Characteristics and Stylized Facts of Macroeconomic Fluctuations in Egypt: A Growth Cycles Approach

Prepared by

Mona Mahmoud Hussein Ibrahim Eliwa

PhD Student at the Department of Economics

Faculty of Commerce

Zagazig University

mmahmoud3182@gmail.com

Journal of Business Research
Faculty of Commerce -Zagazig University
Volume 46 - Issue 1 January 2024
link: https://zcom.journals.ekb.eg/

Abstract:

Economic activity in Egypt fluctuates year after year and undergoes significant short-run fluctuation. The research examines the main characteristics and dynamics of economic fluctuations in Egypt and builds a set of economic fluctuation indicators: leading, coincident, and lagging by using the "growth cycles approach". The result indicates that household consumption, total capital formation, and the unemployment rate are coincident variables. The import, nominal exchange rate, openness, stock market indicator, and interest rate are leading variables, and finally, government consumption, export, trade account, net export, real exchange rate, REER, all price indicators, banking sector indicators nominal, the real wage, M0 and M2 are lagging variables. Key findings include that external shocks, political instability, trade, and change in demand both domestically and abroad, and procicalical monetary and fiscal policies are the main reasons behind the boom and bust cycle in RGDP in Egypt. Shocks to trend growth are the main source of RGDP fluctuations.

Keywords: Fluctuations, economic cycle, coincident indicators, leading indicators, lagged indicators, Stylized Facts, Growth Cycles

1. Introduction

All countries experience regular and irregular economic fluctuations and cycles. Egypt's economy suffered from different periods of expansion and recession, which have been associated with significant internal and external shocks. Therefore, the analysis and characterization of the economic cycle are fundamental areas of research in economic policy. Moreover, stylized facts used to provide a basis for the formulation of theoretical models of the economic cycle. So, the research problem can be formulated through the following question; what are the characteristics and the main stylized facts of macroeconomic fluctuations for Egypt?

The research aims to examine the stylized facts of fluctuations in Egypt; the focus is on co-movement between real gross domestic product (RGDP) cyclical component and main macroeconomic variables as well as their observed persistency and volatilities. Moreover, the research aims to build a set of economic fluctuation indicators: leading, coincident, and lagging .Therefore, understanding the stylized facts of cycle led to a derivation source of economic cycle fluctuations.

The methodology of research depended on both theoretical and empirical approaches to achieve its objective. Moreover, the research measures economic fluctuations based on "*"the growth cycle approach"* and builds a set of economic fluctuation: leading, coincident, and lagging in Egypt. It will use detrending techniques for decomposing the time-series into the long-term trend and the short-term fluctuations. The detrended data are analyzed via three criteria to characterize fluctuations**:** volatility of the fluctuations, persistence of fluctuations and co-movement which measures the cyclical behavior of the macroeconomic variables fluctuations.

Despite the importance of understanding fluctuations; there are few research studies examining economic cycle and fluctuations in general in developing countries. In Egypt, there are shortages of studies about stylized facts of macroeconomic variables over the economic cycle. Therefore, this research makes a contribution to the literature by determining economic cycle stylized facts, which is essential as these often form the basis for the construction and validation of theoretical business cycle models.

2. Theoretical Background:

Economic activities are associated with continuous changes exposed during different periods of expansions and recessions. These changes are known as economic fluctuations. Furthermore, sometimes economic fluctuations are formed as cycles, and each economic cycle is fluctuation, but not every fluctuation forms a cycle. Thus, cycles are part of economic fluctuations [(1)] (Alp, *et al*., 2012). There are many definitions of economic cycle, but most prominent definitions are associated with approaches to measure the cycle:

The First, the classical approach is based on Burns and Mitchell (1946,p.3) definition "Business cycles are types of fluctuation found in the aggregate economic activity of nation that organize their work mainly in business enterprises: a cycle consists of expansion occurring at about the same time in many economic activities, followed by similarly general recessions". The definition has two key features (Diebold and Rudebuschs, 1999);it used the date to determine the turning points as whole and division

[1]- The adjective "business" was used to restrict the concept to fluctuations in economic and addition the noun "cycle" to indicate regular fluctuation.

of business cycles into phases. But there are some restrictions[(2)] of identification of turning points pose significant difficulties for complete business cycles in developing countries including Egypt. Therefore, this research does not observe complete business cycles in Egypt but it examines the economic fluctuations by using "the growth cycle approach".

The second, modern approach; according to Lucas (1977) definition of the business cycle as "movements about trend in gross national income". Therefore, growth cycles approach focuses on persistent deviations of macroeconomic time series from their trends.

3. Literature Review:

One of the key topics of research in macroeconomics is the analysis of factors affecting macroeconomic variables' cyclical behavior. Literatures have documented empirical regularities in fluctuations and economic cycles in several countries. However, the majority of studies have focused on developed countries. The first set of "stylized facts" for USA business cycles were established by Kydl and Prescott, (1990), they used Hodrick and Prescott filter (HP filter), Christodoulakis, *et al.*, (1995) studied business cycle patterns of the Europe countries. They used the HP filter, first difference, and quadratic filter. However, further studies applied on developed countriesas" Fiorito, and Kollintza(1994) stylized facts of real business cycles in the G7;King and Watson, 1996; Basu and Taylor, 1999; Chari,*et al*., 2002",while a few studies attempt has been made in the

[2]- A full economic cycle has to last at least 5 quarters, each cycle phase be compelled last at least five months or 2 quarters, troughs and peaks should alternate, and turning point is not in the first or last 2 quarters of a time series(Alp, *et al.*, 2012).

developing countries, for example "Agénor, *et al.*, 2000;Kaminsky, *et al.*, 2004; Aguiar and Gopinath, 2007;Kollintzas, *et al.*, 2011, Alp, *et al.*,2012"

Results of empirical studies about stylized facts of fluctuations and economic cycle for the developed countries and developing countries were: Economic cycles of developing are shorter and more volatile than those of the developed countries. That the excessive volatility in developing economies arises from three key sources as follow:

a) Developing countries are subject to greater external shocks
b) Developing countries may be subject to greater domestic shocks arising from policy (Abdel Fatah, 2008).
c) The external shocks have greater effects on fluctuations because the developing economies do not possess either the financial markets necessary to diversify risks or the ability to perform stabilizing macroeconomic policy (Loayza, *et al*.,2007)

With regards to Egyptian economy, few research attempts have been made to study fluctuations in Egypt due to both the lack of reliable data; the use of low frequency or short term data in the calculation of fluctuations. Some empirical studies examined fluctuation and economic cycle such as (El-Safty, 2001; Ramadan, 2005; Hegazy,2010; El-Sherpeny, 2014). One of the earliest studies of fluctuation in Egypt presented by El-Safty (2001) explained the Egyptian macroeconomic fluctuations during 1952 -1998; he used HP filter, BP filter m and first deference. The study was suggested that there is a potential role for real variable and nominal variables in the fluctuations of the growth rate.

The study by Ramadan (2005) aims builds a set of economic cycle indicators. He used the classical approach, and measured cycle by

"Generalized dynamic factor model (GDFM)" and "the Bry- Boschan algorithm". The main results highlight the procyclical variables which are household consumption, fixed capital formation, M1, CPI inflation rate, and nominal and real interest rate. Hegazy (2010) studied characteristics of Economic fluctuations in Egypt; the study was interested in finding out whether macroeconomic variables causes fluctuation in RGDP by using Granger causality and it found the components of GDP and productivity are caused fluctuation in RGDP. The study by El-Sherpeny (2014) aims to build a set of economic cycle indicators for Egypt, it is used as well as to demonstrate the nature of the relationship between the foreign trade flows and economic cycle in Egypt compared to major trading partners. Moreover, the study used "Experimental approach" and indicated positive significant relation between foreign trade intensity and economic cycles among Egypt and its major trading partners.

The examination and finding of the literature review covering the fluctuations in Egypt are critically reviewed and summarized as follows:

- In general, there exists a shortage of relevant studies on the subject matter in Egypt. This could be explained by the unavailability of reliable data, the problems concerning their genuine economic structure.
- Few studies attempt have been made on the regularities business cycle and applying unsuitable analysis techniques.
- The propositions and the experience of policymakers offer lessons on the economic fluctuations.

4. Measure Economic Fluctuations:

The first step in measuring economic fluctuations is to define what constitutes a fluctuation and cycle (Alp, *et al*., 2012). In this research"

Growth cycle approach" will be used to measure fluctuations. Therefore, steps of measure fluctuation are as follows:

4.1 Identify Variables for Descriptions Fluctuations:

Fluctuations depend on the behavior of RGDP, which indicators economic activity; it is the core of the economic cycle (Stock and Watson, 1999). Identifying variables and indicators include: The first, GDP and components of aggregate demand. The second: variables indicate external position as trade openness, trade account and exchange rate. The third: prices and inflation indicators. The fourth: labor market indicators. The fifth: financial sector development indicators. Finally, macroeconomic policies include fiscal policy measured by government spending and monetary policy measured by aggregate monetary and interest rate.

4.2 Data Definitions and Its Sources

Study use quarterly data for 2001:3-2020:1 period, the real GDP at market price (2010=100) and its component taken from the ministry of planning and economic development. Inflation is calculated as the annualized percentage rate of change of quarterly CPI , unemployment rate, wages and CPI data taken from CAMPS , trade account and nominal exchange rate data from Central Bank of Egypt , real exchange rate is calculate[(3)] from international financial statistics (IFS). Financial indicators were collected from the global financial development database and financial regulatory authority, where all the real variables for this time interval are constant to

[3]- For further details on the calculations used to estimate real effective exchange rate, see (Nour Eldain , 2017) .

2010 prices. All series are tested and adjusted for seasonality [4] whenever necessary. Logarithm whenever necessary was taken for data under the assumption that macroeconomic series are multiplicatively separable.

4.3 Methodology

The economic time series is decomposed into either trend, cyclical, random, or irregular and seasonal components, where the growth component varies "smoothly" over time (Hodrick and Prescott, 1981). The growth cycle approach assumes a "Multiplicative Form" of cycle components' interaction that takes place simultaneously and needs to carry out the elimination of unimportant fluctuations together with revealing the economic cycle. Therefore, there are often removed seasonal components by adjusted seasonal method and the random component has limited impact and incorporated into the cycle component. Consequently, two components remain: the trend component that expresses long run growth and the cycle component that expresses fluctuations in short run (Alper, 2002).

The cycle component is derived by twodetrendingtechniques[5]; (HP) filter and BP filter (BP).

The HP filter isolates the trend component from a time series by minimizing the following optimization problem:

$$min_{\{\tau_t\}_{t=1}^{T}} \sum_{t=1}^{T}(Y_t-\tau_t)^2 + \lambda \sum_{t=2}^{T-1}[(\tau_{t+1}-\tau_t)-(\tau_t-\tau_{t-1}]^2 \ldots\ldots\ldots\ldots\ldots\ldots(1)$$

[4]- Using X-11 ARIMA methodology to obtain seasonally adjusted series, and using Tramo-Seats methodology when a series with negative values such as net export series.

[5]- HP filter is the best method used in high frequency but PB filter is used when data have low frequency. Studies about the US economy use the growth cycle approach in a way to manifest a revealed preference for the use of the HP filter that generates cycles with a range of periodicities similar to those found in NBER which uses classical cycles approach (Machado, 2001)

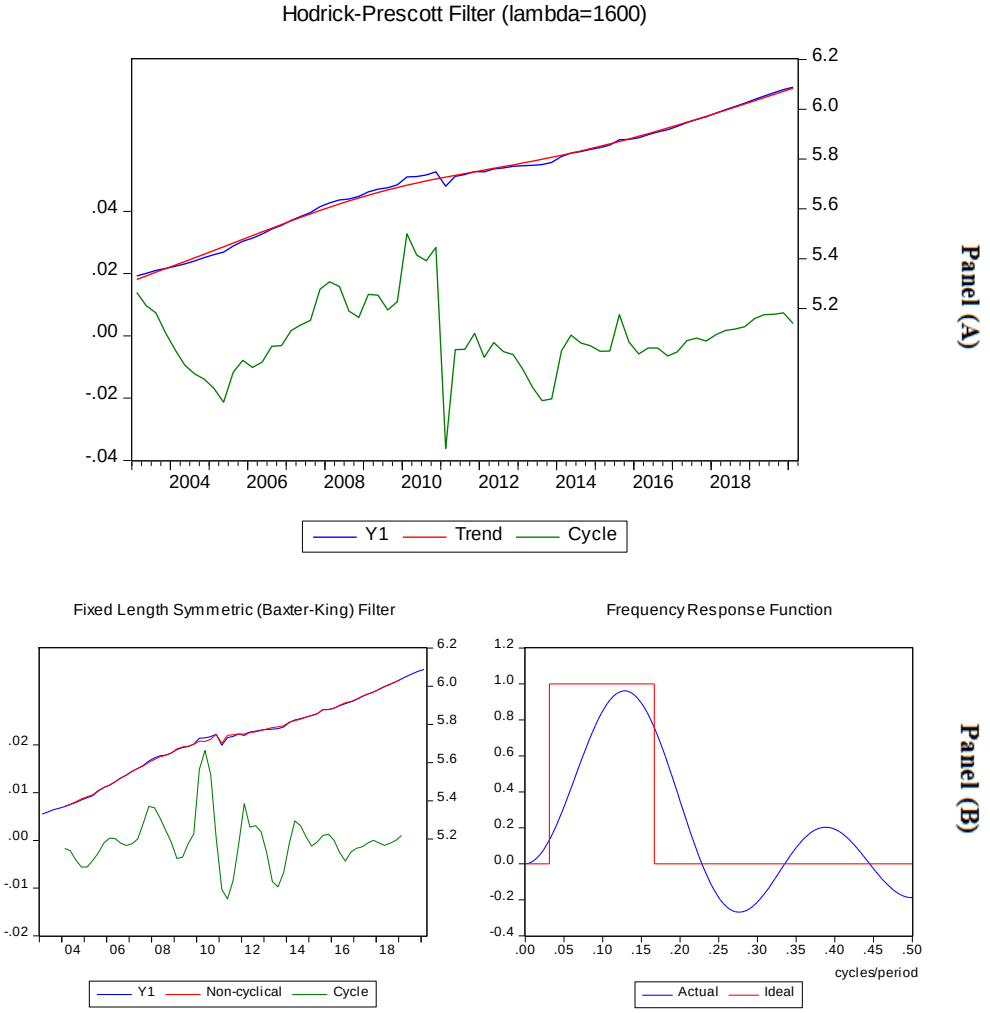
Where $Y_t$is the observable time series, $\tau_t$is the smoothing parameter, the parameter λ is the penalty factor and it reflects the acceleration degree in the trend component, it is estimated to be 1600 for quarterly data. The HP filter decomposes a series into two terms: The first term is the cyclical component that indicates "the goodness of fit". The second term is variations in the growth rate of the trend component; it measures the "degree of smoothness" (Alp ,*et al*.,2012) . As shown in Panel (A) of Figure (1), the RGDP the HP filter decomposes RGDP (Y1) series into trend and cycle component.

When applied the Band-Pass filter takes the form of

$$y_t^f \sum_{h=-3}^{3} a_h y_{t-h} = a(L)y_t \dots\dots\dots\dots\dots\dots (2)$$

Where y_t^f is the observable time series, L is "the lag operator". $a_h$is the weights can be derived from " the inverse Fourier transform of the frequency response function"(El Safty , 2001) . As shown in Panel (B) of figure (1), the RGDP the BP filter decomposes RGDP (Y1) series into non-cyclical and cycle component.

Figure 1: RGDP fluctuation by using HP filter and PB filter



Source:Researcher's calculations based on data from the Ministry of Planning and Economic development.
Note: Y1 is the RGDP in logarithm and seasonally adjusted by Using X-11 ARIMA methodology

4.4 Three Criteria to Characterize Fluctuations:

- ***Volatility*** is reported the magnitude and the size of fluctuating in variables. It can be measured by the standard deviation (σ) of the detrended component time series (Aizenman and Pinto, 2004).
- ***Persistence*** of fluctuations is indicted to inertia phenomenon and examined by Autocorrelations Function (ACF) and autoregressive model AR (ρ).

- ***Co-movement: The Cyclical Behavior of the Fluctuations:*** The extent of fluctuations' co-movements of the variable and RGDP fluctuations is measured by the sign and magnitude of the cross-correlation coefficient (ρ_i), the analysis concentrates on statistical features that determine the stylized facts of economic cycles. So, there are four cases that can be obtained according to the value of the cross-correlation coefficients (ρ_i) (Alpe , 2012; Jenish , 2013):

1. A variable is **a cyclical ,** if coefficients are non-significant**.**

2. A variable is **not clear**, if some of the significant coefficients are negative and other is positive while the largest of each is near to the other.
3. A variable is **procyclical**, if coefficients are positive or if significant positive correlation is larger than the significant negative ones. That means a variable 'move in the same direction of economic cycle.
4. A variable is **countercyclical,** if coefficients are negative or the significant negative correlation is larger than the significant positive one; that means a variable 'move in' the opposite direction.

Furthermore, cross correlation coefficient determines "*phase shift*", as follows (Alp, *et al*.,2012):

1. If the largest (ρ) appears in the time period (t-i), that variable *leads* the cycle.
2. If the largest (ρ) appears in the time period (t+i), that variable *lags* the cycle.
3. If (ρ) appears at similar levels in the time period (t+i) and (t-i), phase shift will be not clear.
4. If the largest (ρ) appears in the time period t=0, that variable is coincidental or synchronous

4.5 Stylized facts of economic fluctuation in Egypt's economy

Table (1) :Thestylized facts of economic fluctuation in Egypt's economy during 2001:3 - 2020:1

	Volatility	Relative Volatility	persistence	Contempora--neous correlation	Cyclicality	Phase Shift
R- GDP	0.012341	1	significant			
Household consumption	0.023209	1.880642	significant	0.3206	Procyclical	Coincidental
Government consumption	0.035327	2.862572	significant	0.1094	Procyclical	lead
Total capital formation	0.101611	8.233612	significant	0.4327	Procyclical	Coincidental
Exports	0.172151	13.94952	significant	0.0559	Procyclical	lead
Imports	0.149657	12.12681	significant	0.0928	Procyclical	lags
Net export to RGDP %*	0.020784	1.684142	Not sign.	-0.048	Countercyclical	lags
openness to RGDP %	0.077903	6.312535	significant	0.0286	Procyclical	lags
Trade account toRGDP%	0.013509	1.094644	significant	-0.2873	Countercyclical	lead
nominal exchange rate	0.114352	9.266024	significant	-0.1951	Countercyclical	lead
Real exchange rate	0.042126	3.4135	significant	-0.2747	Countercyclical	lead
Real effect exchange rate	0.105451	8.544769	significant	0.3235	Procyclical	lead
Consumer price index	0.033184	2.688923	significant	0.1836	Procyclical	lead
Inflation	0.045396	3.67847	significant	0.0219	Procyclical	lead
GDP deflator	0.067936	5.504902	significant	0.0092	Procyclical	lags
Unemployment rate	0.00737	0.597196	significant	-0.7376	Countercyclical	Coincidental
Nominal Wages	0.046788	3.791265	significant	-0.1049	Countercyclical	lead
Real wages	0.06733	5.44797	Not significant	-0.130	Countercyclical	lead
Liquid liabilities to (%)GDP	47.812	38.7	significant	-0.0419	Countercyclical	lead
Private credit by deposit (%) money banks to GDP	25.34	20.528	significant	-0.0656	Countercyclical	lead
Stock market capitalization to GDP (%)	210.35	170.47	significant	0.0812	Procyclical	lags
Stock market total value traded to GDP%	174.2	141.15	significant	0.4966	Procyclical	lags
EGX-30*	0.053323	4.320801	Not sign.	-0.1055	Countercyclical	lags
Reserve money growth (M0)		8.128271	0.5596*	-0.0899	Countercyclical	lag
Money supply growth (M1)		3.546471	0.6573*	-0.3346*	Countercyclical	lead
Domestic liquidity growth (M2)		2.434405	0.71491*	-0.0141	Countercyclical	lag
overnight lending rate	0.016640	1.362817	significant	-0.0155	Procyclical	lead(lag)
Long-Term Interest Rate	0.011665	0.945223	significant	-0.1408	Procyclical	lead
interest rate on deposits at banks less than 3 month	0.009705	0.786403	significant	-0.0704	Procyclical	lead

Source: Researcher preparation based on tables A-1 , A-2 and A-3 in annex .
* Net export/RGDP and EGX-30 showed significant persistence PB filtering.
Note: the phase shift in brackets indicate the results by use BP filter.

Summarizing criteria to characterize fluctuations and the stylized facts of economic cycles in Egypt can be seen in table (1).

4.5.1 RGDP and Components of Aggregate Demand:

Analyzing the magnitude of economic fluctuations in Egypt during period from 2001:3 to 2020:1 by using table (1) and table (2) exposes the following facts:

RGDP volatility: Egypt has small RGDP volatility. By analyzing the trend and the cycle component of R RGDP, it was found that the volatility of trend of RGDP more than volatility of cycle component. Therefore, shocks to trend are the main source of RGDP fluctuations in Egypt; previous results are consistent with Aguiar and Gopinath (2007) study about developing countries cycle.

RGDP persistence: Significant real GDP persistence can be observed from table (1). As evidenced by the estimate, the higher-order AR (k) coefficient is significant until lag 5 by using HP filter, which means that the economic cycle in Egypt is continuing for 5 quarters.

- **Household Consumption** explains 88. 8% of fluctuation in GDP growth (see table 2). *Absolute volatility* exceeds RGDP volatility. So, its *relative volatility* is even greater than on as reported in table (1). This denotes that the household consumption has greater cyclical amplitude than the economic cycle as a behavior of consumption in Egypt like most of developing countries. This result could possibly be attributed to two reasons: The first reason is caused by the lack of *"consumption -smoothing behavior"*. This is due to lack of sophisticated tools in the underdeveloped financial markets (Özbilgin, 2010). In addition, the possibility of different shocks hitting the economy can be among the factors driving the high volatility of consumption in Egypt's economy. The second reason is that

durables inclusion in household consumption data for Egypt makes consumption more volatile and more similar to future expenditure than to current expenditure; it shows a similar behavior to investment (i.e. higher volatility relative to GDP).

Table 2: Contribution of components of GDPto real growth rates (2001-2020)

%

Component of GDP	Growth rate (average)	share in GDP (average)	share in fluctuate (average)
Household consumption (C)	4.345	67.75	88.82
Government consumption (G)	4.353	11.22	12.78
Total capital formation (I)	5.352	17.58	16.09
Exports of goods and services(X)	10.376	22.84	54.3
Imports of goods and services(M)	8.445	28.59	63.38
Net export (X-M)	17.067	-5.7	99

Source: Contributions of GDP components are calculated by researcher.

Persistence of household consumption fluctuation is a one-quarter period by using HP filter while the same data showed is persistence for a 4-quarters period by using (BP) filter. Consequently, persistence analysis was sensitive to the method of detrending the data. *The cyclical behavior of household consumption* showed a contemporaneous procyclical behavior and consumption coincidental with the cycle.

- **Government Consumption** expounds 12.78 % of fluctuating in GDP growth; see table (2), which is important from a policy perspective, as it is included in the design of stabilization programs. The relative volatility is greater than one. This explains that the fiscal policy is one of the main reasons behind the increased severity of RGDP fluctuation, which is consistent with the findings for developing countries (Male, 2010).

Persistence of government consumption is explained in table (A-2) in annex; data using the HP filter showed signs of persistence of fluctuation for a two-quarter period, the same data showed significant signs of persistence for a four-quarter using the (BP) filter.

The cyclical behavior of government consumption is a procyclical behavior in Egypt, as a developing country that due to:

i. A developing country has relatively limited government revenue.
ii. Budget deficits prevent countries to follow expansionary fiscal policy during downturns.
iii. Absence of sovereign wealth funds utilized in time of need as stabilization funds.

Furthermore, government consumption lagged the cycle. Procyclical fiscal policy exacerbates fluctuations. In that sense, when the economy suffers recession, contractionary fiscal policy worsens the situation and leads to an even deeper recession. (Jenish , 2013).

- Total capital formations (investment) expounds 16.09 % of fluctuation in GDP growth (see table 2); the relative volatility is greater than one and it is the most volatile component of RGDP. The investmentispersistence. Moreover, *the cyclical behavior* exhibited the highest correlation with RGDP by coefficient of 0.4327 (see table A-3in annex), investment is procyclical and coincidental (synchronous).

- Net exportexplains-9 % of fluctuation in GDP growth (see table 2), relative volatility is greater than one, although it was very close to one. There is no persistence in net export fluctuations under HP filter method but it shows persistence under PB filter; as indicated, persistence analysis was sensitive

to the method of detrending the data. At the same time, there is persistence in export and import under the two methods (see table 1).

The cyclical behavior of net export; the cross correlation coefficient of net export is non-significant. In general, net export behavior is not clear; this fact could be due to the protectionism strategy followed by the government and to its imposing restrictive regulations on trade as it is adopting means to restrict the import and export of certain products[(6)]. Another reason for this weak correlation could be attributed to the fact that most of Egypt's imports were necessities (either for production, or for consumption).

4.5.2 The External Position Variables:

The relative volatility of *openness* was greater than one. *It was persistent* and procyclical but cross correlation was non-significant and lagged. On another hand, the *relative volatility of trade account* was approximated to one and persistence. The cyclical behavior of trade account showed a contemporaneous countercyclical and lagged, exhibiting larger deficits during expansion than during recessions; the sign of the coefficient of cross-correlation was negative and significant.

Both nominal and real effective exchange rates showed exhibit of significantly higher volatility than RGDP as table (1) has showed. This is due to the fact that Egypt follows a de jure managed exchange rate regime. Furthermore, the actual exchange rate regimes followed by Egypt were changed several times during the study period. Flood and Rose (1995,

[6]- On one hand , the government has banned the export of some agricultural products for some periods of the year such as the export of rice in 2015; and on another hand, it has banned white sugar imports

1999) suggest that the choice of an exchange rate regime affects the volatility of the exchange rate. Therefore, where the Central Bank maintains a fixed exchange rate regime, exchange rates will be less volatile than RGDP. In a similar vein, the exchange rate fluctuations witnessed an increase due to the shortage of foreign currency resources, especially after the retreat in all of tourism revenues, export proceeds, remittances from the Egyptians working abroad, foreign debt, import price, and demand shocks (El Safty, 2002; El Agroudy, *et al*., 2015).Examination of the autocorrelation coefficient of nominal, real, and the real effective exchange rates reveals that significant exchange rate persistence in Egypt is at lag three. Furthermore, both the nominal and real exchange rates are countercyclical, while real effect exchange rate was procyclical[7]

4.5.3 Domestic prices indicators:

All domestic price indices showed similar *volatility* behavior. Alongside, all domestic price indices presented analogous *relative volatility* behavior with higher fluctuations than those of GDP. All domestic price indices have significant persistence; this was indicted to inflation phenomenon inertia, Therefore the Central Bank cannot achieve disinflation without elevating the growth rate above its potential, suggesting that the Central Bank faces a trade-off between disinflation and reducing growth rate. The movement of all prices indicators is procyclical and lead; therefore, inflation rate fluctuations and economic cycle are driven by domestic demand and nominal shocks. Therefore, counter-cyclical macroeconomic policy in

[7]- The real effective exchange rates defined as an increase in the exchange rate implies an appreciation of the currency. Thus, a positive correlation indicates that the exchange rate tends to appreciation when the cyclical component of output rises (Agénor ,*et al*., 2000)

particular monetary policy associated with establishing nominal anchor to price stabilization and fiscal consolidation are a key for the Central Bank of Egypt to reduce the costs of disinflation.

4.5.4 Labor market indicators

Employment and economic cycle are two sides of the same coin. So, unemployment rate is the most variables express the economic cycle, the volatility of unemployment rate fluctuation is less than RGDP fluctuation. Furthermore, it is significantly persistent and has a high correlation with the GDP fluctuation. Furthermore, it is countercyclical and coincidental the cycle. Consequently, reasons behind high unemployment rates in Egypt are that the slowdown in RGDP and growth rates remains insufficient to absorb the new additions to the labor force.

Examining the cyclical properties of real wages [8]is useful to explain how labor markets adjust to changing economic environment, relative volatility in nominal and real wages more than one. In addition, they have significant persistence. But, the cross-correlation coefficient is not significant, this means efficiency wage models predict (Agénor, *et al*., 2000). Nominal and real wages are countercyclical and lagged.

4.5.5 Financial sector

Financial sector indicators are divided into two groups; the first is the banking sector indicators as private credit by deposit money banks to GDP percentage and liquid liabilities to GDP percentage, the second is the stock market sector indicators as stock market total value traded to GDP percentage, stock market capitalization to GDP percentage and EGX30.

[8]- The calculation of real wages by deflating nominal wages by the consumer price index (CPI).

Both the banking sector indicators suffer from high *volatility*. Both indicators have a high significant *persistence*.

Furthermore, there is a negative contemporaneous association between domestic credit and liquid liabilities with RGDP, then, indicators is countercyclical and lagged. All the stock market sector indicators experience extreme volatility. All indicators have a high significant persistence, except that EGX30.The cross-correlation coefficients are not significant. Moreover, stock market total value traded to GDP percentage and stock market capitalization to GDP percentage are procyclical and lead, while EGX30 is countercyclical and lag. Consequently, the financial sector is one of reasons behind fluctuations in Egypt.

4.5.6Monetary policy

Table (1) shows the relative volatility of most **interest rates** is greater than one. The persistence is significant due to CBE's decision to keep the interest rate unchanged for consecutive terms. Furthermore, the analysis of *co-movement and the cyclical* shows that interest rates fluctuation are procyclical with a lead. Therefore, the interest rates are a source of RGDP fluctuations and decisions of Central Bank of Egypt (CBE) regarding interest rates in the incorrect direction to reduce fluctuations. At the same time, it can be observed that the coefficient of contemporaneous correlation is non-significant but it is significant with various lag periods (see tables A-3in Annex). The relative volatility of all growth of monetary aggregates (M0, M1, and M2)is greater than one. Moreover, all monetary aggregates indicators showed signs of persistence and countercyclical.

5. Result and Conclusion:

The nature of macroeconomic fluctuation and the major stylized factsthat describe short-run fluctuation as follows:

1. The first fact is*the irregularity of the economic fluctuations* so that they do not exhibit any cyclical pattern, and it is mostly difficult to predict these with much accuracy
2. The second factis that they are *distributed unequally over the components of GDP*. GDP growth is primarily dependent on household consumption then investments**.** The behavior of each of the components of GDP in the downturn period is very different from that in the expansion period.
3. The third fact is its *asymmetry in real GDP movements*. It can be shown that small asymmetries exist between falls and rises in real GDP and that the GDP growth rate was characterized by frequent fluctuations symmetrically around its mean and its potential levels but the same does not occur across expansion and downturn periods .
4. The fourth fact is the *changes in the magnitude of macroeconomic fluctuation over time*; this indicates that fluctuations can be identified by "leading variable" which is the resource of fluctuation. These were changed over time, but there is a set of changes that have roughly offsetting effects on overall fluctuations; some variables have counter-cyclical behavior and other have procyclical.
5. The fifth fact is that *most macroeconomic variables fluctuate and exercise movement together*. However, they fluctuate by different amounts and some types of variables fluctuate closely together, others are not evidenced.

Identifying characteristics, stylized facts, and source of fluctuation is important to policymakers and economic units. Therefore, the main sources of fluctuations can be derived as follows:

1. Synchronization is historically the norm, this observable in Egypt's fluctuations when the economic activity was influenced by the external shock, that was caused by the sluggish global economic.
2. *A sharp change in investment* especially fixed investment is a precursor to the start of a new stage of the economic cycle and fluctuation in economic activity. So the investment is the most important factor for supporting economic recovery.
3. *Financial indicators* are a tool for expecting a recession or an expansion.
4. When the macroeconomic variable under study has leading and The pro-cyclical behavior
5. The volatility of trend of RGDP in Egypt is more than volatility of cycle component. Therefore shocks to trend growth are the main source of RGDP fluctuations in Egypt.

All variables under observed have significant signs of persistence except real wages and Egx30. This result suggests that it is appropriate to view the Egyptian economy as having short-term fluctuations getting closer to the economic cycle. As evidenced by the estimate, the higher-order AR(k) coefficient is significant until lag 5 by using HP filter , which means that the economic cycle (recession or expansion) in Egypt is continuing for 5 quarters (15months).The research aimed to build a set of economic fluctuation indicators as follows:

Reference

A. Coincidency : Household consumption , total capital formation and unemployment rate

B. Leading: Import , nominal exchange rate , openness, and stock market indicator .

C. Lagging : Government consumption , export , trade account, net export , real exchange rate , REER , all price indicators ,banking sector indicators in addition to nominal and real wages

An analysis of the cyclical behavior of the variable under study compared with the real GDP reveals the following results:

- Components of aggregate demand are all generally procyclical.
- Variables indicate that the external position has contradictory behavior; openness to RGDP percentage and REER areprocyclical, whereas trade account to RGDP percentage, nominal exchange rateand real exchange rate are countercyclical
- Prices and inflation indicators are all generally procyclical
- Labor market indicators are countercyclical
- The banking sector indicators were countercyclical while the stock market indicators were procyclical except EGX30 that is countercyclical.
- Monetary aggregates were countercyclical , while interest rates were Procyclical.

Finally, the external shocks, political instability, trade, and change in demand both domestically and abroad, and procicalical monetary and fiscal policies are the main reasons behind the boom and bust cycle in RGDP in Egypt. Shocks to trend growth are the main source of RGDP fluctuations.

Abdel Fattah , Hanaa Fouad . (2008). Nature and Characteristics of Macroeconomics Fluctuations in Developing Countries. *Unpublished Master Thesis, Faculty of Economics and Political Science,* Cairo University. (Arabic)

Agénor, P., McDermott, C., and Prasad, E. (2000). Macroeconomic fluctuations in developing countries: some stylised facts. *World Bank Economic Review* 14; pp.251-285.

Aguiar, M., and Gopinath, G., (2007). Emerging Market Business Cycles: The Cycle Is the Trend. *Journal of Political Economy, University of Chicago Press*, 115 (1) : 69 – 102

Aizenman, J., and PintoB.,(2004) , Managing Volatility and Crises: A Practitioner's Guide Overview . National Bureau of Economic Research Working Paper 10602.

Alp H, Baskaya YS, Kilinc M, Yuksel C. (2012). Stylized Facts for BusinessCycles in Turkey. Working Papers 1202, Research and Monetary PolicyDepartment, Central Bank of the Republic of Turkey.

Alper,Emre(2002) . Business cycle, Excess volatility and capital flows; evidence from Mexico and Turkey. Emerging markets finance and trade, 38(5): 25-58.

Burns and Mitchell (1946), Burns and Mitchell on Business Cycles. Journal of Political Economy. Vol. 55, No. 4 (Aug., 1947), The University of Chicago Press pp. 281-298

Christodoulakis N., Dimelis, S. P. and Kollintzas, T. ,(1995), Comparisons of Business Cycles in the EC: Idiosyncracies and Regularities, *Economica* (1995) 62, 1-27

Diebold and Rudebusch(1999).Measuring Business Cycles: A Modern Perspective. *Review of Economics and Statistics* · October

EI- Sherpeny,A.,(2014).Economic Cycles and their Relation with Foreign Trade Flows , *Unpublished PhD Thesis, Faculty of Commerce,* Ain shams University .(In Arabic)

El Agroudy,N. Shafiq, F., Mokhtaret, S., (2015) .The Effect of the Rise in the Dollar Rate on the Egyptian Economy. *Middle East Journal of Applied Sciences.* Volume 5, Issue2 , April-June Pages: 509-514

El-Safty ,Ahmed (2001) . Explaining Macroeconomic Fluctuations in a Developing Country: The Case of Egypt .*A dissertation presented to the Faculty of the Graduate School of International Economics and Finance of Brandeis University,* Waltham, Massachusetts .

Fiorito, R., and Kollintzas, T., 1994. Stylized Facts of Business Cycles in the

G7 from a Real Business Cycles Perspective. *European Economic Review*, Elsevier, vol. 38(2), pages 235-269, February.

Flood, R. P., and Rose, A. K. (1996). Fixes: Of the Forward Discount Puzzle. *The Review of Economics and Statistics*, 78(4), 748–752.

Gupta,G. (2003). Economic Fluctuations and Stabilization Policies. VIKALPA . Volume 28. No 1. January - march .

Hegazy, A., 2010, Characteristics of Economic fluctuations in Egypt , *Journal of Development and Economic Policies* , Volume 12-No.1 - January

Hodrick, robert j. and Prescott, Edward C. (1981). Post-war U.S. Business Cycles: an Empirical Investigation. *Pittsburg: Carnegie-Mellon University*, Discussion Paper No. 451, May.

Jenish , Nurbek . (2013). Business Cycles in Central Asia and the Russian Federation. *Institute of Public Policy and Administration*. Working Paper No. 15, 2013

Kaminsky, Graciela L., Reinhart , Carmen M. and Végh, Carlos A.(2004) . When It Rains, It Pours: Procyclical Capital Flows and Macroeconomic Policies. *National Bureau of Economic Research NBER* , Working Paper 10780 , September 2004

Kollintzas , T., Konstantakopoulou ,L.,and Tsionas,E., (2011) Stylized Facts of Money and Credit Over The Business Cycles. *Applied Financial Economics*, 21:23, 1735-1755

Kydland, F.E. and C.E.J.M. Zarazaga (1997).Is the Business Cycle of Argentina Different? *Economic and Financial Policy Review*, Federal Reserve Bank of Dallas, Q IV, 21-36.

Kydland, F.E., and Precott, E.C. (1990) .Business Cycle: Real Facts and a Monetary Myth. *Federal Reserve Bank of Minneapolis Quarterly Review* 14(2); pp.3–18

Loayza, N., Rancière, R., Servén, L., and Ventura, J. (2007) . Macroeconomic Volatility and Welfare in Developing Countries: An Introduction. *The World Bank Economic Review* 21(3); pp.343–357

Lucas, R.E. (1977). Understanding Business Cycles. In Stabilization of the domestic and international economy, Eds. Brunner, K., and Meltzer, A., Carnigie-Rochester *Conference Series on Public Policy* 5،Amsterdam: North Holland; pp.7-29

Machado, Celsa (2001).Measuring Business Cycles: The Real Business Cycle Approach and Related Controversies. *Faculty of economics, university of Porto*. Work paper No. 107, Portugal.

Mahmoud, Mona ,(2010) .Price Stability as a Goal for Monetary Policy in Egypt : In Light of Developing Countries Experience in Inflation Targeting. *Unpublished Master thesis , Faculty of Commerce* , Economic Department , Zagazig University

Male, Rachel .(2010). Developing Country Business Cycles: Revisiting the Stylised Facts. *Working Papers 664*, *Queen Mary University of London*, School of Economics and Finance.

Noureldin, Diaa(2017). Much ado about the Egyptian pound: exchange rate misalignment and the path towards equilibrium. *Egyptian Center for Economic Studies. ECES* Working Paper No. 190 December 2017

Özbilgin, M. H. (2010). Financial Market Participation and The Developing Country Business Cycle. *Journal of Development Economics*, 92(2), pages 125-137.

Ramadan, A. Mohamed . (2005) . Indicators of Business Cycle Activity in Egypt, Economic analysis. *The Cabinet Information and Decision Support Center*, Cairo.

Stock, James H., and Mark W. Watson, (1999). Business Cycle Fluctuations in U.S. Macroeconomic Time Series. *In Handbook of Macroeconomics*, Vol. 1A, ed. by John Taylor and Michael Woodford (New York: North-Holland), pp. 3–64.

Annex: A

Table (A-1) : Volatility of GDP and Macroeconomic variables

(measured as percentage standard deviation)

Variable	HP detrended		BPdetrended	
	Absolute SD	**Relative to GDP's**	**Absolute SD**	**Relative to GDP's**
R GDP	1.2341	1	0.5156	1
Household consumption	2.3209	1.880642	1.1021	2.13751
Government consumption	3.5327	2.862572	1.7457	3.385764
Total capital formation	10.1611	8.233612	4.6653	9.048293
Exports of goods and services	17.2151	13.94952	9.3745	18.18173
Imports of goods and services	14.9657	12.12681	7.3792	14.31187
Net export/GDP	2.0784	1.684142	0.9378	1.818852
openness/GDP	7.7903	6.312535	4.0006	7.759116
Consumer price index	3.3184	2.688923	1.5351	2.977308
Inflation	4.5396	3.67847	2.895	5.614818
GDP deflator	6.7936	5.504902	3.2219	6.248875
Unemployment rate	0.737	0.597196	0.3739	0.725175
Wages	4.6788	3.791265	2.2237	4.312839
Real wages	6.733	5.44797	6.189	12.003
nominal exchange rate	11.4352	9.266024	5.6222	10.90419
Real exchange rate	4.2126	3.4135	2.1123	4.09678
Real effect exchange rate	10.5451	8.544769	5.0465	9.787626
Trade account /GDP	1.3509	1.094644	0.7223	1.400892
EGX30	5.3323	4.320801	2.9577	5.736424
Reserve money growth (M0)	10.03	8.12827	7.0141	13.60376
Money supply growth (M1)	4.3767	3.54647	3.2868	6.374709
Domestic liquidity growth (M2)	3.0043	2.43440	1.8463	3.580877
overnight lending rate (1) *	1.6640	1.36281	0.6886	1.21833
Long-Term Interest Rate	1.1665	0.94522	0.6459	1.25223
interest rate on deposits at banks less than 3 month	0.9705	0.78603	0.4093	0.79352

Source : Researcher's calculations

(1) This rate was first announced on 2/6/2005 in the press release of the MPC, and were applied as of 5/6/2005.

*Notes : Relative volatility of overnight lending rate calculated by RGDP'sstandard deviation equal 0.012210 and 0.005652 by using HP and BP filters respectively.

Table (A-2) : Persistence of RGDP , its components and selected variables (autoregressive and autocorrelation)[1]												
	The data using HP							The data using PB				
	Autoregressive	Autocorrelation						Autoregressive	Autocorrelation			
	AR(1)	lag1	lag2	lag3	lag4	lag 5	lag6	AR(1)	lag1	lag2	lag3	lag4
R GDP [2]	0.658	0.666	0.552	0.436	0.33	0.296	0.259	0.721	0.721	0.186	-0.315	-0.539
Household consumption	0.3356	0.338	0.124	0.085	0.106	-0.064	-0.053	0.670	0.640	0.072	-0.296	-0.395
Government consumption	0.623	0.632	0.33	0.176	0.08	0.102	-0.054	0.716	0.727	0.163	-0.315	-0.464
Total capital formation	0.413	0.388	0.307	0.138	0.112	0.069	0.044	0.681	0.648	0.042	-0.409	-0.478
Exports of goods and services	0.677	0.671	0.389	0.118	-0.01	-0.052	-0.181	0.7468	0.755	0.226	-0.253	-0.454
Imports of goods and services	0.705	0.685	0.421	0.188	0.076	-0.024	-0.187	0.758	0.763	0.262	-0.182	-0.365
Net export/GDP	0.0916	0.091	-0.025	0.041	-0.015	-0.014	0.05	0.610	0.617	-0.019	-0.445	-0.52
openness/GDP	0.728	0.721	0.46	0.195	0.049	-0.055	-0.227	0.766	0.775	0.288	-0.161	-0.365
Consumer price index	0.873	0.849	0.602	0.363	0.183	0.076	-0.019	0.792	0.775	0.279	-0.175	-0.363
Inflation	0.787	0.779	0.398	0.042	-0.167	-0.168	-0.139	0.734	0.738	0.140	-0.421	-0.651
GDP deflator	0.852	0.862	0.628	0.375	0.170	0.025	-0.112	0.813	0.796	0.340	-0.07	-0.264
Unemployment rate	0.754	0.765	0.583	0.336	0.157	0.075	0.038	0.754	0.741	0.193	-0.335	-0.57
Wages	0.955	0.689	0.337	0.027	-0.172	-0.17	-0.141	0.959	-0.284	-0.126	0.244	0.69
Real wages	0.808	0.737	0.380	0.037	-0.203	-0.247	-0.220	-0.147	-0.138	-0.024	0.124	-0.316
nominal exchange rate	0.854	0.813	0.558	0.304	0.086	-0.076	-0.204	0.782	0.791	0.321	-0.138	-0.376
Real exchange rate	0.836	0.794	0.551	0.298	0.083	-0.062	-0.184	0.778	0.79	0.321	-0.137	-0.379
Real effect exchange rate	0.841	0.83	0.605	0.353	0.107	-0.095	-0.26	0.814	0.824	0.43	0.028	-0.228
Trade account /GDP	0.267	0.271	0.16	0.045	-0.172	-0.118	-0.177	0.720	0.723	0.196	-0.321	-0.591
EGX30	0.1049	0.102	-0.024	-0.127	-0.24	-0.022	0.063	0.625	0.631	-0.008	-0.515	-0.616
Reserve money growth (M0)	0.559642	0.566	0.173	-0.191	-0.461	-0.345	-0.320	0.733149	0.7	0.09	-0.452	-0.66
Money supply growth (M1)	0.657344	0.656	0.299	-0.073	-0.403	-0.322	-0.232	0.747886	0.746	0.175	-0.407	-0.718
Domestic liquidity growth (M2)	0.714917	0.724	0.469	0.162	-0.197	-0.178	-0.154	0.804596	0.778	0.305	-0.204	-0.546
overnight lending rate	0.849250	0.793	0.54	0.29	0.143	0.101	0.002	0.804813	0.755	0.311	-0.036	-0.146
Long-Term Interest Rate	0.407005	0.41	0.151	-0.078	-0.107	-0.016	-0.002	0.711657	0.691	0.101	-0.379	-0.499
interest rate on deposits at banks less than 3 month	0.899502	0.813	0.567	0.32	0.11	0.08	0.72	0.828155	0.817	0.433	0.043	-0.214

(1) The significance of the persistence is measured using the Ljung- Box portmanteau (Q) test for white noise.

(2) RGDP has AR(5) = 0.288195 but AR(6) not significance

Table (A-3) : Contemporaneous correlation with real GDP fluctuations (co-movement- cross correlation)

	Household consumption		Government consumption		Total capital formation		Exports of goods and services		Imports of goods and services		Net export/GDP		openness		Trade account /GDP	
i	lag	lead	lag	lead	lag	lead	lag	lead	lag	lead	lag	lead	lag	lead	lag	lead
0	0.3206	0.3206	0.1094	0.1094	0.4327	0.4327	0.0559	0.0559	0.0928	0.0928	-0.048	-0.048	0.0286	0.0286	-0.2873	-0.2873
1	0.3089	0.2742	0.1335	0.0808	0.379	0.2617	0.0114	0.0606	0.0799	0.0827	-0.1668	-0.038	0.0156	0.0454	-0.2099	-0.2148
2	0.3134	0.0653	0.0628	0.0171	0.3639	0.309	-0.0197	-0.0126	0.108	-0.0156	-0.2295	0.0291	0.0285	-0.0579	-0.1278	-0.0913
3	0.0219	0.0413	-0.0481	0.0481	0.2652	0.1572	0.1326	-0.0153	0.1173	-0.0808	0.0162	0.0961	0.1192	-0.0859	-0.1459	-0.0013
4	0.0675	0.0191	-0.102	0.0226	0.1782	0.0454	0.191	-0.0388	0.1813	-0.1224	-0.0035	0.1551	0.1946	-0.1288	-0.013	0.1367
5	0.1494	0.028	-0.1177	0.0597	0.1978	0.0374	0.1641	0.0597	0.2167	-0.0485	-0.1018	0.119	0.2022	-0.0493	-0.132	0.1174
6	0.0992	-0.0871	-0.0681	0.0783	0.0481	0.1279	0.198	0.157	0.2055	0.0363	0.0503	0.0999	0.2335	0.0146	-0.1046	-0.0594
7	0.0368	-0.1451	-0.1015	-0.0539	0.316	0.1245	0.1614	0.0662	0.3173	-0.0752	-0.2657	0.1238	0.2856	-0.087	-0.1661	0.1322
8	0.0491	-0.0394	-0.0659	-0.0051	0.1821	0.0891	0.2107	-0.026	0.3202	-0.0809	-0.1915	0.0289	0.3432	-0.1494	-0.2487	0.0041
9	-0.0317	0.0145	-0.0542	-0.081	0.1528	-0.0135	0.2437	-0.0618	0.2952	-0.1214	-0.0802	0.0385	0.3413	-0.1867	-0.0583	0.0537
10	-0.0826	0.0564	-0.0171	-0.135	0.0961	-0.205	0.1654	0.0635	0.2137	-0.0798	-0.0663	0.1544	0.2569	-0.1187	-0.0063	0.1384
11	-0.0037	0.0003	0.0872	-0.144	0.062	-0.2301	0.0923	0.067	0.1916	-0.0642	-0.2148	0.1232	0.2223	-0.0901	-0.0057	0.1272
12	-0.1397	-0.1619	-0.0015	-0.2722	-0.029	-0.217	0.0158	0.0067	0.0827	-0.1205	-0.1299	0.1836	0.1236	-0.1259	0.0317	0.3375
13	-0.1676	-0.211	-0.1108	-0.3426	-0.1072	-0.2734	0.0291	-0.0435	0.055	-0.1714	-0.0128	0.2161	0.1073	-0.1474	0.1232	0.3133
14	-0.285	0.003	-0.086	-0.2649	-0.0897	-0.2672	0.0864	-0.1566	0.0768	-0.1603	0.0467	0.0522	0.1676	-0.1631	0.078	0.225
15	-0.2896	0.0452	-0.0479	-0.2236	-0.1582	-0.2344	0.0033	-0.1056	-0.0412	-0.0942	0.175	-0.0265	-0.0081	-0.0894	0.1758	0.0905
16	-0.189	0.016	0.0278	-0.0578	-0.1848	-0.2741	-0.0098	-0.0501	-0.028	-0.0573	0.0756	0.0074	0.0006	-0.0477	0.1365	-0.0123
17	-0.209	-0.0728	0.1365	0.0079	-0.2322	-0.1519	-0.0468	-0.0916	-0.1008	-0.0382	0.1551	-0.0527	-0.0692	-0.0359	0.1579	-0.0015
18	-0.0889	-0.1459	0.0942	-0.0221	-0.2529	-0.204	-0.096	-0.0789	-0.1001	-0.0971	0.0072	0.0422	-0.0789	-0.0398	0.11	0.0362
19	-0.182	-0.0566	0.0908	-0.0283	-0.2803	-0.188	-0.0952	-0.1313	-0.1767	-0.0852	0.1837	-0.0357	-0.1325	-0.0346	0.2182	-0.0647
20	-0.1254	0.0114	0.08	0.0131	-0.2676	-0.2446	-0.1	-0.0775	-0.1581	-0.042	0.1159	-0.0286	-0.1395	0.0162	0.1381	-0.0605
21	-0.0873	0.0998	0.0645	-0.0035	-0.217	-0.266	-0.173	-0.2066	-0.2006	-0.0734	0.0655	-0.1359	-0.2116	-0.0265	0.0761	-0.1036
22	-0.0291	0.0029	0.024	0.1084	-0.271	-0.202	-0.21	-0.2214	-0.248	-0.119	0.0516	-0.0873	-0.2666	-0.0589	0.0992	-0.0682
23	-0.0534	-0.0145	0.0173	0.1357	-0.2593	-0.193	-0.194	-0.3937	-0.2649	-0.2544	0.149	-0.0404	-0.2674	-0.1881	0.1404	-0.1421
24	-0.0511	-0.0021	0.0156	0.1254	-0.19620	-0.088	-0.165	-0.2230	-0.2548	-0.1453	0.138	-0.0402	-01678	-0.1066	0.0987	-0.1311
25	-0.0423	-0.0018	0.0127	0.1123	-016354	-0.075	-0.154	-0.1234	-0.1234	-0.0123	0.110	-0.0382	-0.0123	-0.0894	0.0877	-0.0956

Source : Researcher's estimation

Notes : The critical value for the significance of cross correlations at 5% level is 0.22632 and the critical value for the significance of cross correlations at 10% level is 0.18994

（Continued）

Table A-3 (continued): Contemporaneous correlation with real GDP fluctuations (co-movement- cross correlation)

	Nominal exchange rate		Real exchange rate		Real effect exchange rate		Inflation (CPI)		CPI		GDP deflator		Nominal wages		Real wages		unemployment rate		EGX-30	
i	lag	lead	lag	lead	lag	lead	lag	lead	lag	lead	lag	lead	lag	lead	lag	lead				
0	lag	lead	lag	lead	0.3235	0.3235	0.0219	0.0219	0.1836	0.1836	0.0092	0.0092	-0.1049	-0.1049	-0.130	-0.130	**-0.**7376	**-0.**7376	-0.1055	-0.1055
1	-0.1951	-0.1951	-0.2747	-0.2747	0.2657	**0.335**	0.0604	0.0386	0.1562	0.2128	0.0517	-0.0143	-0.126	-0.076	-0.179	-0.118	-0.5402	-0.6514	-0.1596	-0.1933
2	-0.1496	-0.1911	-0.2269	**-0.2893**	0.1981	0.2911	0.0748	0.1077	0.1406	0.2568	0.0732	-0.0443	-0.1627	-0.0453	-0.219	-0.146	-0.4747	-0.5448	-0.1033	-0.1694
3	-0.1144	-0.1671	-0.1681	-0.294	0.1298	0.2292	0.1208	0.1103	0.1591	0.2658	0.0809	-0.0625	-0.209	-0.0105	-0.282	-0.114	-0.3677	-0.456	-0.0297	-0.229
4	-0.0723	-0.1236	-0.1213	-0.266	0.0701	0.1559	0.1243	0.0925	0.1131	0.2714	0.0797	-0.0186	-0.2262	0.0342	-0.302	-0.061	-0.2911	-0.3075	-0.1077	-0.2276
5	-0.0139	-0.0608	-0.0553	-0.2029	0.0374	0.0199	0.1297	0.0941	0.0338	0.3111	0.0437	0.0515	-0.2307	0.0856	-0.316	-0.027	-0.2277	-0.2389	-0.0981	0.0548
6	0.017	0.0491	0.0235	-0.0961	0.002	-0.0453	0.2048	0.0983	-0.0025	0.3647	0.0054	0.1547	-0.2104	0.1373	-0.366	-0.005	-0.181	-0.1601	-0.1872	-0.0103
7	0.0225	0.1108	0.0987	-0.046	-0.0547	-0.0565	0.2361	0.092	-0.0367	0.3699	-0.0199	0.1602	-0.1725	0.1906	-0.3606	0.034	-0.1337	-0.0788	-0.2632	0.1502
8	0.0306	0.129	0.1642	-0.0342	-0.123	-0.0583	0.2002	0.0671	-0.0833	0.3443	-0.0056	0.2019	-0.1243	0.2329	-0.2878	0.0968	-0.0656	0.0008	-0.0933	0.152
9	0.0562	0.1155	0.2275	-0.0208	-0.1884	-0.0902	0.0644	0.0352	-0.1711	0.3468	0.0009	0.2201	-0.1115	0.2825	-0.156	0.1791	0.0307	0.0564	0.1166	0.0924
10	0.0861	0.1459	0.2674	0.0176	-0.2121	-0.1204	-0.0623	-0.0144	-0.2979	0.3451	-0.0667	0.2411	-0.1189	**0.293**	-0.0355	0.241	0.1135	0.0892	0.1915	0.0303
11	0.1127	0.1916	0.2604	0.0705	-0.2131	-0.1648	-0.1081	-0.0358	-0.3648	0.3244	-0.0822	0.2967	-0.1564	0.291	-0.0119	0.261	0.2086	0.2013	0.1691	0.0196
12	0.101	0.224	0.2436	0.1218	-0.1847	-0.1464	-0.0607	-0.0688	-0.3543	0.2619	-0.1306	0.3102	-0.218	0.279	-0.0878	0.279	0.2358	0.2381	0.1195	0.0313
13	0.0844	0.1664	0.2091	0.0848	-0.1506	-0.0679	0.0134	-0.179	-0.2657	0.1364	-0.1467	0.2404	-0.2185	0.2283	-0.1403	0.327	0.2331	0.3569	0.0704	0.052
14	0.0779	0.0537	0.173	-0.0108	-0.1391	-0.0275	0.0153	-0.3439	-0.2315	-0.0596	-0.1276	0.1343	-0.1909	0.1729	-0.116	0.407	0.3157	0.315	0.114	0.1004
15	0.0771	-0.0617	0.1677	-0.064	-0.1442	-0.019	-0.0265	-0.4178	-0.225	-0.1687	-0.0963	0.0746	-0.1315	0.1223	-0.0389	0.435	0.3307	0.3546	-0.0085	0.1421
16	0.0854	-0.1257	0.1746	-0.0771	-0.1539	-0.0109	-0.0986	**-0.4391**	-0.2494	-0.2648	-0.0831	0.0306	-0.0514	0.0802	0.081	**0.437**	0.3627	0.3884	0.002	0.0282
17	0.08	-0.1675	0.1905	-0.0654	-0.1831	0.0352	-0.1352	-0.3937	-0.2453	-0.3355	-0.0919	0.0351	-0.0135	0.0277	0.1384	0.365	0.4434	0.3574	0.0365	0.0539
18	0.0836	-0.1917	0.2097	-0.0694	-0.1888	0.0614	-0.1628	-0.2562	-0.209	-0.3531	-0.0802	0.0277	0.0076	-0.0155	0.1775	0.239	0.3591	0.345	-0.018	0.0162
19	0.0888	-0.1976	0.1771	-0.0767	-0.1548	0.0604	-0.1671	-0.206	-0.1441	-0.3925	-0.0659	-0.0592	0.02	-0.0045	0.1909	0.229	0.2832	0.2737	**0.3089**	-0.0573
20	0.0824	-0.1916	0.1176	-0.0535	-0.1178	0.0567	-0.1276	-0.1678	-0.0772	-0.4304	-0.0337	-0.1592	0.0338	-0.0791	0.1702	0.1585	0.171	0.2511	0.2767	-0.03
21	0.0689	-0.1907	0.0424	-0.0385	-0.1043	0.0905	-0.0397	-0.1837	-0.0235	-0.5022	-0.0033	-0.2476	0.054	-0.1635	0.1048	0.0825	0.1395	0.2441	0.1917	-0.0358
22	0.0701	-0.2333	0.0015	-0.077	-0.0803	0.0731	0.0527	-0.2054	0.0546	-0.5346	0.0184	-0.3256	0.09	-0.19	0.0463	0.05	0.0769	0.2784	0.1423	-0.0729
23	0.0693	-0.2343	-0.0012	-0.0731	-0.0787	0.2334	0.1321	-0.184	0.1234	**-0.5588**	0.0413	**-0.3929**	0.1445	-0.1437	0.0195	0.0336	0.1481	0.2342	0.0747	-0.1043
24	0.081	-0.2272	0.0009	-0.0581	0.1225	0.2235	0.0203	0.0119	0.1836	0.1836	0.0273	-0.0272	0.1239	-0.129	-0.130	-0.130	0.1340	-0.2276	0.0345	-0.1022
25	0.077	-0.2124	0.0002	-0.0342	0.2657	0.135	0.0703	0.0326	0.1542	0.1128	0.0526	-0.0165	0.115	-0.0846	-0.179	-0.118	0.1102	0.2114	0.0186	-0.0933

Source : Researcher's estimation

Notes: The critical value for the significance of cross correlations at 5% level is 0.22632and the critical value for the significance of cross correlations at 10% level is 0.18994.

(Continued)

Table A-3 (continued) : Contemporaneous correlation with real GDP fluctuations (co-movement- cross correlation)

	Interest rate on deposits less than 3 month (1)		Long-Term Interest Rate(1)		overnight lending rate(2)		M0(1)		M1(1)		M2(1)	
i	lag	lead	lag	lead	lag	lead	lag	lead	lag	lead	lag	lead
0	-0.0704	-0.0704	-0.1408	-0.1408	-0.0155	-0.0155	0.2014	0.2014	0.1739	0.1739	0.2758	0.2758
1	-0.0646	-0.0521	-0.2519	0.0073	0.0132	0.0322	0.2678	0.0899	0.3174	-0.0055	0.4283	0.1392
2	-0.0295	-0.0058	-0.2151	-0.0520	0.0509	0.0815	0.3105	0.0245	0.2680	-0.1851	0.4491	0.0543
3	0.0159	0.0096	-0.1469	-0.1365	0.0921	0.0937	0.2439	0.0067	0.1511	-0.2676	0.4230	-0.0463
4	0.0592	0.0179	-0.0993	-0.0324	0.1506	0.0533	0.1565	-0.0721	0.0339	-0.2238	0.3013	-0.1179
5	0.0853	0.0662	-0.0623	-0.0178	0.2250	0.0638	0.0154	-0.0678	-0.0468	-0.1647	0.1675	-0.2672
6	0.0898	0.1120	-0.0724	-0.0154	0.2769	0.0385	-0.1255	-0.1234	-0.0469	-0.1344	0.0530	-0.3841
7	0.0520	0.1528	-0.1105	0.1548	0.2624	0.0695	-0.1578	-0.2249	-0.0735	-0.1729	-0.0528	-0.4285
8	0.0036	0.2013	0.0032	0.0733	0.2138	0.0688	-0.2039	-0.1674	-0.0634	-0.2241	-0.1552	-0.4030
9	-0.0461	0.2216	0.0035	0.1380	0.1089	0.0475	-0.1874	-0.1381	-0.0654	-0.1785	-0.2532	-0.2784
10	-0.0835	0.2482	0.0006	0.2033	0.0322	0.0131	-0.1389	-0.0605	-0.0765	-0.0930	-0.2383	-0.1556
11	-0.0968	0.2793	-0.1183	0.3079	-0.0176	0.0559	-0.0894	0.0409	0.0248	0.0084	-0.1323	-0.0656
12	-0.0946	0.2567	0.0356	0.2753	-0.0478	0.0038	-0.0302	0.0551	0.1346	0.1079	0.0228	0.0266
13	-0.1087	0.1862	-0.0711	0.1477	-0.0631	-0.0520	0.0818	0.0697	0.2850	0.1273	0.2053	0.0795
14	-0.1161	0.0669	-0.1408	-0.1408	-0.0886	-0.1072	0.1198	0.0308	0.3934	0.1311	0.2736	0.0929
15	-0.1290	-0.0663	-0.2519	0.0073	-0.1082	-0.1726	0.0642	0.0058	0.4066	0.0913	0.2669	0.0952
16	-0.1421	-0.1643	-0.2151	-0.0520	-0.1773	-0.2225	0.0369	-0.0156	0.3390	0.0420	0.1954	0.0490
17	-0.1263	-0.2256	-0.1469	-0.1365	-0.2002	-0.2431	-0.0266	-0.0423	0.1324	0.0434	0.0888	0.0167
18	-0.0929	-0.2336	-0.0993	-0.0324	-0.1749	-0.2445	-0.0512	0.0009	-0.0606	0.0334	0.0073	-0.0019
19	-0.0471	-0.1949	-0.0623	-0.0178	-0.1550	-0.2698	-0.0467	0.0276	-0.1942	0.0525	-0.0863	-0.0256
20	0.0012	-0.2114	-0.0724	-0.0154	-0.0338	-0.3009	-0.0128	0.0137	-0.2640	0.0492	-0.1622	-0.0364
21	0.0540	-0.2410	-0.1105	0.1548	-0.0155	-0.0155	0.0247	-0.0002	-0.2264	-0.0013	-0.2346	-0.0509
22	0.0705	-0.2865	0.0032	0.0733	0.0132	0.0322	0.0208	-0.0639	-0.1508	-0.0243	-0.2740	-0.0215
23	0.0604	-0.3169	0.0035	0.1380	0.0509	0.0815	0.0517	-0.1084	-0.1028	-0.0497	-0.2370	0.0296
24	0.0532	-0.3233	0.0006	0.2033	0.0921	0.0937	0.0124	-0.0506	-0.0721	0.0125	-0.1660	0.0891
25	0.0583	-0.1771	-0.1183	0.3079	0.1506	0.0533	-0.0505	0.0295	-0.1077	0.1121	-0.0899	0.1467

Source : Researcher's estimation

(1) The critical value for the significance of cross correlations at 5% level is 0.22632 and the critical value for the significance of cross correlations at 10% level is 0.18994

(2) The critical value for the significance of cross correlations at 5% level is 0.25303 and the critical value for the significance of cross correlations at 10% level is 0.2123

الخصائص والحقائق النمطية لتقلبات الاقتصاد الكلي في مصر: منهج دورات النمو

منى محمود حسين ابراهيم محمد عليوة

طالبة دكتوراه – قسم الاقتصاد – كلية التجارة - جامعة الزقازيق

ملخص:

يتعرض الاقتصاد المصري الى تقلبات كبيرة في الأجل القصير وعانى من فترات مختلفة من التوسع والركود، لذلك يفحص البحث الخصائص والديناميكيات الرئيسية المسببة للتقلبات الاقتصادية في مصر، ويهدف إلى بناء مجموعة من مؤشرات التقلبات الاقتصادية التي انقسمت إلى متغيرات قائدة ومتزامنة ومتباطئة، واستخدم لاشتقاق هذه المتغيرات "منهج دورات النمو". وخلص البحث إلى عده نتائج أهمها: أن الاستهلاك العائلي وإجمالي التكوين رأس المال ومعدل البطالة هي متغيرات متزامنة مع الدورة الاقتصادية، بينما تعتبر الواردات وسعر الصرف الاسمي والانفتاح التجاري ومؤشرات سوق الأوراق المالية من المتغيرات القائدة للدورة، وأخيراً فان المتغيرات المبطأة اشتملت على الاستهلاك الحكومي، والصادرات، ورصيد الحساب التجاري، والصادرات، وسعر الصرف الحقيقي البسيط والفعال، وجميع مؤشرات الأسعار، ومؤشرات القطاع المصرفي، والأجور الحقيقية. وخلص البحث إلى نتيجة رئيسية هي أن الصدمات الخارجية وعدم الاستقرار السياسي وتغيرات الطلب الكلى المحلي والخارجي والسياسات المالية والنقدية المسايرتان لتقلبات الدورة الاقتصادية كانوا أهم الأسباب الكامنة وراء حدوث التقلبات والدورات الاقتصادية في مصر وأن المصدر الرئيس لتقلبات الناتج المحلي الإجمالي الحقيقي هو مكون الاتجاه العام وليس المكون الدوري للمتغير.

الكلمات الدالة: التقلبات، الدورة الاقتصادية، المؤشرات المتزامنة، المؤشرات الرائدة، المؤشرات المتباطئة، الحقائق النمطية، دورات النمو.