



Trade Openness and Inclusive Economic Growth: Poverty Reduction through the Growth – Unemployment Linkage

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ABSTRACT

This paper investigates the relationship between trade and poverty reduction through the channels of economic growth and employment. Two econometric models are utilized to analyze these interconnected linkages for Jordan during the 1980-2014 period. The first model, which is based on a theoretical framework developed for this purpose, estimates the impact of trade, among other factors, on economic growth by applying heteroskedasticity-corrected ordinary least squares estimation method. We further, extended the analysis by employing the second model on the basis of Okun's law to examine the effect of economic growth on unemployment. The findings of the study suggest that external factors are the major contributors to growth, especially workers' remittances, followed by external trade and then foreign direct investment inflows. But the achieved growth has not been sufficiently reflected on unemployment reduction and poverty alleviation, due to the inflated government, fast population growth combined with the flux of foreign labor and refugees.

Keywords: Trade Openness, Okun's Law, Poverty, Foreign Direct Investment, Inclusive Economic Growth

JEL Classifications: F1, I3, O4

1. INTRODUCTION

Explaining the impact of trade on poverty is a very difficult and complex task since it can be seen as the result of interaction between different socio-economic and institutional factors. Also different theoretical models identified different linkages between the two variables, and on the other hand, empirical evidence about these linkages was found to be inconsistent and non-comparable across countries. In order to thoroughly understand the link between trade and poverty we have to consider other variables (growth and employment) which constitute the channels between trade openness and poverty reduction. In other words, we need to study these interconnected relations within the domain of the recently developed concept of inclusive economic growth. Therefore, we first developed a theoretical framework to analyze trade – growth nexus by building a growth model consistent with the neoclassical growth theory to investigate the impact of trade, among other determinants, on growth, and then, the association linking growth to poverty through employment (unemployment) has been constructed on the basis of Okun's law. According to this well-known macroeconomic law, real economic growth leads,

although less proportionately, to less unemployment rates, and hence reduces poverty.

These two theoretical models have been empirically tested for Jordan, as one of the Middle Eastern emerging economies¹. Although Jordan is a small open economy with limited natural resources, it has managed to achieve significant real growth over the last three decades. But this growth has not been accompanied with adequate generation of employment opportunities, and Jordan has suffered – and still suffering – from high unemployment rates, with an average of around 12 percent during the last few decades, and from high levels of poverty. Such inconsistent performance has stimulated us to conduct this research. Our main goal is to combine theoretical analysis and econometric models to assess the interconnected associations between the four variables: Trade, economic growth, unemployment and poverty. We hope that this work contributes to filling the gap in the literature on inclusive economic growth.

¹ According to Dow Jones classification in May 2010, found at: http://en.wikipedia.org/wiki/Emerging_markets.

The outline of this paper is as follows. Section 2 reviews related literature. Section 3 provides the theoretical background on the growth model, the link between growth and poverty and Okun's law. In section 4, the adopted empirical methodology is presented and the results are discussed. Finally, section 5 summarizes and concludes.

2. LITERATURE REVIEW

It was Adam Smith who first tried to explain why some nations were rich and others were poor. He noticed that some nations were rich although not all their peoples were working, while others were poor although almost all their peoples were working. He explained output differences between countries by better organization and labor division. In addition, although most core growth theories agree on the importance of both quantity and quality of factors of production and technology for growth, there has been disagreement among economists on the relative importance of each and the exact definition.

Economic literature identified several key factors explaining economic growth for most countries, but often taken individually. It includes human capital (Locas, 1993; Barro, 1998), natural resources (Shaban, 1987), technology (Kuznets, 1966), trade (Pomiranz, 2000), foreign direct investment (FDI) (Lyroudi et al., 2004). Recently, other factors are considered important for growth including government policies and reform programs, institutions (North, 1990), control of corruption (Aidt et al., 2008) and some indicators of human development such as life expectancy, literacy, fertility...etc.². Among problems facing researchers in this area, is lack of data on some of these variables, especially in the case of time series models as compared to panel models.

Although human capital is certainly important for growth, it is important to note that it is not the only determinant or even the most significant one in some countries. On the other hand, it is not clear which first cause the other, since economic growth may also affect quality of human capital. At the same time although some countries like Russia, India, and Korea have almost the same level of education as the advanced western economies like US, Germany and UK, they achieved much lower growth rates. Similar argument applies to the importance of natural resources to growth. Although Saudi Arabia, Algeria, Brazil, Nigeria, and Sudan are rich in natural resources, they have not achieved as high growth rates and become rich as achieved by similar natural resource abundant countries like Canada, Australia, and China. At the same time countries with natural resource scarcity like Japan, Taiwan, Singapore, and Malaysia have succeeded in achieving much higher growth rates and richness.

Trade – and other related variables such as workers' remittance and FDI – are significant determinants of economic growth in many countries, especially those with open economies. The belief that there exists a positive link between a country's openness and economic growth is widely accepted by economists such as Dollar (1992), Sachs and Warner (1995) and Srinivasan and Bhagwati

(2001), among others. In a recent study carried out by Ramjerdi (2012) surveying the theoretical side of the effect of international trade on growth, the author reached to the conclusion that the evolution of trade theory from Smith and Ricardo to the New Trade Theory, all seem to be in support of free trade. On the other hand; Tahir et al. (2014) also surveyed the available literature on this topic, but from the empirical side. They suggested that the results obtained from the different articles on the trade – growth nexus confirm the hypothesis that trade impacts growth positively, although there are some conflicting results arising mostly from the presence of measurement and methodologies issues, as has been demonstrated by Winters (2004), Berg and Kruger (2008) and Andersen and Babula (2008). The paper of Frankel and Romer (1999) is a good illustration of this relation. The authors constructed a geographical measure of trade and used instrumental variables method to examine the relationship between trade and income. They found positive and robust, although weakly significant, impact of openness on income. More importantly, there results suggested that there is no evidence that the IV estimates are lower compared to ordinary least squares (OLSs). They concluded that the OLS estimates are likely to be more accurate estimates of trade's actual impact on income. Lyroudi et al. (2004) investigated the link between FDI and economic growth of a group of selected transition economies. They used Bayesian analysis to measure the effects of FDI on growth. They found no significant relationship between the two variables. Aidt et al. (2008) studied the relationship between corruption and economic growth using a panel of 71 countries. They found that corruption has a substantial negative impact on growth in the case of countries with high quality political institutions. In countries with low quality institutions, corruption has no impact on growth.

Furthermore, a large number of papers has emerged to examine not only the connection between trade and growth, but also their relationships with employment and poverty. The work of Khan (2007), Osmani (2003; 2005), Dollar and Kraay (2004), Islam (2004), Khan (2007) Srinivasan (2009), Hull (2009), Mandloi and Bansal (2014) and Ajakaiye et al. (2016) are examples of this work. The following two articles analyze these associations for Jordan. Basher and Wahban (2013) investigated the impact of macroeconomic variables (gross domestic product [GDP], openness and FDI) on Jordanian labor employment, applying fully modified OLS approach for the period 1980-2012. The study showed that there is a positive and significant effect of these variables on employment level. The result concerning FDI has been confirmed by Haddad (2016) who reached to the conclusion that increases in FDI cause decreases in unemployment rate. Moreover, several studies covering these relations for Middle East and North Africa Countries – including Jordan – have emerged, mostly, by international organizations. These studies include the work on globalization, growth and poverty reduction by Page and Gelder (World Bank, 2002); on trade, FDI and development by Iqbal and Nabil (World Bank, 2004); on economic growth, employment and poverty by Messkoub (ILO, 2008); and on inequality, growth and poverty (Ncube et al., 2013).

More emphasis, however, has been put on the association between economic growth and employment, specifically, the

2 Led by UNDP, Human Development Reports, several issues.

unemployment – growth relation. Okun (1962) summarized this link in a statistical relationship using the USA data. A wide range of studies investigating this relation emerged later. Examples of recent studies are those for Nigeria (Bankole and Fatai, 2013), Egypt (El Shamy, 2013), South Africa (Phiri, 2014), Australia (Valadkhani, 2015) and the UK (Stober, 2015). In most empirical studies, the results provided evidence of a negative relationship between changes in the unemployment rate and changes in real output.

The study of Shatha et al. (2014), examined the relationship between unemployment and GDP growth in Arab countries. The sample covered nine Arab countries for the period 1994-2010. They have used pooled estimated generalized least squares (cross-section SUR) to estimate their model. They found that economic growth has negative and significant effect upon the unemployment rate, particularly; a 1% increase in economic growth will decrease the unemployment rate by 0.16%.

It is worth noting that Okun's coefficient registered different values for different countries. The study of Ball et al. (2016) compared the performance of Okun's law in a sample of 71 advanced and developing economies. The findings showed that on average, the Okun's coefficient is about half as large in developing countries as in advanced countries.

3. THEORETICAL BACKGROUND

3.1. The Growth Model

The empirical growth model to be used in this paper is based on the neoclassical growth theory in which total output (measured by GDP) is determined mainly by factors of production and technology. We assume a general production function in which production level depends on factors of production: Capital, labor, land and technology. The coefficients in this general specification need not to sum to one (no CRS technology is assumed). The general form of production function can be expressed at time period t as follows:

$$Y_t = A_t F(\text{capital}, \text{labor}, \text{land}) \quad (1)$$

Taking total differential of (1) and rearranging yields:

$$d \log Y_t = dA/A + b_1 d \log(\text{capital}) + b_2 d \log(\text{labor}) + b_3 d \log(\text{land}) \quad (2)$$

Where all variables are transferred into difference log of original variable. The b 's are the partial unknown growth coefficients.

Other policy variables that may affect economic growth through the term dA/A may include trade openness, FDI and corruption. Hence the technological change variable can be viewed as the sum of two effects: First, the effect of policy variables mentioned above, and secondly, random disturbances (e_t) resulting from unobserved shocks like sudden changes in weather and resources availability and other unexplained changes.

Accordingly, the econometric model to be estimated can be written as:

$$d \log Y_t = b_0 + b_1 d \log(\text{capital}) + b_2 d \log(\text{labor}) + b_3 d \log(\text{land}) + b_4 (\text{policy}) + e_t \quad (3)$$

The coefficient of the policy variable added to the production function in equation (3) measures the impact of trade openness and/or other policy variables on technological changes after controlling for the impact of factors of production.

The rate of growth in output is calculated as the log differences of annual GDP values, all other variables are similarly calculated with the exception of policy variable(s).

3.2. The Link between Growth and Poverty

One can explore the association between economic growth and poverty reduction by analyzing the chain of relations that connects these variables with other related variables, namely; growth and employment. This chain works as follows: Trade influences growth, and growth affects employment, which in turn supposed to have an impact on poverty reduction. The relationship between trade and economic growth which was investigated in the previous section reached to the conclusion that trade – openness, as theoretically expected, affects positively real economic growth. But how would economic growth be translated into poverty reduction? The answer is basically through the mechanism of employment³. It is the quantity and quality of employment of the poor that determines how would growth be reflected into higher incomes which indicate improvement in their standards of livings⁴.

Solving the problem of poverty need first investigation of its causes. Poverty is mainly caused by unemployment and low returns to labor⁵. Therefore, the increase of the number of employed people (reduction of unemployment), and the rise of returns of the poor (resulting from improvement in productivity) may mitigate poverty. Based on the above analysis on the growth – poverty nexus, one would expect that trade openness – via economic growth will favorably affect poverty level. However, this conclusion is not always guaranteed and depends on several factors. First, on how the fruits of economic growth are distributed within countries and whether they are distributed fairly and hence reduced inequality gap. Secondly, on whether the achieved growth is a result of capital or labor intensive processes. Trade theory suggests that economic growth resulting from labor-intensive processes is more useful for reducing unemployment and hence combating poverty. Thirdly, on whether the achieved growth in GDP is significantly contributed by foreign labor force residing in the country. The higher the degree of dependency on foreign labor force, the lower the benefits of economic growth to national employment, since

3 There is also the social provisioning instrument. Economic growth generates revenues for the government, which may be used to provide direct social assistance and services for the poor.

4 Poverty, which can be measured by a specific index (income/consumption index for the poor) is related to the short fall from some minimum acceptable level of income or consumption "the threshold poverty level."

5 Poverty may also rise from unequal distribution of income and wealth in the society.

the domestic growth is most likely to be accompanied by more foreign labor influx. Hence, the relationship between economic growth and poverty can only be resolved empirically. In studies dealing with poverty, a macroeconomic indicator of poverty is needed in order to conduct the empirical analysis. Theoretically, there exist many of such poverty indicators; to mention some of them: Income share held by certain percentile, number of poor earn certain amount of dollars a day, poverty gap at national poverty lines, rural poverty gap, mean consumption, etc. Unfortunately, no long enough time series data is available on any of the poverty indicators for the case Jordan⁶. Therefore, the study will utilize the very well-known Okun's law to empirically estimate the relationship between real economic growth and the rate of unemployment based on the following hypotheses: The more economic growth achieved through trade openness, the lower the rate of unemployment, and hence the lower the poverty level in a country⁷. The logic behind Okun's law is simple; output depends on the amount of labor used in the production process, so there is a positive relationship between output and employment. Total employment equals the labor force minus the unemployed, so there is a negative relationship between output and unemployment (conditional on the labor force).

Okun's law is generally written as:

$$U_t - U_t^* = \beta (Y_t - Y_t^*) + \varepsilon_t \quad \beta < 0 \quad (4)$$

Where, U_t is the unemployment rate, Y_t is the log of output and the * indicates a long-run level. As Ball et al. (2013) discuss⁸, the magnitude of the Okun's coefficient "is difficult to pin down a priori. It depends on the costs of adjusting employment, which include both technological costs such as training and costs created by employment protection laws. The coefficient also depends on the number of workers who are marginally attached to the labor force, entering and exiting as employment fluctuates." Since these factors differ across countries, it is quite likely that the Okun's coefficient will also differ across countries. More specifically, according to (the) currently accepted versions of Okun's law, to achieve a one-percentage point decline in the unemployment rate in the course of a year, real GDP must grow approximately 2% points faster than the rate of growth of potential GDP over that period. So, for illustration, if the potential rate of GDP growth is 2%, Okun's law says that GDP must grow at about a 4% rate for one year to achieve a one percentage point reduction in the rate of unemployment."

Another version of Okun's law focuses on a relationship between unemployment and GDP, whereby a 1% increase in unemployment causes a 2% fall in GDP.

In addition to the "levels" or "gap" version shown in equation (4), there is a "growth" version of Okun's law:

$$\Delta U_t = \alpha + \beta \Delta Y_t + \omega_t \quad (5)$$

Where Δ is the change from the previous period. This equation follows from equation (4) if the natural rate U^* is assumed to be constant and potential output Y^* is assumed to grow at a constant rate. In this case, differencing equation (4) yields equation (5) with $\alpha = -\beta \Delta Y^*$, where ΔY^* is the constant growth rate of potential output, and $\omega_t = \Delta \varepsilon_t$.

The next section provides empirical analysis of the previous two econometric models.

4. ECONOMETRIC ANALYSIS

A sample of annual data for Jordan covering the period of 1980-2014 has been prepared using the databases of the Central Bank of Jordan and the World Bank⁹. Consistent with the theoretical model explained earlier, the estimated equation for economic growth included the annual growth rate of the following variables: Real GDP (ld_rgdp), area of utilized land in production (ld_alandu), gross fixed capital formation at constant prices (ld_capf), secondary school enrollment (ld_educ), labor force (ld_labor), life expectancy (ld_life), FDI inflows (ld_fdinf), population (ld_pop), growth in government size (ld_gsize), workers' remittances (ld_remit), growth in unemployment (Ug), and the policy variable ($tradeo$).

Inspection of the correlation matrix of the model variables (Appendix Table 1) reveals that growth of real GDP is positively and strongly correlated with the growth of workers' remittances (0.77) and weakly correlated to the growth of gross capital formation (0.34). Other less significant but negative correlation is found with the growth of government size (-0.18). No significant correlation was detected among explanatory variables which can be considered as initial indication of no multicollinearity problem. The only exception is the high correlation coefficient between growth rates of labor and population (0.81), which may suggest that each one can be taken as good proxy of the other.

As a first necessary step before turning to the model estimation, all the model variables must be checked for unit root to make sure that all model variables are stationary. The result of applying augmented Dickey-Fuller (ADF) unit root test is shown in Table 1.

The results of ADF test shows that all variables are statistically significant at the 0.05 or better level, with an exception for labor and life expectancy variables which are significant at only 11% and 21% level, respectively. Hence, the result indicates to stationarity of all variable used in OLS and assures non-spurious regression results. Experiments with the two weak stationary variables (ld_labor and ld_life) and the education variables produced insignificant coefficients with wrong signs, and hence dropped from the equation. However, as available labor data is found to be inconsistent according to different sources, which could be the source of the series instability, the rate of growth of population is

6 After consulting with several domestic data sources, in addition to the world bank data base at: <http://databank.worldbank.org/data/reports.aspx?source=poverity-and-equity-database#>

7 Robert J. Gordon, 2004.

8 Ball, L.M., Leigh, D., Loungani, P. (2013). "Okun's Law: Fit at fifty?", Working Paper #18668. Available form: <http://www.nber.org/papers/w18668>.

9 After consulting with several domestic data sources, in addition to the world bank data base at: <http://databank.worldbank.org/data/reports.aspx?source=poverity-and-equity-database#>

Table 1: ADF unit root test

Variable	Tau-statistic with constant	P value
ld_rgdg	-3.76682	0.003
ld_alandu	-6.38	0.00
ld_remit	-4.33	0.00
ld_fdinf	-9.22	0.00
ld_gsize	-2.97	0.037
ld_pop	-3.32	0.00
ld_capf	-3.36	0.01
Tradeo	-3.73	0.00
ld_labor	-2.54	0.11
ld_educ	-5.4278	0.00
ld_life	-2.18	0.21

Source: Researchers calculations. ADF: Augmented Dickey–Fuller

used instead. This is justified by the high correlation coefficient between the two variables as indicated Appendix Table 1. All included variables were transformed into log differences of the original variables except the policy variable on trade openness, which was constructed by dividing the value of total trade by GDP. The constant was dropped from the estimated equation consistent with the specification of the growth model.

The growth equation (3) was estimated first by OLSs, and tested for both autocorrelation and heteroskedasticity. Although no evidence of serial correlation was detected, the Breusch-Pagan test for heteroskedasticity indicated to the existence of heteroskedasticity problem as shown below:

Test statistic: $LM = 17.294770$, $P \text{ value} = P(\text{Chi-square}(7) > 17.294770) = 0.015591$

Therefore, the model was re-estimated after correcting for heteroskedasticity and the result is shown in Table 2.

The model overall fit is very good as shown by the relatively high R^2 (78%) and highly significant Fisher F-test. All estimated coefficients carry the correct expected sign; all positive except the coefficient for government size variable which turned out to be negative indicating to the crowding out effect on growth due to over optimal size of public sector. It also may indicate to the negative corruption effect on economic growth usually associated with inflated public sector. However, the estimated coefficients of both capital and labor (approximated by population growth) although carry the correct sign they are statistically insignificant. All other estimated coefficients are statically significant at 5% or better level. Trade openness and FDIs coefficients although very small in size but are highly significant indicating to positive effect of both openness indicators on economic growth. This may be taken as an indicator of the limited positive effect of trade liberalization and FDI on real economic growth in the case of Jordan. Our results are in line with Karras' (2003) and Billmier and Nannicini (2007) findings of positive effect of trade liberalization on the growth of Middle Eastern counties including Jordan.

However, the estimation result reveals that the strongest and most significant effect on the growth of Jordanian economy is due to workers' remittances, which may be taken as an indication of the importance of high quality rather than high intensity of Jordanian

Table 2: Heteroskedasticity-corrected OLS

Dependent variable: ld_rgdg				
Variables	Coefficient	Standard error	t-ratio	P value
ld_alandu	0.027628	0.0151949	1.9182	0.05
ld_remit	0.142669	0.0290033	4.9190	0.00
ld_fdinf	0.000959863	0.000352992	2.7192	0.01
tradeo	0.00028545	6.03735e-05	4.7281	0.00
ld_gsize	-0.14284	0.0691171	-2.0666	0.05
ld_capf	0.0134598	0.0252225	0.5336	0.59
ld_pop	0.00615402	0.162935	0.0378	0.97
$R^2: 0.776183$		$F(7, 23)=11.4$		0.00

Source: Researchers calculations. OLS: Ordinary least squares

human resources. However, the positive and strong impact of remittances on growth is almost fully offset by the negative impact of large size government.

In this paper, under the above assumptions, equation (2) is estimated. Empirically, and as Ball et al. (2013) note, at least in the data both equations (1) and (2) fit quite well for most advanced countries, but poorly for most developing countries.

Consistent with the growth form used, equation (5) was estimated by OLS since all variables were found to be stationary according to ADF test (not shown here). All estimated coefficients carry the correct expected sign and statistically significant at 5% or better. The coefficient of multiple determination R^2 is very low (about 17%), but this is expected when the estimated model is in the growth form. Never the less the model overall fit is satisfactory as Fisher test indicates significance at about 5%. Turning to the explanation of the magnitude of coefficients, the estimated coefficient for real GDP growth (lagged one period) is about -1, meaning a 1% growth in real GDP will (after one-time period and holding other things constant) reduce unemployment rate by almost 1%. However, the coefficient for population growth indicates that a 1% increase in the population will contribute (after one-year pass) to increasing unemployment by about 2%, other things held constant. This result indicates that for Jordan to succeed to cut down unemployment and hence lower poverty, growth in real GDP must surpass growth in population over time (Table 3).

Combining this finding with the fact that Jordan is affected the most in the region by refugee crises and labor inflows, provides a convincing explanation to the main question of this paper: Why the high growth rates achieved by the Kingdom during the last three decades have not contributed significantly to unemployment and poverty reduction.

5. CONCLUSION

The main conclusion of this study is that economic growth of the Jordanian economy is determined mainly by external factors rather than traditional internal resources. The study provides evidence that trade liberalization and other openness policies have contributed significantly to economic growth; in particular, workers' remittances, external trade and FDI inflows respectively, are found to be the main determinants of economic growth in Jordan.

Table 3: OLS, using observations 1982-2014 (t=33)

Dependent variable: Ug				
Variables	Coefficient	Standard error	t-ratio	P value
gdprg_1	-1.03677	0.521125	-1.9895	0.0555
popg_1	2.12118	0.887917	2.3889	0.0232
Mean dependent variable	0.042946	SD dependent variable	0.159994	
Sum squared residual	0.733516	SE of regression	0.153824	
R ²	0.166467	Adjusted R ²	0.139579	
F(2, 31)	3.095546	P value(F)	0.059471	
Log-likelihood	15.98086	Akaike criterion	-27.96172	
Schwarz criterion	-24.96871	Hannan–Quinn	-26.95466	
Rho	0.028365	Durbin–Watson	1.912786	

Source: Researchers calculations. OLS: Ordinary least squares, SD: Standard deviation, SE: Standard error

Government policies should continue to promote more trade liberalization, attract FDI and enhance quality of human resource (by training and education) which is truly the most valuable asset in Jordan. However, the study also provides evidence that the inflated size of public sector, fast population growth combined with flux of foreign labor and refugees are preventing high rates of economic growth achieved over time from affecting favorably unemployment and poverty rates.

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APPENDIX

Appendix Table 1: Correlation coefficients, using the observations 1980-2010

ld_rgd	ld_labor1	ld_pop	ld_remit	ld_capf	Greetings
1.0000	0.0754	-0.0580	0.7668	0.3427	ld_rgd
	1.0000	0.8057	0.0362	-0.0629	ld_labor1
		1.0000	-0.0469	-0.1941	ld_pop
			1.0000	0.4211	ld_remit
				1.0000	ld_capf
		ld_fdinf	ld_gsize	tradeo	
		0.0451	-0.1751	0.0601	ld_rgd
		-0.0760	0.0177	0.3326	ld_labor1
		-0.0794	0.0347	0.2213	ld_pop
		-0.0750	-0.0600	0.1266	ld_remit
		-0.0521	-0.2978	0.1903	ld_capf
		1.0000	0.0346	-0.0805	ld_fdinf
			1.0000	0.0433	ld_gsize
				1.0000	tradeo