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Full Length Research Paper

Determinants of Growth GDP per capita through Panel Data Analysis in Selected Arab Countries

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While empirical studies support the relevance of some factors for economic growth, some of them studies the cross countries of OCED variability, others research the variation between countries variability, in both growth patterns and potentially explanatory variables, this paper focuses on the selected Arab countries represent three levels of Growth domestic product. The data quality has been utilized of data from many sources and using Colman filter then ADF test to ensure stability of data, where the estimation approach assume an even more crucial role as a novel econometric approach, that can be reconciled growth models assumptions. The technique of this paper represents the difference in growth performance as well as the evaluation of performance over time in each selected Arab country, this technique of panel data analysis allows adjustment and convergence speeds to vary across countries in short term, and give a measure signs ,while in long term in which can be imposing restrictions Results can be summarized as the levels of rich or middle of income countries. Some of them depend on returns of oil productivity, while other countries try to develop all sectors, such as financial market, tourism sector, communication sector, industrial sector, and R&D as they could, but in this paper vary among countries. Our found indicates that as well the accumulation of physical as well as human capital is the main drivers of economic growth.

Keywords: economic growth, determinant factors, models of economic growth, panel data, Arab countries, Jell classification:

INTRODUCTION:

The suggested factors in this study are:

- 1- The human capital which can be considered as the 1st source of economic growth, and measured in terms of education level and health.
- 2- Geography.
- 3- Government policies. (Government saving, openness to the global economies, the growth of per capita income, and government expense.
- 4- Political in stability based on a number of coups/year, and assassination as measured by million people per year.
- 5 - Inflation rate. Technical progress.
The differences in income per capita across countries

in the Arab world are varied, also and output per worker, Such as between income per capita in Gulf area and Syria or Jordan or Somalia and other poor Countries. At the top Arab world income distributions the Gulf Countries becomes. Therefore this study interested in the main driving factors which are driving economic growth in selected Arab countries, and renewed the thinking of the obstacles' in front improving income per capita in these countries. Most of these countries in technology development are lagged behind how to improve and have a progressive technology as well as institution and policy.

In particularly, the paper focus on the first fold on the possible influence, also the accumulation of physical capital which influenced of human capital, macroeconomic and efficiency of financial market, structured policy settings of economy, and the trade policy, then other parts of the paper are focused on the factors which can be considered as a driving forces of the Economic growth in these selected Counties. Many researchers and economists and empirical studies support the relevance of these factors in their papers for economic growth.

A: Objectives of the study

The main purpose of this study is to achieve the following specified goals:

1. To check the main impact of these variables (factors) which are derived the economic growth in selected Arab countries.
2. To establish the linkage of relationships between these factors and economic growth of these selected Arab countries.
3. To measure the degree of responsiveness of these selected Arab countries economy's growth to changes which happen in population, trade, and fiscal policy, also the inflation rate.

B: Previous studies

(Steve bond, et al,2004) , found that the impact of investment in GDP has a large And the significant effect, the other found is in high impact on the level of output per worker and extended into its long-run growth rate. The pooled annual data for a large sample of countries have been used in their paper. They are robust to controlling for unobserved country specific effects; while the consistent heterogeneity is viewed due to differences, this according to different policies and institution, and the incentives that create in their paper can have a tremendous impact on economic growth. Where (Pritchett, 1996), (Ben habit and Spiegel, 1994) and Judson (1996). These papers studied with different methods a puzzle involving the relationship between human capital and economic

growth. The puzzle appears when one looks at a growth-accounting approach that involves variables like the Barro and Lee (1993) human capital stocks.

A useful analogy was suggested by But (Weitzman, 1996), understand the research process which is a Childs chemistry set research proceeds, a various elements are used, in this process, few combination are extremely valuable the Capital Accumulation, Where (Robin Grier, 2005) studied the return to human and physical capital as lack of consistent data he used in his study a panel of countries in ISSA. Conclude

(Angeldelafuente, 2011) , Summarize that investment in education has a positive significant and sizable effect on productivity, growth, and the social returns to investment countries .(Barro and Lee, 2010) tried to improve the signal – to – noise ration in the schooling series by exploiting new source of information and introducing different corrections . They found that the results concerning the impact of education on growth improve considerably when these revised series are used.

(Euro S, and Vu, Thai, 2011) studied the East Asia capital accumulation, their investigates aims to ensure of the fast accumulation to make projections for the future. they estimate a " convergence " equation of physical Capital per Capita, using a pooled cross – country.

As recent studies, a pooled cross – Country time series data has used to explain both cross-country differences in growth performance. Some of the authors such as (Andrea . B and Stefano . S, 2001) used econometric technique allows short – term adjustments and convergence speed to vary a cross countries , while imposing restrictions only on long-run coefficients in their study they have found that the two drivers of economic growth was the accumulation of physical as well as human capital beyond R & D activities, trade openness, sound of environment of macroeconomic, political stability, developed of financial markets and financial policies, in addition to other factors which are operated directly in economic growth .

A decoupling between a macroeconomic policy (money supply, budget deficit, taxation) , these affect the income stability and prices with long – run of economic growth. many recent studies such as (Acemoglu et al, 204) and (Easterly, 2005) argued that the correlation between macroeconomic volatility and growth variables, become insignificant once on controls for the institution. (Philippe. A and Loana, M, 2007) find in their study that an increase in financial development, a decrease in openness to trades, and the adoption of an inflation targeting. regime move countries towards a more counter cyclical budget deficit and the more counter cyclical budget deficit has a positive and significant effect on economic growth.

(I . m. F report, 2015) , In their paper they have used cross – section data to reference historical data of 100 countries for the period 1970 – 1998 panel data .(Eric .

M Ergen, Jonathan. Skimmer, 1992), They have used 115 countries cross – sectional data for 15 years upon which is presumably long enough to capture out the effects of short – term fluctuations in government spending and taxes on growth rates . Results of the paper are; a positive effect of government spending on private productivity, inter temporal tax distortions and a transition path from the equilibrium growth path.

While (Ben Anaya et al . 2014); they have used Generalized methods (GMM) methods. analyzing a dynamic panel of data period for 1980 – 2007, to check the long run relationship between fiscal and economic growth, the relationship between the per-capita gross domestic and categories of budgetary revenues reveals a link a positive causality between economic growth and fiscal revenues, then the tax effect is too difficult to isolate empirically.

(CristinaChechenta and Philip Rother, 2010) , Their results provide additional arguments for debt reduction to support longer – term economic growth prospects . and other results such as the channel government debt (level) associated with per Capita GDP Growth rate, the channels are private saving, public investment, and total factor productivity

(TFP). While (Romer, 2007) by using narrative records assessed an impact of taxation on economic movements to explore magnitude, timing, and principal incentive for all chief post – war tax policy activities, the result of the study that found tax increase to be highly counter-dictionary, and results were more significant.

(Peng Sun, et al. 2010) they used a data of 6 years balanced panel data from 2002 to 2007, with total number of observations 186, the regional GDP, Capital stock, and trade volume are normalized to the base year (2002) by CPI and PPI index , they have marked their paper with the idea that the Chinese international trade has experienced rapid expansion together with its dramatic economic growth, which has made the country to target the world assist market . results in both econometric and nonparametric approaches are applied to test the data of 31 provinces of China, a stochastic frontier production function were estimated, also the province specific determinants of inefficiency in trade identified and Divisia index were calculated for each province. Results shown with that global trade helps China reap the statistic and dynamic benefits, and both international trade volume, and trade structure towards high-tech exports with a positive effect of trade toward economic growth.

(Mathias. B and Jens. K, 2012) in their paper investigated the main idea that the less developed countries trade patterns and changes in those patterns over time are closely associated with the transfer of technology, and the openness trade can migrate the certain products by advanced countries to less developed countries.

(Nworji, I, Desmond, et al, 2012) , studied the effect of

public expenditure on an economy in Nigeria, for the period 1970 – 2009. The method of analysis was the OLS multiple regression, in order to specify the causal relationship between government expenditure and economic growth. Results of the analysis show that the capital and current expenditure on economic services had the insignificant negative effect on economic growth and a positive effect on economic growth by capital expenditure on transfers.(Suliman, 2009) observes that the size of government and its impact on economic growth has emerged as a major financial management issue facing economies in transition. And observe that the fiscal volatility of the post period – 1979.

The effect of trade policy on income and growth is more Count over side, lowering trade barriers is likely to foster international trade by reducing transaction costs, which in turn can enhance economic growth rates, the data of their paper consists of 81 developing countries and 21 of developed or advanced countries, covering the period of 1971 – 2007 . Used a panel data set, and their main model core of Solow model, following the specification of Mankiw et al. 1992), and a dynamic panel estimation depends crucially on the specification of trade. The empirical evidence for a causal linkage between trade and economic growth is ambiguous .a positive and highly significant impact of trade on economic growth has the in the steady equilibrium state.

(MarieDawnal, Selin, Ozyurt, 2011), the impact of trade openness on the economic growth of Brazilian states, their study covering the period 199 – 2002. A Brazilian step growth rates are modeled as a dependant on international trade flows, and many control variables are used in the study such as human capital, private and public physical capital, growth rate of labor initial income level, and a number of interaction terms with trade openness. They have used the GMM estimator. Results are declared that the states that depend on agriculture activities are well endowed in human capital less than industrialized states.

(Mesut. S and Ahmet.I . 2015) investigated the effect of globalization on international trade, they have concluded in their paper that the globalization phenomenon is not new; it's clear reasonably expanded its domain after the 1980s. The economies outcomes of this process get increasing interdependence of world economies forth data analysis and scale of cross-border trade of commodities and services increased remarkably. (KaragozKadir and Kargoz Murat, 2009) their study covering the period of 16 years, their study conduct using a gravity model of panel data, using the gravitational factor affected bilateral trade in BSEC. The result implied that the economic size and population of the importer countries have a positive impact on trade volume, where the distance between them works on opposite way.

(ArisAisen and Fransisco J. Velga, 2011) , have argued in their paper about the effects of political instability on economic growth using the system – GMM

estimator for linear dynamic panel data models . on a sample covering up to 169 countries . and a period of 1960 – 2004. MarieDawnal, find that the higher point of political instability flows, with lower growth rates of GDP per Capita and their growth argued that the adverse effects growth by lowering the rates of productivity growth by lowering the rates of productivity growth while democracy may have a small causal effect .(Takis.S.Pappas and Eoin O MALLEY, 2014), They have referred to a phenomenon as political Buddhism . And they have argued that their holding extreme values on the dependent variable and they suggest that government should be a prior variable in the model in which economic deprivation has an intervening role.

The political process suggests that protest and violence against the state have deep structural form, which is tipped by exogenous shock, such as fiscal crisis, leading to violence and ultimately possible revolution such as what happened in Egypt 2011.

(AftabHussain et al., 2016) have studied the effect of political unrest on the economics of Pakistan.ArieAisen and Francisco Jose Veiga (2011), " How does political instability affect economic growth ?. And it is volatility over last 22 years .they have used terrorism, election, regime, and strikes as political instability proxies. An Arch and Garcia (1.1) has been used in their study, they have among the proxies that only terrorism has significant negative effects on the mean equation the other findings, that overall results imply that the political instability has negative significant effects on economic growth.Terrorism is one of the major cause of slow down the economic activities and economic growth it negatively affected (Range and Pradhan, 2014). Where (Ali Hashim and Hassan, 2013) investigated both economic as well as political factors to predict the reasons for the volatile economic growth and low investment in Pakistan, the proxies are used in their study are corruption, political instability, frequent regime changes, Energy crises and political conflicts among parties.

(Okafor, 2015) suggested that there is a positive effect of political instability on economic growth, he used good governance, social unrest, corruption, political instability analyzed by GMM estimator. Where (Mohammad- M. Alalaya, et al, 2016) studied the factors affected tourism, one of these proxies is political instability, they found that the political instability has a negative significant effect in growth tourism, which in general one of the component of GDP.

(Faraji.K and Kenai. M. A, 2013) Studied the impact of inflation of economic growth, their case study in Tanzania, the data series covering the period of (1990 – 2011), correlation coefficients and co integrating technique were used to established the linkage relationship between inflation and economic growth and coefficients of elasticity were applied to measure the degree of responsiveness of change in GDP to changes in price levels. Results suggest that inflation rates have a

negative impact on the economic growth.

Nell, (2000) examined the issue of inflation was the detriment to economic growth by using Vector Auto Regressive (VAR) technique. Data for the period from 1960-1999 was used and his empirical, results suggested that inflation within the single-digit zone may be beneficial to economic growth, while inflation in the double digit zone tends to limit economic growth

Sergii, (2009) found that growth - inflation interaction was strictly concave with some threshold level of inflation. Inflation threshold level is estimated by using a non-linear least squares technique, and inference made by applying a bootstrap approach. The main findings were that inflation rate above 8 percent tends to slow down economic growth while below 8 percent promotes economic growth. Espinoza et al. (2010) examined threshold effect of inflation on GDP Growth by using a panel data of 165 countries including Oil Exporting Countries and Azerbaijan over the period of 1960-2007. Their study found that for all country groups' threshold level of inflation for GDP growth was about 10 percent (with the exclusion of industrialized countries where threshold level was much lower). Estimated results suggested that inflation from higher than 13 percent decreases real non-oil GDP by 207 percent per year. Umaru and Zubairu, (2012) suggested that all the variables in the unit root model were stationary and the results of causality revealed that GDP caused inflation and not inflation causing GDP. The results also revealed that inflation possessed a positive impact on economic growth through encouraging productivity and output level and on an evolution of total factor productivity.

Hasanov, (2010) employed an annual data set on the growth rate of real GDP, Consumer Price Index Inflation and growth rate of real Gross Fixed Capital Formation to investigate whether there was any threshold effect of inflation on economic growth over the period of 2001-2009. Estimated threshold model indicated that there was a nonlinear relationship between inflation and economic growth in the Azerbaijani economy and threshold level of inflation for GDP growth was 13 percent. Inflation rate lower than 13 percent reflected the statistically significant positive effect on GDP growth but this positive relationship became negative when inflation exceeded 13 percent. He added that economic growth was expected to decline by about 3 percent when inflation increased above the 13 percent threshold. ; Odusola and Akinlo (2001) and Essien (2005), opined that exchange rate devaluation or depreciation includes higher import prices, external shocks and accentuates inflationary expectations.

There are three major types of inflation according to neo-Keynesians. The first is the demand-pull inflation, which occurs when aggregate demand is in excess of available supply (capacity). This phenomenon is also known as the Phillips curve inflation. The output gap can result from an increase in government purchases,

increase in foreign price level, or increase in money supply. The Phillips Curve Two major goals of interest to economic policy makers are low inflation and low unemployment, but quite often, these goals conflict. The adoption of monetary and/or fiscal policy moves the economy along the short-run aggregate supply curve to a point of higher price level. As higher output is recorded, this is followed by lower unemployment, as firms need more workers when they produce more and vice-versa. This trade-off between inflation and unemployment is described as the Phillips curve. This was an empirical discovery by Phillips (1958), which showed an inverse relationship between wage and unemployment rates, using United Kingdom data plotted over the period 1862-1957. The discovery is strengthened by the fact that movement in the money wages could be explained by the level and changes of unemployment. An argument in favor of the Phillips curve is the extension that establishes a relationship between prices and unemployment. This rests on the assumption that wages and prices move in the same direction. The strength of the Phillips curve is that it captures an economically important and statistically reliable empirical relationship between inflation and unemployment. The Monetarists The monetarists, following from the Quantity Theory of Money (QTM), have propounded that the quantity of money is the main determinant of the price level, or the value of money, such that any change in the quantity of money produces an exactly direct and proportionate change in the price level. The TQM is traceable to Irving Fisher's famous equation of exchange: $MV=PQ$, where M stands for the stock of money; V: for velocity of circulation of money; Q: is the volume of transactions which take place within the given period; while P: stands for the general price level in the economy. The Special Issue on Social Science Research © Centre for Promoting Ideas, USA www.ijbssnet.com 186 Transforming the equation by substituting Y (total amount of goods and services exchanged for money) for Q, the equation of exchange becomes $MV=PY$. The introduction of Y: provides the linkage between the monetary and the real side of the economy. In this framework, however, P, V, and Y are endogenously determined within the system. The variable M is the policy variable, which is exogenously determined by the monetary authorities. The Monetarists emphasize that any change in the quantity of money affects only the price level or the lead side of the economy, with the real sector of the economy totally insulated. This indicates that changes in the supply of money do not affect the real output of goods and services, but their values or the prices at which they are exchanged only. An essential feature of the monetarist's model is its focus on the long-run supply-side properties of the economy as opposed to short-run dynamics.

(Dornbush, et al, 1996). The Keynesian opposed the monetarist's view of the direct and proportional relationship between the quantity of money and prices.

According to this school, the relationship between changes in the rates, of money and prices is non-proportional and indirect, through the rate of interest. The strength of the Keynesian theory is its integration of monetary theory on the one hand and the theory of output and employment through the economy. of interest on the other hand. Thus, when the quantity of money increased, the rate of interest falls, leading to an increase in the volume of investment and aggregate demand, thereby raising output and employment. In other words, the Keynesians see a link between the real and the monetary sectors of the economy and economic phenomenon that describes equilibrium in the goods and money market (IS-LM). Equally important about the Keynesian theory is that they examined the relationship between the quantity of money and prices both under unemployment and full employment situations. According, so long as there is unemployment, output and employment will change in the same proportion as the quantity of money, but there will be no change in prices. At full employment, however, changes in the quantity of money will induce a proportional change in price. Olofin (2001) thus, this approach has the virtue of emphasizing that the objectives of full employment and price stability may be inherently irreconcilable. The Neo-Keynesian The neo-Keynesian theoretical exposition combines both aggregate demand and aggregate supply. It assumes a Keynesian view on the short-run and a classical view in the long-run. The simplistic approach is to consider changes in public expenditure or the nominal money supply and assume that expected inflation is zero. As a result, aggregate demand increases with real money balances and, therefore, decreases with the price level. The neo-Keynesian theory focuses on productivity, because, declining productivity signals diminishing returns to scale and, consequently, induce inflationary pressures, resulting mainly from over-heating of the economy and widening output gap.

Theoretical approach:

A: Education as a driving force of economic growth:

Since 1980's, much of the attention of macro economist has focused on long-term effects of education on growth, this emphasis reflects the recognition that the difference between prosperity and poverty for a country depends on how fast it grows over the long term. Recent endogenous growth models are useful for understanding why advanced economies can continue to grow through the long term despite the effect of diminishing returns in the accumulation of physical and human capital. Many researchers argued that the quality of schooling is more important than the quantity, measured, for example by years of attainments.

Table 1. Total government outlays and “ productive government spending as a share of total spending as a share of total spending, 2000,2005, 2010, 2016 percentage

| | Education (A) | | | | RGD (B) | | | |
|---------|---------------|------|------|------|---------|------|------|------|
| | 2000 | 2005 | 2010 | 2016 | 2000 | 2005 | 2010 | 2016 |
| Egypt | 5.1 | 5.7 | 5.1 | 6.3 | 1.31 | 1.29 | 1.42 | 1.28 |
| Tunisia | 4.2 | 4.9 | 5.2 | 6 | 1.41 | 1.26 | 1.18 | 1.32 |
| Jordan | 3.9 | 4.1 | 4.3 | 4.6 | 0.8 | 0.75 | 0.83 | 0.86 |
| Qatar | 9.4 | 9.7 | 10.2 | 12.9 | 1.1 | 1.21 | 1.27 | 1.38 |

Transportations and Communications (C)

| | 2000 | 2005 | 2010 | 2016 |
|---------|------|------|------|------|
| Egypt | 3.15 | 3.29 | 4.21 | 4.15 |
| Tunisia | 5.7 | 6.7 | 6.8 | 7.2 |
| Jordan | 3.29 | 4.81 | 5.1 | 5.4 |
| Qatar | 9.1 | 9.8 | 10.2 | 11.3 |

Table 2. The geographic distribution of the world population has changed over time.

| | 1650 | 1800 | 1933 | 1985 | 2010 | 2030 |
|------------------|------|------|------|------|------|------|
| World population | 545 | 906 | 2057 | 5716 | 6909 | |
| Europe | 18.3 | 20.7 | 25.2 | 12.7 | 10.6 | |
| North America | 0.2 | 0.7 | 6.7 | 5.1 | 5.1 | |
| Oceania | 0.4 | 0.2 | 0.5 | 0.5 | 0.5 | 0.8 |
| Latin America | 2.2 | 2.1 | 6.1 | 8.4 | 8.5 | 9.2 |
| Africa | 18.3 | 9.9 | 7 | 12.8 | 15 | 17.2 |
| Asia | 60.6 | 66.4 | | 60.8 | 60.3 | |

Many researchers discussed the available cross-country aggregate measures of quality such (Barro and Lee, 2000) and (Hanushek and Kimi, 1999) their finds can be calculated as that the indicators of quality of schooling can be the matter more than years of attainment of subsequent economic growth. and they have used the science score such as the mathematics examination, which has significant positive effects on economic growth, and the estimated effects of economic growth and the estimated effect parity over the school attainment variable now simply would increase the growth rate on impact by only 0.2 percent per year. But in another hand, many macroeconomic studies have found that the test scores may just proxy for another characteristic of students such as family income and parent's education. Therefore, it is too difficult to tell that there is a positive relationship between test scores and student outcomes, such as future earning, reflects the quality of education of these characteristics.

B: Population growth and the demography transition:

The population has been growing very slowly for millennia, at yearly growth rates lower than 1% until 1700, the population growth started to rise in Western Europe and it is offshoots in the 18th and 19th centuries. Peaking around 1850 at 1% and then decreased to 0.5

percent now a day. In the developing world, population growth remained low throughout the 19th century. Rose sharply after 1950 to peat at 2% in 1970, and has since gradually decreased to about 1.3% now a day.

Table (1): Total government outlays and “ productive government spending as a share of total spending as a share of total spending, 2000,2005, 2010, 2016 percentage.

The potential w/o of the structure of financing and expenditure is considered by looking separately at direct and indirect taxes which are imposed by the government, but as in the period of 2000 to 2016 increased. In this context, the human capital variable discussed above may be taken to present the past and present governments' efforts in financing education. The realistic scenarios predict stabilization by 2050 at 10 billion. The population dynamics model can be as:

$$Pt+1=Pt+ Bt - Dt + Mt \dots\dots\dots(1)$$

where: Pt: population at time t. Bt: number of births, hence the birth rate: $bt = Bt / Pt$

Dt : number of deaths, hence the mortality rate: $it = Dt/Pt$, Mt = net migrations, hence the migration rate: $mt = Mt / Pt$. The population growth rate:

$$Pt+1 / Pt = 1+nt \dots\dots\dots(2)$$

where $it = bt - it + mt$

In the table (2), demographic growth exceeds the capacity of agriculture to sustain a growing population

dependent leads to demo-economic cycles with adjustment through famine, epidemics, wars, also we can note that any increase in income is absorbed through higher population growth. The scientist's ideas in this field can be demonstrated as:

- Pual Ehrlich ((1968) the population bomb), it predicts that within a decade, over population will cause repeated famines and resurgence of diseases, eventually killing one fifth of the of the world's population. but this not happen.
- Political Economy of Institutions:
We should think about why institutions and policies differ across countries driving factors to stand why some countries are poor and some are rich, an explanation of differences in income across countries and over time in terms of institutional differences is also incomplete.
- Lester Brown: (Beyond Malthus, 1999) over population will constrain and even reverse economic progress.

C: Literature review

C.1: Fiscal policy and economic growth :

In the medium term, many authors demonstrate that fiscal policy settings that it relevant still affected output and economic growth of a country as well as over the business cycle, where the government deficit, finance consumption or transfer a traditional argument in order to reduce the out effects on private sector investment. also, it seems as being at odds with the monetary policy the researchers in their papers note that the credit can be leading to risk premier in interested rates also pressures on exchange rates, with regressions on capital accumulation on the country economy. The necessary taxes which imposed to finance government spending could all distort incentives, finally, we can summarize that there is may be side effects of government intervention as well as specific effects stemming from the financing and composition of public expenditure. The public expenditure in the selected Arab countries focuses on unproductive activities, thus the negative effects may more evident that the financing relies heavily direct on taxes upon in all of them.

The financial systems can provide the economic growth for capital accumulation by helping the diffusion of new technologies. The diversifications may prompt to use holds to save less if income effects dominate substitution effects.

C.2: Models of economic growth

C.2.1: Exogenous models:

A1: Alfred Marshal and Gustav Cassel:

The idea of economic growth in their models, that system of growing is exclusive because there is some exogenous

factors make it grow. Alfred Marshal (1890) has introduced the famous fiction of the stationary state ... to contrast the results Marshal thought to get gradually closer to the actual conditions of life. The same idea in Gustav Cassel's (1932) in his book "the theory of social economy ". The model of exogenous growth delineated by Cassel can be considered the proximate starting point of the neoclassical growth theory.

Cassel (1932. Pp125-3) assumed that there are two primary factors of production, the quantities of these resources, and the amounts of services provided by them are taken to be in a given supply. General equilibrium is characterized by the quality of supply and demand for each factor service and for each good produced. Generally, Cassel arrived at basically to the same results of Marshall.

C.2.2: The neoclassical models:

C.2.2.1: The models (1950s and early 1960s) differ from the: growth version of the Walras - Cassel model, in many respects:

A - Their models are analyzed with one produced good which can be considered as a consumption good and as a capital good, therefore their models are macro-models.

B - The primary factor is reduced in their model to one active factor of production such as (Solow, 1963, Swan 1956), how are reduced the factor to homogeneous labor, or two as land factor and homogeneous labor, such as (Swan 1956, Meade 1961)

C - Labor, capital are produced all-purpose goods.

D - The technical alternative is given by a macro economic, production function which has specified properties as homogeneous of the first degree. With a positive and decreasing marginal productivities, with respect to each factor of production. The model of one factor is a steady state equilibrium as:

$$Sf(k) = gk, \dots\dots\dots(3)$$

Where: f(k) is the production function/unit of labor or per capita.

k represents the capital/labor ratio, S: is the marginal propensity to save, and g: is the steady state growth rate of capital. These models can be described as models of exogenous growth, also they can describe as models of endogenous profitability when:

$$r = f(k).R \text{ the rate of profit, which is a function equal to the marginal productivity of capital.}$$

D: The other new models of endogenous growth:

1- constant returns to capital. In this mode set aside all not-accumulate factors of production distributions, the labor, and level, the simple version of this class is the so-called (Ak model). This model assumes that there is a linear relationship between total output Q and k which are consisting of the same commodity:
 $Q = Ak \dots\dots\dots(4)$ Arab world: 1/A

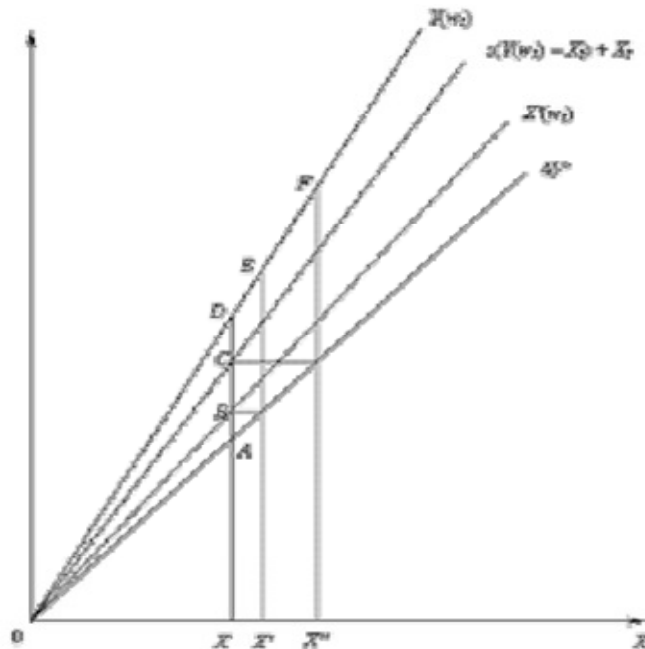


Figure 1. The Smithian- Marxian model of growth.

is the amount of that commodity required to produce one unit. The rate of return on capital r : can be as:

$$r + G = y/k = A \dots\dots\dots(5)$$

where G : is the rate depreciation, it exogenous factor, Rebelo (1991 PP 504 ...) obtain other function:

$$g = (A-G-P)/6 = (r-P)/6 \dots\dots\dots(6)$$

$$G = (A - 6) s = Sr$$

These equations obtained when saving are determined on the assumption that there are $\int e^{-pt}/(1-6) [c(t)1-6].dt\dots\dots\dots(7)$

Where: P : is the discount rate, or rate of time preference. $\frac{1}{6}$ is the elasticity of substitution between present and future.

$$\text{And } Q = c(t) + k \dots\dots\dots(8)$$

Then $c(t)$, in this mode is the rate of profit which is determined by technology alone and saving, and the investment mechanism can determine the growth rate.

2- Below model (returns to capital):

This model preserves the dualism of accumulate and nonaccountable factors but restricts the impact of an accumulation of the former on their returns by modification of the aggregate production function. The function which contemplated by this model is:

$$h(k) = f(k) + bk \dots\dots\dots(9)$$

Where: $h(k)$ in the per capita production function.

And b is a positive constant and $f(k)$ is the conventional per capita production function. Through these models, we can summarize the factors which are constructing the growth as human capital formation. We can depend on a macroeconomic production function:

$$y = AKb (uh)^{1-b} h^* y \dots\dots\dots(10)$$

Where N : times the fraction of time spent working, u times h which gives labor input in the efficiency unit. h^* the society as whole the accumulation of human capital.

The second factor is the technical changes, and the second - sub class of the models attempts to portray technological changes as the endogenous factor. Arrow's (1960), Romer (1986), Who are focused on a role of single state variable called (knowledge), assumed that information contained on innovation and considered as a non-rival goods. Romer stipulates a research of technology that is concave and

E.1: Smithian – Marxian model:

The model can be intuitively grasped in figure (1). The first assumption that there is one good product by itself as circulating capital and labor Linder constant returns, and there is a single method of production is available. The model can use (U) units of capital and one unit of labor, and the production period (t). Then $Q = \min (K/U, L1)$. It assumed that the fraction of capital uninspected to the worker at time t . when the wage rates positive than the equilibrium steady state conditions.

$$K_t = K_{t+1} + w t l_1, \dots\dots\dots(11),$$

$$Q_t = K_{t+1} = L \dots\dots\dots(12),$$

Figure (1): shows this state .

The equilibrium between demand and supply can be interpreted as the net of supply capital, we can assume that at time (t), there is full employment of labor, than $L_t = N$ and capital at time (t), at time $t+1$ the demand of labor

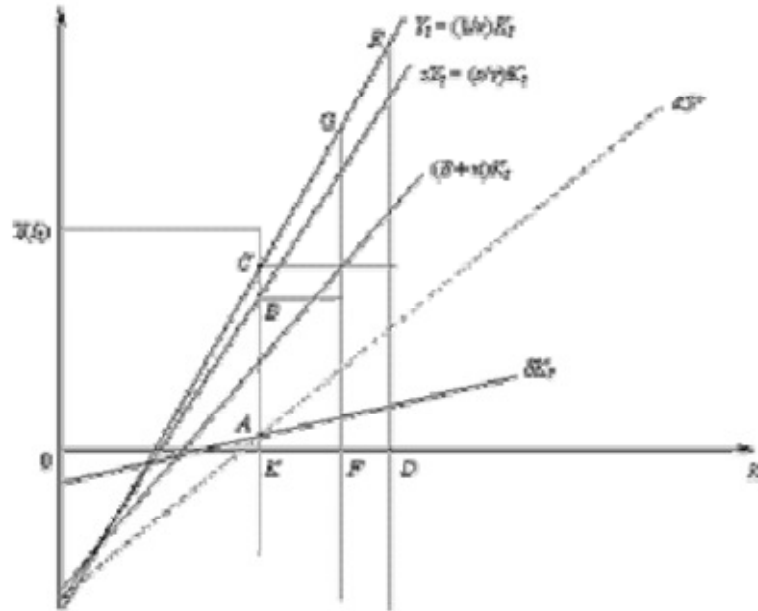


Figure 2. The accumulation process in the Harrod-Domar and Kaldor models

is full employment, the steady state of capital supply and demand can be as follow.

$$I + Gn(w^*) = S / (\gamma + w^*) \dots \dots \dots (13)$$

From the adjustment on the capital market between saving and investments is not same as in neoclassical economics.

E2: The Von Neumann Model:

Smithian von studied the multi-sector version of the Marxian model, then the looks for activity which can be maximized rate of growth and the system associates competitive price system. His view point that to deal with labor as classic economists and the focuses on a linear because it's produced by liner technology, due to the wage goods, and his model of multi-sector can become the first complete model in which the rate of growth is endogenously determined, and all factors are endogenously determined, and all factors of production are producible.

E.3: The Harrod – Domar Model:

(Harrod, 1948) cycle, domains (1945) have developed a macro economic model to analyze the problem of economic growth, they have paid their attention to make explicit the relationship between the consumption and saving by households and the decision of entrepreneurs. The consumption can be defined as an exogenous given propensity to consume, while the investment decision can be a by the accelerator principle. Where production is obtained by labor and physical capital, in their analysis

we can notice that there is only on cost- minimize. The technique, that implies, that the capital/labor ratio and capital/production ratio are determined by : $(k/l_t = k/q_t = v)$, as Harrod and Domar following Keynes who believed that market mechanism is not able to attain full employment of labor, they have focused on the equilibrium of market. They have decided that along the becomes. on the goods market called a warranted growth path. And the warranted growth rate of income allow this equilibrium can be as:

$$Cw = St / Vt \dots \dots \dots (14)$$

The model structure of the economy is endowed with a technology (T), which assumed to be addressed as exogenous. Technical progress, with an amount of labor L_t , and stock of capital K_t according to these given, the level of investment can be demonstrated as the action of a celebrator principle, and according to the optimal level of capital employed.

Figure (2) shows the accumulation process in the Harrod – Domar and Kaldor models, the figure describes the level of productivity that ensures full employment of the capital stock , this appears in figure by curve Y, Saving function Set by assuming that the decay rate of capital is $S1 \ 0 \leq S \leq 1-$, white curve $(N+S) k$ indicates to a number of resources with are necessary to ensure the reintegration of capital and increase the demand for labor equal to the population growth rate.

E.4: The Solow Model:

(Solow 1999, 2000) in his view, the major problem is to construct the theory of general full employment growth. And the most important attention should be now to

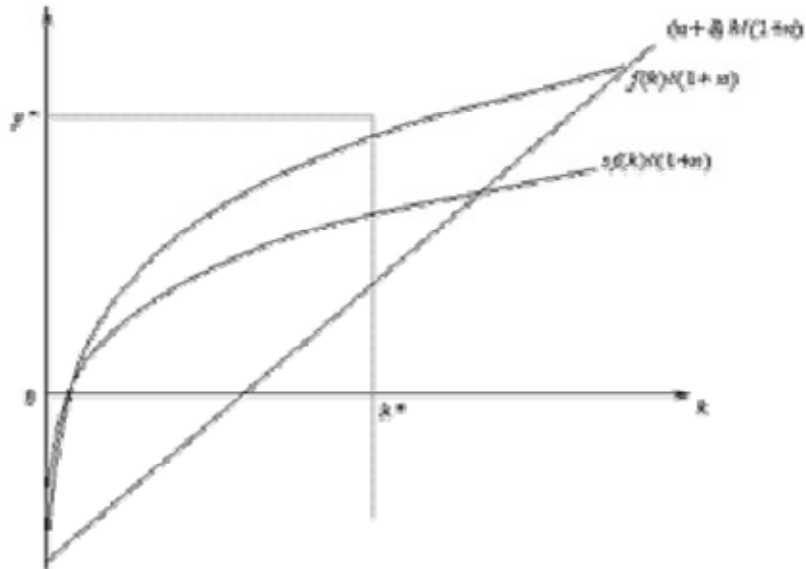


Figure 3. The Solow model in discrete time and without technical progress

ensure the convergence toward the natural growth path. Solow assumes that is only labor and capital factors of production, where the technology is represented by the neo classical production function with constant return of scale, also he assumed that the prices are fixed, as a result of all market is cleared, and the equilibrium of capital market fields the investments which are equal to saving.

In his opinion production is distributed between saving and consumption. If the level of the investment equal to aggregate saving this equilibrium can ensure the constancy of per capita capital with full employment, and the equilibrium toward the steady state is attained. Figure (3) explained slow ideas model.

A positive rate of technical progress assumed in Solow model toward the positive rate of population growth the figure describes the equilibrium; curve (n-S) k indicates the per capita demand for capital, with curve S f (K), indicates capital supply of capital. If they exceed the full employment steady state with contempt per capita capital. to reach this study state as full employment on the labor market interest rate will decrease and entrepreneurs find it profitable to increase the demand for capital.

DATA AND METHODOLOGY

In the first section stated of introduction of the subject of the literature on economic growth which is vast and policy-oriented studies, relaxing the hypothesis of exogenous saving and capital formation, let us have a policy of the affected growth in

Short- run via the saving and the level of compositions of investment, also other assumptions which relaxing the basic determinants of growth has been declared throu the literature review and the economic growth, then we

have the model of study through specification the equations of the study. Therefore we should determine the variables and data resources of this study.

The variables are human capital (H), Growth exchange rate age population ($\Delta \ln \text{pop}$) real GDP/ person of working Age (Y/w). Inflation is left-1. An accumulation of physical capital PC row-1, Tax and nontax receipts to share of GDP (Tax-1). Total R & D expenditure to GDP (R & D grow) Business performed R & D /as a share of GDP. (BPRD), stock market capitalization as a share of GDP (SMC-1), Trade exposure Trade exp-1).

A: The data sources of the study and methodology:

- 1-central banks of selected Arab countries monthly reports and yearly issues since 2000 to 2016.
- 2-Arab unified economic reports- the Arab-Monetary fund for several, issues for years of study.
- 3-I.M.F yearly reports, development, 2006, 2010, 2015.

B: The growth equation can be derived from the growth model around a constant return to scale, the empirical approach adopted in this paper in the first estimation starts with a parsimonious specification of growth equation and extended analysis model. The general form of the estimation of selected Arab countries can be written as:

$$\Delta \ln \text{Gdp/Cup} = a_0 + a_1 \ln \text{GDr} + a_2 \ln \text{his} + a_3 \ln \text{Skil} + a_4 \ln \text{pop} + a_5 \ln \text{vit} + a_6 \ln \text{is} + a_7 \ln \text{am} + a_8 \ln \text{jt} + a_9 \ln \text{bil} + a_{10} \ln \text{Ski} + a_{11} \ln \text{B2} + a_{12} \ln \text{LN} + a_{13} \ln \text{hi} + a_{14} \ln \text{b3} + a_{15} \ln \text{skill} + a_{16} \ln \text{B3} + a_{17} \ln \text{Bit} + \sum B_j \Delta \ln \text{vit} + \sum \text{it} \dots \dots \dots (15)$$

Where: GDP per capital G dependent variable, h represents the human capital, pop is population growth rate. V: vector of a variable affecting economic efficiency, t represents time trend, Sk represents the propensity an accumulate physical capital, b: regressors capture short time dynamic for selected countries, and $\sum \text{it}$: is the disturbance error. Results of analysis.

Table 3. Basic statistics for the whole sample as pooled sample:

| GDP/per capita (Lin us #) | Sample mean | St/deviation |
|-------------------------------|-------------|--------------|
| Sk(%) | 3685.42 | 4273.89 |
| H(years) | 21.167 | 5.921 |
| (A verge years of education). | 9.34 | 2.163 |
| Inflation -1(%) | 8.72 | 8.4 |
| R & D (%) | 0.962 | 0.643 |
| Stockempital -1(%) | 21.419 | 18.765 |
| Trade exp-1 | 26.781 | 16.933 |
| Δ Loop(%) | 0.651 | 0.483 |

The results of pooled data for all selected Arab countries.

Table 4. augmented analysis for human capital accumulation and trade policy

| Estimated variables | contrary | Human capital | Trade policy |
|----------------------------|----------|---------------|--------------|
| Ln t1 | Egypt | 0.195** | (0.23) ** |
| | Jordan | 0.216** | (0.15) ** |
| | Tunisia | 0.187* | (0.12) ** |
| | Oman | 0.176** | (0.17) ** |
| Ln SK | Egypt | (0.281) * | (0.396) ** |
| | Jordan | (0.195) ** | (0.774) * |
| | Tunisia | (0.224) * | (0.315) ** |
| | Oman | (0.263) * | (0.364) ** |
| Ln GDP/capita-1 | Egypt | (-0.12) *** | (-0.178) *** |
| | Jordan | (-0.06) ** | (-0.004) ** |
| | Tunisia | (-0.09) * | (-0.016) ** |
| | Oman | (-0.1) ** | (-0.08) * |
| Classical of thmay capital | Egypt | (0.61) | (0.38) |
| | Jordan | (0.59) | (0.31) |
| | Tunisia | (0.62) | (0.27) |
| | Oman | (0.60) | (0.37) |

V1: EMPIRICAL RESULTS:

A1: The first model results:

Table (3) reports the mean of pooled data and the standard deviation to the selected Arab countries, to ensure of the st/deviation of the pooled data, the human capital and R & D exposure. Results are not important in the regression for pooled due to the analysis of each country in this part separately. In the Table (4): We have analyzed the convergence and the capital accumulation for growth for each country the analysis considered as augmented for h and trade exposure.

In so far as the results of analysis, indicates to the policy affects the accumulation of human capital must prominently through education policy in all selected countries, and spill-over Not declining returns over some ranges, finally it is important that policies should shift into steady states and not have irreversible effects for these countries, this can happen through developed education methods and encouraged research and develop. The medium output elasticity should be associated with a low speed of convergence to the steady state or vice verse. There for the physical and

human capital in the selected Arab countries can be observe equivalent to neoclassical growth model with diminishing returns scale.

A2: Macroeconomic policy and institutions on growth:

The table is implied parameters of physical and human capital for 4 selected countries and convergence time. In all countries convergence parameters is significant , also the human parameters is significant, in the human capital the speed with which each country converge to its specific steady state path of output per capita is ordinary , while the estimates report that about 7 years to 3.9 years to go half way to the new steady state output per capita, with rapid convergence, potential effect on living standard, and will be quickly felt and policy change will have temporary impact on growth for selected countries. Results indicate that one extra year of average education corresponding to arise in human capital by not less than (10%). This can lead to an increase in the average of steady –state output/per capita 3-6 percent. Where table (3), reflects the results of variables which influenced in

Table 5. declared the Macroeconomic policy affect growth
Dependent variable : Δ IN GDP/ per capita

| Variables / policies | Countries | With control of inflation | With control of the inflation and fiscal policy |
|---------------------------------|-----------|---------------------------|---|
| Convergence coefficient | Egypt | (-0.14)** | (-0.16)** |
| | Jordan | (-0.12)*** | (-0.14)** |
| | Tunisia | (-0.13)** | (-0.15)** |
| | Oman | (-0.17)** | (-1.13)** |
| Ln h | Egypt | (0.68)** | (0.68)** |
| | Jordan | (0.49)* | (0.62)*** |
| | Tunisia | (0.57)* | (0.70)** |
| | Oman | (0.63)*** | (0.59)* |
| Physical capital | Egypt | (0.241) | (0.203) |
| | Jordan | (0.164) | (0.156) |
| | Tunisia | (0.195) | (0.143) |
| | Oman | (0.218) | (0.192) |
| Tinrp Way to convergence (1) | Egypt | 6.4 years | 7 years |
| | Jordan | 5.9 years | 6.3 years |
| | Tunisia | 4.6 years | 3.9 years |
| | Oman | 4 years | 3.5 years |

* Significant at 1% level, **5% level, *** at 10% level. (1)Half way to convergence implied by estimated average coefficients of Ln GDP per capita -1.

Table (6): indicators of financial policy results through regression process as panel –pooled estimation.
Dependent variable Δ ln GDP / per capita.

| | | | |
|-----------------|---------|------------|------------|
| Ln sk | Egypt | (0.21)** | (0.29)*** |
| | Jordan | (0.19)** | (0.22)** |
| | Tunisia | (0.20)* | (0.18)* |
| | Oman | (0.17)* | (0.20)* |
| Δ Ln pop | Egypt | (-5.61)*** | (-9.67)** |
| | Jordan | (-5.18)** | (-11.21)* |
| | Tunisia | (-6.2)** | (-10.19)* |
| | Oman | (-3.15)** | (-10.43)** |
| Ln if 1-1 | Egypt | (-0.019)** | |
| | Jordan | (-0.027)** | |
| | Tunisia | (-0.022)* | |
| | Oman | (-0.043)* | |
| Ln Gov exp-1 | Egypt | (-0.10)** | (-0.15)* |
| | Jordan | (0.11) | (-0.12)** |
| | Tunisia | (0.16) | (-0.14)*** |
| | Oman | (0.12) | (-0.10)* |
| Ln Tax-1 | Egypt | (-0.32)** | (-0.26)* |
| | Jordan | (-0.30)*** | (-0.21)*** |
| | Tunisia | (-0.28)* | (-0.18)* |
| | Oman | (-0.47)** | (-0.23)** |
| Ln trade exp-1 | Egypt | (0.17) | (0.23) |
| | Jordan | (0.15) | (0.21) |
| | Tunisia | (0.145) | (0.19) |
| | Oman | (0.22) | (0.28)** |
| Log Likelihood | Egypt | 972 | 983 |
| | Jordan | 865 | 841 |
| | Tunisia | 917 | 908 |
| | Oman | 843 | 829 |

Coefficient is estimated without cross-country striations
*Significant at 10% level, **at 5% level , at *** 10%level

macro economic policy for trade expo sure and inflation control with fiscal policy in these selected Arab countries.

The regression results show that the long-term coefficients of variables such as interest which varies

Table 7. indicators of financial policy results through regression process. As panel. Pooled Estimation. Dependent variable Δ GDP/per Capita

| | | With control of inflation | With stock capitalization |
|--|---------|---------------------------|---------------------------|
| Δ Ln pop | Egypt | -16.31*** | -7.93** |
| | Jordan | -13.47** | -5.81*** |
| | Tunisia | -12.36** | -5.29** |
| | Oman | -12.17*** | -5.34*** |
| Ln h | Egypt | 1.67*** | 0.972** |
| | Jordan | 1.15** | 0.783*** |
| | Tunisia | 1.04** | 0.651** |
| | Oman | 0.987** | 0.613*** |
| Ln sK | Egypt | 0.713** | 0.451** |
| | Jordan | 0.695*** | 0.408** |
| | Tunisia | 0.681*** | 0.405*** |
| | Oman | 0.603** | 0.401*** |
| Ln(to cup)-1 | Egypt | ----- | 0.091** |
| | Jordan | ----- | 0.063** |
| | Tunisia | ----- | 0.60** |
| | Oman | ----- | 0.053** |
| Ln Private Credit | Egypt | 0.061** | |
| | Jordan | 0.048** | |
| | Tunisia | 0.053*** | |
| | Oman | 0.039*** | |
| Convergence coefficient Ln GDP/percapita-1 | Egypt | -0.106** | -0.221** |
| | Jordan | -0.139** | -0.291** |
| | Tunisia | -0.173*** | -0.265** |
| | Oman | -0.214** | -0.214** |
| Log-Likelihood | Egypt | 769 | 819 |
| | Jordan | 715 | 736 |
| | Tunisia | 728 | 475 |
| | Oman | 719 | 735 |

along time of study period and country to other, homogeneity of long- run coefficients along the period of analysis data have imposed. In this regression, the explanatory variable is physical capital. As a result of the analysis that suggests a positive impact of trade expenditure of GDP per capita, the process affects the operating indirectly of investments which influenced output growth. The variability of inflations and different fiscal policy variables are included in the analysis in order to have key results of stability of inflation variability across countries specification, the size of government and output of country impacted in results and total tax or government expenditure (consumption). These included to the effect on the growth of the size of government specification. There is a negative effect coming from direct tax, where the coefficient on government consumption becomes statistically negative impacts on side of government budget.

Over all, the result of fiscal policy variables and macroeconomic variables with both of the influenced in Δ LGDP/Per capita, results indicates that the variability of inflation has an important impacts government, growth of GDP/per capita and it has a negative influenced. This

effect supports the economic idea that high inflation ratio adds more noise to capital and other markets and make life is difficult in a country. And the effect of inflation on all across specific countries in the study is large size affecting the growth of GDP/per capita.

In the financial indicators of analysis of privet credit from the banking sector and stock market capitalization appears in results of the table (6). Results can support the hypothesis: that the level of financial development influenced growth in the specific countries. Results accords countries in this study indicate that the developed of the financial system can lead the channel resources towards the higher return projects. There is the wrong relation (negative sign) between the banking credit and the privet sector and growth, this means in these selected countries that bank credits are related to other monetary variables, which leading the bank credit process. When inflation includes there is a positive sign will appear, it means that there is a relationship between the growth of GDP/per capita and privet credit.

The study is restricted to 4 Arab countries depending on the specification. The period of the study 2000-2016. And also restricted to the number of variables, these

Table 8. R & D intensity
Dependent variable: Δ in GDP/per capita

| | | With total R & D | With Business R & D only |
|---|---------|------------------|--------------------------|
| $\Delta \ln y$ | Egypt | -19.76*** | -24.01** |
| | Jordan | -12.15** | -18.73*** |
| | Tunisia | -11.68** | -16.96*** |
| | Oman | -9.07*** | -12.64** |
| $\Delta \ln h$ | Egypt | 1.131** | 0.89** |
| | Jordan | 0.765** | 0.651*** |
| | Tunisia | 0.893** | 0.785** |
| | Oman | 0.431** | 0.27** |
| $\Delta \ln Sk$ | Egypt | 0.25** | 0.19** |
| | Jordan | 0.16** | 0.21*** |
| | Tunisia | 0.18* | 0.15** |
| | Oman | 0.12** | |
| $\Delta \ln R \& D^{tot}$ | Egypt | 0.10** | |
| | Jordan | 0.07** | |
| | Tunisia | 0.09** | |
| | Oman | 0.065** | |
| $\Delta \ln R \& D^{pub}$ | Egypt | -0.18 | |
| | Jordan | -0.11 | |
| | Tunisia | -0.10 | |
| | Oman | -0.04 | |
| $\Delta \ln BERD$ | Egypt | 0.21** | 0.11*** |
| | Jordan | 0.15 | 0.07 |
| | Tunisia | 0.17 | 0.10 |
| | Oman | 0.08 | 0.03 |
| Convergence Coefficient $\Delta \ln$ GDP/per capita | Egypt | -0.22** | -0.14** |
| | Jordan | -0.18* | -0.10 |
| | Tunisia | -0.15** | -0.08 |
| | Oman | -0.17** | -0.09 |
| Lag Likelihood | Egypt | 769 | 743 |
| | Jordan | 718 | 709 |
| | Tunisia | 772 | 731 |
| | Oman | 709 | 693 |

variables included beyond to R & D, trade exposures, where R & D activity is the expenditure on R & D (intensity) of R & D for each country. The result of the analysis is supporting the hypothesis that a significant effect of R & D in each country of selected Arab countries, also the positive effect can drive the growth of output and total intensity. The indicator between R & D and a Business sector is low in the regression of sample comprised to trade exposure and R & D. Therefore we can suggest that there is an interaction between trade exposure and R & D in all countries selected in this study. economic growth Some economists considered the state as to generate the basic knowledge not more in possible technology spill over.

The changes in R & D do not affect output growth in the selected countries, in addition to the 0.1 increase of R & D, the effect as 10%, of output growth in Egypt, 7% in Jordan, in 9% of Tunisia, and 6% in Oman. The easiness with R & D, when we considered a permanent effect on GDP per capita growth, this can be reduced the steady-state level of GDP per capita in these countries.

The 1 percent increase of R & D in countries. The 1 percent

increase of R & D could boost output per capita growth with 21% in Egypt, 18 percentage in Jordan, 17 percent in Tunisia, and 8 percent in Oman, these high results due to use the imported R&D and implement in a country the external lies in R & D activities in Business and other fields of social life in country.

B: The panel data analysis results:

The recent growth theories ignored the Solow model; they have concentrated on endogenous growth models, which assume constant and increasing returns to capital. Where the neo classical model fails to explain the difference, in, per GDP capital across countries, in recent years many authors s has led to renew the opinion about new thinks of endogenous and exogenous growth models, they have renewed their major concerns to the convergence of steady-state. The policies in developing

Table 9. Results of pooled data by OLS

| Variables | Coefficients | St/Error | T-statistic | Prob level |
|-----------|--------------|-----------|-------------|------------|
| Constant | 12.867 | 0.3966 | 45.453 | 0.0001* |
| XRAT | 0.00048 | 8.05*10-4 | 1.726 | 0.0658 |
| PPP | -0.00067 | 0.000381 | -0.1964 | 0.5109 |
| P | 0.001782 | 0.00678 | 0.289 | 0.634 |
| PG | -0.02196 | 0.005481 | -2.963 | 0.0038 |
| PL | 0.00584 | 0.002932 | 2.784 | 0.0044 |
| Y | -0.00482 | 0.003671 | -1.256 | 0.1654 |
| | | 1.627-e5 | 9.673 | 0.0001 |

R² = Egypt : 0.6632. Jordan : 0.614. Tunisia : 0.6932. Oman 0.6144.

Table 10. fixed effects model(LSDV) for selected Arab countries (2000-2016).

| Variable | Coefficients | St/dr | t-statistic | Pro/leve |
|-------------|--------------|-------------------------------------|-------------|----------|
| Constant | 11.0763 | 0.2937 | 43.138 | 0.000 |
| XRAI | 0.000981 | 0.000065 | 1.275 | 0.154 |
| PPP | 0.000672 | 0.000159 | 1.132 | 0.186 |
| P | 0.00163 | 0.006421 | 0.2478 | 0.815 |
| PG | -0.03687 | 0.00528 | 3.967 | 0.0001 |
| PI | 0.02831 | 0.00234 | 3.986 | 0.000 |
| T | -0.03776 | 0.008654 | -2.843 | 0.003 |
| RGDP/worker | 0.000245 | 0.000932 | -3.09 | 0.002 |
| Egypt | 0.01693 | 0.12106 | 3.16 | 0.06 |
| Jordan | -0.4376 | 0.1652 | -2.789 | 0.000 |
| TuniSia | 0.17724 | 0.1733 | 1.563 | 0.153 |
| | | R2 E0.7563 J 0.07482 T 0.7369 | Oman 0.763 | |

countries based on their needs to channel more money into education, capital investments, and works programs. Also, their main concerns to the investments of infra structures and health, in other hands there Policies as a consequential acts o promote openness of the economy. And in order to minimize the adverse effects on economic growth of supply shocks in their main sector of the economy.(Swamy et..al, 1989), used in their study an extension of random effects model, the model which used as:

$$GDP = \text{But it} + \sum_{i=1}^T \text{it} \dots\dots\dots(16)$$

where t =1,2,... T and i=1,

$$B_t = B + v_t \dots\dots\dots (17) \quad \text{Where } E(v) = 0 \text{ and } \text{var}(v_t) = I$$

In this study, we have used a specific model with the significant test with Breach Pagan, Hausman test, and F – test world income to the data model results.

B1: pooled OLS:

We have pooled all data and run OLS regression models, according to the assumption that all coefficients are constant across time and individuals. The model can be as:

$$\text{Ch DPit} = \alpha_0 + \alpha_1 \text{XRAT} + \alpha_2 \text{PPP} + \alpha_3 \text{P} + \alpha_4 \text{PG} + \alpha_5 \text{PI} + \alpha_6 \text{RGDP/worker} + \alpha_7 \text{Egypt} + \alpha_8 \text{Jordan} + \alpha_9 \text{TuniSia} + \epsilon_{it} \dots\dots\dots(18)$$

Where: CGDP it= Gdp per capita, PPPx is purchasing power parity over GDP for x countries, Pit is the price level of GDP, PG presents the price level of government, PI represents price level of investments, RDdp work it is the real chain per worker. XRAI is the exchange rate of each country. I stand for I the cross section. AI unit, and t for its time period

B.2 .Fixed effects models: the fixed effects model used to analyze data with (interceptor individuals).

From table (9) there is positive relationship except for PPP, PG, and Y, while R2 determinant is (0.724), also it is reasonably high. While the positive relationship between X Rat, and P and PI with Ln GDP per capita, also RGDP/worker it has a positive relation. The cross-sectional unit/each country, the intercepts is varied when using the dummy variables for fixed effects. While dummy variable for Oman country which used as comparison country, a low P-Value (0.0001) country against the null hypothesis it signs that pooled model is adequate.

Table 11. Country intercept Value

| Intercept | Country | Value |
|-----------|---------|---------|
| 1. | Oman | 11.0763 |
| 2. | Egypt | 10.8742 |
| 3. | Jordan | 8.5543 |
| 4. | Tunisia | 8.6272 |

Table 12. Random effects models for CGDP data of selected Arab countries (2000-2016)

| Variable | | Coefficients | St/Error | T-Stat | Prob/level |
|-----------|---------|--------------|----------|--------|------------|
| Constant | | 10.927 | 0.2844 | 36.755 | 0.000* |
| XRAT | Egypt | 8.43e-4 | 6.38 e-4 | 1.48 | 0.0181 |
| | Jordan | 6.16e-4 | 6.76 e-4 | 1.76 | 0.0214 |
| | Tunisia | 6.09e-4 | 5.72 e-4 | 1.72 | 0.0213 |
| | Oman | 5.98e-5 | 4.01 e-5 | 2.01 | 0.162 |
| PPP | Egypt | 0.00036 | 0.00027 | 1.281 | 0.2162 |
| | Jordan | 0.00027 | 0.00021 | 1.263 | 0.2310 |
| | Tunisia | 0.00031 | 0.00023 | 1.341 | 0.2204 |
| | Oman | 0.0042 | 0.00019 | 1.520 | 0.3180 |
| P | Egypt | 0.00189 | 0.00765 | 0.2673 | 0.8769 |
| | Jordan | 0.00175 | 0.00643 | 0.2844 | 0.9613 |
| | Tunisia | 0.00163 | 0.006215 | 0.2930 | 0.9724 |
| | Oman | 0.00172 | 0.006984 | 0.3105 | 0.9931 |
| PG | Egypt | -0.0.02786 | 0.00534 | -4.18 | 0.000* |
| | Jordan | -0.03115 | 0.006422 | -4.73 | 0.001* |
| | Tunisia | -0.0293 | 0.00731 | -4.96 | 0.002* |
| | Oman | -0.2615 | 0.00548 | -4.29 | 0.006* |
| P1 | Egypt | 0.02341 | 0.002891 | 4.16 | 0.00* |
| | Jordan | 0.02183 | 0.002163 | 4.28 | 0.00* |
| | Tunisia | 0.02477 | 0.002561 | 4.32 | 0.00* |
| | Oman | 0.02551 | 0.002763 | 4.48 | 0.00* |
| T | Egypt | -0.0263 | 0.005392 | -2.96 | 0.036* |
| | Jordan | -0.0197 | 0.00654 | -3.17 | 0.002* |
| | Tunisia | -0.0248 | 0.00728 | -3.08 | 0.001* |
| | Oman | -0.0216 | 0.005431 | -2.94 | 0.001* |
| RGDP work | Egypt | 0.00039 | 1.36e-05 | 17.96 | 0.000* |
| | Jordan | 0.00028 | 1.33e-05 | 17.84 | 0.000* |
| | Tunisia | 0.00021 | 1.28e-05 | 16.97 | 0.000* |
| | Oman | 0.00024 | 1.29e-05 | 7.63 | 0.000* |

B3 :The fixed effects models can be as:

$$Y_{it} = a_0 + a_1 D_{2i} + a_2 D_{3i} + a_3 D_{4i} + B_2 XRAT_{it} + B_3 PPP_{it} + B_4 P_{it} + B_5 PG_{it} + B_6 P1_{it} + B_7 T_{it} + B_8 RGDP_{it}$$

Where: D2i =if observations for Egypt, otherwise=0, D3=if observation belongs to Jordan, otherwise =0.D4=1 if observation for Tunisia otherwise=0, to avoid falling into the dummy variable trap. we did not use the dummy for Oman, Therefore a represent the intercept of Oman and a1, a2 and a3 are the different intercept coefficients, can tell us how much the intercepts of countries differ from Oman interplant. table (10) represents the results.

There is a positive relationship of Ln GGDP to ward XRAT, P, Pi, PG, PGDP worker.

The PP, PG. Have a negative on CGDP.interplant. Us individuality of each country is varied Fund Table (12) results. the dummy variable for fixed effects for Oman which used as a comparison country.

C: Random effect models:

The intercepts in random effects model assumed to be random outcome variable a and to be a function of a mean value plus a random error. the random effects model can be written as:

$$GDDP_{it} = \alpha_{it} + \alpha_2 XRAT_{it} + \alpha_3 PPP_{it} + \alpha_4 P_{it} + \alpha_5 PG_{it} + \alpha_6 P1_{it} + \alpha_7 T_{it} + \alpha_8 RGDP_{it}$$

Table 13. - Across sectional unit the random error.

| | | |
|--|---------|--------|
| Cross-section random(sigma - 4)S.D/Rho | 0.3658 | 0.2165 |
| Idiosyncdri random sigma-2 | 0.63814 | 0.9367 |

Table 14. cross. Section Random effects for (intercept countries values)

| Cross section | Country | Value |
|---------------|---------|--------|
| 1 | Egypt | 0.9164 |
| 2 | Jordan | 0.7243 |
| 3 | Tunisia | 0.7155 |
| 4 | Oman | 0.6982 |

Table 15. Effect specifications of the study group

| | t-state | P-value |
|--------------------------------|---------|---------|
| Cross sections/Rho(sigma-4 | 0.3672 | 0.2851 |
| Idiosyncratic S.D/Rho Sigma -e | 0.6397 | 0.9344 |

$$Ali=a1+ \sum l, l =1,2,3,...N.$$

And Ail i8 net fixed, lob it assumed as intercept with ($\sum i$) the random error, with a value of zero and various of 63. Therefore we can write the model in new phase as:

$$CGDPit=a1+G2XRATit+A3PPPxit+ A4Pit +As PGit + a6 Plant + a77it+ a8 RGDP look it + wit \dots\dots\dots(19)$$

Where: Wit= $\sum it + \mu it$.

- Across sectional unit, the random error(Wit) is to be heterogeneity, and constant over time where $E(wit [x] = \sigma^2i$

When we applied the model we assumed that the slope coefficients are constant across cross- sectional, the intercept of Oman is a comparison cross- sectional for the study group. capital, The unique financial and monetary policy of each government can be the effect the trade policy of the country as (export and import of goods and service, and the effect of the exchange rate, the prices of another country of the goods and services.

From table (15) the random error component of Oman tells us how much it, from the International value of the study. Similar cross-section random value of Egypt, Jordan, and Tunisia. Oman 11.076 Egypt 10.87, Jordan 8.88 and Tunisia 8.627. F-test for group effects has applied, the result of the test is 27.0563with P-value 0.00045, therefore this results counts against the null hypotheses that pooled OLS made is adequate. Also, Hausman test is applied to test the fixed error mode or error component model the results is Hausman test =18.732 with prob level clique(3) =0.04228. This small P-value shows that the coefficients estimated differ in each model.

V 11: CONCLUDED REMARKS:

We have studied the selected countries through two methods, first to study the steady state levels of selected countries rather than the different position of the country along transitional paths, the second method is through panel data analysis, through fixed effect and random effect.

The financial structures and micro economic conditions and policy settings seem to play an important roles in GDP per capita of each country of the study, their fore in the first method we have chosen stock capital, human capital, inflation rate population growth, physical capital, trade and R& D as variables to study the selected countries as a group, in consequence, the changes which happen in these variables can rapidly affect the living standards and make some changes in.

A low side of the range has been noticed when we estimated the elasticity of output to human capital, thesis results can point the investment and the potential effort externalities in the investment of education a d training of each country, but in these countries the ---- curatively low.

The results indicate that government size in the economy as overall may reach levels that hinder growth, in the long run, education, expenditure of government on health, and educational training can seem sustains wing standard, the results of the study advise and suggest that higher direct taxed to lower GDP precipitate, also government expenditure in both directions consumption and investment which should tend to have monetary effects on GDP per capita, and this may also influence growth.

The study has proved an evidence that high inflation

rate is negatively associated with an accumulation of physical capital and a negative effect bearing on GDP per capita

The other results of research of selected Arab countries give some evidence as the overall size of government in the economy may reach levels herder growth. Results of expenditure on education and on health clearly situation living standards in these countries in the long run also governments conceptions and government investments in the selected countries tend to be negative effects on GDP per capita, but in general, the government investments can influence the growth. 2002. authors can influence the growth, some authors, in this case, advice that improving -----frame work condition as.

The environment around the investment projects. While the R & D activities have a clear but relationship which established between nonbusiness –oriented R & D activities and growth.

But there is a small portion of interaction and the spell –overs, that is not clearly unidentified in the results of these countries. where the channels of financial market can help and influence on growth by helping channel resources to wards in urging the privet sector investments according to the results of a strong effect on investment rate and growth of GDP per capita and the effect of stock market capitalization in these countries.

Anthers advise the successful strategy of these countries should be towards reduced public and privet sector deficits, also to remove the pressure of overall taxes which risen in all years of study. Ad to increase the diminishing social returns by improving education levels, and a number of resources devoted to R & D should be increase years to other, beyond these the economic structure should be developed, and the resources should be channeled directly to the business sectors.

These results supported by their results of evaluating the suggested determinates of GDP per capita growth with panel data analysis carried ye/Pt, and. PPP which played a strong effect on per capita of output by pooled OLS model and fixed effect model, the random effect model, we can notes through our analysis that R2 increased and standard errors decreased, this led us to conclude that LSDV, as compare to random effects, is more beneficial to our analysis of data.

Results of Housman test give more avoidance to choose fixed effect against random effects, the results of the analysis support, in general, the first model of analysis.

Future papers of another researcher can be related to have more variables in their analysis and choose other models, in addition, to have a dynamic analysis, for more countries to emphases which variables are more effective in GDP per capita growth.

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