

Macroeconomic determinants of savings in Egypt "Statistical Model"

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Keywords

Consumption, Savings, Permanent Income, Hypothesis, Random Walk Model, Keynes Consumption Function, Determinants of Savings.

Abstract

Like lot of countries, aggregate consumption constitutes a major portion of Gross Domestic Product (GDP) in Egypt. Consumption decisions determine savings decisions. In long term growth literature, differences in long term growth had been explained to a large extent by differences in the rates of savings which also determine a country's investment in productive capacity, human capital and socio-economic infrastructure.

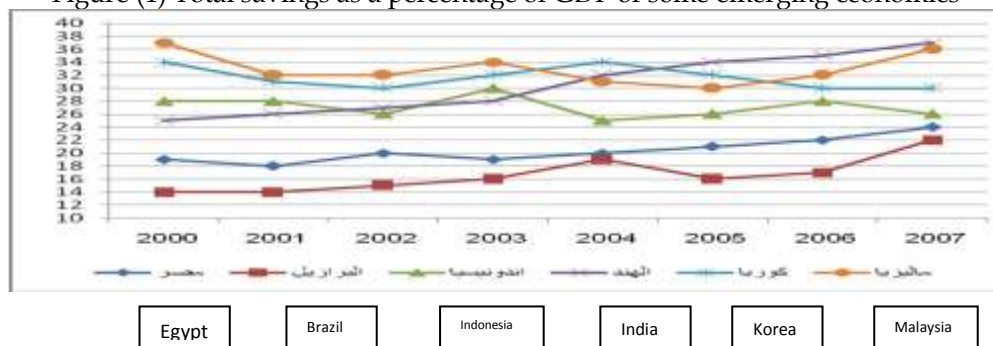
In this study, we analyse macroeconomic determinants of savings in Egypt using Ordinary multiple regression. Our results indicate that national savings rate is positively related with real GDP growth rate. This suggests that saving is a positive function of income. The evidence suggests that national savings rate is negatively related with federal debt growth and inflation. This hints towards crowding out of private sector investment through decline in savings rate as a result of government's indebtedness. Finally, negative association between savings rate and inflation implies that the consumer is rational and makes decisions based on his perceptions when it comes to allocating the lifetime resources over the period of his life. Increase in inflation dampens the incentive to save and people respond rationally which is made evident by the negative sign on inflation coefficient in our model.

1. Introduction

Egypt is one of those developing countries that have resiliently maintained decent growth despite a lot of structural problems. In economic literature, differences in growth had been explained to a large extent by differences in the rates of savings which also determine a country's investment in productive capacity, human capital and socio-economic infrastructure.

The rate of national saving in Egypt as a percentage of GDP has gone down. That is a result of structural crisis afflicting the Egyptian economy.

Figure (1) Total savings as a percentage of GDP of some emerging economies



Source: National Council of Egyptian competitive, post-financial crisis: competitiveness and sustainable development, the sixth report of the Egyptian competitive, June 2009.

Reasons of low rate of national savings in Egypt by (Economic watch.com)

(1) The low per capita income and its modest rate of growth.

It is well known that the per capita income is divided between consumption and savings, what remains of the consumption goes automatically to save. If the part was directed mainly to the consumption of a small, but not nearly enough, it leads to a lack of part-oriented savings, or falling sharply in the case of existence. The modest rate of growth of per capita income compared with the rate of price growth has contributed to the other, is the low rate of national savings.

(2) High rates of inflation.

High rates of inflation especially food prices, thus leading to the lack of any surplus can be directed to the family savings. The inflation outweighs the interest rates on deposits in banks, which means that real interest rates on savings with the banking system are considered a negative, in fact. This is what kills the motivation of individuals to keep their savings with the banking system, and makes them look for safer havens to put their savings in them.

(3) Increased in luxury consumption

Which has led to a lack of resources-oriented savings? This has helped to increase this pattern of consumption and the development of means of communication and modern technology, which helped in the transfer of the pattern of life in developed countries.

(4) Banking system

The direction of the banking system to encourage consumer lending, bringing a lot of bank loans are guiding to finance the purchase of cars and consumer durables, led to direct toll of the remaining portion of the per capita income to repay the loans, and non-availability of more funds to be directed to savings.

Investment to GDP Ratio

Egypt is a lower middle-income economy in the Middle East and North African region. Since the turn of the new millennium, the pace of structural reforms, including fiscal, monetary policies, privatization and new business legislations, helped Egypt to move towards a more market-oriented economy and has attracted more foreign direct investments as a result. The economy's performance is stable and has been experiencing continuous economic growth.

Table (1)
Investment % GDP for Egypt

Year	%	year	%
2000	19.5	2008	22.39
2001	18.26	2009	19.19
2202	18.26	2010	19.5
2003	17	2011	17.1
2004	16.9	2012	16.7
2005	17.9	2013	15.5
2006	18.7	2014	16.1
2007	20.8		

Source: www. Economy watch. Com /economic- statistic / Egypt

Investment (% of GDP) for Egypt in year 2013 is 15.5 %. Data are based on individual countries' national accounts statistics. For many countries, the estimates of national saving are built up from national accounts data on gross domestic investment and from balance of payments-based data on net foreign investment.

This makes Egypt No. 153 in world rankings according to Investment (% of GDP) in year 2013. The world's average Investment (% of GDP) value is 22.20 %; Egypt is 6.67 less than the average. In the previous year, 2012, Investment (% of GDP) for Egypt was 16.74 % Investment

(% of GDP) for Egypt in 2013 was or will be 7.22% less than it was or will be in 2012. In the following or forecasted year, 2014, Investment (% of GDP) for Egypt was or will be 16.17 %, which is 4.16% more than the 2013 figure.

2. Brief Literature Review

2.1 Intertemporal Consumption Literature in Macroeconomics

In one of the first studies on consumption, Keynes (1935) postulated that consumption is a function of current income and that marginal propensity to consume is positive but less than 1. His model can be expressed mathematically as:

$$C = \beta_0 + \beta_1 Y + \mu$$

Where,

C = Consumption

Y = Real Income

μ = Random error term.

β_0, β_1 are parameters of the model.

As per Keynes (1935), MPC (β_1) is positive but less than 1. As a result, Average Propensity to Consume (APC) would fall with successive increase in income.

Hall (1978) argued that consumption is a random walk and hence it is not determinable through current income. Income changes cannot determine changes in consumption. As per his hypothesis, consumption function is given by:

$$C_t = \beta_0 + \beta_1 C_{t-1} + \mu$$

Where, Hall (1978) hypothesized that $\beta_0=0$ and $\beta_1=1$

$$C_t = C_{t-1} + \mu$$

Where,

C_t = Aggregate Real Consumption in time period t.

C_{t-1} = Aggregate Real Consumption in time period t-1.

μ = Random error term

Friedman (1957) argued that consumption is a function of permanent income.

$$C = cY_p + \mu$$

Where,

C = Aggregate Real Consumption.

Y_p = Permanent Income.

μ = Random error term.

He argued that APC would not fall and consumption would be smooth. According to his model, consumption choices differ from changes in transitory income and permanent income. Change in permanent income will affect consumption, but change in transitory income will mostly be saved as per Friedman (1957).

Ando & Modigliani (1963) introduced lifecycle hypothesis. In their model, the consumer makes consumption decision intertemporally the consumer could borrow from the future to spend more in current time period or could invest the current surplus income and have more consumption in future.

2.2. Micro foundations of Savings Behaviour in Egypt

First, we give a brief account of studies that have taken primary data to analyse the consumption and savings behaviour at the micro and household level. Since consumption data in Egypt is only calculated through a residual approach, the micro data analysis provides more useful insights and foundation. In an empirical study taking primary data through a structured questionnaire, Abid & Afridi (2010) found that rural areas have more savings ratio as compared

to urban areas. It is possibly due to the fact that remittances received by rural households in the sample were taken as transitory income and was mostly saved.

Quite possibly, expenditure on education and health is lower in rural areas and furthermore, they are able to afford food supplies at much lesser cost as compared to urban households and they are able to save more as a result. It is also plausible that due to dependence on agriculture and weather conditions, people in rural areas have a tendency to save for the precautionary motive.

In the study by Abid & Afridi (2010), it was found that family size is inversely related to saving. One plausible explanation is that people in large family size and especially with increased number of non-working age family members and non-participating women tend to have lesser savings. In a study by Farhan (2011), age-dependency ratio also had inverse relationship with savings in the long run. Abid & Afridi (2010) also established that savings is inversely related with education. It maybe a characteristic of the sample being chosen. One of the possible explanations could be that people who have just completed their higher education tend to start careers at nominal salaries and most have already accumulated debt from private sector education. Also, people with more education tend to spend relatively more on education of siblings/children, health and quality food supplies. Their formal sector employment may necessitate tax deduction at source which may decrease their disposable income and hence savings. Rehman et al. (2010) also found that marginal propensity to save for job holders is lower than labor class savings due to more consumption habit in the former group.

However, at macro level, a study by Vincelette (2006) discovered that demographic changes, captured by urban migration have a positive influence over national savings rate on average at the macro level. Possible explanation of this result could be that richer households in urban localities have more saving opportunities in urban localities and increased awareness about financial planning, consumption smoothing and its advantages. Rehman et al. (2010) through a sample based micro-econometric study in Multan concluded that spouse participation, total dependency rate, total income of household and size of landholdings significantly raise household savings. Education of household head, children's educational expenditures, family size, liabilities to be paid, marital status, and value of house significantly reduce savings level of households.

The study also found empirical evidence in support of life cycle hypothesis by Ando & Modigliani (1963). It is established by including both household's head age and square of household's head age in the model. Age variable has positive relationship with savings and square of age has negative relationship with savings. This indicates that age versus savings is a concave up function. However, this goes against the observation that people save for their children in our society. However, it can be reconciled by noting that usually people leave behind tangible assets or property and usually distribute the holdings mostly in their lifetimes.

Chaudhry et al. (2010) discovered positive relationship of savings with exports as a proportion of GDP, remittances, inflation as measured by CPI, interest rate and government consumption. In their study, public loans in the long run had a negative relationship with savings. Hussain (1995) noted that increased savings in post 1970 era were majorly influenced by financial deepening. He measured financial deepening as the ratio of money stock divided by total aggregate income.

3. Hypothesis

- There is Positive relationship between investment and GDP.
- There is inverse relationship between unemployment and GDP.
- There is inverse relationship between unemployment and investment.

4. Research Methodology

4.1 Nature: This research is quantitative, analytical in nature. It uses both inferential and descriptive statistics to carry out the objectives of the study, and analyse hypothesis.

4.2. Time Coverage: Study will cover time period from 2007-2014 taking annual observations on macroeconomic variables listed below in the model description.

4.3. Methods Used: The study uses Ordinary Least Squares (OLS) to run multiple regression on time series variables using SPSS Program.

4.4. Serial Correlation: Durbin Watson (D-W) test and Breusch Godfrey (BG) test of serial correlation. We also use alternate Durbin Watson (D-W) test for the possibility of non-exogenous repressors'.

5. Macroeconomic Determinants of Savings

a. Model

To estimate determinants of savings, we estimate the following model.

$$SR = \beta_0 + \beta_1g + \beta_2c + \beta_3f + \beta_4V + \beta_5U + \mu$$

Where

- SR = National Savings Rate.
- G = Real GDP Growth Rate.
- C = Consumption Rate.
- F = Inflation Rate.
- V = Investment rate.
- U = unemployment Rate

$$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$$

Are the parameters of the model?

μ = Random error term

We first carry out stationary test using Durbin-Watson test and Phillips Person (PP) test on the variables included in the model. We find that as per our expectation, all variables are stationary at levels.

Table 2: Empirical Results for Determinants of Savings Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.840 ^a	.706	.216	12.4246226	2.192

a. Predictors: (Constant), unemployment, consumption, inflation, investment, GDP , b. Dependent Variable: SR

Coefficients

Model		Un standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-159.016	320.800		-.496	.654
	GDP	17.658	12.739	2.497	1.386	.260

Consumption	4.606	16.293	.223	.283	.796
Inflation	3.753	3.240	.914	1.158	.331
Investment	-8.071	11.123	-1.160	-.726	.521
Unemployment	13.494	10.283	1.370	1.312	.281

Table:3 indicates anova table & correlations between all variables .

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1111.362	5	222.272	1.440	.406 ^a
	Residual	463.114	3	154.371		
	Total	1574.476	8			

Predictors: (Constant), unemployment, consumption, inflation, investment, GDP

Correlations

	SR	GDP	consumption	Inflation	investment	Unemployment
SR	1.000	.377	.566	-.403	-.021	-.013
GDP	.377	1.000	-.141	-.038	.825	-.800
Consumption	.566	-.141	1.000	-.635	-.624	.402
Inflation	-.403	-.038	-.635	1.000	.376	-.469
Investment	-.021	.825	-.624	.376	1.000	-.821
Unemployment	-.013	-.800	.402	-.469	-.821	1.000
Sig. (1-tailed)						
SR	.	.159	.056	.141	.479	.487
GDP	.159	.	.359	.461	.003	.005
Consumption	.056	.359	.	.033	.036	.142
Inflation	.141	.461	.033	.	.159	.101
Investment	.479	.003	.036	.159	.	.003
Unemployment	.487	.005	.142	.101	.003	.

Table 3 report the iterated estimates results from Prais-Winsten estimation which is a procedure meant to take care of the serial correlation .

b. Results & Data Analysis

It can be seen that all variables except inflation and consumption are statistically significant at 5% level of significance. Model is overall significant with adjusted $R^2 = 0.70.6$

- After the Analysis we come to a conclusion that the relationship between investment and GDP is Positive with a significance at 0.003 .
- The relationship between unemployment and GDP is shown negative on the analysis of the figure from the table.
- According to the analysis there is negative relationship between investment and unemployment with a significance at 0.003
- Model can be represented as follow:

$$SR = -159.01 + 17.6g + 4.6c + 3.7f - 8.07V + 13.4U + \mu$$

our Model refers to there is negative effect from inflation on saving , where the sharp , continuous rise in prices will leads to reduction in saving , increase rate of unemployment will affect also in saving .

7. Recommendations

To boost savings in the economy and achieve sustainable growth, we recommend the following:

- i) Reducing cost push inflation through investment in renewable energy so that real returns on savings increase and people can plan and invest for long term.
- ii) Tax base needs to be increased through documentation. Income tax should be increased on all investors and capital gains from stock trade and real estate investment. Services especially the hotels/restaurants, franchises etc must be brought in tax net rather than looking to burden the already registered tax payers and small number of savers. Tax reforms will enable the government to lessen its debt and that will help in reducing crowding out effects.
- iii) Providing incentives for producers to incorporate their businesses in formal sector and raise capital through issuing financial securities to the general public so that people have alternative direct investment opportunities that offer them better yields on savings. This will also compel banks to offer financing at lower rates so that they do not lose lending business to direct issuance of financial securities by firms. It will also compel banks to offer better yields so that people do not substitute bank investment with holding corporate financial securities. This will help in reducing the banking spread. Incentives in this regard could be a) tax exemption for small producers or b) reduction on savings and c) allowing fast amortization of loans in financial accounts for tax purposes by firms.
- iv) Increase in investment through the above mentioned measures will help reduce market imperfections and concentration and hence increased competitiveness will help reduce market prices, curb monopolistic practices and keep inflation in check so that real returns are not hurt.

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