a basket of currencies. When the peg is to a single currency, fluctuations in the anchor currency imply fluctuations in the effective (trade-weighted) exchange rate of the economy in question. By pegging to a currency basket instead, a country can reduce the vulnerability of its economy to fluctuations in the values of the individual currencies in the basket. Thus, in a world of floating exchange rates among the major currencies of big developed countries, the case for single currency peg is stronger if the peg is to the country of dominant trading partner.

**Table 3****SHARE OF GERMANY IN TOTAL TRADE VOLUME**

(in percent)

Country	1990	1991	1992	1993	1994	1995	090-95
Austria	81.4	82.1	82.7	80.5	78.1	82.0	81.1
Belgium-Luxembourg	45.3	47.3	46.8	42.5	40.4	42.6	44.1
Denmark	42.7	44.4	47.3	44.9	42.6	46.0	44.6
Netherlands	53.6	55.2	54.8	50.6	49.5	48.2	52.0
Average	55.7	57.2	57.9	54.6	52.6	54.7	55.4
Macedonia	n.a.	n.a.	20.5	13.7	15.5	14.9	16.1

Although the trade concentration with Germany is not on the so high level as the one in the four small EU countries the Germany is still the most important trading partner to Macedonia (16.4% of total trade in 1996). The second largest trading partner is Greece with 6.4% in total foreign trade, then are following: Italy with 5.8%, Bulgaria with 5.2%, USA with 5.0%, Russia with 4.4% and Netherlands with 3.1% in total foreign trade. The independent states of former SFRY Republics (Bosnia and Herzegovina, Croatia, Slovenia and Yugoslavia) accounts for 24% of total trade of goods in 1996. From the point of view of regional distribution, the trade with European Union countries is the highest with average trade concentration rate of 38.0% in the period 1992-1996. The second largest block of countries with whom Macedonia has high trade links are Central and East European Countries (CEEC), with average trade concentration rate of 23.6% in the period 1992-1996. The third main trading block for Macedonia are the independent states of Former SFRY Republics, with average share in total trade of 20.8% in the period 1992-1996. Taking in mind that currencies of CEEC and independent states of Former SFRY Republics are unstable and are with low credibility from one side, and that all this countries are striving to become member countries of EU on long run, some of them even in the medium run, on the other side, there are two possibilities for foreign exchange peg: either to use a Deutsche mark as a anchor currency, either to use the common EU currency - the Euro as an anchor currency .

The usage of the Deutsche mark as an anchor currency for the Denar at this stage is determined from three main factors: first, mainly all EU countries through the Exchange Rate Mechanism System are linked with the Deutsche mark and explicitly follow the monetary policy of the Bundesbank that is considered as a Central Bank with the highest low inflation reputation, second, even the main anchor is the Euro, because there is no unique Central Bank to conduct the monetary policy of the Euro (that is not the role of the

European Monetary Institute), the monetary policy of the Bundesbank mainly would be followed because the weight of the Deutsche mark and countries that use the Deutsche mark as an anchor currency in the Euro is very high, third, there is high markization of the Macedonian economy and Deutsche mark is used as main mean for store of value, measure of value, and in parallel with the Denar, although illegally it is used as means for payment. Of course, after the Euro substitutes the German mark in 2001, the anchor currency will be changed to reflect the introduction of the single currency within the EU.

Markization and dollarization means that domestic residents hold significant share of their assets in foreign-currency-denominated form. It is a common feature of many developing and transition economies. It is a response to economic instability, high inflation and low credibility of policymakers, and to the desire of domestic residents to diversify their assets portfolios. There are two motives in holding foreign currency assets: currency substitution and asset substitution. Currency substitution occurs when assets denominated in foreign currency are used as means of payment, while asset substitution occurs when assets denominated in foreign currency serve as stores of value. Currency substitution typically arises during high inflation, when the cost of holding domestic currency for transactions purposes is high. Asset substitution results from portfolio allocation decisions and reflects the relative risk and return characteristics of domestic and foreign assets. In the Macedonian case both motives have been causing high markization of the economy. The Deutsche mark is dominating by 70% in total foreign assets portfolio of domestic residents. The other foreign portfolio currencies are: US dollar, Swiss franc, Dutch guilder, French franc and Italian lira.

**Table 4**

**FINANCIAL MARKET, FOREIGN EXCHANGE MARKET DEVELOPMENT  
AND MARKIZATION/DOLARIZATION OF THE ECONOMY**

Period	Financial market development		Foreign exchange market development		Markization/Dollarization	
	M1/GDP	M2DN/GDP	Total annual turnover in USD mill.	Total annual turnover to GDP	FD/M1	FD/M2DN
1994	0.058	0.090	976	31.0	0.589	0.375
1995	0.076	0.103	1,079	28.6	0.403	0.293
1996	0.080	0.104	1,116	30.2	0.336	0.258
1997I-VI.	n.a.	n.a.	474	n.a.	0.349	0.261

FD is foreign currency deposits within banking system, M1 is the narrowest definition of money supply, M2DN is broader definition of money supply Denar part, GDP is Gross Domestic Product.

Although the markization of the economy is decreasing it is still very high. The average share of foreign currency deposits in the period January 1994 - June 1997 to M1 was 41.9% and to M2-denar 29.6%. Such level of markization was the median among the ones in Central and East European Transition Countries.<sup>2</sup> In the first half of 1997, the average month markization measured by the rate of foreign currency deposits to money supply was 34.9% in the case of foreign currency deposits to M1 and 26.1% in the case of foreign currency deposits to M2-denar.

<sup>2</sup> For more detail see IMF, World Economic Outlook, October 1997, pp. 112-127.

As a consequence of currency and asset substitution the financial market is very thin. The same is true for foreign exchange market. The usual measure for the depth of financial market is the broader money supply aggregate - M2 to GDP. In the Macedonian case this ratio shows existence of very shallow financial market. An average M2 Denar to GDP rate, in the period 1994-1996, was 9.9%. This rate has an increasing tendency and in 1996 it reached 10.4%, but it remained still considerably below the average in the most developed economies with M2 to GDP rate of 74.5% in 1996.

The average annual turnover in the foreign exchange market, in the period 1994-1996 was US dollars 1,055 million with average exchange turnover to GDP rate of 29.9%. Although the foreign exchange turnover was increasing by annual rate of 4.8%, it was lower than the rate of nominal GDP growth. Due to this fact, the share of foreign exchange turnover in GDP in 1996 (30.2%), was lower by 0.8 percentage points than the one in 1994. The size of foreign exchange market underdevelopment can be assessed if domestic rate of foreign exchange to GDP is compared to the one that is prevailing in other economies. The comparison is presenting facts for high Macedonian foreign exchange market shallowness. In comparison to the most developed economies, the domestic foreign exchange turnover to GDP rate is lagging behind by 40 times and in comparison to the most advanced transition economies (Hungary, Czech Republic and Poland) the lag is 16.8 times.

In thin financial and foreign exchange markets, only few transactions can cause extremely large short term interest rate and exchange rate movements if there is no management foreign exchange policy. In such markets, it is very difficult for the participants to identify the equilibrium exchange rate. Thus there is a need for active foreign exchange rate management policy. The more thin is the financial and foreign exchange market the more feasible and more appropriate is the fixed exchange rate regime. From this regard, high markization and thin financial and foreign exchange market, are supporting the fixed exchange rate targeting to be the most appropriate and feasible strategy for Macedonia.

The product and export diversification is another criteria for the selection of the foreign exchange rate regime. In accordance to Kenen (1969) the higher the product and export diversification than the more stable the foreign exchange earnings are. Namely, the shocks, provided that are independent across industries, tend to cancel-out in the aggregate and do not constitute an important source of disturbance to the entire economy. The conclusion is that the more diversified the economy is, it is more likely that the asymmetric shocks will not require correction of the exchange rate. Contrary, for the less diversified economy it is more likely that the asymmetric shocks will require exchange rate correction. But the other view claims the opposite. The less diversified the economy is, than the exchange rate change can create higher price instability, and the more diversified the economy is, exchange rate changes do not have strong inflationary effect. Thus, in accordance to this view, the more diversified the economy is, the more feasible is a flexible exchange rate regime.

**Table 5****PRODUCT AND EXPORT DIVERSIFICATION BY SECTORS**

(In percent)

<b>Sectors</b>	<b>1995 Share in GDP</b>	<b>1995 Share in Export of goods</b>	<b>1996 Share in GDP</b>	<b>1996 Share in Exports</b>
Industry and mining	17.6	65.3	17.9	84.1
Agriculture and fisheries	10.4	1.4	10.4	1.9
Forestry	0.6	0.1	0.7	0.1
Water resources management	0.4	0.0	0.5	0.0
Construction	5.0	0.1	4.8	0.1
Transport and communications	6.1	0.0	6.2	0.1
Trade	12.3	32.0	12.6	11.4
Catering trade and tourism	2.0	0.0	2.2	0.0
Crafts and services	2.9	0.0	3.0	0.0
Utilities, public services, landscaping and maintenance	1.9	0.0	2.0	0.0
Financial, technical, business and insurance services	21.8	0.1	19.6	0.0
Education, science, culture and information	6.6	0.0	6.5	0.0
Health care and social welfare	5.4	0.0	5.3	0.1
Socio-political organizations and communities	6.3	0.0	5.9	0.0
Rents	4.7	-	4.8	-
Minus: imputed bank services	19.0	-	17.1	-
Import duties	4.5	-	4.4	-
Net indirect taxes	13.3	-	13.1	-
Minus: subsidies	2.7	-	2.7	-
Other	-	1.0	-	2.2
Total: GDP/Export of goods	100.0	100.0	100.0	100.0

The diversification of production and export by economic sectors and branches are presented in tables No. 5 and 6. The leading export sector is industry and mining. It accounted for 84.1% of total export of goods in 1996 and 65.3% in 1995, whereas its contribution to GDP was 17.9% in 1996 (17.6% in 1995). The second largest export oriented sector is trade. Its' share in total export of goods in 1996 and 1995 was 11.4% and 32%, respectively. The share in GDP of this sector was 12.6% in 1996 and 12.3% in 1995. The share of agriculture and fisheries in total export of goods was 1.9% and 1.4%, respectively in 1996 and 1995, whereas its share in GDP was 10.4% in both years. Thus, this three economic sectors that in 1996 and 1995 on average accounted for 40.6% of GDP gave 98.0% on average of total export of goods in the period 1995-1996. The rest (all the other economic activities) that have an average share in GDP of 59.4%, gave only 2.0% of total export of goods. That leads to conclusion of high export concentration, mainly in two economic activities. This also means, that all the other sectors mainly are producing nontradable goods.

**Table 6****PRODUCT AND EXPORT DIVERSIFICATION BY INDUSTRIAL BRANCHES**

(in percent)

Industrial branches	1995 Share in GDP created  by mining and industry	Share in Exports of goods created by mining and industry	
		1995	1996
Generation, transmission and distribution of electricity	17.0	0.1	0.0
Extraction of coal	0.2	0.0	0.0
Petroleum products industry	0.8	0.4	0.9
Extraction of iron ore	0.2	n.a.	n.a.
Iron and steal industry	1.2	14.3	14.6
Non-ferrous ore mining	2.1	3.4	6.5
Non-ferrous metal production	0.1	n.a.	n.a.
Non-ferrous metal processing	1.3	n.a.	n.a.
Extraction of non-metal minerals	0.9	n.a.	n.a.
Processing of non-metal minerals	1.8	n.a.	n.a.
Manufacture of metal products	3.1	1.9	2.1
Machine industry	0.7	2.3	0.8
Manufacture of transport equipment	4.1	2.1	2.2
Manufacture of electrical equipment	5.6	9.5	5.7
Basic chemical industry	4.1	4.7	5.3
Chemical product industry	4.0	3.9	3.6
Stone, gravel and sand quarrying	1.4	0.2	0.5
Building materials industry	5.2	n.a.	n.a.
Lumber industry	0.4	n.a.	n.a.
Finished wood products industry	1.3	3.3	0.6
Paper and paper products	0.5	0.2	0.5
Textile fiber and fabric industry	4.3	3.4	3.4
Finished textile products industry	8.4	12.2	27.6
Leather and fur industry	0.2	1.6	1.1
Leather footwear and accessories manufacturing	4.1	6.3	6.0
Rubber industry	0.1	n.a.	n.a.
Food products industry	13.1	5.4	3.8
Beverage industry	2.9	0.7	1.3
Feed industry	0.1	0.0	0.0
Tobacco industry	9.2	5.1	7.1
Printing	1.2	0.0	0.0
Collection and recycling industrial waste	0.3	n.a.	n.a.
Miscellaneous manufacturing	0.1	19.0	6.4
<b>Total:</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

The same situation is within the branches of industry and mining sector. The total export is concentrated mainly in seven industrial branches. Only two branches - iron and steal industry and finished textile products industry - in 1996 accounted for 42.2% of total export of the industry and mining sector. Simultaneously, they created 9.6% of GDP in industry and mining sector. The other industry and mining sector branches that accounted for more than 5% of the export of goods are: tobacco industry (7.1% of the export of the industry and mining sector), non-ferrous ore mining (6.5%), leather footwear and accessories (6.0%), manufacture of electrical equipment (5.7%) and basic chemical industry (5.3%). Together with the export of iron and steal industry and finished textile products industry they accounted for 72.8% of total industry and mining sector export, whereas, their share in the GDP of industry and mining sector was 34.7%. The rest 26 branches that

created 65.3% of GDP in industry and mining sector accounted for 27.2% of sector's export. Thus, we can conclude that export diversification through industrial branches was very poor and mainly it was concentrated in seven branches out of 33.

In accordance to Kenen this will be disadvantage for fixed exchange rate regime. Because the effects of asymmetric shocks can not be dispersed to large number of industries, negative effects can not be cancel out with the positive ones. This will require usage of the exchange rate in order to neutralize the effects of asymmetric shocks. But, high export concentration in only few industries, can lead to high price instability if flexible exchange rate is selected, which on long run is not appropriate environment for fast economic growth and low unemployment. This unambiguity, can be solved by accepting fixed exchange rate regime that can be changed if the economy is affected with strong asymmetric shock than the anchor currency country, but only if its effects is not possible to be neutralized by other policy measures.

Out of six analyzed factors, five give strong support for selecting fixed exchange rate as intermediate monetary target, they are: very small price taker economy, high openness and high integration in international trade flows, high trade concentration to EU countries and Germany as main trading partners, high markization of the economy with deep roots for indexing prices and wages in accordance to the exchange rate movement of Denar against Deutsche mark, and very thin financial and foreign exchange markets. The only unambiguous factor is low product and export diversification. From one side, low product and export diversification do not allow the effects of asymmetric shocks to cancel out automatically. On the other side, low product and export diversification determines high price instability if a flexible exchange rate is adopted as a intermediate monetary target. Taking all factors together and instability of money demand that was analyzed in the second chapter, we can conclude that exchange rate targeting is the best strategy for maintaining price stability. The intermediate target should be fixed exchange rate regime. A central parity of Denar against Deutsche mark should be established by the Government. The exchange rate can fluctuate within very narrow bands from the parity  $\pm 3\%$ . By allowing the exchange rate moderately to adjust upwards and downwards in response to capital inflows, high volatility of money market interest rates is avoided, otherwise, if there are no bands, in the case of huge capital inflows and outflows high swings in the money markets interest rates will be needed. Pegged exchange rate without bands, will stabilize foreign exchange market but create high volatility in money market. Accepting the fixed exchange rate within a bands introduces also bands for interest rate volatility on money market. The priority is stability of the exchange rate. But, if capital inflows and outflows are huge and require excessive interest rate shifts, than moderate exchange rate adjustment within a bands will be allowed either upwards or downwards. The consequence of the choice of exchange rate regime is the change in the distribution of short term volatility between the foreign exchange market and the short term money market (Mills, Wood, 1993, p. 5).

If a strong asymmetric shock occurs, that can not be neutralized by other policy measures and by labor and wage flexibility, than the exchange rate will be used as corrective instrument. The Government will announce a new parity of the Denar exchange rate against the Deutsche mark and it will become new intermediate target of the monetary policy. The monetary policy will remain locked in by exchange rate policy, and the burden of adjustment to asymmetric shocks mainly will be borne by fiscal policy and wage flexibility and labor mobility.

The choice of exchange rate regime also involves a trade off between "credibility" and "flexibility", and may depend not only on the nature of the economy and the disturbances to which it is subject but also on political considerations. If the costs on short-run, especially if there are big inflation differentials between the countries, are high to keep the fixed exchange rate may be it will be not politically acceptable to maintain fixed exchange rate. From that point of view, Macedonia already paid all the short term costs of maintaining fixed exchange rate. Now when there are no inflation differentials between the domestic rate of inflation and the one that prevails in Germany, I do not expect any further costs. Contrary there will be long term benefits if the fixed exchange rate is perceived as permanent instrument that dictates swift pace for restructuring of the real sector.

### **5.1. Degree of Convergence of Macedonian to German Economy**

The original optimum currency areas theory (Mundell, McKinnon) stipulate that the monetary union or irrevocably fixed exchange rate regime is possible only among countries with similar economic performances: similar level of economic development, similar potential growth, similar domestic inflation rates, similar domestic saving and investment, in order the countries to give up from the exchange rate as balance of payment adjustment instrument. Thus, fixed exchange rate works best if shocks originate primarily in money demand. Fixed exchange rate (or a greater degree of fixity) is generally superior if the disturbances impinging on the economy are predominantly domestic nominal shocks, such as money demand shocks, whereas a flexible rate (or greater degree of flexibility) is preferable if disturbances are predominantly foreign shocks or domestic real shocks, such as shifts in the demand for domestic goods.

But Balassa-Samuelsson hypothesis (Balassa, 1964, Samuelson, 1964), allows possibility for monetary union and irrevocably fixed exchange rate regime for countries with different economic performances: different potential growth, different level of development, and different domestic saving and investment. The recent evidence proves the validity of this hypotheses. Such examples are: integration between German Democratic Republic and Deutschland, and the currency board arrangements (Hong Kong, Singapore, Argentina, Estonia, Lithuania, Bulgaria, Bosnia and Herzegovina) which constraints the monetary policy to operate according to the principles of the gold standard: the money supply should be contracted in response to a deficit in the balance of payments (Fischer, 1997, p. 39).

In tables 7 and 8 main economic features are given for Macedonia and Germany. By the comparative analyses I will try to give an answer how much Macedonian economy is converged to German one. On first glance, except the high interest rate differential all the other financial variables in Macedonia were converged to the ones in Germany in 1996. The growth rate of money supply in Macedonia converged to the German ones in May 1996. Since May 1996, the monetary growth in Macedonia is in line to the monetary growth in Germany. The same stance is with the fiscal policy. It do not rely on inflation tax and Central Bank seigniorage. Since 1996 the rate of seiniorage (measure I 0.6% and measure II 0.01%) and the rate of inflation tax (0.2%) are at the level of that prevailing in Germany. Also, fiscal deficit has been reduced significantly, from 13.6% of GDP in 1993 to 3.2% in

1994 and 1995 and further to 2.5% in 1996. Such a fiscal deficit is lower than the one in Germany (3.9% of GDP in 1996), and in accordance to the set up Maastricht criteria about the size of government deficits. Also fiscal revenues and expenditures in last two years in Macedonia on average were by 8.5 percentage points lower than the ones in Germany. That means that there is lower crowding out of the private sector in Macedonia than in Germany. Total domestic government debt in 1996 was 42.7% of GDP whereas the Maastricht rule sets up an upper limit of 60% of GDP. In the same year the government debt in Germany was 60.7%. The bright picture in the financial area is spoiled by very high domestic interest rates in comparison to the ones in Germany. The average borrowing nominal interest rate differential in the period 1992-1996 was 237.2 percentage points. The main cause for such a big nominal borrowing interest rate differential was high inflation differentials. If the interest rates are adjusted for the inflation than real borrowing rates in Macedonia in the period 1992-1996 on average were negative (-4.9%). On the contrary, in Germany real borrowing rates in the whole period were positive, and the average real borrowing rate was 2.1%. In parallel with bringing down the inflation there was a tendency of slow convergence of domestic borrowing interest rates to that in Germany. In 1996 the nominal domestic borrowing rate was 12.6% and it was higher by 9.8 percentage points than the German one.



**Table 7****KEY ECONOMIC INDICATORS OF MACEDONIA**

	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>
Nominal GDP in million Denars	11,794	59,164	136,033	143,597	147,554
GDP at 1990 prices in million Denars	433.1	393.7	386.6	382.0	384.6
Real growth rates of GDP	-8.0	-9.1	-1.8	-1.2	0.7
GDP Per Capita in US dollars					
Purchasing Power Parity	n.a.	n.a.	n.a.	n.a.	3,125
Current Exchange Rate	1,204	1,299	1,618	1,920	1,860
Rate of unemployment	19.0	19.2	20.3	23.7	26.0
GDP Deflator	1,393.1	451.8	134.1	6.9	1.9
Retail price rate: Dec./Dec.	1,923.4	229.5	55.0	9.2	0.2
Borrowing interest rate, Annual average	557.4	491.4	123.2	26.7	12.6
Lending interest rate, Annual Average	1,130.8	741.6	180.8	56.5	22.4
Gross investment in current prices, in million Denars	1,826	9,462	25,354	25,847	27,445
Gross investment as % of GDP	15.5	16.0	18.6	18.0	18.6
Domestic saving as % of GDP	16.5	11.6	7.8	6.9	5.8
General government as % of GDP					
Revenues and grants	38.6	40.9	51.0	44.8	42.9
Expenditures and net lending	48.2	54.5	54.2	48.0	45.4
Deficit-/Surplus+	-9.6	-13.6	-3.2	-3.2	-2.5
Total government debt	n.a.	n.a.	n.a.	n.a.	42.7
Current account balance, in million US dollars	-19.0	15.0	-161.0	-221.0	-288.0
Current account balance, as % of GDP	-0.8	0.6	-5.1	-5.9	-7.8
Trade balance in million US dollars	-7.0	-111.0	-340.0	-420.0	-472.0
Trade balance as % of GDP	-0.3	-4.4	-10.8	-11.1	-12.8
Export of goods and services in million US dollars	1,259	1,139	1,258	1,390	1,301
Export of goods and services as % of GDP	54.3	45.3	39.9	36.8	35.3
Import of goods and services	1,236	1,250	1,598	1,810	1,773
Import of goods and services as % of GDP	53.3	49.8	50.7	47.9	48.1

**Table 8****KEY ECONOMIC INDICATORS OF GERMANY**

	1990	1991	1992	1993	1994	1995	1996
Nominal GDP in billions Deutsche mark	2,429	2,854	3,076	3,155	3,320	3,459	3,540
GDP at 1990 prices, in billions Deutsche mark	2,429	2,751	2,811	2,778	2,858	2,914	2,952
Real growth rates of GDP	5.9	13.2	2.2	-1.2	2.9	1.9	1.3
GDP per capita							
PPP in US dollars	15,991	16,993	18,581	18,500	19,668	20,497	20,784
Current exchange rate in US Dollars	23,770	21,505	24,451	23,500	25,132	29,569	28,683
Rate of unemployment	4.8	4.2	7.7	9.8	10.6	10.4	11.5
GDP Deflator	3.2	3.8	5.5	3.8	2.2	2.2	1.0
Retail price rate: December/December	2.9	5.3	3.3	4.2	2.5	1.8	1.4
Borrowing interest rate, Annual average	7.1	7.6	8.0	6.3	4.5	3.8	2.8
Lending interest rate, Annual average	11.6	12.5	13.6	12.8	12.4	10.9	10.0
Gross investment in current prices, in billion marks	520	670	707	676	705	776	800
Gross investment as % of GDP	21.4	23.4	22.9	21.4	21.2	22.4	22.6
Domestic saving as % of GDP	26.2	23.3	22.9	21.8	21.8	23.2	23.8
General government as % of GDP							
Revenues and grants received	44.9	45.7	48.6	49.4	50.1	50.5	50.2
Expenditures and net lending	47.1	49.4	52.6	53.7	53.5	54.0	54.1
Deficit-/Surplus+	-2.2	-3.7	-4.0	-4.3	-3.4	-3.5	-3.9
Total government debt	40.8	41.5	44.1	48.2	50.1	58.2	60.7
Current account balance, in billion of US dollars	48.1	-17.9	-19.4	-13.4	-20.3	-20.8	-13.9
Current account balance as % of GDP	3.2	-1.0	-1.0	-0.7	-1.0	-0.9	-0.6
Trade balance in billion US dollars	69.0	19.9	28.7	41.7	51.7	66.3	73.4
Trade balance as % of GDP	4.6	1.1	1.4	2.2	2.5	2.7	3.1
Export of goods and services in billion US dollars	477.5	472.0	503.7	450.9	501.1	609.2	609.0
Export of goods and services as % of GDP	31.8	27.4	25.6	23.6	24.5	25.2	25.9
Import of goods and services in billion US dollars	405.7	473.3	505.6	442.3	489.4	589.4	580.6
Import of goods and services as % of GDP	27.0	27.5	25.6	23.2	23.9	24.4	24.7
GDP in billion US dollars, current exchange rate	1,503	1,720	1,970	1,908	2,046	2,414	2,352

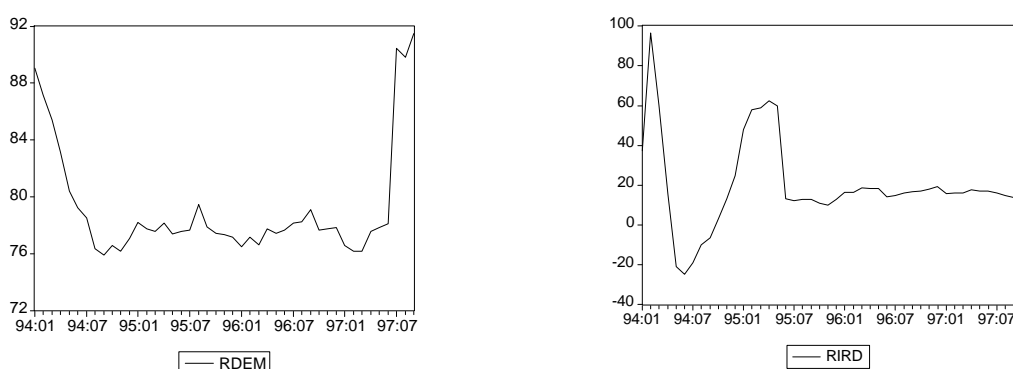
Source: International Monetary Fund, International Financial Statistics, May 1997, and Statistisches Bundesamt, Statistisches Jahrbuch fu Die Bundesrepublik Deutschland 1997.

The same pattern of behavior was followed by the domestic lending interest rates. The average real lending interest rate differential in the period 1992-1996 was 15.9 percentage points, whereas in 1996 it was reduced to 13.2 percentage points. Such high interest rate differentials were connected with the high real exchange rate appreciation and the need to defend the nominal exchange rate anchor. In accordance to uncovered interest

rate parity rule the interest rate differential is equal to the expected change of the exchange rate. The distortion in the interest rate was presumably the percentage rate of real appreciation. Of course part of interest rate differentials has been result of the lower degree of credibility of the National Bank of Macedonia in comparison to the Bundesbank and the lower domestic saving than the German one. The appreciation of the real exchange rate of Denar against Deutsche mark almost disappear after the devaluation of the nominal exchange rate. That will lead to more dynamic convergence of Macedonian to German interest rates. However, some interest rate differential will remain because of the still lower credibility of the National Bank of Macedonia than the Bundesbank, different credit risks and lower domestic saving than that in Germany.

**Chart 1**

**REAL DENAR EXCHANGE RATE AGAINST DEUTSCHE MARK AND REAL INTEREST RATE DIFFERENTIALS**



RDEM = Real exchange rate of Denar against Deutsche mark, November 1993 = 100; RIRD = Real interest rate differential

The real sector data presented in Tables 7 and 8 are showing that Macedonia in many aspects of the economic performance, significantly is lagging behind the Germany. First, Germany is big country and its national currency area is an optimum currency area. As such it can serve as an anchor currency country. The total population is 81 million, with total GDP in 1996 of USD 3,689 billion (at current market exchange rate) which accounts for 7.9% of value of world output. The share of trade to and from the world to the world one was 9.6%. This is an evidence for a big economy that can influence the world prices. The openness of the economy is high, although it is not the case with other big economies. Export and import of goods accounted for 40.5% of GDP, that was by 4.3 percentage points higher than the average world one.

On the contrary, Macedonia is very small economy. Its national currency area is an unoptimum currency area. The total population is 2 million and the total GDP in 1996 was USD 3.7 billion (at current market exchange rate) which accounted for 0.012% of the value of world output or 0.16% of German GDP in the same year. Total trade to and from the world was USD 2.6 billion. The share in world trade was 0.024% and 0.26% in the total German trade with the world. As such small size, the Macedonian economy is a price taker in the world trade. The openness of the economy (export plus import of goods/GDP) is 70.8% and is by 30.3 percentage points higher than the German one. That is a common characteristic of small economies.

Second, the economic development of Macedonia, measured by GDP per head is very low. In comparison to GDP per head of Germany, Macedonia in 1995 was lagging behind 6.6 times. The Macedonian GDP per head in 1995 accounted for: 16.7% of the average EU one, 25.7% of the GDP per head of the Greece as undeveloped country within EU, and 54.9% of the one of Turkey, as a country which entrance in EU is expected to be very soon.

**Table 9****GDP PER CAPITA AT CURRENT PPS IN US DOLLARS**

Country	1990	1991	1992	1993	1994	1995	Ø90-95
Austria	16,623	17,326	18,687	19,167	20,206	20,773	18,797
Belgium	16,467	17,253	18,929	19,451	20,316	20,792	18,868
Denmark	16,552	17,450	18,210	19,191	20,445	21,529	18,896
Germany	15,991	16,993	18,581	18,500	19,668	20,497	18,372
Luxembourg	22,809	24,303	26,704	28,176	30,116	31,303	27,235
Netherlands	15,958	16,438	17,561	17,817	18,724	19,782	17,713
Greece	9,187	9,798	10,702	11,032	11,590	12,174	10,747
Portugal	9,372	10,135	10,962	11,431	12,018	12,457	11,062
Spain	11,787	12,745	13,279	13,329	13,596	14,226	13,160
Turkey	4,691	4,806	5,143	5,562	5,271	5,691	5,194
EU (15) Average	15,426	16,079	17,184	17,131	17,928	18,612	17,060
Macedonia	n.a.	n.a.	n.a.	n.a.	n.a.	3,125	n.a.
Share of Macedonia:							
In EU (15) Average	-	-	-	-	-	16.7	-
In Germany	-	-	-	-	-	15.2	-
In Greece	-	-	-	-	-	25.7	-
In Turkey	-	-	-	-	-	54.9	-

Third, there is big difference among the level of domestic saving and investment in Macedonia and Germany. That difference is reflected in the current account of the balance of payment, growth rates and unemployment. The motor of the economic growth, saving is on the very low level in Macedonia, with decreasing trend in last five years. The average share of domestic saving to GDP in the analyzed period was 9.7%, that is by 13 percentage points lower than the average one in Germany. Furthermore, the saving rate decreased from 16.5% in 1992 to 5.8% in 1996. The main causes for such sharp decrease were shrinkage in the disposable income as the consequence of the transformation recession, supply shocks in the region and very low and in some cases even negative profitability of the export sector since 1994 as a consequence of the real appreciation of the exchange rate of the Denar.

The transmission mechanism to the real sector in the regime of fixed exchange rate goes through the profitability of tradable sector (Whitley, 1994, pp. 218-219). The real rate of return (profitability of investment) in tradable industries declined, as the real exchange rate appreciated. Thus, the total current losses in 1996 (Denar 17,163 million) were by 12.5 times higher than the ones in 1992. Simultaneously, the gross profit in 1996 was Denar 4,459 million, and in comparison to 1992, was higher by 4.1 times.

Although the average rate of investment to GDP (17.3%), in the period 1992-1996 was by 4.8 percentage point lower than the one prevailing in Germany, on average it was by 7.6 percentage points higher than the domestic saving. The exception was 1992, when domestic saving was by 1 percentage point higher than the domestic investment. Such

fundamental disequilibria in the domestic saving and investment have been creating permanent very high and volatile deficit in the current account of the balance of payment, which in 1996 reached 7.8% of GDP while the trade deficit approached to 12.8% of GDP. Taking in consideration the causes of the deficit, it is not possible only by exchange rate changes to equilibrate the current account of the balance of payment. Appropriate demand and supply policies and restructuring are required in order to increase and equilibrate domestic saving to the investment. Relying only on the exchange rate changes will have only short run balance of payments effects, permanently distorted fundamentals and high inflation as a consequence of exchange rate changes. Contrary, almost balanced domestic saving and investment in Germany resulted in very small and stable current account deficit of 0.8% of GDP and a permanent high trade account surplus. This will have a tendency on medium term, until the fundamentals are not changed in Macedonia, the Deutsche mark to appreciate against the Denar, or reverse, the Denar to depreciate against the Deutsche mark.

Fourth, until 1996, the Macedonian economy was in transformational recession that was strengthened by supply shocks emanating from the disintegration of the unique market of former Yugoslavia, UN embargo towards Yugoslavia (Serbia and Montenegro) in the period 1992-1995 and Greek informal economic embargo towards Macedonia in the period 1993-1995, and by disinflationary fiscal and monetary policy in the period 1992-1995. In the period 1992-1995 the real GDP cumulatively was reduced by 21.4%, and in 1995 it was -63.0% of its 1989 level. In 1996 the real GDP increased by a moderate rate of 0.7% and in 1997 by 1.5%. In the same period the real GDP of Germany, except in 1993, has been increasing by an average growth rate of 2.0% that was by 0.7 percentage points below its long-run potential growth. The expected potential growth for Germany for 1998 is 2.3%, and for next five years about 2.7%.<sup>3</sup> The potential growth of real GDP in Macedonia for 1998 is projected at rate of 5.0%, and for the period 1998-2002 at an average rate of about 6.4% (Macedonian Academy of Science and Art, 1997). This will open an era of closing the gap between the economic development of Macedonia and Germany. If such relations remain unchanged on long run, it will need 34.5 years in order Macedonia to reach the level of GDP per capita that the Germany had in 1996 and 61.3 years in order Macedonia and Germany to have the same level of GDP per capita (same level of development).

The fall of real GDP was followed by rapid increase of unemployment. The defensive restructuring of enterprises was also a cause for considerable growth of unemployment, especially since 1994. The rate of unemployment in 1996 (26%) was by 7 percentage points higher than the one in 1992, and by 2.3 times higher than the one that was prevailing in Germany in the same year.

Fifth, achieved price stability in 1996 was higher than the one in Germany. The retail prices in 1996 (December to December) increased by 0.2% that was by 1.2 percentage points lower than that in Germany. The inflation rate measured by retail price index converged to the German one in May 1996. Since then, as a result of fixed exchange rate targeting strategy the prices in Macedonia have been following the German pattern of price movement. The domestic price stability was not undermined even after the devaluation of the Denar exchange rate against Deutsche mark, on July 9<sup>th</sup>, 1997, by 16.1%. Thus, since

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<sup>3</sup> OECD data series, WIFO 1997.

May 1996, there almost do not exist inflation differential between the inflation rates in Macedonia and Germany.

## **5.2. Possibility for Sterilization of Asymmetric Demand and Supply Shocks by High Factor Mobility**

Factor mobility as means of absorbing asymmetrical shocks is widely accepted in the literature. In the irrevocably fixed exchange rate regime, it should play the role of an instrument of balance of payment adjustment. If wage flexibility together with labor mobility and capital mobility are not efficient mechanism for balance of payment adjustment, than the asymmetric supply and demand shocks will lead to higher unemployment than in the anchor county. It will be unacceptable cost for the irrevocably fixed exchange rate regime. In that case the county will be unwilling to give up from the exchange rate as means for balance of payment adjustment in order to neutralize asymmetric supply and demand shocks.

### **5.2.1. Labor Mobility and Wage Flexibility**

Labor mobility contributes to the adjustment in response to asymmetric shocks. Although there exists legal barriers for labor mobility of Macedonia to and from most developed countries, that is not the case with the labor mobility within EU countries, the cumulative stock of international migrant flows from Macedonia (6.9%), was by 10 times higher than the stock of international migrant flows of the average of six EU countries (Belgium, Germany, France, Italy, Netherlands). In comparison to Germany, the stock of international migrant flows are higher by 12.1 times, whereas compared with Belgium as a country with the highest migrant flows, the international labor mobility in Macedonia was higher by 4.3 times.

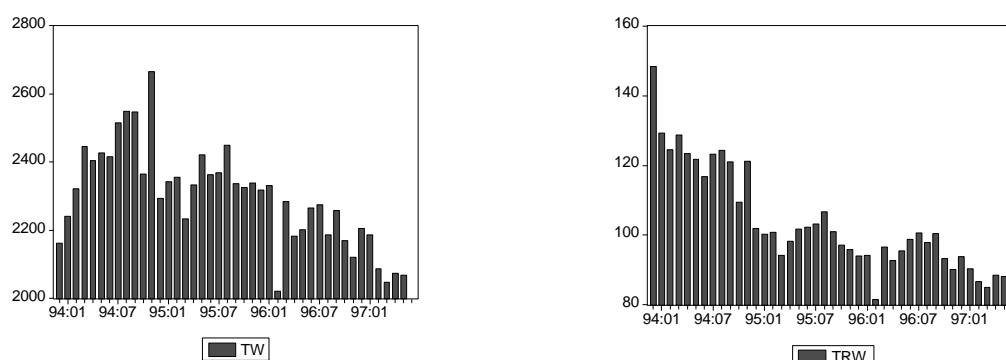
**Table 10****STOCK OF COUNTRY'S MIGRANTS FLOWS**

Country	Percent
Belgium	1.59
Germany	0.57
France	0.41
Italy	0.72
Netherlands	0.70
EU - 6 average	0.64
Macedonia	6.93

Source: Paul De Grauwe, Is Europe Optimum Currency Area? Evidence from Regional Data, CEPR Discussion Paper No. 555/May 1991, p. 9, and for Macedonia, Statistical Office of Macedonia, Statistical Yearbook 1996.

The flexibility of wages in Macedonia is also higher than the one in European Union Countries. The sensitiveness of real wages depends on the elasticity of nominal wages with respect to unemployment and with respect to prices. The nominal wage elasticity in Macedonia with respect to unemployment rates in the period January 1994 - June 1997, (monthly data used) was -2.8 and generally was quite high. The corresponding elasticities in EU countries are the following: -2.2 in Sweden and -0.9 in Austria as countries with very high wage elasticity with respect to unemployment within EU countries, a second group of countries including Spain, Belgium, the Netherlands, and France, show a moderate wage flexibility, with wage elasticity to unemployment varying between -0.20 and -0.30, finally, Denmark, Germany and the United Kingdom have a relative low nominal wage flexibility with elasticity to unemployment rate of around -0.1 (Rentsch, 1994, p. 19-20).

The (short-run) elasticity of nominal wages with respect to prices (0.27) is on the same level as the median one within the EU countries, but almost double than the wage elasticity in United States (0.14). Germany and Italy with wage elasticities to prices of 0.75 and 0.6 respectively, are the countries with high indexation of wages in accordance to the price movement.

**Chart 2****NOMINAL AND REAL WAGES**

TW = Total wages in million Denars, TRW = Real wages in million Denars, 1992 IV. = 100.

Low elasticity of nominal wages with respect to prices was followed by real wage decrease in the period January 1994 - June 1997. In this period real wages fell by 47.5%, and the real wage in June 1997 was half of the level in December 1993.

Thus, with regard to labor mobility and wage flexibility we can conclude that labor can be an instrument for neutralization of asymmetric demand and supply shocks, and effective balance of payment adjustment, and thus support the fixed exchange rate regime. But, further labor market reforms should be undertaken in order to increase real wage flexibility (decrease the nominal wage elasticity to prices) to the United States level.

### **5.2.2. Capital Mobility**

Labor mobility can be partially replaced by capital mobility. The movement of the production factor capital is to be considered free if entrepreneurs can satisfy their need for capital, and investors can offer their disposable capital in a specific country, where conditions are most favorable. With a gross average wage of USD 315, Macedonia is an attractive country for foreign investors. The quality of human capital is very high. Macedonian population is highly qualified and well educated. The educational system provides 90% of total population above 10 years to be able to read and write. About 16% of total labor force are university graduates, and additional 2.8% have post-graduate studies. Economically active population represents 40% of total population. A lot of people are trained to work with computers, many speak foreign languages, and the number of those who have studied abroad is rapidly increasing. Another favorable condition for the inflow of the foreign capital is very low corporate income tax (15%).

The capital inflow to the country is fully liberal. The capital outflow, because of the lack of the domestic saving is under control, but repayment of interest, dividends, profit, principal of the invested capital is exempted from the foreign exchange control. The total capital inflow to Macedonia, in the period January 1994 - September 1997 was USD 768 million. The largest part of the capital inflow (USD 626.5 million or 81.6%) was due to the short term commercial credits. This credits cannot be used for investment in fixed assets and on this base to increase the stock of capital, productivity, growth and employment. The main cause that stimulate this type of capital inflow were very high real domestic interest rates in comparison to the world ones. This also secured the stability of the exchange rate on short run on the level that was not in line with the fundamentals.



**Table 11****CAPITAL AND FINANCIAL TRANSACTIONS**

(In million USD)

Period	Capital transfers	Commercial credits	Direct investment	Net Loans	Total
1994	29.9	189.2	24.0	-96.8	76.7
1995	1.7	141.6	9.5	29.3	205.5
1996	0.0	78.7	11.2	41.5	192.8
1997I-IX.	0.0	217.0	6.0	50.0	293.0

Direct investments, as the most appropriate type of the capital inflow for increasing the investments, capital stock, productivity and employment, in the period January 1994 - September 1997 were very low. Total capital inflow on this base was USD 50.7 million, that accounts for only 6.6% of total capital inflow. In order to increase the pace of convergence of the Macedonian real sector performances to the German ones, especially to increase the economic growth, employment and reduce the rate of unemployment in the regime of fixed but adjustable exchange rate, additional effort should be made to increase the attractiveness for the foreign investors to invest in Macedonia. Taking into account its location (in the heart of the Balkan Peninsula), the achieved price and political stability, together with the transparent and rule based monetary policy, it can be expected that the direct investments to Macedonia will significantly increase in the future.

Loans, on net basis, in the analyzed period generated capital inflow to Macedonia of USD 24 million. Such a small amount is due to net loan repayment in 1994 in amount of USD 96.8 million. In the subperiod 1995 - September 1997 the net loans created capital inflow to Macedonia of USD 120.8 million. Taking into account the current and future arrangements with the World Bank, European Bank for Reconstruction and Development and with IMF, the normalized relations with the Paris Club of creditors (bilateral creditors) and London Club of creditors (commercial banks), it can be expected that this channel of capital inflow will continue to play a significant role in closing the gap between the domestic saving and investment and reduce the role of the exchange rate as instrument for balance of payment adjustment. The main factors for balance of payments adjustment will become fundamentals through high economic growth and high disposable income that will lead to high domestic saving.

### **5.3. Effectiveness of the Exchange Rate Targeting Strategy in a Country with Different Potential Growth**

The nominal anchor in an open economy, either it is the money supply or the nominal exchange rate, assuming that appropriate fiscal and microeconomic policies are in place, should ensure that the economy achieves long-run economic growth equal to its long-run potential growth. From that point of view, the exchange rate targeting strategy will not be acceptable if other alternative monetary strategies, on long-run, secure higher economic growth through maintaining price stability.<sup>4</sup>

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<sup>4</sup> "In an open economy, either the money supply or the nominal exchange rate can serve as a nominal anchor. Such an anchor is usually viewed as a necessary condition for macroeconomic stability since, at least in the long run, all nominal variables will converge to the pre-set rate of growth of either the money supply or the exchange rate." (Krueger, 1997, p. 7).

The traditional models include the following relationships for exports and imports:

$$X = f(Y^*, ep/p^*) \quad (1)$$

$$M = f(Y, ep/p^*) \quad (2)$$

where:  $Y^*$  is foreign income and  $ep/p^*$  is the real exchange rate, with  $p$  the domestic price,  $p^*$  the foreign price and  $e$  the nominal exchange rate. From equation (1) and (2) is evident that there will be no need for exchange rate adjustment if the growth rates of domestic income and anchor currency income are equal. However, if the growth rates of the countries are different on long run, then there is a need for exchange rate adjustments in order to equilibrate the export to import. In such case if the fixed exchange rate regime is used as an intermediate monetary target then the growth of the domestic economy will be constrained. This popular view of the constraint imposed on fast-growing countries that decide to target fixed exchange rate regime, has very little empirical support.

The empirical evidence do not present a firm relationship between the economic growth and real depreciation of the exchange rate. The observations do not imply any necessary relationship between the exchange rate arrangement and economic performance. We observe that among the fast-growers there are countries that saw their currency appreciate and others depreciate. The same is true for the slow growers.<sup>5</sup>

The lack of firm relation between economic growth and exchange rate regime has been given an elegant interpretation by Paul Krugman (1989) and Balassa (1964) and Samuelson (1964). Economic growth has relatively little to do with the static view. Economic growth implies mostly the development of new products. Fast-growing countries are those that are able to develop new products, or old products with new qualitative features. The result of this growth process is that the income elasticities of the export in equation (1) of fast-growing countries are typically higher than those of slow-growers. More importantly, these income elasticities of the export of goods of the fast growing economies will also typically be higher than the income elasticities of their imports (Krugman, 1989). As a result, these countries can grow faster without incurring trade balance problems. This also implies that the fast growing economies can increase their exports at a fast pace without changes of the nominal exchange rate.

The domestic price level in an open economy can be defined as the weighted average of the prices of tradable and nontradable goods:

$$P = \beta P_{nt} + (1 - \beta)P_t \quad (3)$$

where:  $P$  represents the domestic price level,  $P_{nt}$  is the price of nontradable goods, and  $P_t$  is the price of tradable goods,  $\beta$  and  $1-\beta$  are relative weights. The price of tradable goods can be expected to follow the time path of the exchange rate very closely:

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<sup>5</sup> For more details see: De Grauwe P., *The Theory of Optimum Currency Areas: A Critique*, The Economy of Monetary Integration, Oxford, 1992, pp. 35-37., International Monetary Fund, *Exchange Rate Arrangements and Economic Performance in Developing Countries*, World Economic Outlook, October 1997, pp. 87-95., Anne O. Krueger, *Nominal Anchor Exchange Rate Policies as a Domestic Distortion*, NBER Working Paper Series No. 5968/March 1997, pp. 7-35.

$$P_t = eP_w \quad (4)$$

where:  $e$  is nominal exchange rate,  $P_w$  are world prices.

From equations (3) and (4) follows that if the economic development leads to shift of the production from nontradable to tradable goods where the productivity growth is higher, then there will be a tendency of appreciation of the real exchange rate under the regime of fixed exchange rate.

The positive relationship between economic growth and real appreciation is often assumed to arise from a tendency for productivity growth in the tradable goods sector to outpace that in the nontradables sector to a greater extent the more rapid is the economy's overall productivity growth. This implies that the higher is the growth rate of total productivity, the more will the prices of nontradables rise relative to the prices of tradables, and the more will the domestic currency appreciate in real terms when measured using general price indices. Such real appreciation does not necessary entail any loss of competitiveness in terms of traded goods prices.

There is a second reason why the fast growing economies should select fixed exchange rate regime without constraining their potential for growth. A fast growing economy is usually also an economy where the productivity of capital is higher than in the slow growing economies. This difference in the productivity of capital will induce investment flows from the slow growing economies to the fast growing economies. These capital flows then make it possible for the fast growing economy to finance current account deficits without any need to change the foreign exchange rate.

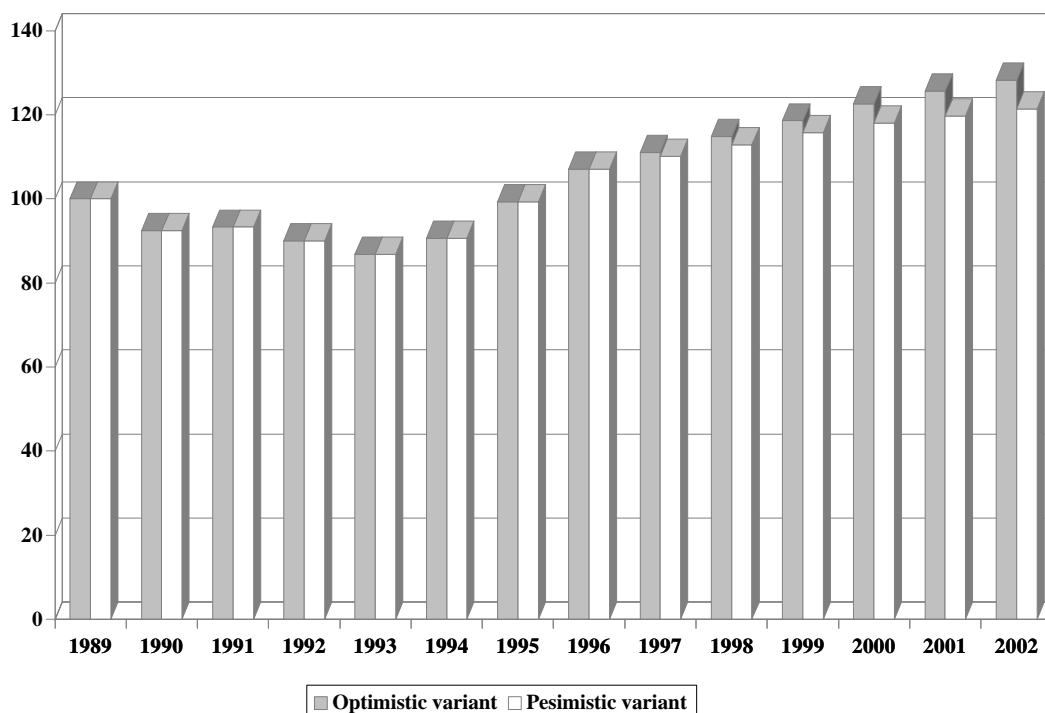
In accordance to starting positions, it is expected that the medium term growth potential of Germany will be 2.7% per year (OECD Data Series, WIFO 1997) and the medium term growth potential of Macedonia will be 6.4% per year (Macedonian Academy of Science and Art, 1997). Due to the traditional modeling of export and import (equations (1) and (2)), the higher growth potential of Macedonia relative to the growth potential of Germany will require real devaluation of the exchange rate in order to keep the equilibrium in the current account of the balance of payment. On the contrary, in accordance to Krugman and Balassa-Samuelson hypothesis, higher growth potential of Macedonia, will not necessarily require real devaluation of the exchange rate. If the economic growth is determined by higher productivity growth and shift of the production factors from nontradable goods sector to tradable goods sectors, where the productivity growth is higher, then the high Macedonian growth potential can be connected with real appreciation of the exchange rate in a strategy of fixed exchange rate targeting.

In last four years the average annual productivity growth in Macedonia was 6.7%, that is by 3.9 percentage points higher than the productivity growth in Germany. The same tendencies are expected to continue in the future.

Chart 3

**PRODUCTIVITY GROWTH**

(Index 1989 = 100)



The higher productivity growth is expected to lead to high capital inflow in Macedonia, that will close the gap between the domestic saving and investment. This will make possible to finance the current account deficits in the next 5-6 years without the need of considerable changes of the real exchange rate.

The domestic and foreign saving will be efficiently allocated in the most profitable sectors, i.e. in the tradable goods sector where the productivity growth is the highest. Thus, there will be no deterioration of international competitiveness although the nominal exchange rate remains unchanged. Furthermore, rapid investment activity will be followed by a change in the structure of the industry to more value added products and the more diversified export of goods. Instead of dominance of seven products on the side of export from the industry and mining sector as currently it is, it is expected that more than 65% (21 branches) of the total number of branches (33) within the industry and mining sector, will produce tradable goods. That will create strong export lead growth that through the adjustment of fundamentals will maintain the current account of the balance of payment equilibrium. Such external adjustment determined by the fundamentals will reduce the role of the exchange rate as an balance of payment adjustment instrument. The fixed exchange rate mainly will be used as intermediate target for maintaining price stability and as an instrument for swift restructuring of real sector and convergence of the domestic economic development to the level of economic development of Germany.

#### **5.4. Long-term Effectiveness of the Exchange Rate Changes as Means of the Balance of Payments Adjustment**

In accordance to the monetarist view nominal exchange rate adjustments are effective only if they are followed by domestic expenditure reducing policies. The devaluations are not effective instrument for balance of payments adjustment if they lead to wage indexation, t. i. if nominal wages are perfectly elastic to the prices of imported goods. In that case exchange rate changes have only temporary effect, without any effect on fundamentals that are determining the long run balance of payment stance.

Although the economic history is very short and definite conclusions for long run effects of changes of the exchange rate cannot be reliable, the data about the effects of the devaluation of the exchange rate of the Denar against the Deutsche mark by 16.1% on July 9<sup>th</sup>, 1997 are confirming the validity of the monetarist view.

The devaluation was followed by tight monetary and fiscal policy and wage freeze. There was almost no growth of money supply M1 in September 1997 in comparison to the same month of the previous year. The annual growth rate of the broader definition of money supply M2-denar in the same month was 1.9%. Simultaneously, the real inter bank interest rate was 16.5%.

The nominal wages in third quarter of 1997 in comparison to the same quarter of the previous year were higher by 0.8%, whereas the real wages were higher only by 0.2%. This did not allow the development of imported goods price - wage spiral. The annual rate of inflation in September 1997 was 8.6% and 4.8% measured by the producer price index and consumer price index, respectively.

The real international competitiveness was improved by 9.6%, and it was very quickly reflected in the current account of the balance of payments. The export of goods, that before the devaluation was moderately decreasing, in the third quarter of 1997 in comparison to the same quarter of the previous year increased by 16.3%, whereas the import of goods increase by 8.6%. This led to significant reduction of the trade and current account deficit. The final effects of the devaluation of the exchange rate will depend on the microeconomic policies for enterprise restructuring and wage flexibility and labor mobility. However, if satisfactory wage flexibility and labor mobility is achieved, then there will not be a need for exchange rate changes in order to correct the balance of payment disequilibria. The international competitiveness will be maintain through the lower unit labor costs. Thus, the aim of structural reforms should be to create high labor mobility and wage flexibility that will equilibrate the current account of the balance of payment and increase employment on one side, and support the fixity of the exchange rate through the reducing the unit labor costs on the other side.

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## 6. CONCLUSION

Macedonian national currency area is not an optimal currency area. By all standards it is very small currency area. The total population is 2 million, and total GDP in 1996 was USD 3.7 billion, which accounts for only 0.012% of the value of world output. The share in world trade is 0.024%. With such a small size, the Macedonian economy is price taker in the world trade, and shock absorber economy.

Out of seven analyzed factors, six are giving strong support that Macedonia is an optimum currency area with Germany and fixed but adjustable exchange rate regime is the most appropriate intermediate target for the monetary policy. The factors supporting the exchange rate targeting strategy of the Denar against Deutsche mark are: a) high openness and integration of the economy into the international trade flows (export plus import of goods in 1996 account for 70.8% of GDP), b) high foreign trade concentration to Germany and to other EU countries representing 16.2% and 21.8% of total trade, respectively, c) high markization of the economy with deep roots for indexing prices and wages in accordance to the exchange rate movement of the Denar against Deutsche mark, d) very thin foreign exchange market with the rate of total turnover to GDP of 30.2% in 1996, and very thin financial market with the liquidity rate (M2 to GDP) of 10.4% in 1996, e) high wage elasticity with respect to unemployment (-2.8) and low short-run elasticity of nominal wages with respect to prices (0.27), and high labor mobility - although there exists legal barriers for labor mobility from Macedonia to and from most developed countries, that is not the case with the labor mobility within EU countries. The cumulative stock of international migrant flows from Macedonia (6.9%), was by 10 times higher than the stock of international migrant flows of the average of six EU countries (Belgium, Germany, France, Italy, and Netherlands), that allows the asymmetric shocks to be neutralized mainly through labor mobility and wage flexibility. Furthermore, the long-run effectiveness of the changes of the exchange rate on the balance in the current account mainly depend on the responsiveness of the wages with respect to the import price increases. If wages are sensitive to the import price increases then exchange rate devaluation do not have long-run effects on the current account of the balance of payment, f) unstable money demand and strong relationship between exchange rate changes and the inflation rate.

The low product and export diversification is ambiguous factor in determining the exchange rate regime. Namely, the leading export sector is industry and mining, it accounts for 84.1% of total export of goods, whereas its contribution to GDP was 17.9% in 1996. Within the branches of industry and mining sector, almost total export is concentrated in seven industrial branches: iron and steel industry (14.6% of total export of industry and mining), finished textile products industry (27.6%), tobacco industry (7.1%), non-ferrous ore mining (6.5%), leather footwear and accessories (6.0%), manufacture of electrical equipment (5.7%) and basic chemical industry (5.3% of total export of industry and mining). In accordance to Kenen this is disadvantage for fixed exchange rate regime. Because the effects of asymmetric shocks can not be dispersed to large number of industries, negative effects can not be canceled-out with the positive ones. This will require usage of the exchange rate in order to neutralize the effects of asymmetric shocks. But, high export concentration in only few industries, can lead to high price instability if flexible exchange rate is selected, which on long run is not appropriate environment for fast



economic growth and low unemployment. This ambiguity can be solved by accepting fixed exchange rate regime that can be changed if the economy is affected by strong asymmetric shock than the anchor currency country, but only if its effects can not be neutralized by other policy measures.

The different level of economic development and different potential economic growth in the traditional optimum currency area theory are considered as obstacles for the monetary union or irrevocably fixed exchange rate regime. But, empirical evidence do not confirm this view. The observations do not imply any necessary relationship between the exchange rate arrangement and economic performance. Among the fast growing economies there are countries that saw their currencies to appreciate, and others their currencies to depreciate. The same is true for slow growing economies. Fast growing countries are those that are able to develop new products, or old products with new qualitative features. The result of this growth process is that income elasticities of the export of fast growing countries are typically higher than those in slow growing economies. The economic development of Macedonia, measured by GDP per head is very low (USD 3,125 measured at purchasing power parity) . In 1996, compared to GDP per head in Germany, Macedonia was lagging behind 6.6 times. Simultaneously, medium term annual growth potential between Germany and Macedonia are different, 2.7% and 6.4%, respectively. Taking in mind the size of the country, the economic growth will be mainly export lead. That means development of new export products, diversification of export goods among economic sectors and branches within the industry and mining sector, and lower unit labor costs on the base of high productivity growth in comparison to the slow growing economies (Germany). That can determine, the high domestic economic growth to be connected with real appreciation of the exchange rate in a strategy of fixed exchange rate targeting.

Taking together the effects of all factors, we can conclude that the exchange rate targeting is the best strategy for maintaining price stability in Macedonia. The intermediate target should be fixed but adjustable exchange rate regime. A central parity of the Denar against the Deutsche mark should be set up by the Government (in accordance to the Act on the foreign exchange operations). The exchange rate can fluctuate within very narrow bands of  $\pm 3\%$  from the parity. By allowing the exchange rate moderately to adjust upwards and downwards in response to capital inflows, high volatility of money market interest rates is avoided. Otherwise, if there are no bands, in the case of huge capital inflows and outflows big swings in the money market interest rates will be needed. Pegging the exchange rate without bands, will stabilize foreign exchange market, but it will create high volatility on the money market. Accepting the fixed exchange rate within a bands, means also an introduction of a bands for interest rate volatility on money market. The priority is the stability of the exchange rate. However, if capital inflows and outflows are huge and require excessive interest rate shifts, then moderate exchange rate adjustment within a bands will be allowed, either for upwards or downwards.

From January 1994 to September 1995, the monetary targeting was in place as a strategy for bringing down the inflation and the exchange rate was used as main indicator for the stance of monetary policy. Since fourth quarter of 1995, the exchange rate targeting has been implemented as a strategy for maintaining price stability, and the fixed exchange rate regime was selected as the main intermediate target. The main effects of the exchange rate targeting strategy were the following:

1) The money supply lost its accommodative stance, and since May 1996 money supply growth rates in Macedonia converged to the German ones.

2) The nonaccommodative stance of monetary policy was reflected also in the Central Bank seigniorage and the inflation tax. The Central Bank seigniorage and inflation tax in 1996 in Macedonia were below the ones prevailing in Germany. The total role of the National Bank of Macedonia was subordinated to maintaining the fixed exchange rate target, and by this, to achieving the ultimate goal - the price stability.

3) The fixed exchange rate regime disciplined fiscal policy and put clear bands to the scope of fiscal deficits. The fiscal deficit became negligible, below the Maastricht edge of 3% of GDP. Furthermore, there was no government borrowing from the Central Bank. On the contrary, in order to sterilize the Central Bank interventions on the foreign exchange market, there were considerable transfers of deposits by the government at the Central Bank.

4) The inflation rate in Macedonia converged to the German one after 16 months of the implementation of the exchange rate based stabilization (May 1995). But, from January 1994 to May 1995, the inflation rate differential of 22.6% was created.

5) Although real interest rates started to fall, they remained high even after the convergence of the inflation rate in Macedonia to the German one. The average real interest rate differential in 1996 was 16.9 percentage points, whereas, the discount rate and the credit auction rate of the Central Bank, mainly were in accordance to the Taylor rule of setting the interest rates.

6) In the period January 1994-June 1997, the international competitiveness was deteriorated by 22.6% if measured by difference in producer price index, or by 50.5% if measured by the difference in the movement of the unit labor costs.

7) The weakened international competitiveness, led to deterioration in export to import coverage ratio, and unsustainable high trade and current account deficits. That determined in July 1997 the exchange rate of Denar against Deutsche mark to devalue by 16.1%, and the new level of the exchange rate became an intermediate target of the monetary policy.

8) The long-run employment and output effects of the exchange rate targeting strategy are impossible to be assessed due to a very short sample of data series, overlapping of the period with the period of transition in which the largest transformation costs had occurred, and because of the three supply shocks emanating from three sources: a) breakdown of former Yugoslavia and shrinkage of the domestic market from 22 million citizens to 2 million citizens, b) UN embargo towards Yugoslavia (Serbia and Yugoslavia) in the period 1992-1995, and c) informal Greek embargo on the flow of goods and services to and from Macedonia in the period 1993-1995.