

# NEW KEYNESIAN MACROECONOMICS: IN THE ROLE OF THE GLOBAL TREND OF MIGRATIONS ON THE LABOR MARKET AND DEMOGRAPHIC CHANGES

Nikola V.Dimitrov <sup>1</sup>  
Dushko Josheski <sup>2</sup>  
Cane Koteski <sup>3</sup>

## Abstract

In this paper we test New Keynesian propositions about inflation and unemployment trade off with the New Keynesian Phillips curve and the proposition of non-neutrality of money.

The NAIRU rate in the unemployment inflation trade off model is almost similar as high to the actual unemployment. Therefore, we argue that NAIRU concept is far from being applicable in the case of Macedonian labour market. In the New Keynesian Phillips curve not surprisingly, there appears to be no statistically significant relationship between inflation and Unemployment –even in the classical Philips curve and in adaptive expectations Philips curve by Modigliani-Papademos (1975). Or the Friedman-Phelps- Lucas expectations-augmented one between the difference of actual and expected inflation rate and the gap between actual and the natural rate of unemployment presented in the next equation. This situation causes continuity in this process of emigration of the population outside of the country. Modern trends are present in Macedonia as well. Our migration can be treated as well as” transitional migration’ because there still is classical –physical migration of certain categories of people, vs new trends of migration, i.e. intellectual or technological migration. And in the end partially , through the case of R. Macedonia , we will talk about the role of institutions and policies on the migrations and demographic changes.

---

<sup>1</sup> (University Goce Delcv-Stip)  
email: [nikola.dimitrov@ugd.edu.mk](mailto:nikola.dimitrov@ugd.edu.mk)

<sup>2</sup> (University Goce Delcv-Stip)  
email: [dusko.josevski@ugd.edu.mk](mailto:dusko.josevski@ugd.edu.mk)

<sup>3</sup> (University Goce Delcv-Stip)  
email: [cane.koteski@ugd.edu.mk](mailto:cane.koteski@ugd.edu.mk)

## Introduction

In this paper we will investigate the issue of inflation and unemployment trade off and the money and output. In the part where we use data we will investigate this relation with data for Macedonian macroeconomic aggregates<sup>4</sup>. Since, 1991 Macedonia has gone from command to a market economy (process called transition). This resulted in high level of poverty and unemployment. Unemployment was a problem even before 1990, in 1970 in Macedonia were registered 20% unemployed, and in 1991 already there were 24% unemployed but the situation with the unemployment later further deteriorated. Some factors that contributed to the high levels of unemployment are: low export intensive economy, low level of FDI's, decline of economic activity, large informal economy, inefficient labor market policies weak law enforcement and rigid labor legislation. In one study for transition vs OECD countries(Cazes,2002), was tested whether policies that promote social dialogue, extending it to pay higher attention to employment promotion and unemployment reduction and to ensure more labor market stability, are to be on political agenda rather than just a pure deregulation. And the results were that social dialogue is more efficient than just pure deregulation.

### **New-Keynesian Macroeconomics: Inflation-Unemployment trade offs**

Alben Phillips (1958) in his paper concluded that there exist stable relationship between rate of change of money and unemployment for almost 100 years. That means that wages are stationary  $\left(\frac{dw}{w}=0\right)$  at certain level of unemployment<sup>5</sup>. There is countercyclical "loop" meaning that

$$\frac{dw}{w} \uparrow \quad \text{when} \quad \frac{du}{t} \downarrow \quad \text{and opposite case when} \quad \frac{dw}{w} \downarrow \quad \text{when} \quad \frac{du}{t} \uparrow \quad .\text{Lipsey (1960)}$$

introduced new theoretical relationship between  $w = \frac{dw}{dN} = k \times \left[ \frac{N^d - N^s}{N^s} \right]$

Where  $N^d$  is demand for labor and  $N^s$  is a labor supply. , this relationship tells that the change in money wage rate is proportional to excess demand for labor. Now the key transformation from Phillips –Lipsey to Samuelson Sollow (1960) curve is done through *mark-up* pricing

---

<sup>4</sup> Data used in this paper cover the period from 2004.1 to 2009.4 quarterly data .Data on inflation (CPI) unempolment, M2(monetary aggregate), and GDP(Gross Domestic Product).

<sup>5</sup> It was 5 ½ % for the United Kingdom for the period 1861-1957

$$P_t = (1+a) \frac{W_t N_t}{Q_t}$$

On the next equation nominal GDP is equal to 1+a times nominal wage.  $P_t Q_t = (1+a)W_t N_t$   
 So the inflations is negatively associated with productivity and is positively associated with wage growth. Next more general Phillips curve is being introduced

$$w = \pi^e + bu^{-1} + \beta \text{laborproductivity}, b > 0, 0 \leq \beta \leq 1$$

Here  $\pi^e$  is assumed to be stable and to be zero. Next it is being assumed modern Phillips curve  $\pi = \pi^e + bu^{-1} - (1-\beta)\text{laborproductivity}$ .

Friedman-Phelps Phillips curve was about the short run trade -off between unemployment and inflation and that on the short run, expectations shift the short run Phillips curve which is depicted in the following expression:  $\pi = f(u) + \pi^e$

Now, from Friedman's accelerationist hypothesis

$$(1-\theta)\pi_{t-1} = (1-\theta)\pi_{t-1}^e - b(1-\theta)(u_{t-1} - u^*)$$

If we subtract from the original equation:  $\pi_t = \pi_{t-1} + b(1-\theta)(u_{t-1} - u^*) - b(u_{t-1} - u^*)$

So when inflation is fully anticipated:

$$\pi_t = \pi_t^e, \pi_t = \pi_{t-1}, \text{ and } u_t = u_{t-1}.$$

By substituting:  $\pi_t - \pi_{t-1} = -b\theta(u_t - u^*) - b(1-\theta)(u_t - u_{t-1})$

But  $\pi_t = \pi_{t-1} \Rightarrow \pi_t - \pi_{t-1} = 0$  and  $u_t = u_{t-1} \Rightarrow u_t - u_{t-1} = 0$ .

$$\text{So } 0 = -b\theta(u_t - u^*) \text{ and } u_t = u^*.$$

This expression implies that unemployment reverts to the natural rate at the long run Phillips curve once inflation is fully anticipated.

### **The Role of Monetary Policy and Inflation and Unemployment**

The term "natural rate of unemployment" was used by Milton Friedman in order to express the idea that high levels of unemployment in a society could not be pegged by monetary policy, and that it is a result of real economic forces only<sup>6</sup>.

---

<sup>6</sup> In his presidential lecture to the American economic association in Washington D.C., Friedman discussed monetary policy limitations.

## Money and output

Summary of Monetary Policy and Output: Three Alternatives			
Is current Output Affected by an...			
Alternative	Unexpected change in money supply?	Expected change in money supply?	Is Activist policy desirable?
<b>Real Business cycle model</b>	No	No	No
	Prices are perfectly flexible, so monetary policy cannot affect real money balances or output in the short run		
<b>New classical model</b>	Yes	No	No
	Only expected changes in the money supply affect output.		Monetary policy affects output and the real interest rate only by "fooling" households and firms.
<b>New Keynesian model</b>	Yes	Yes	Rarely
	Both unexpected and expected changes in the money supply affect output, although effects of unexpected changes are greater.		Frequent changes in monetary policy can reduce the credibility of the monetary authority.

Credibility in some research (Geraats, 2002)<sup>7</sup>, is measured as low past inflation outcomes. Recent evidence supports the New Keynesian view.

### Empirical investigation of unemployment and inflation trade off

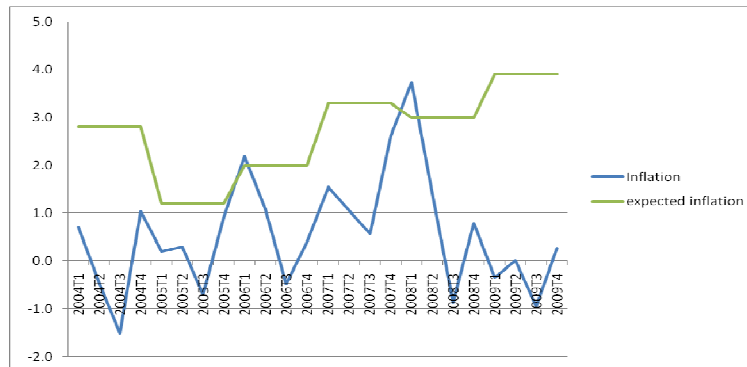
Here we use quarterly data from 2004 quarter 1 to 2009 quarter 4<sup>8</sup>. Data are collected from Econstats<sup>TM</sup>. The low inflation is associated with the primary goal of National bank of Republic of Macedonia which is price stability. The persistent unemployment is because there are no posts (involuntary unemployment) or due to lack of qualifications necessary to be employed (structural unemployment). The mismatch between the skill requirements of newly created jobs and effective skills owned by the workers has become a substantial problem (Svejnar, 2002). In the next Table are presented the Inflation and Unemployment in percentages quarterly data.<sup>9</sup>

<sup>7</sup> Geraats, M.Petra, (2002), *Central bank transparency*, The Economic Journal, (112), Royal Economic Society

<sup>8</sup> [http://www.econstats.com/ifs/NorGSc\\_Mac2\\_M.htm](http://www.econstats.com/ifs/NorGSc_Mac2_M.htm)

<sup>9</sup> Data on inflation are derived from CPI indexes and converted into percentages

On the next graph are presented the movements in the period 2004.1 to 2009.4 of actual inflation and expected (projected) inflation by the National bank of Republic of Macedonia.



Source: Econstats<sup>TM</sup>, and NBRM (reports of projected inflation)

The classic Philips curve:

$$(\pi_t) = f(U_t)$$

$$\pi_t = 4.39 - 0.1225U_t$$

Standard errors

$$(8.816) \quad (0.247)$$

We can compute the underlying natural rate of unemployment as:

$$U^n = \frac{\hat{\beta}_1}{-\hat{\beta}_2} = \frac{4.39}{0.1225} = 35.84 \quad R^2=0.0298$$

From the results above we can observe that estimated coefficients have the expected signs, but they are both highly statistically insignificant. Moreover, the coefficient of determination is close to zero, which indicates a low explanatory power of the applied linear regression model. Therefore, we argue that NAIRU concept is far from being applicable in the case of Macedonian labour market. The NAIRU concept applies for mature market economies, not for a young labour market like that in Macedonia set up just at the beginnings of 1990's. And most of the transition countries including Macedonia in the beginning of establishing the labour market had experienced high inflation rates which cannot be explained by the unemployment.

Most of the NAIRU literature emphasises its importance as a long-run concept (Hahn, 1995; Ball, 1999; Ball and Mankiw, 2002). In the short-run, unemployment can deviate from the NAIRU, but in the long run is assumed to return to a unique NAIRU.

The simple adaptive expectations Phillips Curve (Modigliani-Papademos, 1975):

$$(\pi_t) = f(\pi_{t-1}, U - U^*)$$

$$\pi_t = -0.015 - 0.96\pi_{t-1} - 0.40(U - U^*)$$

Std.errors                      (0.256)      (0.339)      (0.205)                      **R<sup>2</sup>=0.54**

Not surprisingly, there appears to be no statistically significant relationship between inflation and Unemployment –even in the classical Philips curve and in adaptive expectations Philips curve by Modigliani- Papademos (1975). Or the Friedman-Phelps- Lucas expectations-augmented one between the difference of actual and expected inflation rate and the gap between actual and the natural rate of unemployment presented in the next equation.

The simple expectations augmented Phillips Curve (Friedman, 1968-Phelps, 1967):

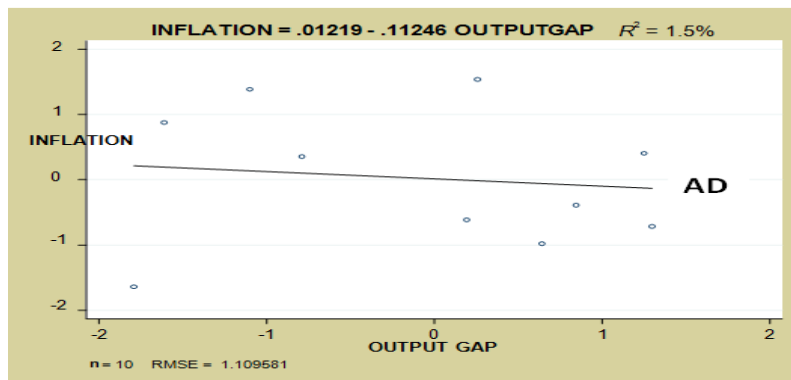
$$(\pi_t) = f(\pi_t^e, U_t - U^*)$$

$$\pi_t = 0.932 - 0.294\pi_t^e - 0.34(U - U^*)$$

Std.errors                      (0.97)      (0.285)      (0.327)                      R<sup>2</sup>=0.157

### INFLATION AND OUTPUT GAP TRADE-OFF IN MACEDONIA

According to New-Keynesian theories, fluctuations in output and employment rise because of fluctuations in nominal aggregate demand (Ball, Mankiw, Romer, 1988).

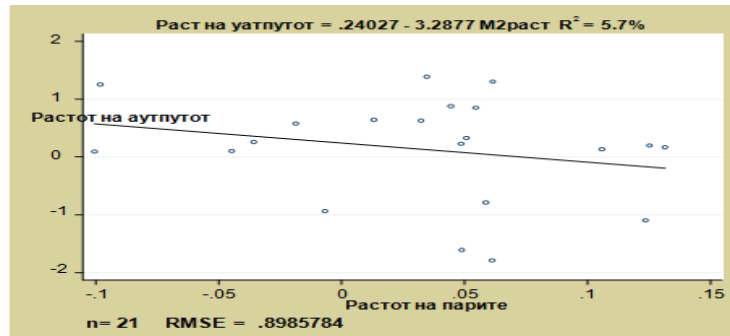


Output is demand determined, according to a Keynesian view prices below Walrasian levels, raise output, same as when decreases in demand decrease output.

## MONEY AND OUTPUT

The most obvious thing to do is to run a regression of current output on the current money supply

(all in log differences or growth rates).  $\Delta \log(y_t) = b \Delta \log(m_t) + \varepsilon_t$ <sup>10</sup>



## STATIONARITY OF THE VARIABLES

In this section we do a unit root testing for the variable economic growth. The result of the ADF (Augmented Dickey-Fuller tests) test is presented in the next table.

Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-8.439	-3.750	-2.630
MacKinnon approximate p-value for Z(t) = 0.0000			

From the table we clearly can reject the null of unit root for the economic variable and accept the alternative of stationary process In this section we do a unit root testing for the variable Money growth. The result of the ADF (Augmented Dickey-Fuller tests) testis presented in the next table.

Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	<b>-3.767</b>	<b>-3.750</b>	<b>-2.630</b>
MacKinnon approximate p=0.0033			

<sup>10</sup> This is often called St.Louis equation because it was used by the St. Louis FED economists in 1960's.

## VAR MODEL

Vector autoregression (VAR model) is possible to deal with dynamic relationships between macroeconomic variables, where causality may be mutual. According to Sims, if there is true simultaneity among a set of variables, there should not be any a priori distinction between endogenous and exogenous variables. It is in this spirit that Sims developed his VAR model.<sup>11</sup>

Now we will estimate two equations:

$$GDPgrowth_t = \alpha + \sum_{j=1}^k \beta_j GDPgrowth_{t-j} + \sum_{j=1}^k \gamma_j Moneygrowth_{t-j} + u_{1t}$$

$$Moneygrowth_t = \alpha + \sum_{j=1}^k \theta_j GDPgrowth_{t-j} + \sum_{j=1}^k \gamma_j Moneygrowth_{t-j} + u_{2t}$$

In the next Table it is presented VAR estimation of the above equations<sup>12</sup>

DEPENDENT VARIABLE Growth of GDP				
Variable	coefficient	Standard errors	Z-value	Probability of type I error
Growth of GDP (-1)	<b>-0.60</b>	<b>0.20</b>	<b>-2.99</b>	<b>0.00</b>
Growth of GDP (-2)	<b>-0.34</b>	<b>0.21</b>	<b>-1.62</b>	<b>0.11</b>
M2growth (-1)	<b>4.76</b>	<b>2.47</b>	<b>1.93</b>	<b>0.05</b>
M2growth (-2)	<b>-3.63</b>	<b>2.42</b>	<b>-1.50</b>	<b>0.13</b>
Constant	<b>0.11</b>	<b>0.18</b>	<b>0.61</b>	<b>0.54</b>
DEPENDENT VARIABLE Money growth(M2growth)				
Variable	coefficient	Standard errors	Z-value	Probability of type I error
Growth of GDP (-1)	<b>0.02</b>	<b>0.02</b>	<b>1.26</b>	<b>0.21</b>
Growth of GDP (-2)	<b>-0.03</b>	<b>0.02</b>	<b>-1.72</b>	<b>0.09</b>
M2growth(-1)	<b>0.33</b>	<b>0.20</b>	<b>1.61</b>	<b>0.11</b>
M2growth(-2)	<b>0.20</b>	<b>0.20</b>	<b>0.98</b>	<b>0.33</b>
Constant	<b>0.02</b>	<b>0.01</b>	<b>1.14</b>	<b>0.25</b>

Below are given the general statistics for the two equations.

<sup>11</sup> Gujarati, D. **Basic Econometrics**, (McGraw Hill, 2003) 4th edition (GJ).

<sup>12</sup> We can estimate the two equations by SURE method also.



From the above results we can see that Money growth influences positive on economic growth on 1 lag, but negatively on 2 lags while GDP growth influences negatively and statistically significant at two lags. While in the autoregressions growth of GDP on 1 lag negatively influences current GDP growth, and monetary growth influences its current value negatively at minus 2 lags.

### Granger causality test

Null hypothesis is that excluded variable does not Granger cause the variable in the equation.

<b>Equation</b>	<b>Excluded</b>	$\chi^2$	<b>Degrees of freedom</b>	<b>Pvalue of <math>\chi^2</math> test</b>
<b>GDPgrowth</b>	Money growth	4.8766	<b>2</b>	<b>0.087</b>
<b>Money growth</b>	GDPgrowth	7.6854	<b>2</b>	<b>0.021</b>

According to Gujaraty(2003) R.W.Hafer used the Granger test to find out the causality between GDP and money supply(M2). He used the growth rates of the variables, and we also use the growth rates of the two variables.

### Wald test

From the above results we reject the null hypothesis that money growth does not influence the GDP growth at 10% level of significance, while we can't reject at 1% and 5% conventional levels of significance. While in the second equation where the null hypothesis is that Money growth is supposedly influenced only by its own lagged values and not by the GDP growth variable, we reject the null at 5% and 10% levels of conventional significance and not on 1%.

So in a way the causality runs in both directions from GDPgrowth  $\rightarrow$  M2 growth and from M2growth  $\rightarrow$  GDPgrowth. But this test has some drawbacks for which the literature must be consulted.

### **Migrations on the labour market and demographic changes (case study Republic of Macedonia)**

All of the statistical and other indicators confirm, that Republic of Macedonia more decades has a process of demographic recession- decrease of the natural population movement (fertility, natural population growth and etc.). depopulation of the most of the rural space, decrease in the number of pupils , emigration of young and fertile population , emigration of working age population and highly educated population-“brain drain” etc. According which, the state is weakly economic productive, increased unemployment, large part of the economy is not productive, population is increasingly ageing, and many other elements lead to demographic and economic recession.

What is there to be done?

**First** : Change in the demographic structure-people are the key factor for development. Systematic application of the measures, from the institutions and defining of policy pr strategy for migrations, labour market and the demographic changes. Application of the socio-economic population , because the young population is the one that needs to be educated and to be active to produce, create and spend. Implementation of measures in the sphere of employment(benefits and subsidies for every new employment), redistribution of the assets and the labour contributions (alignment of the incomes of the low productive work, piece rate wages, additional hours of work payment, subsidies for the good business ideas,...)restructuring of the working hours (according to age , sex, education, expertise, type of business, space distribution-town, village, valleys, mountains,.....,annual time, time zone, productivity- alignment for new and effective (skills for new working posts..), new measures in the pension system (amount of the pensions , using benefits, subsidizing of certain activities....), access in all of the levels of education, decrease of the regional and economic difference etc.

**Second**: New pragmatic macroeconomic policy-attraction of mighty companies under most favorable economic conditions, application of the new technology in the new industrial, agricultural, tourist and other zones, building of the modern infrastructure and new capital

objects (hydro-thermo-windmills-sun and other plants, roads, railways, water accumulations),sail-concession of the land space of the home and foreign investors, economic benefits and subsidies for the population (in the sphere of housing, infrastructure costs, living standard, education etc.)

**Third:** Application of the modern digital technology in the direction of the new values-new life style of the global rural-virtual world. Application of the digital technology in the direction of ease of the work, communication and life in general. New technology in practicing life skills and economy- in planning, organizing, realization and evaluation all types of jobs. New technology in the area of education , nutrition, medicine, culture, vacation, recreation etc. Massive application of the new technology will cause new types of jobs as well as changes in the global migration trends on the labour market. In the case of Republic of Macedonia all efforts must be made in the direction of the application of the new technology , which will cause less physical and more virtual migration of the labor markets, i.e. we will work home(in a home conditions – factories, companies etc, located on the territory of R.Macedonia) without necessity to migrate in other countries. In such a case ,RM fro country of emigration will be competitive destination in the global migration labor market, i.e. will get into “transition migration’ which besides economic effects will cause and demographic changes in the Macedonian landscape.

### **Conclusion**

Our specialized attachment do not have pretensions to show on all the migration movements and modern trends on the labour market, but to contribute and to initiate thinking in the formulation of appropriate decisions in the way of improvement of the employment and decreasing the social aspects of the migration. We appreciate, that if R.Macedonia wants changes in the migrations, labor market and poverty alleviation, we need institutional politics on migrations, labor market and demographic changes, by application of national strategy for migrations, labor market and demographic changes, based on a new socio-economic population policy, new pragmatic macroeconomic policy and universal application of the modern digital technology.

## References

- [1] Ball, Laurence, N. Gregory Mankiw, and David Romer. (1988.) "The New Keynesian Economics and the Output-Inflation Tradeoff," *BPEA*, 1988:1, 1-82.
- [2] Ball, Laurence, N. Gregory Mankiw,(2002), "The NAIRU in Theory and Practice",Discussion Paper, Harvard Institute of Economic Research
- [3] Cazes, Sandrine(2002), Do labour market institutions matter in transition economies? An analysis of labour market flexibility in the late nineties, INTERNATIONAL INSTITUTE FOR LABOUR STUDIES
- [4] Dwyer, Jr. Gerald P., and Hafer R. W.(1988)," Is Money Irrelevant?" Federal Reserve Bank of St. Louis
- [5] Friedman M.(1968), The Role of Monetary Policy, The American Economic Review, Volume LVIII
- [6] Friedman M.(1976), Inflation and Unemployment, Nobel Memorial Lecture, December 13, 1976,The University of Chicago Illinois
- [7] Geraats, M.Petra, (2002), *Central bank transparency*, The Economic Journal, (112), Royal Economic Society
- [8] Gujarati, D. Basic Econometrics, (McGraw Hill, 2003) 4th edition (GJ).
- [9] Modigliani, Franco, and Lucas Papademos, (1975) "Targets for Monetary Policy in the Coming Year" *Brookings Papers on Economic Activity*, 141 – 165. The Brookings Institution.
- [10] Phelps, Edmund S. (1967), *Expectations of Inflation and Optimal Unemployment over Time*, *Economica*, New Series, Vol. 34, No. 135, (Aug., 1967), pp. 254-281
- [11] Phillips, A. W. (1958). "The Relationship between Unemployment and the Rate of Change of Money Wages in the United Kingdom 1861-1957". *Economica* 25 (100): 283–299.
- [12] Samuelson, P.A., and R.M. Solow, (1960) "Analytical Aspects of Anti-Inflation Policy" *American Economic Review Papers and Proceedings* 50(2), pp. 177