



Munich Personal RePEc Archive

Education and employment in Egypt: the policies, discrepancies and possible solutions

Abdel-Rahman, Alaa and Fuller, David

Concordia University, Department of Economics

6 May 2014

Online at <https://mpra.ub.uni-muenchen.de/67571/>
MPRA Paper No. 67571, posted 02 Nov 2015 09:38 UTC

CONCORDIA UNIVERSITY
DEPARTMENT OF ECONOMICS

Education and Employment in Egypt: the policies, discrepancies and possible solutions

M.A. RESEARCH PAPER

Student's Name: Alaa Abdel-Rahman

Student ID: 9120912

Date Submitted: 6th of May 2014

Supervisor: Prof. David Fuller

ABSTRACT

For the past decades, different economic policies were implemented in order to better the Egyptians' living standards. However when we look at where Egypt stands in terms of quality of education and labor efficiency, we realize that those policies did not help as much as we would have hoped. With an outlook on these different policies and potential solutions to overcome their inefficiencies, the author analyzes a potential starting point which includes working on the education sector in order to upgrade the Egyptians' living standards and hopefully, the growth path of the economy. It was found that a simple increase of 20% in the quality of education leads to almost double the average growth rate of the country.

Table of Contents:

• INTRODUCTION -----	1
• SECTION I: ECONOMIC POLICIES IN EGYPT-----	4
○ A POPULIST OUTLOOK -----	5
○ OPENING-UP THE ECONOMY-----	6
○ FALSE HOPE FOR DEVELOPMENT-----	8
○ WHAT WENT WRONG? -----	9
• SECTION II: A MODEL TO SOLVE THE PROBLEM? -----	11
○ THE MODEL -----	12
○ MODEL CALIBRATION -----	15
○ RESULTS -----	16
○ RELATIONSHIP BETWEEN QUALITY OF EDUCATION AND GROWTH RATE? -----	19
• SECTION III: CONCLUSION AND RECOMMENDATIONS -----	20
• BIBLIOGRAPHY -----	29
• APPENDIX-----	31

INTRODUCTION

“A book has got smell. A new book smells great. An old book smells even better. An old book smells like ancient Egypt.”- Ray Bradbury.¹

“Egypt is not a country we live in but a country that lives within us.”- Pope Shenouda III.

“Egypt is a large, complex, very important country.”- Hillary Clinton.

The above mentioned quotes do not come close to describing how Egypt came to be one of the most talked about countries in many aspects; historically, politically, socially, and religiously. Ever since the ancient times of the Pharaohs, Egypt has been the epicenter of the world, making history as she goes along. From the ancient empire that arose on her lands to the 6th of October 1973 victory and the peace treaty with Israel to the 25th of January 2011 revolution, Egyptians never failed to impress and garner the awe of the world. Historical events are witnesses on how grand and mysterious she is. Egypt went through a lot of changes and conflicts that have changed the shape of the society altogether. Most of these changes and conflicts have risen because of the unfortunate overall descent of the country and the multi-faceted failures of the state to deal with the people’s demands and the country’s many problems.

After President Hosni Mubarak stepped down on the 11th of February 2011 and Egypt entered its transitional path into democracy and a hopeful achievement of a better life for her people, a lot of questions and problems have come into the light, most importantly its dying economy and the hard fact that Egyptians do not seem to be getting the education they need in order to thrive and better themselves. In 2007, 32 per cent of the population was completely illiterate and most recently, Egypt has been placed last in terms of quality of primary education; i.e., Egypt officially has the worst primary

¹Quotes are provided by <http://www.brainyquote.com/quotes/keywords/egypt.html>.

education system in the world. Even with impressive improvements in the country's infrastructure especially in utilities and telecommunications (an increasing access to internet and better telecom services), with an average GDP growth rate of circa 6 per cent throughout the new millennium, the overall development of the country is deteriorating. For example, Egypt saw its ranking settle among the lower 40 per cent of all developing countries in the UN's 2007 Human Poverty Index. Hence, the reason for the study that I conducted presents itself; does the answer to Egypt's ailing economy lie within its educational sector? And if so, how much impact on economic growth could education reforms produce?

The previous literature discusses the relationship between economic growth and education including the role of government involvement. Hanushek (2003) mentions that a resource-based policy of the government has little effect on the educational sector. He argues that the educational attainment of students is almost unaffected by government policy. Using U.S. data, he clarifies that an active involvement of government in the education sector is deemed as a failure. While Hanushek might strike some important points regarding that matter, I argue that the question should not be just about resource management in the education sector, but also about the quality of the outcomes arising from those resources.

Basu and Bhattari (2012) ask whether a resource based public education policy can be counterproductive. They also explore the proactive role of the government as a factor determining public education spending behavior (across countries), and the relationship between public education spending and schooling returns. Glomm and Ravikumar (1992, 1997) link public expenditure on education to growth as well as

Blankenau and Simpson (2004) and Blankenau, Simpson and Tomljanovich (2007). Blankenau and Camera (2009) show that in a strategic environment, when a government spends more on the education sector, students may underinvest in their efforts, which may dampen any spillover effect on economic growth.

In this paper, I focus on the quality of the educational system and human capital in Egypt. Specifically, the following questions are explored: Has the path to growth and development been hindered by an inefficient educational system? What needs to be done in terms of improving the quality of education in order for Egypt to have more qualified workers? How can “labor and education” work together in order for Egypt to move from a developing to a developed country? From the study conducted, I find that despite the important illiteracy rate that seems to persist in Egypt, Egyptians spend half of their lives educating themselves and building their human capital. However, that time spent on education yields little in terms of building the stock of human capital for Egyptians. Therefore, any potential the educational system has of contributing positively to economic growth is not currently being used effectively.

To answer these questions, I use an endogenous growth model similar to that used in Basu and Bhattari (2012). The model focuses on the relationship between government involvement in the educational sector, in terms of spending on education, and the impact it has on the productivity of schooling and the average growth rate of the economy. In their model, the authors aimed for cross-country results on how government involvement in education can negatively affect the average growth rate of the economy. In my analysis, I apply their growth model on Egypt and try to establish a positive relationship between the quality of education and the average growth rate of the country. The results

that I reach support my hypothesis that increasing the quality of education will in fact contribute in increasing the average growth rate of Egypt's economy by significant strides.

The paper proceeds as follows. Section I present a brief history of Egypt's economy and where it appears to be going, while also shedding some light on potential policy prescriptions that could help resolve the issues mentioned a priori. In Section II, I present a simple endogenous growth model, the purpose of which is to measure how effective the educational system in Egypt is. Section III concludes with possible solutions for improving the Egyptian educational system so that it can begin to contribute positively in the growth of the Egyptian economy.

SECTION I: ECONOMIC POLICIES IN EGYPT

This section discusses a brief history of economic growth and reforms in Egypt. Under the reign of three presidents, Egypt has seen different economic approaches and policies to better the economic situation and turn the country into an economic stronghold. The goal is to understand the path of growth to date, as well as to reinforce that a poor education system has limited the access to economic growth among the country's poor, even with the different economic policies applied "for their benefit".

According to the African Development Bank's *2012-2013 Interim Strategy Paper: Egypt*; Egypt is considered to be the second largest economy of Africa and the 25th globally. The Egyptian economy is known to be well-diversified and driven mainly by tourism revenues, oil and gas exports, trade services and agriculture. As of 2011, Egypt's population stands at 83 million with a distinctive characteristic of being poor and having

financial hardships. Over the past 50 years or so, the Egyptian economy has seen many reforms and policies implemented to restructure and redesign the market to better cope with the regional and global markets, as well as cope with the people's demand of a better and improved lifestyle.

A. A POPULIST OUTLOOK:

Egypt was known to be one of the “must-watch” countries in terms of economic development during the late 50's to the end of the 60's. Following the 1952 July coup d'état that disposed of the monarchy, the Egyptian economy went through a major change, most importantly on the economic side. During Gamal Abdel-Nasser's presidency, the economy was mainly driven by a populist agenda hence, eliminating the massive concentration of resources and riches in the hands of the elite capitalists of the disposed monarchy.

President Nasser's most important policy was to revolutionize the public sector with more state-owned factories and companies being built. By the late 50's and early 60's, Egypt's most sizeable businesses were nationalized which helped the late president's economic vision at that time; to remodel the structure of wealth by transferring ownership from a narrow strata of capitalists to the poorer and ordinary people. This direction brought on a more balanced socio-economic status to the society. The social curve eventually flattened, aided by a dramatic increase in university education, expansion in industry and services, as well as an emerging public sector. As a

result, the previously poorer strata of Egyptians moved up to the middle class². He was able to transform Egypt's society from a poor and helpless society into a working and driven one.

The results were staggering; the country's economy grew at an average of 9% per year for almost a decade. The manufacturing contribution to the GDP increased from 14% to 35%³ in the early 70's. The aforementioned sector became the largest employer of Egyptians making Egypt a country with a very large share of labor force in the manufacturing sector. Unemployment decreased from 2.7% in 1960 to 1.15%⁴ in 1966, a record low. This is was due to the rapid growth of the public sector after nationalizing most of the companies and factories and to the increasing number of graduate students because of the expansion of free education.

The newly empowered public sector was not accompanied by proper training and skill enhancement to the poor, low skilled farmers that came to acquire a larger portion of the agriculture resources from the more educated and well-capitalized landowners (following the President's land reform act). That resulted in a poorer quality of agrarian produce and poor marketing for it (especially the cotton which is Egypt's main agriculture produce) i.e. a poorer labor productivity and effectiveness.

B. OPENING UP THE ECONOMY:

Following Gamal Abdel-Nasser's reign, the late President Mohamed Anwar Al-

² The nature of one's job replaced the landownership in determining one's social class. The middle class swelled and increased with doctors, engineers, teachers, lawyers and journalists being the main jobs occupied by the middle class.

³(Osman, 2011)

⁴(Osman, 2011)

Sadate ushered in a new economic agenda, one that depended on the alliance between politics and economics. The economic changes expected from the opening-up policy were to transfer power from the state, the government, the military establishment and the public sector to a newly emerging private sector. One of the major impacts of the “*al-iftah*” policy was on the social aspect. The middle class saw its structure transform under the pressure of different forces of change such as the rise of the private sector and the increase of Foreign Domestic Investments (FDI). With those effects in play, the public sector saw its role decline in the 70’s and 80’s with substantial income gaps between workers of both sectors. The opening-up policy adopted at that time created a new wave of financial liberalization for the Egyptian economy. It upgraded the country’s job market, created a momentum and triggered an increase in a number of industries. The private sector became the leading economic player in the country for the three following decades, pushing aside the decaying role of the public sector. With the new “opening-up” policy set in motion, the average growth rate during El Sadate’s reign ranged around 8% as opposed to an average growth rate of almost 5% during Abdel-Nasser’s presidency⁵.

However, because of the sizeable income gap between the decaying public sector and newly emerging private sector, the former’s top talent and elite university graduates moved to much better paying jobs, leaving a vacancy that was hard to help better the public sector. Millions comprising Egypt’s middle class, found themselves stuck in that sector since the focus of the regime was directed at the private sector. The public sector was left stuck with an increasing marginalization and stagnancy and low wages. Despite the previous, the public sector remained the backbone of the economy up until the early

⁵ Average growth rate of GDP per capita calculated over a period of 5 years from figures 2 and 3 respectively.

2000's. With the Egyptian economy opening up to the labor market as well, more than 3 million Egyptians were lured to work in Gulf States following the first oil boom between 1974 and 1985. The resulting social mobility in that period was not due to an overall socio-economic equality or higher education and professional standing like Nasser's policies. This mobility was supported by an increase in domestic purchasing power. The middle class in Egypt was now defined as a function of the disposable income of families and no longer by education or professions.

With that being said, it is important to mention that having the middle class status in the economy be determined as a function of the disposable income, rendered it vulnerable to the new economic forces in play. "*Al-infitah*" caused immense pressure on the middle class where the middle class saw its purchasing power eroded, with real-wages in the public sector being affected by high inflation. The newly adopted policy was not flexible enough to respond to the social dynamics of the time. With the sudden surge of new economic opportunities and an upgrade of the country's job market, the skills of the Egyptian middle class were mismatched with the period's skill demands and requirements.

C. FALSE HOPE FOR DEVELOPMENT:

Mubarak was able to turn the economy into a different version of itself. The economic reform the young president then wanted to adopt focused on strengthening and solidifying the country's economic foundations so as to have change come in in a less disruptive manner. With the improvement of the people's economic conditions in mind, Mubarak launched a programme of structural adjustments with the help of the World

Bank and the International Monetary Fund (IMF). He wanted to improve living conditions, expand high-employment sectors and decrease poverty through enhancing the sources of foreign currency, most importantly the tourism sector (with almost 1.5 million Egyptians working in the sector by 2007, representing 4.3% of total GDP and accommodating 10% of the workforce.⁶).

As a result, labor force participation increased following the flow of FDI in the country, especially in the tourism sector and a combined effect from the industry and services sector (that includes the telecoms sector) (see figures 6, 7, and 8). Despite the trend of employment in the industrial sector is lower than the one in the services sector, its contribution to the employment of the Egyptians is not negligible, reaching as high as 25% of total employment in 2011. Following the restructuring of the economy's infrastructure and an important flow of FDI in the 2000's, the employment trend in the services sector grew tremendously, pushing it to become the highest employment sector between 2001 and 2005. Despite its decline during 2010/2011, the services sector still contributed to about 45% of the employment in the country. Following the ambitious restructuring of the economy, unemployment and inflation reached all-time highs during Mubarak's presidency. At a rate of 18-21% in the 25-54 age group, unemployment attacked the country's core labor force (and is still in the double digits following the revolution and instability the country is witnessing). This came to affect a sizable section of the middle class's living standards.

WHAT WENT WRONG?

In my opinion, the main problem plaguing the economy is the lack of consistency

⁶(Osman, 2011)

between the different policies applied. With every regime that came to power in Egypt since the monarchy was overthrown, there has been no uniformity in terms of views and perceptions of the essential changes needed, or even an idea of what the alternative model should be in order to develop Egypt's economy. The common mistake committed by the aforementioned policies was their ignoring of the fact that the Egyptian society and average workers were still unequipped with the necessary skills and tools to compete in a global and more open market, and become more effective and productive as workers.

Interestingly enough, out of 22 million workers, 42% are either illiterate or semiliterate. This has led to the Global Competitiveness Index to classify the Egyptian workers as "working poor", not only because of the stagnation of real wages in the public sector over three decades, but because Egyptians have the lowest level of productivity. Egypt has been ranked 141/142 in terms of labor market efficiency.⁷ Egyptians were considered "unemployable" due to their lacking skills domestically and internationally. Following the new "opening-up" policy and the rapid implementation of the socialist policy, the Egyptians were in no way prepared to face a competitive and demanding global market with new technology and demanding skills. Enhancing the Egyptians' skills should have been the number one objective for both policies, to match up with their agenda of propelling the economy forward.

Following what has been mentioned above, the perfect remedy for the ailing economy lies within the educational system of the country. Over the past 60 years, the skills and tools acquired by the Egyptian workers have not been sufficient to increase their productivity and value in the market. Education refers to not only schools and universities, but also to training and enhancing the Egyptians' set of skills so they are

⁷(Radwan, 2012)

more able to compete and produce on the labor market. In the last Global Competitiveness Index of 2013, Egypt was placed last (148th place) in terms of quality of primary education. The Adequacy of Education Index has Egypt placed 110/182.⁸ Even if Egyptian workers enhanced their skills, they would be given unnecessary skills and sometimes unrelated to the labor market demands rendering them unable to work with what they have. Educational policies thus far have only served in expanding or minimizing the educational system i.e., increasing or decreasing the number of years of schooling. They have not served the economic growth and failed to link what the youth acquire during their “student” life to what they will face in the labor market.

SECTION II: A MODEL TO SOLVE THE PROBLEM?

In this section, I attempt to quantify the major defect that has affected Egypt’s educational system: lack of quality. “Quality” is an ambiguous indicator and difficult to measure seeing as how the word itself expands over a wide spectrum of definitions. In my opinion, the education sector has a great potential in contributing to the growth rate of the Egyptian economy. It is my belief that if properly developed and reformed, the education sector could have a positive spillover effect, mainly on employment. I use the model to determine the level of productivity provided by the present educational system and try to establish a link between the quality of education and the growth rate of the economy. If a positive relationship exists, I can then examine how much the growth rate changes given a change in the productivity of education.

I acquired data on the percentage share of education in the Egyptian GDP from the Egyptian Government Finance Statistics (GFS) over the period of 1990 to 2012. I also

⁸(Radwan, 2012)

acquired data on the annual growth rate of GDP from the World Development Indicators (WDI) over the same period. These two data sets help determine whether there exists a link between the quality of education, the share of education in GDP and the annual growth rate of the economy.

THE MODEL:

My analysis utilizes the model of Basu and Bhattari (2012). Their paper discusses the relationship between government involvement in education and the growth rate of the economy. The economy has two major sectors: the goods producing sector and an education sector. There is a fixed time allocated between schooling and producing goods such that l_{Ht} is time allocated to schooling (i.e. time spent on education) at date t . Time allocated to schooling contributes to an individual's stock of human capital in the next period, denoted by h_{t+1} . Specifically, the law of motion for human capital follows,

$$h_{t+1} = (1 - \delta_h)h_t + A_H g_t^\eta (l_H h_t)^{1-\eta}$$

The previous equation represents the human capital production function, where $\delta_h \in (0,1)$ is the depreciation rate of human capital and $\eta \in (0,1)$ is a schooling technology parameter. Public spending on education is denoted by g_t , while $l_H h_t$ represents private spending on education; i.e., the time spent on education by the households given a level of pre-acquired human capital. It is also the opportunity cost of diverting time from goods production to human capital production.

It is important to mention that the productivity of the schooling input depends on two factors:-

- (i) A_H is the education productivity parameter, or in the context of my paper, the quality of the education in Egypt. This particular parameter helps determine how much additional human capital the Egyptians get for an additional input of schooling time.
- (ii) Public spending on education, g_t , represents the second factor affecting the productivity of the schooling input in terms of how much the government spends on the educational infrastructure.
- (iii) Another important parameter for my analysis (as well as it was for Basu and Bhattari), is η , which represents the infrastructural role of the government in the education sector. In other words, it represents a schooling technology parameter and determines how involved the government was in the past in the education sector. Basu and Bhattari (2012) call it the *government bias in education*. This parameter represents the tying point in the relationship between public spending on education and the growth rate of the economy.

The final goods, y_t , are produced using a Cobb-Douglas production function:

$y_t = A_G k_t^\alpha (l_{Gt} h_t)^{1-\alpha}$; l_{Gt} is simply $1 - l_{Ht}$, which is the time allocated for the production of goods in the economy and A_G is total factor productivity (TFP) which is assumed to be constant. The investment goods technology is defined as follows: $k_{t+1} = (1 - \delta_k)k_t + i_t^k$; where $\delta_k \in (0,1)$ is the rate of depreciation of the physical capital.

The government finances education spending, g_t , by imposing a proportional tax rate, denoted by τ_t , on y_t . The government thus faces the budget constraint:-

$$g_t = \tau_t y_t$$

A representative household takes the sequence of tax rates $\{\tau_t\}$ as given and

chooses the sequences of $\{c_t\}$, $\{i_t^k\}$ and $\{l_{Ht}\}$ that maximize expected lifetime utility:-

$$\max \sum_{t=0}^{\infty} \beta^t \ln(c_t)$$

Such that : $c_t + i_t^k = (1 - \tau_t)y_t$ (Flow budget constraint)

$$h_{t+1} = (1 - \delta_h)h_t + A_H g_t^\eta (l_H h_t)^{1-\eta} \text{ (Schooling technology)}$$

Given an optimal behavior by the private sector, the government sets tax rates $\{\tau_t\}$ such that they maximize the social welfare.

Following in the footsteps of Basu and Bhattari, I proceed by defining the balanced growth path of the Egyptian economy. Since I focus on 23 years of education spending and growth from 1990 to 2012, displaying the balanced growth path of the economy allows me to look at the long-run relationship between public education spending and the growth rate, *ceteris paribus*. The balanced growth path is characterized by the following equations. First,

$$\tau = \frac{\frac{1-\alpha}{1-\eta} \cdot \frac{\eta l_H}{l_G}}{1 + \frac{1-\alpha}{1-\eta} \cdot \frac{\eta l_H}{l_G}} = \frac{g}{y}$$

This represents the welfare maximizing steady state government spending on education as a share in GDP. The gross balanced growth rate of GDP is given by:-

$$\gamma = 1 - \delta_h + A_H \tau^\eta l_H^{1-\eta} A_G^\eta l_G^{(1-\alpha)\eta} \left(\frac{k}{h}\right)^{\alpha\eta}$$

Three expressions are worth mentioning;⁹

- (i) k/h is the physical to human capital ratio and could be expressed as follows:-

⁹For more details on how we derived the physical to human capital, output to physical capital and output to human capital ratios, please check Appendix.

$$k/h = \left[\frac{y/k}{A_G(l_G)^{1-\alpha}} \right]^{\frac{1}{1-\alpha}}$$

- (ii) The second expression that is important to my analysis is y/k ; which is the output to physical capital ratio. It can also expressed as follows:-

$$y/k = \frac{y/\beta - (1 - \delta_k)}{(1 - \tau)\alpha}$$

- (iii) The third expression represents the output to human capital ratio y/h which is expressed as:-

$$y/h = A_G[(1 - l_H)^{1-\alpha} (k/h)^\alpha]$$

MODEL CALIBRATION:

The goal of this section is to calibrate the values of several key parameters related to the educational sector, namely $A_H, \eta,$ and l_H . First, several of the model's structural parameters are fixed at baseline levels. The capital share parameter α is set at 0.36 while the rate of physical capital depreciation δ_k is at 0.1 as per Prescott (1986). The discount factor β is set at 0.94 and A_G , or TFP, is fixed at 3.9 (the value used in (Basu & Bhattari, 2012)). The rate of human capital depreciation δ_h is equal to 0.05. The following table summarizes the previous expressions.

Table 1 *Baseline Parameters.*

α	β	δ_k	δ_h	A_G
0.36	0.94	0.1	0.05	3.9

Contrary to Basu and Bhattari's approach, I need to identify the values of A_H and

l_H for Egypt alone, rather than having to study a cross-country distribution. Using the four previously mentioned equations, I solve for these four unknowns, A_H, η, l_H and y/k . That is, given the observed growth rate of GDP, γ , and the observed ratio of government spending to GDP, τ , the four equations can be solved for the aforementioned four unknowns.

Thus γ and τ represent two important moments in the data. According to the data available on Egypt, the average growth rate of GDP between 1990 and 2012 (the range of the sample acquired) is equal to $1 + \gamma$ which is 1.0249. Egypt's education share in GDP on average over the same period is equal to 4.5%.

RESULTS:

With the given parameters and information that I was able to gather on Egypt's education spending share in GDP and growth rate over 1990-2012, I was able to identify a specific A_H and l_H as follows:-

Table 2 *Parameters of the Egyptian case.*

η	A_H	l_H
0.0694	0.1575	0.4967

The results obtained coincide with the reality of the educational sector in Egypt. The government bias to education is high enough to actually mirror the country's recent attention to "improving" education especially since the 2000's. The education productivity parameter A_H or the quality of the education stands at a low rate of almost 0.16. Think of human capital as a swimming pool being filled with a hydro pump. If the hydro pump is of a good quality and effective, the additional hour of working that pump

is worth that hour spent filling up the pool. Applying this analogy to the Egyptian situation, we find that an additional hour of education adds relatively little to the Egyptians' overall stock of human capital.

However, when we look at the time Egyptians put into their education l_H , we can establish that approximately half of their “time” is dedicated to educating themselves. With an important weight given to education by the government, a relatively high level of effort going towards human capital investment and a low productivity of schooling, one cannot help but think that all the recent investments done in the educational sector are going to waste.

Given these calibrated parameters, how does Egypt compare to the rest of the world? I compare the results I obtained to the cross-country average calculated by Basu and Bhattari (2012) first.

Table 3 *Comparison between cross-country average distribution and Egypt's parameters.*

$\eta_{Average}$	$l_{H,average}$	$A_{H,average}$	η_{Egypt}	$l_{H,Egypt}$	$A_{H,Egypt}$
0.07	0.47	0.15	0.0694	0.4967	0.1575

Source: Basu and Bhattari (2012)

I find that Egypt is actually quite close to the cross-country average. Its government bias to education is slightly less than the average value however; the time allocated to education is higher with a value of approximately 0.5 for Egypt and 0.47 for the cross-country average. As for the quality of schooling, I find that the difference between both values is almost negligible with Egypt's productivity parameter standing at

approximately 0.16 and the cross-country average standing at 0.15.

As for where Egypt stands among the different regions of the world, the following can be established:-

Table 4 *Egypt's stat compared to world's regions.*

Regions	Egypt	Europe	Latin America and the Caribbean	Mideast and North Africa	Asia	OECD	North America	South Asia	Africa
η	0.0694	0.078	0.068	0.063	0.057	0.08	0.096	0.036	0.077
g (%)	2.49	2.111	1.478	1.518	2.830	2.259	1.756	3.811	0.731

Source: Basu and Bhattari (2012).

Using Basu and Bhattari's results (2012) as reference, I can identify Egypt's stance in accordance to the other regions in the world. Hitting close to home, Egypt has a slightly higher government bias for education that the Mideast and North African region, but it has a higher average growth rate. The Mideast and North Africa have an average growth rate of 1.518% over the period 1980-2008, while Egypt observing an average growth rate of almost 2.49% over the period 1990-2012.

This is where one important limitation to my study makes its appearance; the sample period that I examine falls short by 12 years from Basu and Bhattari's sample period of 1980-2008. The reason behind my choice of that sample period is the dilemma of missing data on education in Egypt prior to 1990. The 1990-2012 sample period that I examine was the most coherent and complete data set I was able to collect. If ever the

sample periods were the same, the government bias in education and average growth rate in Egypt would most likely either converge to the same numbers as the Mideast and North Africa regions, or turn out to be slightly higher.

RELATIONSHIP BETWEEN QUALITY OF EDUCATION AND GROWTH RATE?

After getting the parameters describing the state of education in Egypt, I proceeded with establishing a relationship between the quality of education (A_H) and the average growth rate of the economy (γ). The purpose of this experiment would be to test whether or not an increase in the quality of education will have an impact on the average growth rate of the Egyptian economy, given everything else constant. Moreover, the balanced growth path defined above determines two optimal responses to this structural change: (i) the optimal response of households in l_h and (ii) the optimal response of the government in adjusting the welfare maximizing level of government spending on education, i.e. τ .

The experiment fixes the government bias for education (η) at the country-specific level of 0.0694. I then proceed with increasing the parameter A_H by 20%, 40% and 60%. These increases should have an impact on the time spent on education (l_H), the education spending share as a % in GDP (τ) and of course, the average growth rate of the economy (γ). The following results were found:-

Table 5 *Changes in parameters as a result of increases in quality of education.*

Increase in A_H	20%	40%	60%
l_H	0.5575	0.6014	0.6343
τ (%)	5.68	6.72	7.65
γ (%)	5.02	7.54	10.04

As shown from the table above, an increase in the quality of education has a positive and significant effect on all the parameters related to education. By increasing the education from its initial level of almost 16% to 60%, the number of hours spent on education jumps from 0.4967 to 0.6343, an increase of almost 28%. To accommodate that 60% increase in quality of education, the government has to increase its spending on education (as a % share of GDP) from 4.5% to almost 8%. But the most important result of all is the positive effect the increase of A_H has on the average growth rate. By increasing the quality of education by 60%, the average growth rate jumps from 2.49% to 10.04%, an increase of almost 303%, 4 times the average growth rate!

SECTION III: CONCLUSION AND RECOMMENDATIONS:

Egypt has undergone a lot of economic policies that contributed in shaping the Egypt we know today. From a socialist/populist outlook on the economy to an open free market, one can only say that the system Egyptians are dealing with is nothing short of a “Frankenstein”, a hybrid of different policies that lack consistency, continuity and coherence. It is because of the latter reason that we find Egyptians struggling to improve their socio-economic status. They’re facing a high level of unemployment (with 18-21%

unemployed among the under-25 and with university degrees), a high level of poverty (with 20% of the population below the absolute poverty line), complications with receiving high quality medical care to tend to their needs, and above all, a poor quality of education that leaves them unprepared for the requirements of the global and domestic job market.¹⁰

One of the most important sectors that could actually help alleviate some of the pressure off of the average Egyptian is education. By education, I not only refer to the schooling system and universities but also include training and skill enhancement programs to arm the workers with the required and necessary set of skills needed to compete in the domestic and global labor markets. It goes without saying that the quality of education in Egypt is very low hence, Egyptians have a very low rate of return on education. By using Basu and Bhattari's economic growth model, I was able to establish a relationship between quality of education and average growth rate of the Egyptian economy.

It was shown that by increasing the quality of education, average growth rate will significantly increase; a 20% increase in the quality of education will lead to an increase of almost 102% in terms of average growth rate! However important these results are in linking the quality of education to the growth rate of the economy, they appear very much unbelievable and stand on their own without taking into consideration other factors and sectors in the economy. The results shown above are meant to display how vital an educational reform in Egypt is and how, if properly reformed and the quality of the education provided improved, could contribute positively to the growth rate of the economy. The analysis in this paper determines the impact of an exogenous increase in

¹⁰(Sanz, 2011)

the “productivity” of the education sector. Given this change, the model determines the welfare maximizing response in government spending on education. This welfare maximizing level internalizes the opportunity cost of the increased taxes associated with more government spending. That said; the exogenous increase in A_H ignores what resources may be required to achieve this change. While difficult to quantify, this one time increase in resource use may not be negligible. Therefore, it is advisable that future research expand in order to include other sectors in the Egyptian economy that might help put the effect of the increase in educational production on the growth rate into a more focused perspective. For now, the question is; how should the government proceed with such a result?

Investments in the educational sector (whether private or public) should be well targeted and aimed at improving the quality of school facilities and not just increase their numbers. (Loveluck, 2012) mentions that state-schools in Egypt lack playgrounds, music programs, art rooms and even laboratories; they are very rare and even if one crosses paths with such facilities, they are in very poor shape. Instead of just increasing their numbers, resources should also be directed at increasing the facilities’ quality in order to create a conducive educative environment. For example, more equipped laboratories with the necessary tools to help with certain subjects, mainly the sciences.

Another way to increase the quality of education would be to eliminate the concept of “overcrowding”. The ratio of students to teachers stands at 40-50:1, which represents a great burden on the teacher who receives a salary of US\$281/month (1,600 EGP/month)¹¹. We find that some teachers – if not all of them – take on a second and even a third job to cover their necessities and be able to live comfortably (especially with

¹¹(Loveluck, 2012)

a high inflation rate in the economy). This tends to overwork the teachers and increases the likelihood of poor performance in class. Some economists and experts suggest that the main outlook of any educational policy should be on the schooling quality and recognizing the importance of cognitive skills.¹² It does not just lie in expanding the educational system because if the quality remains the same, then any expansion is nothing but a waste of investments and efforts. Possible solutions are various. First, to help reform education and in turn, advance with the labor market, a qualitative transformation of the institutional framework behind the educational system in Egypt should take place. By quality, I refer to the quality of the curriculum presented to the students, the method of teaching and the cadre of professors and teachers available, and how the students in both schools and universities are able to acquire the skills needed to face the labor market i.e., link education to labor.

One other possible solution could be to revise Egypt's Labor Law of 2003 and set up an autonomous institution responsible for capacity building throughout Egypt. More investments should be directed to improving technical and vocational education and training. If properly reformed and maintained, on a short and long run basis, employability will improve dramatically and have workers better skilled and trained. However, I cannot stress enough of how important it is to reform the schooling process and the way students in Egypt are being taught. The system is one that depends on the ability of the students to cram for exams and neglects their ability to analyze, think strategically and logically and create. The students' purpose is to get high enough grades to go to one of the ivy leagues in Egypt because "it is the social decorum". Technical schools are ignored completely although they have the potential of generating high levels

¹²(Helmy, 2011)

of employment and talents.

What we lack in Egypt in terms of education is the vision of developing the youth's abilities and skills, to make them think and analyze, to relate what they are studying to the real life. Education is all about developing a decent and worthy character in the youth rather than developing their ability to cram subjects that will eventually leave them unprepared for the real world.

In short, reforming the education correctly will create a ripple effect that will affect the labor market which in turn will have an impact on poverty and inequality. Eventually, growth will be induced and sustained as long as correct education is implemented.

In order to compensate their poor wages, some of the teachers take on private tutoring and according to CAPMAS (Egypt's Central Statistics and Mobilization Agency), over 60% of private investments in education (the households' resources) go to private tutoring.¹³ The latter has a very negative effect on those students who don't have the capacity to pay for these private lessons, in that the teachers themselves tend to go over the material very lightly and superficially so that students would be encouraged to attend these private lessons.

One way to eliminate that loss of resources and better the educative process is to (i) reduce the strain on the teachers with a class capacity of max 20-25 per teacher, (ii) provide incentive to teachers in order to better focus on their work inside the classroom by increasing the salary based on performance evaluation. Government and third party personal monitor the professors a few times each semester and write a report detailing their in-class work, and (iii) the government should provide high quality training for the

¹³(Loveluck, 2012)

teacher in order to eliminate the “unqualified teachers” dilemma.

Some accuse the government of having a tight centralized control over the curriculum across the country. By “centralized control”, I mean that the Ministry of Education provides state schools with specific lesson plans and controls the curriculum: what should be included in the material and what shouldn’t, what the students should be exposed to and what they shouldn’t know. This is done by having government officials visit the classrooms and observe the teachers’ in-class time. This gives the teachers a very tight space in which they can teach; they cannot go beyond what the material states.

One way to overcome that obstacle would be to have the Ministry of Education loosen the grip on how and what should be taught and focus more on how it should be handled by the teachers. The Ministry should allow the teachers to cover the material in the best way they see fit in order to develop the students’ skills, knowledge and way of thinking. Curriculums should be provided by the schools and not by the Ministry as a way to avoid politicizing the content (like when it occurred during Mubarak’s reign and post-2011 where exams had a compulsory exam question where students had to thank the Supreme Council of Armed Forces on its efforts).

Learning in Egypt has become all about examinations and focus entirely on how high up a student can get in terms of grade points. That being said, pedagogical methods and approaches have come to be shaped around helping the students memorize and cram as much information as they can in order to exactly reproduce that information during exams. Critical thinking, logic analysis, understanding and creativity become a needless luxury in the eyes of the students. Following this track, we can notice that high degrees of concentration and effort are pooled into getting “overrated” grades in the National

Examinations (surpassing the 100% at times) in order to get admitted into Egypt's Ivy League faculties who require at some times, a minimum of 98% to be admitted (without further requirement such as language skills). Such faculties include the Faculty of Engineering, Medicine and Pharmacy who have become the main target for any student. The rest of the branches are shunned out especially the technical colleges and vocational training.

Those who fail in being admitted in those high-tier schools face the poor funded, low quality technical colleges where the students face a future of low status. Possible solutions to solve the above mentioned dilemma would be to:-

- (i) Shift the focus from solely getting high grades to actually understanding the material at hand and developing one's skills that will serve in the labor market later on. Exams have become the key determinant of students' future tracks. Instead, each faculty and university should have an admission test that doesn't depend on the students' performance during the National Examinations. These admission tests would test the students' skills on critical and logical thinking, language, ability to analyze and produce ideas instead of reproducing them.
- (ii) Technical colleges and vocational training are just as important as any other faculty or university in Egypt. Resources should be focused on improving the quality of education in those colleges, and increasing their funding instead of just focusing on the prestigious universities (where only a small % of the students end up actually working in their respective fields because of high supply and low demand in engineering and medicine in the country.)

Ever since President Gamal Abdel-Nasser's socialist policy, education has been accessible to all Egyptians, from schools up to higher education. While that may have been an important move in his economical/political agenda, a free access to education has caused a huge burden on the National Accounts of the country. Instead of having a free access to education in all its stages, free access to education should be admissible up till 6th grade (the end of the primary cycle). Afterwards, up to the 12th grade (the end of the secondary cycle); the government covers only a part of the expenses (half-subsidies). However, university access should not be permitted to all. At this point, equal attention should be given to prestigious schools and technical ones. Students with special skills, who excelled in their national examinations and were able to secure a spot in any school (whether it be a scientific or technical one) is eligible for a government backed grant or scholarship. Private scholarships are also encouraged to alleviate the pressure from the government. In the spirit of relating the educative process to the labor markets, faculties and schools of different genres should be encouraged to apply a "Co-Op" program as a way for students to cover a part of their educational expenses and gain experience working in the field of their study.

Having discussed the possible ways of reforms and the benefits that could come out of it, it is only right to mention the costs mirroring those benefits:-

- Training the teachers to become more effective and productive will most certainly demand a reallocation of the government's resources and a review of its national budget to incorporate such trainings effectively. Increasing taxes is one way the government could respond to such a reform. To determine the welfare maximizing tax rate that could incorporate these

training costs, an extension of the model used in this paper could be possible since the tax rate is already incorporated. It is also possible to relate the tax rate the Egyptian government wishes to apply to an effective level of education spending in GDP i.e., the government should reallocate its resources in a manner to support a certain level of education spending that should match the tax rate as well as the level of quality needed to be reached. This could also be a very useful extension to this paper.

- Decreasing the subsidies on education could also be met by an increase in school tuition fees and with higher taxes perceived in the future of this reform, if not handled effectively and in a welfare maximizing way, the reform could backfire with poorer families taking their children out of school given the high costs they will incur.
- Decreasing the student-teacher ratio will require a more deepened and heavy infrastructure to support that decrease. Seeing as how the numbers of students in Egypt are huge, more schools and classes could be needed to support that cut and even, several school shifts which is already a norm in governmental schools. Aside the fact that this will be a burden on the government's budget, the productivity level of one teacher will decrease as the shifts pass by and if there are several other teachers teaching the same subject and covering the different shifts in the school day, this will mean more wages and therefore, an increase in costs.

BIBLIOGRAPHY

- (NCERD), N. C. (n.d.). Education Development from 1990 to 2000. NCERD.
- Abdou, D. S., & Zaazou, Z. (2013). The Egyptian Revolution and Post Socio-Economic Impact. *Topics in Middle-Eastern and African Economies*, 92-115.
- Abida, Z., & Sghaier, I. M. (2012). Economic Growth and Income Inequality: Empirical Evidence from North African Countries. *Zagreb International Review of Economics and Business*, 29-44.
- Basu, P., & Bhattari, K. (2012, January 2). Government Bias in Education, Schooling Attainment and Long-Run Growth. *The Southern Economic Journal*.
- Binzel, C. (2011, November). Decline in Social Mobility: unfulfilled aspirations among Egypt's Educated Youth . IZA.
- Blankenau, W. F., & Simpson, N. B. (2004). Public education expenditures and growth. . *Journal of Development Economics*, 583-605.
- Blankenau, W., & Camera, G. (2009). Public Spending on Education and the Incentives for Student Achievement. *Economica*.
- Blankenau, W., Simpson, N., & Tomljanovich, M. (2007). Public Expenditure on Education, Taxation and Growth: Linking data to theory. *American Economic Review, Papers and Proceedings* , 393-397.
- Freund, C. (2013, July 3). The economic roots of Egypt's crisis. (B. Plumer, Interviewer)
- Ghanem, H. (2012, June 25). *Two Economic Priorities for Post-Election Egypt: Macro-stabilization and Corruption Control*. Retrieved 2013, from Brookings: <http://www.brookings.edu/research/opinions/2012/06/25-post-election-egypt-ghanem#>
- Glomm, G., & B., R. (1997). Productive Government Expenditures and Long-Run Growth. *Journal of Economic Dynamics and Control* , 183-204.
- Glomm, G., & B., R. (1998). Flat rate taxes, government spending on education and growth. *Review of Economic Dynamics*.
- Hanushek, E. A. (2003). The Failure of Input-based Schooling Policies. *Economic Journal*, F64-F98.
- Hanushek, E. A., & Wößmann, L. (2007, February). The Role of Education Quality in Economic Growth.

- Helmy, H. (2011, February 25). *Rebuilding Egypt's Education* . Retrieved March 25, 2014, from Egypt Independent:
<http://www.egyptindependent.com/news/rebuilding-egypts-education>
- Ibrahim, S. (2011, January). Poverty, aspirations and wellbeing: afraid to aspire and unable to reach a better life - voices from Egypt . *Brooks World Poverty Institute* .
- Kandeel, A. A. (2011). Egypt at a crossroads. *Middle East Policy Council*.
- Kruseman, G., & Vullings, W. (2007). *Rural development policy towards 2025; Targeted conditional income support, a suitable option?*
- Loveluck, L. (2012, March). Education in Egypt: Key Challenges. Chatham House .
- Maher, S. (2011, November). *The Political Economy of the Egyptian Uprising* . Retrieved from Monthly Review : <http://monthlyreview.org/2011/11/01/the-political-economy-of-the-egyptian-uprising>
- Nassar, H. (2011). Growth, Employment Policies, and Economic Linkages: Egypt. Geneva : International Labour Office.
- Osman, T. (2011). *Egypt on the brink: from the rise of Nasser to the fall of Mubarak*. Yale University Press publications.
- Radwan, S. (2012, November 7). *The Egyptian Economy: waiting for a miracle*. Retrieved 2013, from Carnegie Middle East Center: <http://carnegie-mec.org/publications/?fa=49929>
- Saif, I. (2011, November). Challenges of Egypt's Economic Transition . *The Carnegie Papers*. Carnegie Middle East Center .
- Sanz, R. (2011, August). Socio-economic profile of Egyptian migrants returning from Libya due to the crisis: a sample analysis.
- Tapsoba, S., & Kolster, J. (2012). *Egypt: 2012-2013 Interim Strategy Paper*. African Development Bank .

APPENDIX:

- Figure 1: The labor force participation following Mubarak's restructuring of the economy. (Source: World Development Indicators)
- Figure 2: The employment rate in the services sector. (Source: World Development Indicators)
- Figure 3: The employment rate in industry. (Source: World Development Indicators)
- Figure 4: GDP growth rate during Mubarak's reign.
- Figure 5: Unemployment rates during the 1990's and 2000's.
- Figure 6: Correlation between education spending as a share of GDP and GDP growth rate.
- Figure 7: Education spending share as a percentage in GDP.

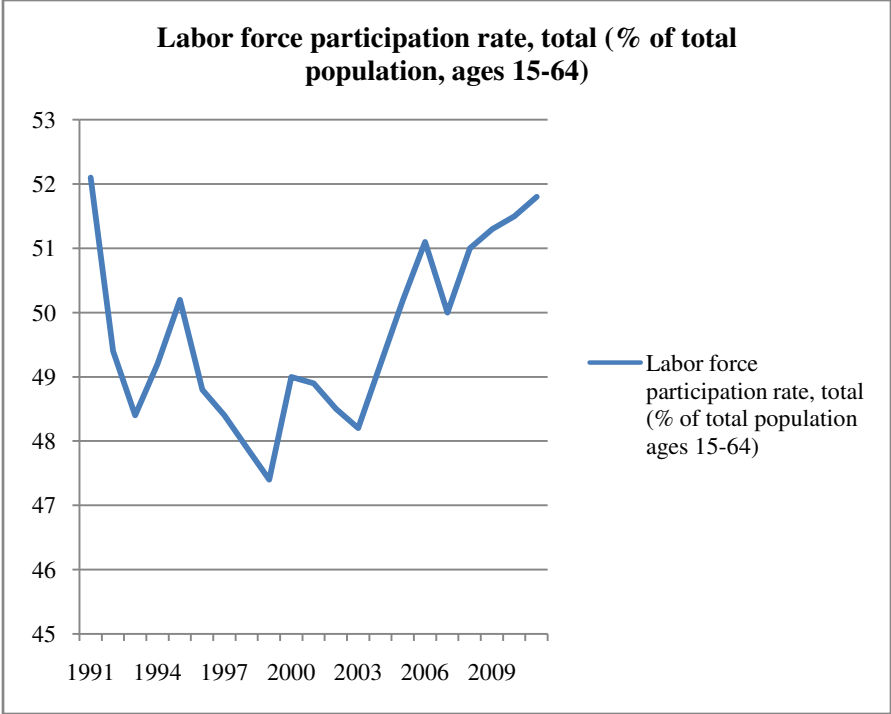


Figure 1

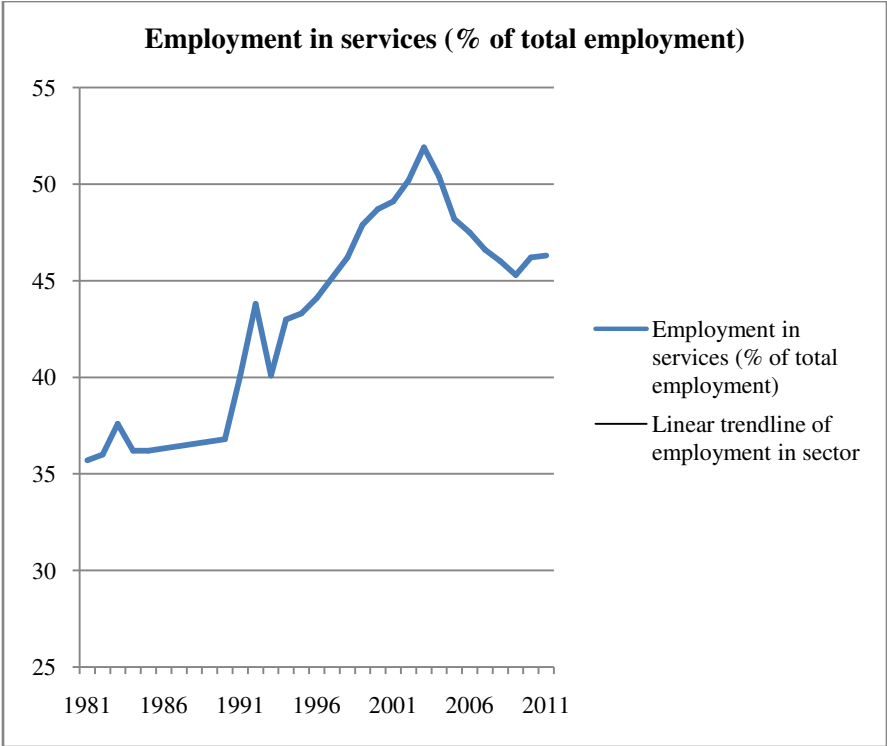


Figure2



Figure 3

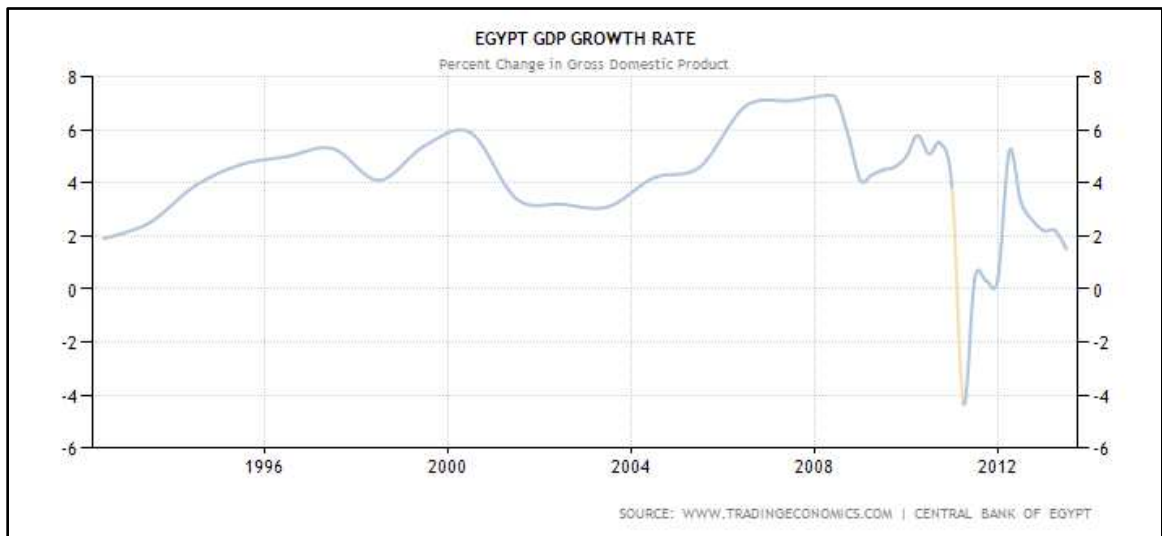


Figure 4 It can be seen that throughout the 2000's, the country has seen an impressive growth rate of the economy reaching up to 7.2% in 2007/2008. Following the revolution and the instability the country witnessed, the growth rate dropped dramatically in 2011.

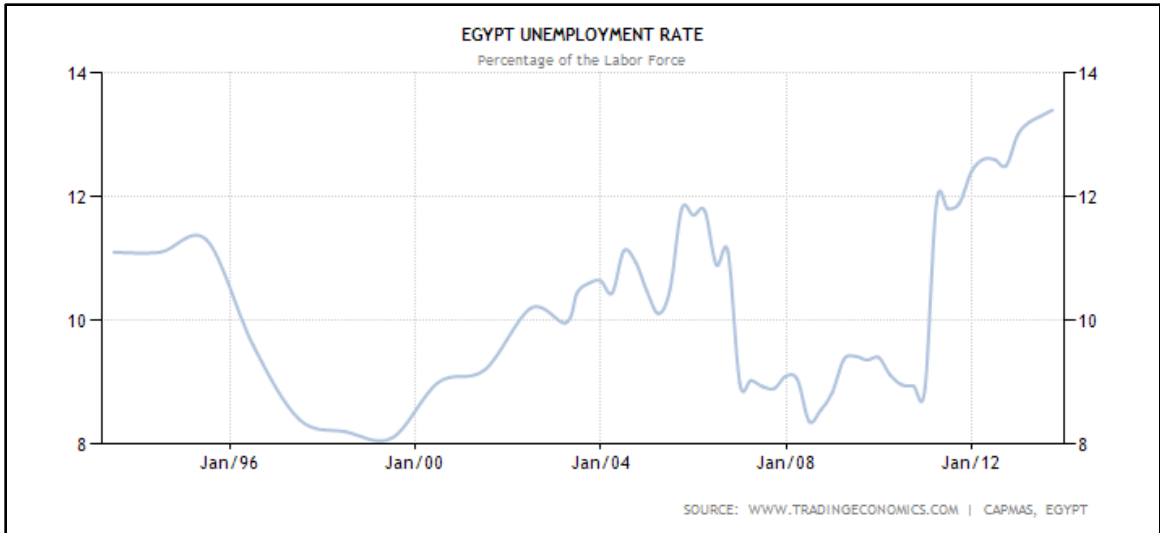


Figure 5 Unemployment rates compared to those in Gamal Abdel-Nasser’s era, reached the double digits despite the improvement of certain sectors in Egypt such as the telecoms and service sectors. Following the revolution of 2011 and the current instability the country is witnessing, unemployment stands at around 13%, affecting mostly those between 15 and 29, who account for 90% of the unemployment in the country.¹⁴

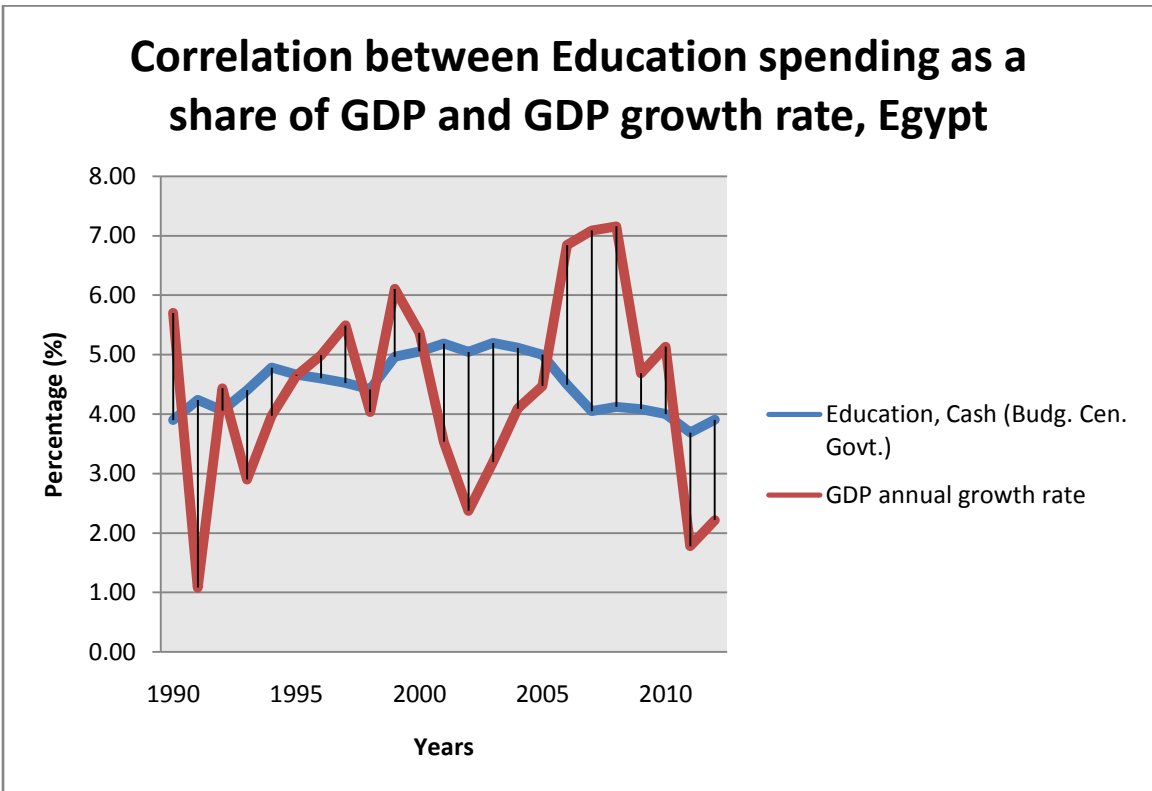


Figure 6 We can observe a definite persistent negative trend between g (%) and τ between 1990 and 2012. (Source: the Egyptian Government Finance Statistics and the World Development Indicators.)

¹⁴(Kandeel, 2011)

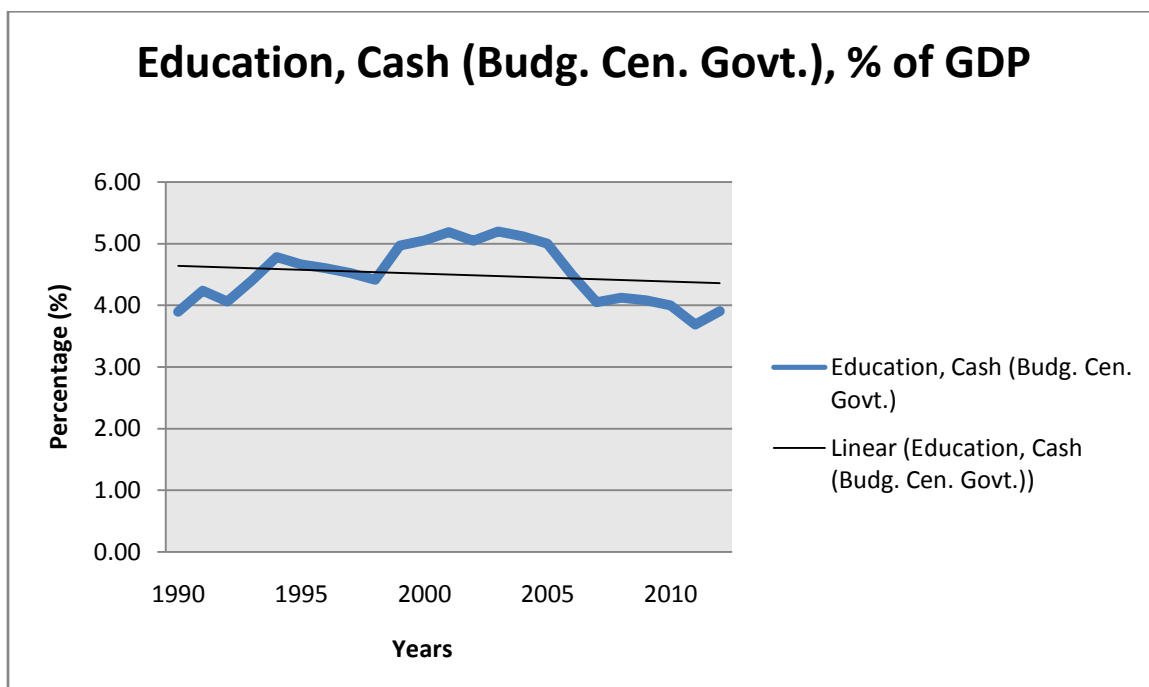


Figure 7 The education spending share is almost constant despite its negative linear trend in the graph over the period from 1990 to 2012. Data comes from the Egyptian Government Finance Statistics. (Source: Central Government Budget)

IMPORTANT DERIVATIONS

Using the following equations:

- The Cobb-Douglas production function; $y = A_G k^\alpha (l_G h)^{1-\alpha}$,
- The balanced growth path of the economy with respect to the output to physical capital ratio; $\gamma = \beta[(1 - \tau) \left(\alpha \frac{y}{k}\right) + \beta(1 - \delta_k)]$,

We can get the value of the three ratios mentioned in Section II of this paper. The time subscripts have been taken out to display a stationary analysis of the economy along the balanced long-run growth path.

- To get the value of the output to physical capital ratio, we use the balanced growth path with respect to the aforementioned ratio;

$$\gamma = \beta[(1 - \tau) \left(\alpha \frac{y}{k}\right) + \beta(1 - \delta_k)]$$

$$\gamma - \beta(1 - \delta_k) = \alpha\beta(1 - \tau) \frac{y}{k}$$

$$y/k = \frac{\gamma/\beta - (1 - \delta_k)}{(1 - \tau)\alpha}$$

- To get the value of the output to human capital ratio, we use the Cobb-Douglas production function in its stationary form;

$$y = A_G k^\alpha (l_G h)^{1-\alpha} \text{ (we divide by } h)$$

$$y/h = A_G k^\alpha l_G^{1-\alpha} \frac{h^{1-\alpha}}{h} \text{ (seeing as how } l_G = 1 - l_H)$$

$$y/h = A_G [(1 - l_H)^{1-\alpha} (k/h)^\alpha]$$

- And finally, to get the last ratio of physical to human capital ratio, we once again use the Cobb-Douglas production function in its stationary form;

$$y = A_G k^\alpha (l_G h)^{1-\alpha} \text{ (we divide by } k)$$

$$y/k = A_G k^{\alpha-1} (l_G)^{1-\alpha} h^{1-\alpha}$$

$$y/k = A_G (l_G)^{1-\alpha} \left(\frac{h}{k}\right)^{1-\alpha}$$

$$\left(\frac{k}{h}\right)^{\alpha-1} = \frac{A_G (l_G)^{1-\alpha}}{\frac{y}{k}} \text{ (we take the inverse of this equation)}$$

$$\left(\frac{k}{h}\right)^{1-\alpha} = \frac{y/k}{A_G(l_G)^{1-\alpha}} \text{ (we take it to the power of } (1/1-\alpha)\text{)}$$

$$k/h = \left[\frac{y/k}{A_G(l_G)^{1-\alpha}}\right]^{\frac{1}{1-\alpha}}$$