The relationship between key economic parameters and growth -
A case study of Egypt

Hany Elshamy,
Associate Professor of Economics,
Faculty of Commerce, Tanta University, Egypt.

Hala El-Hadidi,
Lecturer in Economics,
Faculty of Business Administration, Economics and Political Sciences (BAEPS),
The British University in Egypt (BUE), Egypt.

Abstract
This paper investigates the relationship between economic growth and key economic parameters in Egypt over the period 1980-2012. It estimates a single equation model which employs long run co-integration analysis and short run analysis (ECM). It depends on annual data collected from the World Bank and Vanhanen's data for democracy for the period 1980-2012. It was found that there is a positive and significant relationship between the GDP per capita growth rate and both the investment shares of GDP and the adult literacy ratio. With respect to the effects of democracy on economic growth, the analysis shows that the increase of investment shares of GDP, and literacy level substantially increase the probability of political institutions to become more democratic over time.

Keywords: Democracy, Egypt, Economic growth
JEL Classification: F50, O40
1. Introduction

Does regime type affect economic performance? Despite many attempts to address this question, the answer remains elusive. Richer countries are generally democratic. But this cross-country correlation could reflect reverse causation or omitted variables. Evidence that political regime changes produce subsequent economic growth is considerably weaker.

Does this mean that political regimes do not influence economic growth? Not necessarily, but such causal effects are difficult to identify from the within-country variation. A possible reason for this difficulty is that “democracy” is too blunt a concept.

Political regimes come in various forms and are reformed in different circumstances. Such heterogeneity is interesting in its own right. Moreover, if heterogeneity is not random, correlation between specific reform features and their occurrence makes it hazardous to estimate an average causal effect on economic growth.

This paper illustrates the relationship between the democracy and economic growth in Egypt over the period 1980-2012. This paper depends on annual data collected from the World Bank. The index of democratization is collected from Vanhanen (2014).

The Vanhanen's data contain three different variables, created by Tatu Vanhanen in his long-term research, for each year from 1810 to 2012. The variables in question are political competition, political participation and the index of democratization.

The competition variable portrays the electoral success of smaller parties, that is, the percentage of votes gained by the smaller parties in parliamentary and/or presidential elections. The variable is calculated by subtracting from 100 the percentage of votes won by the largest party (the party which wins most votes) in parliamentary elections or by the party of the successful candidate in presidential elections.

Depending on their importance, either parliamentary or presidential elections are used in the calculation of the variable, or both elections are used, with weights. If information on the distribution of votes is not available, or if the distribution does not portray the reality accurately, the distribution of parliamentary seats is used instead. If parliament members are elected but political parties are not allowed to take part in elections, it is assumed that one party has taken all votes or seats. In countries where parties are not banned but yet only independent candidates participate in elections, it is assumed that the share of the largest party is not over 30 percent.

The political participation variable portrays the voting turnout in each election, and is calculated as the percentage of the total population who actually voted in the election. In the case of indirect elections, only votes cast in the final election are taken into account. If electors have not been elected by citizens, only the number of actual electors is taken into account, which means that the degree of participation drops to the value 0. If an election to
choose electors has been held, the participation variable is calculated from the number and distribution of votes in that election.

National referendums raise the variable value by five percent and state (regional) referendums by one percent for the year they are held. Referendums can add the degree of participation at maximum by 30 percent a year. The value of the combined degree of participation cannot be higher than 70 percent, even in cases where the sum of participation and referendums would be higher than 70.

The index of democratization is formed by multiplying the competition and the participation variables and then dividing the outcome by 100.

The organization of the paper is as follows: Section 2 presents political background in Egypt. Section 3 presents the literature review. The methodology and results are explained in Section 4 and Section 5 provides the conclusion.

2. Political background in Egypt

In 1952, the free officers, a group of unaffected officers in the Egyptian army founded by Nasser, and headed by General Naguib, initiated the Egyptian revolution 1952, with the overthrow of King Farouk, whom the military blamed for Egypt's poor performance in the 1948 war with Israel and the lack of progress in fighting poverty, disease, and illiteracy in Egypt. In the following two years, the Free Officers consolidated power. Popular expectations for immediate reforms led to the workers' riots in 1952. Following a brief experiment with civilian rule, the Free Officers abrogated the 1953 constitution and declared Egypt a republic on 1953 and Muhammad Naguib as Egypt's first President.

President Nasser announced a new Constitution, setting up a presidential system of government in which the president has the power to appoint and dismiss ministers. An elections law was passed granting women the right to vote for the first time in Egyptian history (Cook, 2012).

Egypt's economy grew at an average rate of 9% per annum for almost a decade. The share of manufacturing to Egypt's GDP rose from around 14% in the late 1940s to 35% by the early 1970s (Cook 2012).

Egypt had been seeking loans from the World Bank since late 1955 to finance the construction of the Aswan High Dam. An agreement with the World Bank, the US and Britain indicated that US$ 70 million would be provided for the project. However, Nasser in 1955 negotiated an agreement with the Soviet Union which provided technical and military aid to the regime, thereby angering the US which had been supportive of Nasser and his anti-British and anti-French colonialism. Consequently, after pressure from the British government concerning the threat posed by Nasser in 1956, the US and Britain withdrew their offers of funding, and the World Bank went back on the agreement. The nationalization of the Suez
Canal escalated tension with Britain and France, which froze Egyptian assets and put their armies on alert. Egypt's nationalization of the British-owned Suez Canal was a great victory for Nasser who was celebrated as both an Egyptian hero and an Arab one, capable of `defeating the nation's enemies` and `representing Arab dignity. Egypt's defeat in the 1967 War compelled Nasser to resign. However, he relented following massive popular demonstrations of support (Daly, 2008).

At the time of the fall of the Egyptian monarchy in the early 1950s, less than half a million Egyptians were considered upper class and rich, four million middle class and 17 million lower class and poor. Fewer than half of all primary-school-age children attended school, and most of them being boys. Nearly 75% of the populations were over ten years of age, and over 90% of all females were illiterate. Nasser's efforts had been extensively focused on changing all these underdeveloped situations through implementing different policies: Land reform, the major assets' confiscation programme, the dramatic growth in university education, the creation of a dominating public sector flattened the social curve. From academic year 1953-54 through 1965-66, overall public school enrollments more than doubled. Millions of previously poor Egyptians, through education and jobs in the public sector, joined the middle class. Doctors, engineers, teachers, lawyers, journalists, constituted the bulk of the middle class in Egypt under Nasser (Cook, 2012).

After Nasser's death, Sadat was elected President of Egypt. Nasser's supporters in government settled on Sadat as a transitional figure that (they believed) could be manipulated easily. However, Sadat had a long term in office and had different visions in mind for Egypt. Sadat encouraged the emergence of an Islamist movement which had been suppressed by Nasser. Believing Islamists to be socially conservative he gave them "considerable cultural and ideological autonomy" in exchange for political support (Daly, 2008).

Sadat used his immense popularity with the Egyptian people to try and push through vast economic reforms. Sadat introduced greater political freedom and a new economic policy, the most important aspect of which was the infitah or "open door". This relaxed the government controls over the economy and encouraged private investment. While the reforms created a wealthy and successful upper class and a smaller middle class, these reforms had little effect upon the average Egyptian who began to grow dissatisfied with Sadat's rule. In 1977, Infitah policies led to massive riots involving thousands of Egyptians (Daly, 2008).

Regarding foreign relations, Sadat launched changes from the Nasser era. President Sadat shifted Egypt from a policy of confrontation with Israel to one of peaceful accommodation through negotiations. The outcome was the Camp David accords in 1978, by which Egypt regained control of the Sinai in 1982. Throughout this period, US-Egyptian relations steadily improved, and Egypt became one of America's largest recipients of foreign aid. Sadat’s
willingness to break ranks by making peace with Israel earned him the enmity of most other Arab states (Marsot 2007).

Hosni Mubarak became the President of Egypt following the assassination of Sadat on 6 October 1981. Political reform was limited during this period. Prior to 2005, opposition candidates were not permitted to run for President, with the position instead being reaffirmed via referendum in the People's Assembly at regular six-year intervals. This changed after a constitutional amendment on 2005. Presidential elections were held four months later, with Mubarak receiving nearly 89% of the popular vote against two other candidates. The opposition parties have been weak and divided compared to the National Democratic Party (NDP). The Muslim Brotherhood was kept an illegal organization and not recognized as a political party (Marsot 2007).

Mubarak maintained Egypt's commitment to the Camp David peace process, while restoring relations with other Arab states. Under Mubarak, Egypt was a staunch ally of the United States, whose aid to Egypt has averaged $2 billion a year since the 1979 signing of the Camp David Peace treaty. In 2007-2008, Egypt witnessed more than 150 demonstrations and strikes. "Some were violent and required heavy deployment of the security forces." (Cook, 2012)

From 1991, Mubarak undertook an ambitious domestic economic reform program to reduce the size of the public sector and expand the role of the private sector. During the 1990s, a series of International Monetary Fund arrangements, coupled with massive external debt relief resulting from Egypt's participation in the Gulf War coalition, helped Egypt improve its macroeconomic performance (Marsot, 2007).

In the last two decades of Mubarak's reign, inflation was lowered and from 1981 and 2006, GDP per capita based on purchasing-power-parity (PPP) increased fourfold (from US$1355 in 1981 to US$4535 in 2006, and US$6180 in 2010) (Daly, 2008).

However, this growth was far from evenly spread and sustainable. Monetary restructuring, especially the floatation of the Egyptian pound, the liberalization of the country's money markets, a reform of the tax system and strategic reductions in governmental social spending, resulted in "staggering hardships for the majority of the people"(Daly, 2008).

Mubarak was ousted after 18 days of demonstrations during the 2011 Egyptian Revolution and authority was transferred to the Supreme Council of the Armed Forces.

3. Literature Review

There is plethora of empirical studies that have examined the relationship between the democracy and economic growth. From the empirical literature surveyed, no study was found that specifically estimates the relationship between democracy and economic growth in
Egypt. It is therefore only logical to survey the literature that is directly relevant to the theme chosen for this study but in different countries.

Stability Studies by (Feng 1997; Sirowy et al 1990; Gerschenkron 1987) investigated the interaction between democracy, political stability and economic growth using simultaneous approach which combines the study of economic growth and political stability with that of economic growth and democracy. The results also indicate that the two types of political change have significant and opposite effects on growth, that growth has a negative effect on regime change and positive effect on the probability of the ruling party remaining in power and that long run economic growth tends to exert positive effect upon democracy. Studies of the political economy of growth is surrounded with contradiction, democracy is alleged to promote and to inhibit economic development.

Other study (Haan, 1995) showed that democracy is luxury which comes at a price in terms of subsequent slower increases in national living standards. The results evidenced that the lack of civil and political freedom are negatively correlated with economic growth.

(Barro, 1994), the study, used a cross-section study for a panel of 100 countries from 1960-1990. Positive impact on growth comes from the maintenance of the rule of law, free markets, small government consumption and high human capital. If these are held constant, the effect of democracy on growth is negative. There is a non-linear relation in which democracy enhances growth at low levels of political freedom but depresses growth when moderate level of freedom has been attained. If there is positive impact on democracy, it comes from political freedom, improvements in the standard of living (measured by GDP, life expectancy) and education. The results allow for predictions about which countries will become more or less democratic in the future. Variables affecting democracy are free markets, small governments that focus on maintaining property rights; all have positive impact on growth.

Following Barro’s model, Plumper, et al (2003), developed a political economic argument for the inverse relation between the level of democracy and economic performance. A model shows why and how political participation affects the spending behavior of opportunistic governments that can choose an optimal combination of rents and public goods to attract political support. Whenever the level of democracy remains low, governments choose rents as an instrument to assure political support. With increasing democratic participation, rents become increasingly expensive instrument while the provision of public goods becomes more and more efficient in ensuring the government survival in power. As a result, an increase in democracy tends to raise growth rates of per capita income. However, the beneficial impact of democracy on growth holds true only for moderate degrees of political participation. If in
semi-democratic countries, political participation increases further, governments have an incentive to over-invest in the provision of public goods.

(Minier, 1998), focuses on the relationship between economic growth and democracy. The growth experiences of countries that witness significant changes in democracy are examined directly. Those countries democratized, are found to grow faster than similar countries, while countries that become less democratic grow more slowly than comparable countries. These differences are not due to differences in education or investment levels. Regression analysis suggests that democracy, along with initial income and literacy, contributes to the identification of regimes of countries facing similar aggregate production functions. However, each provides an examination of the relationship between democracy and economic growth and at a unique stage of political development, no clear correlation between economic growth and democracy exists.

(Helliwell, 1994), using cross-sectional and pooled data for up to 125 countries over the period from 1960-1985 for high, middle and low income groups, the study evaluates the two way linkages between democracy and economic growth. The effects of income on democracy are found to be robust and positive. The effects of several measures of democracy and personal freedoms on growth are assessed in a comparative growth framework in which growth of GDP per adult depends negatively on initial income levels as implied by the convergence hypothesis and positively on rates of investment in physical and human capital. Adjusting for the simultaneous determination of income and democracy makes the estimated partial effect of democracy on subsequent economic growth negative, but insignificant. This non-significant negative effect is in any case counter balanced by the positive indirect effect that democracy exerts on growth via education and investment. The general result of the growth analysis is that it is still not possible to identify any systematic net effects of democracy on economic growth.

(Gerring, et al 2005), does regime type affect economic performance? The view is that democracy has either a negative effect on GDP growth or no overall effect. Countries with authoritarian political systems are thus predicted to grow as rapidly as democracies. Democracy may have some positive indirect effects:

1. Greater stability

2. More extensive property rights. The econometric evidence suggests however that these positives are balanced by negatives such that the net effect of democracy on growth performance cross-nationally over the last 5 decades is null or negative. This study confirms the results. Although most of the rich countries in the world are democratic, the direction of causality is unclear. Many rich countries have become rich under authoritarian regimes.
4. Methodology & Empirical results

This paper follows Barro model (1994) which is developed by Plumper & Martin (2003). The following equation is used:

\[ GDPG = B_0 + B_1 I + B_2 P + B_3 H + B_4 D + B_5 D^2 + \epsilon \]  \hspace{1cm} (1)

Where \( GDPG \) is the growth rate of per capita GDP, \( I \) is the Investment share of GDP, \( P \) is the population growth, \( H \) is the lagged human capital which is measured by the adult literacy rate, \( D \) is the democracy index.

First, the co-integration analysis was conducted. Table 1 shows the results of the Augmented Dickey Fuller (ADF) test on the first difference based upon the Mackinnon P values at various lag lengths. The preferred lag length is based upon the Akaike information Criterion (AIC) and these indicate that co-integration is generally accepted.

Table 1 shows the estimation results using co-integration analysis. It was found that there is a positive and significant relationship between the GDP per capita growth rate and both of investment shares of GDP and adult literacy ratio. Moreover, there is a negative and significant relationship between the GDP per capita growth rate and population growth rate.

According to the co-integration analysis in Table 1, it can be observed that there is an inverse U shaped relationship between economic growth and the measure of democracy. This result confirms with the results of Barro (1994) and Plumper & Martin (2003).

Table 2 shows the Error Correction Mechanism (ECM). It indicates the same results like co-integration results. Most importantly of course the lagged error is negative and significant. This confirms the acceptance of the long–run relationship; which is further validated given there are no problems with any of the diagnostic tests presented (the AR(1) test for first order residual auto-correlation, the ARCH(1) test for auto-regressive conditional heteroscedasticity and the Jarque-Beta test for normality).

<table>
<thead>
<tr>
<th>Dependent Variable: Growth rate of per capita GDP</th>
<th>Coefficients</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.0723</td>
<td>*</td>
</tr>
<tr>
<td>Investment share of GDP</td>
<td>0.154</td>
<td>***</td>
</tr>
<tr>
<td>Population growth</td>
<td>-0.365</td>
<td>**</td>
</tr>
<tr>
<td>Human capital Lagged</td>
<td>0.0021</td>
<td>***</td>
</tr>
<tr>
<td>Democracy</td>
<td>0.002</td>
<td>***</td>
</tr>
<tr>
<td>Democracy squared</td>
<td>-0.0001</td>
<td>***</td>
</tr>
</tbody>
</table>
### ADF Tests

<table>
<thead>
<tr>
<th></th>
<th>Favoured lag Length=2</th>
<th>Favoured lag Length=2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF(0)</td>
<td>0.005</td>
<td>0.004</td>
</tr>
<tr>
<td>ADF(1)</td>
<td>0.063</td>
<td>0.024</td>
</tr>
<tr>
<td>ADF(2)</td>
<td>0.065</td>
<td>0.007</td>
</tr>
<tr>
<td>ADF(3)</td>
<td>0.072</td>
<td>0.005</td>
</tr>
</tbody>
</table>

***=significant at 1%  
**=significant at 5%  
*=significant at 10%  
ADF figures show the Mackinnon approx P-value

### Table 2: Error Correction Mechanism (ECM)

<table>
<thead>
<tr>
<th>Dependent Variable: Growth rate of per capita GDP</th>
<th>Coefficients</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.0645</td>
<td>*</td>
</tr>
<tr>
<td>Investment share of GDP</td>
<td>0.131</td>
<td>**</td>
</tr>
<tr>
<td>Population growth</td>
<td>-0.284</td>
<td>**</td>
</tr>
<tr>
<td>Human capital Lagged</td>
<td>0.0018</td>
<td>**</td>
</tr>
<tr>
<td>Democracy</td>
<td>0.0015</td>
<td>**</td>
</tr>
<tr>
<td>Democracy squared</td>
<td>-0.0001</td>
<td>**</td>
</tr>
<tr>
<td>Lagged Error</td>
<td>-0.253</td>
<td>***</td>
</tr>
<tr>
<td>No. of observation</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>F- statistics</td>
<td>7.38</td>
<td>***</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>DW</td>
<td>2.16</td>
<td></td>
</tr>
<tr>
<td>AR(1)</td>
<td>1.62</td>
<td></td>
</tr>
<tr>
<td>ARCH(1)</td>
<td>1.52</td>
<td></td>
</tr>
<tr>
<td>Normality</td>
<td>2.31</td>
<td></td>
</tr>
</tbody>
</table>

***=significant at 1%  
**=significant at 5%  
*=significant at 10%

### 5. Conclusions

This paper investigates the relationship between the democracy and economic growth in Egypt over the period 1980-2012. It estimates a single equation model which employs long run co-integration analysis and short run analysis (ECM). It depends on annual data collected from the World Bank and Vanhanen's data for the democracy for the period 1980-2012.

A positive and significant relationship was found between the GDP per capita growth rate and both the investment shares of GDP and the adult literacy ratio. Moreover, there is a negative and significant relationship between the GDP per capita growth rate and population...
growth rate. In addition, it can be observed that an inverse U shaped relationship between economic growth and the measure of democracy exists. This result confirms the results of Barro (1994) and Plumper & Martin (2003).

The interplay between democracy and economic growth involves the effect of democracy on growth and the influence of education level on the extent of democracy. With respect to the effects of democracy on economic growth, the analysis shows that the increase of investment shares of GDP, and literacy level substantially raise the probability of political institutions to become more democratic over time.

References


