

Open vs Closed economy: An Empirical analysis of the Unemployment and Economic growth Relationship

Hend Yousef (*Management Technology: Economics*) and Dr. Dina M. Yousri (*Assistant Professor and Co-chair of Student Curriculum Committee*):
The German university in Cairo
hend.yousef@student.guc.edu.eg . dina.elsayed@guc.edu.eg



Introduction

The objective of this paper is to introduce the moderating variable “openness to trade” by validating Okun’s law in countries with open economies such as Vietnam and the Netherlands as well as in closed economies like Brazil and Nigeria to compare if the factor “openness to trade” strengthens or weakens the relationship. Through this, the research question developed: “Is the relationship between unemployment and economic growth moderated by the level of trade openness?”.

Literature Review

According to the classical school of thought comparative advantage can be attained through specialization and division of labor and hence, the trade of resources from areas of abundance to where it is scarce. Such changes in trade patterns have been brought on by the adoption of liberalization policies (Nwaka, Uma and Tuna, 2015).

Foreign trade liberalization decreases unemployment affirming the presence of a negative relationship between openness and unemployment which corresponds with the Ricardian Comparative Advantages theory (Dutt, Mitra and Ranjan, 2009; Betul, 2015) which is explained by Janiak (2006) stating that with the liberalization of trade, the large exporting firms will demand more labor for production in order to capitalize on new investment opportunities which results in workers moving from the lesser productive firms to the more productive firms with the potentiality of job creation in the lesser productive firms.

Okun proposed the negative relationship between unemployment and real GDP in 1962. Ever since then, the fact that unemployment decreases with economic growth is a generally accepted concept in economics (Akeju and Olanipekun, 2014).

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The ‘First difference model’

$$y_t - y_{t-1} = \alpha + \beta(u_t - u_{t-1}) + \varepsilon_t$$

The ‘Gap model’

$$y_t - y_t^* = \alpha + \beta(u_t - u_t^*) + \varepsilon_t$$

y_t is the log of real GDP

u_t is the unemployment rate,

α is a constant,

β is the Okun coefficient

ε is the error term

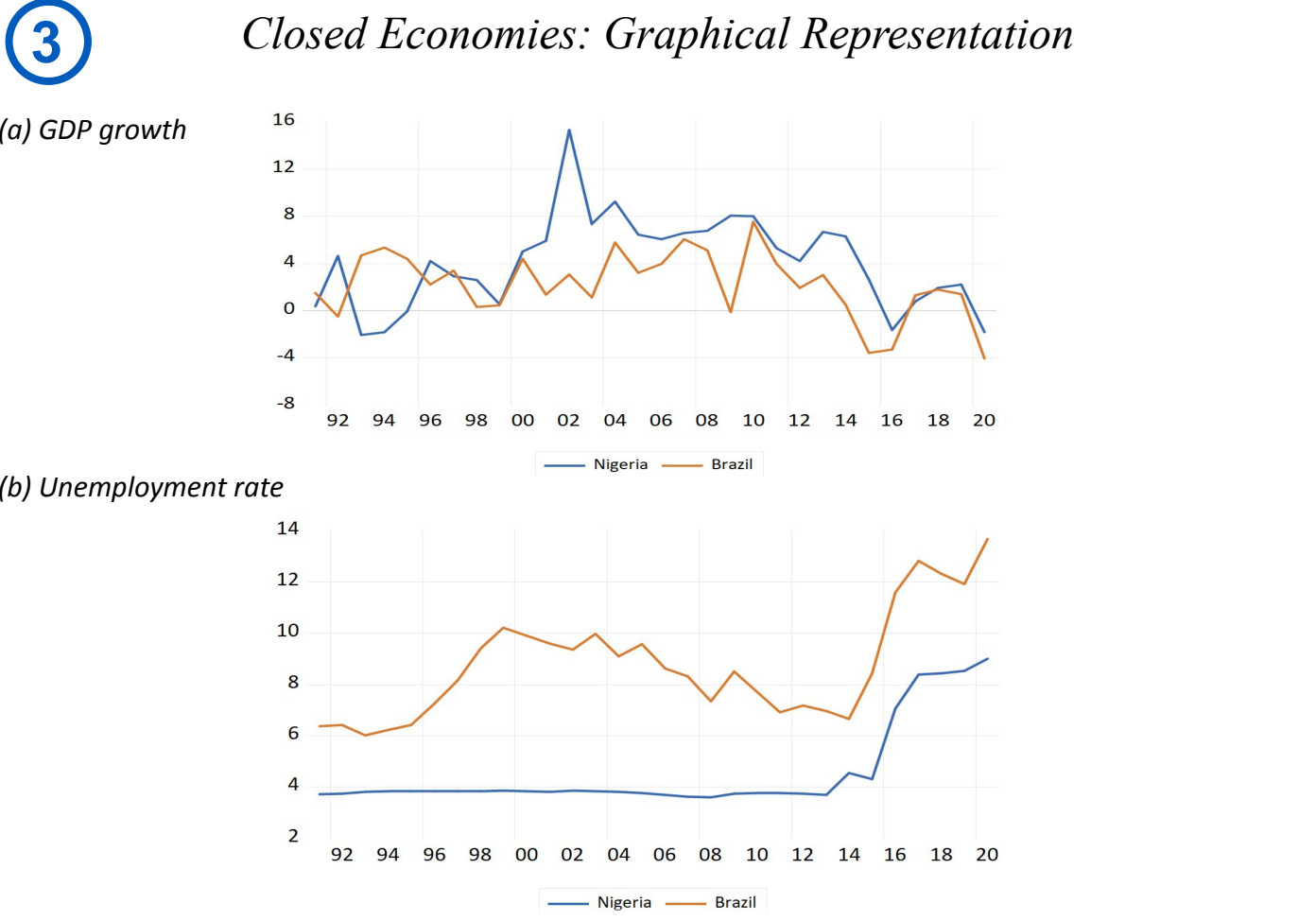
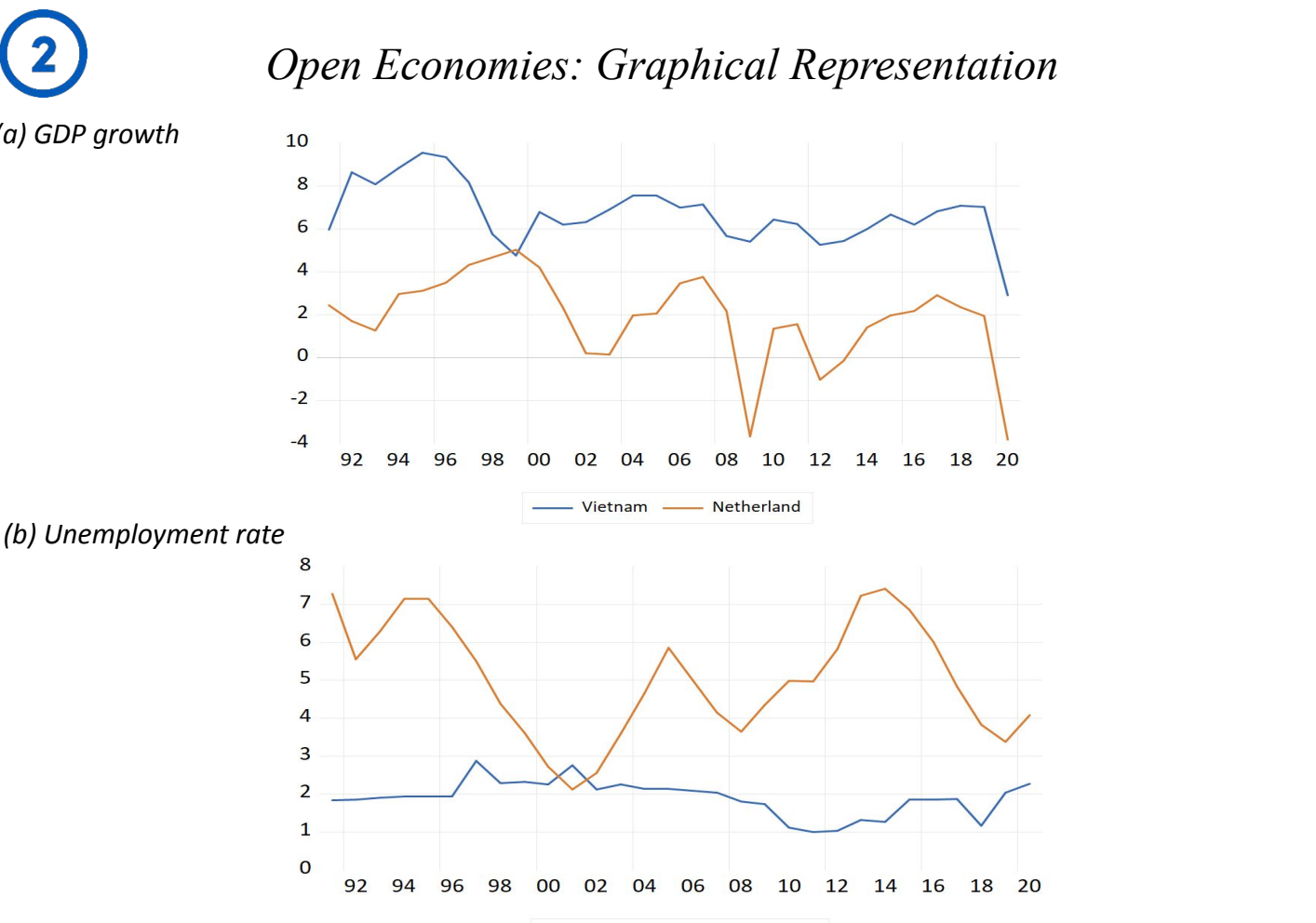
y* is the log of potential

u* is the natural rate of employment rate

(y_t-y_t*) the cyclical level of GDP

(u_t-u_t*) the unemployment gap

Conceptual Framework



Source: World Development Indicators, world bank (2020)

Methodology

The dependent variable, economic growth expressed as percentage GDP growth and the independent variable, unemployment rate are regressed. A control variable, percentage capital growth will be added to the initial model to make it more robust.

Regression will be performed using data from Vietnam, Brazil, the Netherlands and Nigeria for the years 1991 to 2020 making it a panel OLS regression. The Hausman test will then be performed on a random-period regression in order to determine whether fixed effects model or a random effects model will be more appropriate to use. The final robust equation can be presented as:

$$y^* = \alpha + \beta_1x_1 + \beta_2x_2 + \varepsilon$$

Results

A

Period random effect OLS regression for the robust model (open)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.002153	0.705164	9.929823	0.0000
UNEMP	-0.986484	0.145344	-6.787242	0.0000
CAPG	0.099126	0.032499	3.050098	0.0050

Effects Specification

Period fixed (dummy variables)			
R-squared	0.859500	Mean dependent var	4.299478
Adjusted R-squared	0.703945	S.D. dependent var	3.004980
S.E. of regression	1.635036	Akaike info criterion	4.125734
Sum squared resid	74.85363	Schwarz criterion	5.242717
Log likelihood	-91.77201	Hannan-Quinn criter.	4.562647
F-statistic	5.525406	Durbin-Watson stat	0.871749
Prob(F-statistic)	0.000009		

$$y^* = 7.002153 - 0.986484x_1 + 0.099126x_2 + \varepsilon$$

The negative coefficient of the regression indicates that as unemployment rate increases by 1%, GDP growth decreases by 0.986484% on average (all else being equal) which complies with Okun’s negative relationship presented in the literature while the positive coefficient implies that a 1% increase in capital growth will cause a 0.099126% increase in GDP growth on average (all else being equal). The intercept of 7.002153 shows that with 0% unemployment and capital growth, the GDP growth will be 7.002153%. The p-value for all three parameters are less than 0.01 meaning that which indicates a highly (strong) significant relationship at 99% significance level. As for the goodness of fit (R2) which is equal to 0.859500 or 85.95% which means that nearly 85.95% of the variations in GDP growth is explained by variations in unemployment rate and capital growth.

B

Period random effect OLS regression for the robust model (closed)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.378000	1.036004	6.156346	0.0000
UNEMP	-0.516096	0.146714	-3.517701	0.0015
CAPG	0.094820	0.043488	2.180405	0.0378

Effects Specification

Period fixed (dummy variables)			
R-squared	0.760248	Mean dependent var	3.153225
Adjusted R-squared	0.494809	S.D. dependent var	3.502531
S.E. of regression	2.489486	Akaike info criterion	4.966556
Sum squared resid	173.5312	Schwarz criterion	6.083540
Log likelihood	-116.9967	Hannan-Quinn criter.	5.403470
F-statistic	2.864114	Durbin-Watson stat	1.275710
Prob(F-statistic)	0.003074		

$$y^* = 6.378 - 0.516096x_1 + 0.09482x_2 + \varepsilon$$

The negative coefficient of the regression indicates that as unemployment rate increases by 1%, GDP growth decreases by 0.516096% on average (all else being equal) which complies with Okun’s negative relationship presented in the literature while the positive coefficient implies that a 1% increase in capital growth will cause a 0.09482% increase in GDP growth on average (all else being equal). The intercept of 6.378 shows that with 0% unemployment and capital growth, the GDP growth will be 6.378%. The p-value for the intercept and the okun coefficient is less than 0.01 meaning that which indicates a highly (strong) significant relationship at 99% significance level while the coefficient of capital growth is significant at 95% significance level. As for the goodness of fit (R2) which is equal to 0.760248 or 76.0248% which means that nearly 76% of the variations in GDP growth is explained by variations in unemployment rate and capital growth.

Conclusion

The objective of this study was to analyse the relationship between unemployment and economic growth in open and closed economies using Okun’s law. The results of previous empirical findings varied greatly from each other. Some results validated Okun’s law while others provided weak support and some even provided mixed results. Results of regression run in this paper indicate that the okun coefficient is negative and is statistically significant as well as the fact that the coefficient in open economies is larger than that of closed economies.

However, one thing remains true and is that the need to introduce moderating variables in order to better understand the relationship between unemployment and economic growth. Factors that can be taken into consideration for future research: the effect of past unemployment on current GDP growth, larger panel, and different moderating variables such as labour mobility.

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