Is Egypt willing to embrace Inflation Targeting as a framework for its monetary system?

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Is Egypt willing to embrace Inflation Targeting as a framework for its monetary system?

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Introduction:

The main purpose of this paper is introducing Inflation targeting as framework for the monetary policy while focusing on the Egyptian economy to be able to answer our research question which is "Is Egypt willing to embrace inflation targeting as a framework for its monetary system?.

The intuition beyond choosing to study inflation targeting framework is attributed to the fact that since inflation (which is the increase in the overall price level) is considered to be one of the most crucial issues that great attention should be paid towards it by all the countries, because high and volatile inflationary rate has negative effects on the economic efficiency leading to distorting relative prices, eliminate saving, inhibit investment, encourage capital outflows as local investors will invest their money in foreign assets, precious metals or real estate, restrain growth and development making economic planning a horror and encouraging social and political instability.

In addition, developed and developing countries that have witnessed high inflation rates during 1970s and 1980s have suffered from deterioration in their economic growth, acting against their external competitiveness, inhibiting employment.

Henceforth, governments all over the world have concluded that the major assistance the central banks can present for a satisfactory economic performance over the long run is to make inflation as well as inflation expectations fixed at a low level through adopting "Inflation Targeting" as a framework for monetary policy used to control price level increase.

Inflation targeting is a monetary policy strategy, in which the central bank estimates or target inflation rate while making it clear for the public and then try to drive real inflation towards the target inflation rate using interest rate changes in addition to other monetary instruments, that it will lead to achieving price stability.
Inflation targeting was primarily adopted by New Zealand in 1990, where inflation target has been very successful leading to achieve price stability, lessening long term inflation beneath the levels that should have been attained before adoption of inflation targeting in addition to attaining economic growth, accordingly such results have attracted other countries to embark adopting inflation targeting as a framework for their monetary policy, thus New Zealand was followed by Advanced Courtiers such as Canada, the United Kingdom, Finland, Sweden, Australia, and Switzerland, moving to Emerging countries such as Chile, Brazil, Korea, Thailand and South Africa and Transition countries such as Czech republic, Poland and Hungary, whereby this countries have experienced satisfactory economic performance represented in low inflation rate as well as steady economic growth.

Since inflation targeting has been widely used framework for monetary policy in most of the developed and developing countries, Egypt is one of the countries that has the potential to embrace inflation targeting as a framework for its monetary policy evidenced by the central bank of Egypt (CBE) has announced in 2005 its intention to adopt inflation targeting regime as a framework for its monetary policy once the fundamental prerequisites are achieved (IMF, 2007; CBE, 2005).

Moreover, the central bank of Egypt (CBE) mentioned that it is currently applying implicit inflation that will be explicitly announced once the CBE finalize building up its inflation-targeting framework in collaboration with the IMF.

This paper is organized as follows: section 1 reviews the literature of inflation targeting framework regarding what is inflation target, its prerequisites, advantages and disadvantages in addition to the transmission channels. Section 2 describes the way of designing and implementing inflation targeting framework, where section 3 displays success stories of some
countries experience that have adopted inflation targeting, moving to section 4 which elaborates Inflation targeting in Egypt and finally section 5 which answers our research question regarding is Egypt wiling to embrace inflation target for its monetary framework? Then, this paper ends with a brief conclusion.

**Section one: Literature Review**

1.1 Why Inflation Targeting

Monetary policy is the process through which the government, central bank, or monetary authority of a country manages money supply, availability of money as well as cost of money or interest rate seeking to accomplish a set of objective related to growth and stable economy.

The main objective of monetary policy is achieving price stability followed by full employment, local financial steadiness as well as normal operations of foreign transactions.

To achieve price stability, different tools are used such as inflation targeting, monetary targeting as well as exchange rate targeting, whereby inflation targeting is considered the mastering framework used that has currently by been adopted by many central banks to manage the monetary policy aiming to curb the increase in the price level and as a result of the failure of other monetary policy regimes such as monetary targeting as well as exchange rate targeting.

Worth to mention that monetary targeting is a strategy that many central banks started targeting the growth of money supply to curb inflation, this approach is valid in case the central banks can control the money supply in a reasonable way and if the growth of money is related to inflation steadily. Eventually, monetary targeting had an inadequate success because of the instability of the demand for money due to financial markets usual innovations.
One the other hand, Exchange-rate Targeting is a strategy where the Central banks used the currency peg as a nominal anchor that links the value of the local currency to another currency of a low inflation Co, which indicates that the country's monetary policy was the same as the country to which it is pegged, thus restricting the Central bank capability in responding to shocks such as any alteration in trade terms or changes in real interest rate, thus many countries started to adopt flexible exchange rates leading them to look for another nominal anchor.

Accordingly, several countries having flexible exchange rates started to target inflation directly, according to their understanding to the "Transmission mechanism" from the central banks policy instruments to inflation (e.g. interest rates).

1.2 What is inflation targeting?

The most appropriate definition for inflation targeting is given by Ben Bernanke et al. (1999) which is "Inflation targeting is a monetary policy framework having the following features:

Public declaration of official quantities targets for the inflation rate over one or more time horizons, in addition to clear acknowledgment that low and stable inflation is the prime long term goal of the monetary policy, among the other crucial features of inflation targeting are effective efforts to communicate with the public about the plans and objectives of the monetary authorities and in many cases, mechanisms that enhance the central banks accountability for achieving these objectives.

This definition can be packed up through adding independence tool for the central bank as well as the shortage of an explicit intermediate target, since all the factors influencing inflation are taken into consideration.
1.3 Advantages of Inflation Targeting

Ensuring and Preserving price stability through reducing inflation as well as making it less volatility.

Improving central bank accountability to achieve inflation target.

Inflation targeting entails central bank independence in managing monetary policy, where by independence we mean Central bank independence from the government, in addition to awarding the central bank full and exclusive power in choosing and implementing the rules of the monetary policy.

Transparency of the monetary policy through communicating with the public the monetary policy purposes and decisions.

In contrast to exchange rate peg, inflation targeting empowers monetary policy to concentrate on local considerations and to react to shocks in the local economy.

In contrary to monetary targeting, inflation targeting has the advantage that a steady relation between money and inflation is not necessary for its success, albeit inflation targeting utilizes all accessible information to set the supreme settings for the tools of monetary policy.

Inflation targeting can be simply understood by the public; accordingly, it is very transparent framework.

Owing to that an explicit numerical target for inflation augments the central bank accountability, thus inflation-targeting framework minimize the probability that the central bank may drop in the trap of time inconsistency.

In addition, given that the source of time - inconsistency is found in political pressures on the central bank to carry out additional expansionary monetary policy, inflation targeting has the benefit of concentrating the political argument on what a central bank can do in the long run.
which is managing inflation rather than on what it cannot do like enhancing output growth, reducing unemployment, augmenting external competitiveness via monetary policy

For inflation targeting to be able to achieve theses outcomes, there must exist a strong institutional commitment to make price stability the main aim of the central bank,

Moreover, inflation targeting regimes put too much load in making monetary policy transparent and to preserve regular channels of communication with the public

As demonstrated in Mishkin and Posen (1997), and in Bernanke, et. al. (1999), inflation targeting central banks have regular communications with the government and their officials take the advantage of every opportunity to make speeches to the public about their monetary policy strategy, in addition, inflation-targeting central banks have conducted additional steps by publishing reports to present their point of views about the past and future performance of inflation and monetary policy.

Since inflation, targeting regimes are associated with the transparency of policy, which has tended to make the central bank highly accountable towards the public

Fixing long run inflation expectations to inflation target.

Via inflation targeting, the market can evaluate the central banks performance.

1.4 Disadvantages of Inflation Targeting

As mentioned in Mishkin (1999) and in Bernanke, et al. (1999), inflation targeting is very rigid

Inflation targeting permits too much discretion.

Inflation targeting can raise output volatility.

Inflation targeting may reduce economic growth
Adding to the previously stated disadvantage, there are others shortfalls to the inflation targeting. Inflation targeting cannot avoid fiscal domination, as in the long run, huge fiscal deficits will drive inflation targeting regime to collapse.

Flexible exchange rate entailed by inflation targeting can lead to financial volatility. Unlike exchange rates and monetary frameworks, inflation rate under inflation targeting regime cannot be easily managed by monetary authorities (central banks).

Inflation targeting can lead to fragile central bank accountability, since inflation is not easily controlled by monetary authorities.

Inflation targeting is not adequate to guarantee fiscal discipline or avoid fiscal dominance, governments can keep following irresponsible fiscal policy while applying inflation targeting, subsequently large fiscal deficits will break down inflation targeting regime.

1.5 Motives for adopting IT

Since IT has achieved a quick widespread in various countries, led to the question what are the motives beyond countries decision to shift to inflation targeting? these motives can be demonstrated via two factors, which are:

1.5.1 IT deemed to be a way to reform monetary policy

Nowadays, there is a huge consensus that a monetary policy framework is effective as long as it's capable of attaining the goal of price stability.

In this respect, a nominal anchor of monetary policy is essential for price stability since it ties down public predictions about price.

Consequently, the effectiveness of a monetary policy is decided by the effectiveness of the embodied nominal anchor that send the accurate message to all practitioners about the potential behavior of the price level.
Hence, IT is a way to enhance monetary policy by anchoring public predictions of inflation around a declared target of inflation.

1.5.2 IT does not worsen economic performance

In literature, there is no accord between economists regarding the contribution of IT in the economic performance.

E.g. Truman (2003, 33) contributed the widespread of IT specifically in the nineties decade to the appropriate global macroeconomic environment during this period which contributed in awarding a good reputation and a good beginning to the inflation targeting regime. Albeit, disagreement between economists regarding the role of IT in the economic performance may be referred to the inconsistent results of empirical studies.

On one side, Mishkin and Schmidt-Hebbel (2000) discovered that IT is helpful specifically on lessening the inflation rate, decreasing the sacrifice ratio and output volatility, steering inflation predictions and handling inflation shocks in a better way, strengthening central bank independence as well as enhancing communication, transparency and accountability. Neumann, Manfred J.M., and Jurgen Von Hagen (2002) reached similar results concerning inflation volatility and output. Also, Landerretche, Oscar, et al. (2001) found alike consequences regarding output sacrifice, industrial output volatility and lessening inflation forecast errors according to a country VAR’s models.

On the other side, some studies discovered that IT did not add to the economic performance. Bernanke, et al. (1999), demonstrated that applying IT was not beneficial regarding the cost and pace of price stabilization.
Through comparing 7 inflation marketers to 13 non targeters Laurence, Ball, and Niamh, Sheridan (2003) found that the performance of both groups have been enhanced and there is no proof that IT foster performance

Though, Hu, Yifan (2003) followed mild point of view throughout the outcome of 66 countries from the period 1980-2000, where the author found weak support regarding that applying IT foster the trade-off between inflation and output volatility, even though IT doesn’t represents a helpful position in enhancing the performance of inflation and output.

However, the obvious view in the empirical studies is that IT doesn’t deteriorate economic performance in the countries adopting inflation targeting.

1.6 Inflation targeting prerequisites

The common inflation targeting preconditions that are desirable by the majority of the economists (Khan 2003, p. 10; Truman, 2003, p. 49; Batini et al., 2006, p. 18; Jonas & Mishkin 2003, p. 6) are classified into two categorized:

1.6.1 Institutional prerequisites, which are:

- Commitment to price stability.
- Independence of the central bank
- Macroeconomic stability
- A strong and well-developed financial system
- Monetary policy transparency and central bank accountability
- Absence of fiscal dominance
- Coordination between monetary and fiscal policies
- Exchange rate flexibility.
- Transparency and Accountability.
1.6.2-Technical prerequisites:

- Selecting a suitable price index that represents the purchasing ability of money, in addition to being simply understandable by the public, in relation to which the inflation target is determined.

- Clear setting of a quantitative target with the accepted variation band and of the time horizon over which the target will be followed, owing to the imperfection of monetary authorities in controlling inflation rate appears the need to determine a bandwidth, considering that a narrow band means a strong commitment of the central bank to follow price stability goal, albeit it may weaken the credibility of the monetary authority and may encourage instability in the monetary policy tools to achieve a given movement in inflation rate.

- Concerning determining the time horizon of the target, this depends on the primary inflation rate and the length of the transmission mechanism.

- The central bank’s prediction of inflation means that the central bank must react to the gap between the inflation prediction and the target, before the inflationary stresses become obvious.

Considering that the three crucial preconditions for inflation targeting that are highlighted in most of the literature are as hereunder:

1- Factual (de facto) independence of the central bank.

The independence of the central bank has to be de facto and not only de jure, where Complete legal independence of the CB (including independence of the objective and tool independence) is a debatable issue among economists; however factual instrument independence of the CB is a crucial condition as a precondition for applying inflation targeting.
The central bank should have the freedom to select the suitable instruments and alter them whenever it is essential without suffering from any stresses from the government.
In addition, the central bank should have the techniques and technicians that enable it from attaining its goals without having the need for external intervention.
That is, the government may plan the inflation targets and their acceptance intervals and delivers it to the central bank to start attaining it, however the implementation of inflation targeting should be achieved solely by the central bank without receiving any instructions from any entity, accordingly the existence of government representatives in the monetary policy committee as a voting member should be banned.
Worth noting that if there is fiscal domination, thus the CB independence is not factual even if the CB is having both legal independence of instrument and there are no government representatives in the MPC.
Hence the existence of fiscal domination make it hard for in any country to adopt IT framework.
The fiscal dominance can be noticeable through the official responsibility of the CB to finance government budget deficits.
Masson et al. (1998), Debelle et al. (1998) and Khan (2003) mentioned additional factor for fiscal dominance which is the capital market shallowness.
To sum up, the factual independence of a central bank can be represented in three main pillars which are:
- CB legal instrument independence
- No presence for the government representatives as voting members in the monetary policy committee (MPC).
Non existence for fiscal dominance represented in no commitment for the central bank to finance budget deficit, while financial markets must have sufficient capability to absorb government debt such as treasury bills.

2-The main goal of monetary policy should be commitment to price stability

The central bank main goal should be concentration in attaining price stability without targeting any other goals such as exchange rate or employment.

On one hand, if the monetary policy was committed to other targets it will be confined to those goals and as a result it will not succeed in attaining the declared inflation target.

On the other hand, the public will not guarantee that the monetary authorities are giving the full attention to inflation targets, which in return will worsen the public expectations regarding the future of inflation due to the doubt regarding the credibility of the declared target.

Yet, the central bank should interfere to stop any undesirable effects due to the variation in macroeconomic variables on the future inflation. (Khan, 2003, p. 10).

The commitment to attain price stability as a crucial objective of monetary policy entails some degree of CB accountability regarding inflation targeting completion.

The lessons from the international experiences as stated by Bernanke et al. (1999, p. 38, p. 296) delivered two shapes of accountability through:

- Fist, comparing inflation results with the target
- Second, through CB commitment to present the public with a persuading rationale for the selection of the policy that they are following

Since inflation react to followed policy after some time lags, in addition that inflation targets are barely attained accurately in the short term.
Thus the second shape is considered to be the solely option for preserving accountability

Practically, most CBs favor to be more transparent and credible to the public through declaring the reasons for missing the target (exception from the commitment to accomplish the inflation target) which clarify two things which are

- Why accountability of CBs is less formalized in practice.
- Why a transparent monetary policy is very essential not only as a tool to anchor public anticipation around a declared inflation target but also as a tool of CB accountability to the public.

To sum up, an obligation to price stability entails two main factors:

- A CB should not aim to target any variables other than inflation rate.
- CB has to be transparent to the public regarding the exceptions of inflation target, meaning that the CB should declare inflation target escape clauses.

Accordingly, transparency is a practical tool making the CB accountable to the public in attaining the inflation targeting.

3-Anticipating capability:

Due to the fact that there is time lag between the alteration of monetary policy tools and their related impacts on inflation, an IT framework has to be followed in a forward-looking behavior. Where the present alteration of monetary policy tools shall be created on a systematic evaluation of the future trend of inflation.

Accordingly, the adoption of an IT framework through declaring various targets for inflation to be implemented in the future and the method to be carried on towards achieving those targets entails (Debelle et al., 1998, pp. 3-4):

- Designing in advance a model for predicting inflation and inflation projection.
The CB should have apparent idea regarding its monetary policy transmission mechanism and the related lags.

Availability of comprehensive high quality and modernized database of the economic variables

1.7 How does Inflation Target work?

According to (Sarwat Jahan, 2011)

- First, the central bank projects the future pathway of inflation.
- After that comparing the projection with the target inflation rate, where the target rate is the inflation rate that the government considers matching with the economy.
- The disparity among them sets to what extent the monetary policy has to be altered.
- Some countries have selected inflation targets with regular ranges around a midpoint,
- Where others have set only a target rate or a ceiling limit to inflation
- In short, all countries set their inflation targets in low single digits
- Inflation target close to zero is not preferable since it will not permit real interest rate to decrease sufficiently to enhance overall demand while the central bank is attempting to foster the economy.

1.8 Monetary Policy Transmission channels

Monetary policy transmission mechanisms are the process through which variation in monetary policy decisions influence the economic growth rate and/or inflation rate (Taylor 1995).

According to Mukherjee and Bhattacharya (2011), the literature highlighted four key transmission channels through which Monetary policy affects demand which are:

- The conventional interest rate channel;
- The credit supply channel
- Exchange rate channel
- The asset price channel

**Transmission channels under Inflation Targeting:**

A well understanding to the monetary policy transmission mechanism is a precondition for the successful adoption of inflation targeting.

The prime monetary policy tool under inflation targeting is the short term interest rate

- The first step of the transmission process: when alteration in the policy rate causes movements in the retail interest rate which is the commercial bank deposit and lending rates.

- The second step: the alteration in the retail rates influences private consumption and investment and accordingly aggregate demand.

- The third step: alteration in aggregate demand influence the level of activity in the local economy, thereby influencing the inflation rate in the last step of the monetary policy transmission process.
Section Two: Design and Implementation of Inflation Targeting

Recognizing the fruitful benefits of inflation targeting depends mainly on how well the IT strategy is designed and implemented.

There are two main advantage of Inflation targeting which are: Transparency and flexibility

Transparency: means obvious and timely communication of policy objectives plans to the public, the purpose from ensuring policy transparency:

- Raise the public understanding regarding what monetary policy can and cannot do.
- Decrease of economic and financial doubt.
- Enhancing the accountability towards the government.

Flexibility: it is the central bank ability to respond in a good way to the short run macroeconomic development within the restrictions imposed by the inflation targeting framework.

Over the long run, transparency often contributes to flexibility; albeit on the short run applying operational choices that foster transparency sometimes lead to minimizing flexibility and vice versa.

Therefore in designing the inflation targeting framework, the important issue is to balance between transparency and flexibility.

2.1 Operational Issues

2.1.1-Which measure of inflation should be used?

The first stage in designing an inflation target strategy is to determine the price index that its rate of variation will be targeted.

To achieve maximum transparency, the selected price index has to be well known to the public, wide ranging and timely.
To achieve maximum flexibility, the index has to rule out variation in prices existing in small sectors and sudden price jumps that may affect the core inflation "e. g an increase in the value added tax or sales tax", the selected index has to exclude at least the effect of the first round due to such prices variation.

Almost all inflation targeting CBs have chosen CPI to measure inflation rate, as it ignores specific volatile components to concentrate on core inflation.

2.1.2-What numerical value should the target have?

To determine a numerical value for an inflation target, "Price Stability" has to be the CB’s main concern in achieving their policy objective.

Price stability can be defined according to Federal Chairman Alan Green Span as a very low inflation rate to an extent that it is not paid an attention by business & households in planning their decisions, albeit this definition doesn't assist in determining inflation targets.

On the contrary, a strict definition of price stability proposes an inflation rate equal or very closes to zero.

There are significant economic risks to targeting inflation at a very low level as well as targeting inflation at too high level.

For example: Akerlof ,Dickens ,and Perry (1996) showed that if nominal wages are inflexible to decline, thus reducing real wages can takes place through inflation, though with an extremely low inflation rate, reduction in real wages can’t happen as a reply to the reduction in labor demand causing a rise in unemployment.

Additional argument against targeting inflation rate equal to zero is that such policy drive the economy towards deflation, generating severe liquidity and solvency problems worsening the economic contraction (Bernanke and James 1991, Mishkin, 1991).
To sum up, undershooting a zero IT (deflation) is costly than overshooting a zero inflation target. From that, we can propose that inflation targeting has to be set around 1%-3% per annum, where this is deemed to the common practice of all inflation targeting CB’s. Consequently, one of the advantages of the inflation targeting is that it presents a floor as well as ceiling for Inflation rate.

2.1.3. What Horizons?

Inflation target can be determined for one or more horizons. Noting that targets less than one year or more than four years has no meaning, justified in light of the short tem horizon, inflation is out of the monetary policy control and for the long horizon, distant target would have little credibility. Although from 1-4 years, CB choice of target affects the tradeoff between transparency and flexibility. The more tightly is the target, the less uncertainty the Central bank communication with the public, but the greater the restraints on Central Bank liberty of action in the short run.

2.1.4-A Point or a Range?

Following the choice of the horizon and the numerical values of targets, Inflation Targeting Central Bank has some caution about whether to declare its target as a single point or as a range around some midpoint. Such choice depends on what are the factors affecting the expectations and how the public will react to a target miss. In case the central bank decided to declare a range for its target, in this case a narrower range communicates more commitment by the central bank to arrive at its inflation goal than does a
wider range, albeit as per the usual tradeoff, it diminishes the bank ability to reply to unexpected events.

Unavoidable errors in managing inflation may lead inflation outside its range despite the Central Bank best efforts.

Worth stressing that credibility damage as a result of missing a target range is greater than missing a target point.

The spreading of the target range reflects the central bank evaluation of ambiguity surrounding the effects of its policy.

Some authors have recognized that the uncertainty accompanied with high inflation (e.g. Haldane and salmon (1995), and Stevens and Debelle (1995) entail a wider range on the order of 5-6%.

While, a broader range might lead the public and the markets to doubt the CB commitment to IT, it remains to be seen whether doubt about inflation will be as high under IT as it has been in the past.

As long as public are expecting the CB to control inflationary pressures, accordingly the forecasting and management of inflation may be improved.

Lately, there was a noticeable decrease in the volatility of inflation in the majority of industrial countries even if they are inflation targeters or not

2.1.5-What information should be used in policy making?

Once the CB has determined its Inflation Targeting, it turns to the practical problem of reaching the target. So, *what information should be used to make inflation among the preferred range?*

The answer to this question is “any information related to the forecasting of inflation”.
Inflation targeting Central Banks have depended more on variables presenting helpful information about the situation of the economy known as information variables or indicator variables.

An example of information variables utilized by several Inflation targeting CB (especially Canada, Sweden and New Zealand) is “Monetary Condition index”.

*Monetary Condition index* is a weighted combination of interest and exchange rates which is thought to help the Central Bank decides what the future path of inflation is likely to be.

### 2.1.6-When deviations from the target should be allowed?

Inflation targeting is sometimes missed and some of the misses are as result of decisions by monetary authorities, deciding whether to alter the target or not depends mainly on the type of the shock striking the economy.

E.g. An aggregate supply shock such as an increase in oil prices that may lead to a conflict between stabilizing output and employment in the short run and stabilizing inflation in the long run, therefore targeting a price index that ignores first round effects of supply shock can enhance this conflict.

Though a supply shock that is resulting from unexpected sources may give reason for missing or altering previously announced Inflation targeting.

### 2.1.7-When is the best time to start implementing Inflation Targeting?

It is exciting that Inflation Targeting has been presented at times of when inflation was already low and decreasing rather than at times when inflation was increasing and uncontrollable.

### 2.2 Second Communication Issues of Inflation Targeting:

One of the advantages of IT is that it enhances the *transparency and accountability* of monetary policy, to attain this advantage, it entails answering a number of essential questions.
2.2.1-What should be communicated to the public?

The central bank has to introduce data about the economy, the banks' monetary policy as well as its policy intention and communicate the justification for adopting Inflation targeting and the policy strategy itself.

In addition to communicating the current outlook for the economy and inflation indicators reports comprising private sector predictions and central bank forecasts and introducing progress reports on its success or failure in reaching its targets while illustrating why a target was missed or altered. Moreover, communicating the credibility of the central banks on the objectives and plausibility of communication and its proofs of reaching targets.

Ahead of this information, the inflation targeting central bank has a liability to educate the public about policy tradeoff and what monetary policy cab and cannot do, as well as provoking the public to understand and participate in the policy since that will improve the policy makers' accountability to the public resulting in a better economic output.

2.2.2 What Forums?

The central banks have different forums to communicate with the public such as speeches, press, conferences, statistical release and occasional publication.

Currently, various inflation targeting central banks issue reports including comprehensive evaluation of economic conditions and current information on inflation and monetary policy.
Section Three: success stories of some countries that have embraced IT

3.1. Developed Countries experience

3.1.1 Reviews about developed countries experience with inflation targeting

The academic argument about inflation targeting regime embarked recently after New Zealand first adopted inflation targeting as a framework for its monetary policy in the beginning 1990. And since that time, more than 22 countries have formally adopted inflation targeting and no country that has adopted it has detached it, even though there is still an argument around the contribution of inflation targeting to the whole economic performance.

The findings of empirical studies illustrated that inflation-targeting countries have succeeded in eliminating inflation and its volatility and to get inflation results closer to target levels.

Debelle and Lim (1998), have compared average inflation levels for seven inflation targeting countries with seven non inflation targeting countries, this study found that a sharp reduction in inflation in the inflation targeting group concluding that inflation targeting is beneficiary for countries suffering from lack of anti inflation credibility.

Another study has concluded that inflation targeting countries are able to reach their inflation targets and minimize inflation volatility.

Adding to the aforementioned studies results, another study has used cross section difference in difference regressions to inspect the treatment effects of inflation targeting in 20 OECD countries, out of which seven has adopted inflation targeting, they found that after adopting inflation targeting, there was an enhancement in the economic performance in these countries, albeit non targeting countries also witnessed enhancements at nearly the same time.
Thus, better economic performance reflects factors rather than monetary regime and it is concluded that inflation targeting does not result in a significant effect, in other words, inflation targeting is unrelated.

On the other side, there are some studies that delivered different results. Dueker and Fischer (2006) found minimal empirical evidence that an inflation targeting framework performs much better than a non inflation targeting regime. Svensson, Blum and Durlauf (2007), concluded that there is no evidence that inflation targeting has been harmful to growth productivity, employment or other measures of economic performance. Lin and Ye (2007), Used matching methods to examine the treatment effects of adopting inflation targeting on seven industrial countries with fifteen non inflation targeting industrial countries as the non treatment group, they found insignificant results regarding inflation and its variability, Angeriz and Arestis (2008), Using intervention analysis found less inflation rates, well anchored and precise inflation expectations for both targeting and non targeting countries. Accordingly we can conclude that empirical studies reviews haven't succeeded in producing convincing evidence that IT framework enhances inflation rate and economic stability, in addition one of the studies pointed out that in 1990's the surrounding circumstances were having stagnant economic environment "friendly period to price stability" and inflation was enjoying a declining trend in many countries specially developed countries.
3.1.2 Case study: United Kingdom experience

3.1.2.1 Rationale for choosing United Kingdom

Since the main aim of this paper is examining Inflation Targeting in Egypt, accordingly the rationale behind choosing United Kingdom was due to the fact that it is having circumstances that are quite similar to Egypt.

Thus through studying UK experience with Inflation Targeting, various useful lessons and experience can be extracted as guidance for the Egyptian case.

3.1.2.2 What are the common circumstances between UK and Egypt?

**Motivation:**

United Kingdom motivation to adopt inflation targeting was aftermath of sterling’s exit from the European Exchange Rate Mechanism (ERM) “The foreign exchange crisis” of September 1992, which has resulted in the Floating and depreciation of the pound.

Which was quite similar to Egypt motivation to adopt inflation targeting regime which was the CBE devaluation to the pound in March 2016, by 13% (EGP 8.85/ US dollar), which causes an increase in inflation, in addition to the further action that happened in November 3, 2016, where the government and the CBE floated the pound, which was followed by an instantaneous increase in inflation where by the end of 2016, the twelve month inflation rate had stroked 23%, and carry on its rise through the first four months of 2017, reaching a historical high of 31% in April.

**Purpose:**

The purpose from adopting Inflation Targeting in United Kingdom was similar to Egypt purpose for adopting Inflation Targeting which was to strengthen the credibility of monetary policy and restore a nominal anchor.
**Role of the Central Bank**

The bank of England did not have *unilateral authority* to manipulate the instrument of monetary policy, and due to the weak position of the bank of England before May 1997, the bank focused its inflation targeting efforts on:

- **Limited forecasting inflation and assessing past inflation performance**
- **Bank functioned as the chancellors “Counter inflationary conscience”,** where control was exercised by the “Chancellor of the Exchequer”.
- **Communicating to the public its monetary policy strategy and its commitment to price stability, relying heavily on publications such as the "Inflation Report".**

The role of the central bank of England was similar to the role of the central bank of Egypt, since Egypt central bank was not totally independent from the government in managing the monetary policy.

3.1.2 .3 Learned lessons from the United Kingdom Experience:

The United Kingdom's experience has particularly interesting lessons for inflation targeting. Since inflation targeting was conducted until May 1997 under severe political restrictions in which the government, not the central bank, sets the monetary policy tools, thus it was not clear which is the responsible party for conducting the decisions to shift interest rate as well as which party is accountable for achieving inflation targets, Was it the bank of England (which is the entity responsible for making public predictions or the Chancellor of the Exchequer which set the monetary policy tools.

Albeit, this ambiguity causes some perplexity regarding the degree of commitment to inflation targets, England inflation targeting has assisted in lowering and making inflation rates more stable.
Although the weak position of the bank of England, the success of inflation targeting can be attributed to bank of England regarding:

- Concentration on transparency and the efficient illustration of monetary policy strategy.
- Creating innovative ways of communicating with the public, especially through its inflation report.
- Moreover, the bank of England's success in communication has been imitated by many other central banks following inflation targeting.

3.1.2.4 Recommendation for Egypt from United Kingdom Experience

Thus, Egypt can benefit from United Kingdom in the point of even if the central bank was not the fully responsible entity for setting the monetary policy, England succeeded to implement inflation targeting, in addition the central bank was able to play a prominent role in achieving transparency and communicating with the public in such away that many countries have emulated England in it.

Thus, even if the CBE was not fully independent in setting its monetary policy, it still can succeed in hitting the target; in addition CBE can supplement the government by doing additional roles that support the success of the target.

3.2. Developing Countries Experiences

3.2.1 Reviews about developing countries experience with inflation targeting

Lately, more than dozen developing countries have officially adopted inflation targeting

In general, most of the developing countries whether they targeted inflation or not acted much better in light of growth and inflation since 2000 than during 1990's

The evidence elaborated that those that adopted inflation targeting have witnessed much more enhancement than others, whether in light of inflation and growth performance
Lin and Ye (2007), examined the effect of inflation targeting framework on inflation an inflation variability in 13 developing countries that have this framework by the end of 2004 using a variety of propensity score matching methods. They discovered that inflation targeting has quantitatively and statistically significant results on reducing both inflation and inflation variability in these countries, on average adopting inflation targeting has led to a decline in the level of inflation by almost 3%.

Goncalves and Salles (2008), Concentrated especially on developing economies concluded that the inflation targeting effects were statistically and economically significant.

Brito and Bystedt (2009) used a panel data to evaluate the effect of inflation target in developing countries and concluded that no evidence that inflation targeting framework enhances inflation performance and output growth in developing countries. Accordingly inflation targeting framework doesn’t reduce the costs of disinflation.

Eventually a group of scholars from Cambridge university derived a painstaking research in the effect of inflation target, they concluded in these words: We have attempted in this study to gauge empirical evidence for both developed and emerging countries that adopted the new monetary policy strategy that has come to be known as inflation targeting (IT). It may very well be the case that IT countries, developed and emerging, have been successful in taming and controlling inflation. But then there is also evidence that clearly suggests that non-IT central banks have also been successful in achieving and maintaining consistently low inflation rates.”

The preceding empirical findings constructed mixed evidence in economic performance regarding developed and developing countries, but it is clear that developing countries has reaped more from inflation targeting policy than developed countries.
We can conclude that inflation targeting countries whether developed or emerging have been successful in lowering and managing, albeit there is also no evidence that proves that non-inflation targeting countries have been successful in attaining and preserving low inflation rates in general, from the available evidence we can conclude that a central bank doesn’t need to follow inflation targeting framework to attain and preserve low inflation, especially during the mature stage of stationary targeting.

3.2.2 case studies from developing countries: Chile

3.2.2.1 Rationale for choosing Chile

The rationale behind Selecting Chilean case to be studies can be traced to the following reasons: It has been enjoying with similar economic circumstances as Egypt (such as the role of the central bank, financial position, banking regulation and government dominance) except that it did not suffer from a state deficit.

Chile is considered one of the earliest example of an emerging market country adopting inflation targeting in 1990, with the inflation rate in excess of 20% which is quite similar to the Egyptian case,

3.2.2.2 Learned lessons from the Chilean experience:

Since Chile was having similar economic circumstances like Egypt, although before going ahead on applying inflation targeting, Chile’s central bank was well aware of the severity of controlling inflation and reaching the target when inflation was in the double digits, thus it dealt with this problem through the following.

- Chile passed new central bank legislation in 1989, thus giving independence to the central bank, making its main objective price stability.
- Working on improving the fiscal policy, making the fiscal balance in surplus.
- Enhancing the quality of the banking regulation and supervision making it with high quality like industrialized countries.

The Chilean case proved that inflation targeting can be used as a successful framework in emerging countries, even when initial inflation was 20%.

Chile’s central bank succeeded in lowering its inflation, starting with targets of over 20% for 1991 and lowering them slowly to 3.5%.

It is worth stressing that the success of inflation targeting cannot be accredited solely to the Chilean central bank, though there are complementary policies such as absence of large fiscal deficits and strict regulation and management of the financial sector have been important to its success.

One of the essential factors of Chile’s strategy success has been its gradual hardening of the targets across time; instead of applying firm inflation targeting that tighten the flexibility of the central banks leading to its failure in hitting the target.

3.2.2.3 Drawbacks in Chile's inflation Targeting regime:

Chile has not accomplished a full-fledged inflation targeting regime, Since the Chilean central bank has not released an Inflation Report, nor does it issues inflation predications; in addition that the accountability mechanisms of monetary policy are weak.

3.2.2.4 Recommendations for Egypt from the Chilean experience:

Since Egypt and Chile are emerging countries that are having similar circumstances, accordingly Egypt can learn from what Chile has done to hit the target through following Chile's steps while adopting inflation targeting like passing new central bank legislation, improving fiscal deficit and enhancing banking regulations and supervision, etc.
Accordingly, from the Chilean case of study, we can conclude a lot of lessons that can be used as guidance for policy makers in Egypt.

3.2.3 case studies from developing countries: (Czech Republic - Poland and Brazil)

3.2.3.1 Rationale for choosing CPB Countries

The rationale behind selecting these countries is that the economic circumstances of these countries in 1990's were quite close to the economic circumstances in this period, where these alike economic circumstances can be summarized in two folds:

- The implementation of the economic reform program at the beginning of 1990's
- The pegging of foreign exchange rates for long period of time

However, the chief difference was the action of the CBE to the economic crises that took place in the second half of 1990's, where the CPB countries acted to these economic crises by floating theory local currencies and started to adopt IT framework, where the situation was not alike in CBE.

3.2.3.3 learned lessons from the experience of CPB with IT

1. These countries were eager and aiming to attain the aim of price stability, the main intention beyond achieving the goal of price stability was their incentive to start preparing their economy for adopting IT regimes and since these countries intention was real, it has been translated quickly into concrete steps.

For instance the Brazilian experience, the Brazilian CB as well as the government became persuaded with the idea of adopting IT as a framework for their monetary policy to attain the goal of price stability; accordingly the preparation and the shifting to the IT regime took place in a very short time that ranges from March and June 1999.
Till the beginning of March 1999, the Brazilian CBE was not enjoying formal instrument independence; in addition the anticipation capabilities were inadequate and most of the BCB staff was not fully aware with what IT regime was.

2- IT was adopted to provide a nominal anchor for monetary policy, as after these counties have floated their currencies, the Czech Republic Central bank concluded that adopting IT framework is the best option to attain the goal of price stability on a forward looking basis.

On one side, a monetary policy regime without an explicit nominal anchor was not a suitable option for fastening individual's expectations about the future lane of inflation, since CBs in these counties don’t have a track record of credibility.

On the other side, a monetary targeting framework was not a suitable option especially after the liberalization of capital flows and financial markets which has weakened the relation between the money supply and the price levels.

The stimulus beyond that those counties have floated their currencies was not to lose the effective part of their foreign reserves especially on the aftermath of the economic crisis owing to the rough attacks on the local currencies due to the Asian crisis as well as the external imbalances in their current accounts which has emerged due to pegging the foreign exchange rate in coincidence with high local inflation, whereby the depreciation of the local currencies took place.

3- IT is challenging if the pass-through effect is high, the problem here is that the CB has to be credible regarding the declared inflation target in order to make it act a nominal anchor for individuals expectations, albeit the CB may face a high effect of the exchange rate pass through which may weaken the CB capability to attain the inflation target.

Accordingly to be credible, The CB has to previously decide escape clauses for its targets.
After Brazil was enforced to float its currency in order not to lose the effective portion of its foreign reserves under the pegging of the foreign exchange rates, the BCB was scared of a higher level of pass-through effect in the economy, where BCB has estimated that the pass-through effect at that time was around 30-40% according to the predictable portion of tradable goods in the economy.

Even though the pass-through effect was high, the BCB didn’t maintain targeting the foreign exchange rates but rather it declared its stimulus to adopt IT framework,

The motive for switching to inflation targeting was that a nominal anchor for the monetary policy was essentially required at that time to mitigate the panic in the economy (Fraga, 2000).

4-Missed inflation targets can be referred to as prediction fault, even though the escape clauses were elaborated explicitly in the case of the CNB (Czech Republic) and implicitly in the case of the NBP (Poland), the CBs in both countries missed their inflation targets several times.

The CNB in its evaluation of 10 years of IT subtracted that the forecast faults were the reason for missing the majority of its targets.

Although the NBP was less transparent concerning the actual causes beyond the missing targets, it took same steps as the CNB to enhance its prediction capabilities through creating more precise models in addition to enhancing its knowledge about monetary policy transmission mechanism.

5- The CB independence was factual. The CBs in these countries enjoy legal instrument independence in coincidence of the non existence of both government representatives on the MPC as a voting member as well as there was no fiscal dominance through formal commitment to finance budget deficit.
6 Factual independence of the CB was not awarded by the government albeit it was presumed by the CB. The CBs, especially in the Czech Republic and Brazil, were the originators for suggesting IT framework to their government. Perhaps the CNB didn’t paid much effort to induce the government with the idea of adopting IT framework because the government was already stimulus by the EU accession

3.3.4 overall learned Lessons from the experience of countries adopted inflation targeting

From the experience of the countries that have adopted inflation targeting, we can draw several lessons, which can be demonstrated hereunder:

- There is no trade-off over the medium to long term between growth and low inflation, albeit evidence stresses that a credible commitment to preserve low inflation is useful for long-term growth where this evidence stresses this relation for emerging as well as developed countries.
- No country follow a strict inflation targeting regime that concentrate only on inflation even in the short run, but most countries pursue flexible form of inflation targeting in which short term conflicts between growth and inflation arising from unfavorable supply shocks are solved in order to lessen the employment and output volatility
- Inflation targeting doesn’t present a magic formula for isolating a country from external financial troubles or other effects on the real exchange rate and external competitiveness, in light of this inflation targeting is not unlike other monetary policy regimes, albeit what inflation targeting can do is to makes use that when troubles occur, hey don’t generate an inflationary process that weaken long term growth
- The experience of emerging as well as industrialized countries that have adopted inflation targeting proposes that inflation targeting can be useful even if not all of the requires
conditions are in place, noting that the least required conditions are represented in central bank independence, and related accountability are desirable to follow an obvious mandate.

- The central bank needs to have an efficient tools to affect local pending and savings trend which requires financial markets and stagnant financial system
- Eventually, the central bank needs to have a sufficient economic and financial data, analytical capabilities and a reasonable understanding of how monetary policy has an effect on inflation in order to react in a timely manner to inflation pressure

Section 4: Egypt switching to Inflation targeting Regime is it a feasible option or not?

4.1 Overview about Egypt current economic situation

Throughout the past decade, Egypt has witnessed relatively high rates of inflation, but starting from 2011, the rise in consumer prices started to accelerate, Where during the period 2011-2015, the average rate of inflation was about 10% a year; such increase can be attributed to many factors such as the increase in oil prices globally, rise in the food prices, increasing fiscal deficit as well as the fast increase in the supply of money.

In 2016-2017, the situation has been totally altered, where the inflation rate has started to move to a higher level. Where the the twelve-month inflation rate jumped from 10% in 2016 to above 30% in April 2017, the reason for such severe increase can be
attributed to the following:

During 2011-2015, the Egyptian pound has deprecated by an average of 7% a year, regardless the instable political situations and severe balance of payments stresses.

In March 2016, the CBE has devaluated the pound by 13% to reach EGP 8.85/1$ leading to a rise in inflation in April 2016, since the devaluation has affected consumer prices through the increase in the import prices which is called the effect of exchange rate pass-through, where the Inflation continued then to increase for the next six months.

On November 3, 2016, the Egyptian government in accordance with the CBE has announced the floatation of the Egyptian pound, allowing the market forces to set its foreign currency value leading to a depreciation of 48% in the currency’s value.

Where, the currency instantaneously has dropped to EGP 13.89/ 1$ and by November 8, 2016 it has witnessed further decrease to EGP 17.8/1$, since then the value of the pound has stabilized at around EGP 18/US dollar.

As a result this dramatic decline in exchange rate has resulted in, an instant rise in inflation because of the adoption of the new floating exchange rate regime, in addition to Egypt nominal GDP (in US dollar) has declined from $ 350 Billion to $ 170 Billion.

By the end of 2016, the inflation rate for the twelve months had reached 23%, and continued its increase until the first four months of 2017 reaching a historical increase of 31% in April.

The floatation of the currency as well as the high inflation both are having two separate effects on the Egyptian citizens, which are:

- First: they meant a critical decrease in the purchasing power of many, as the prices of basic goods and imports are anticipated to increase by 200-300%
• Second: it will result in a reduction in the real interest rate regardless the increase in nominal interest rate.

The intuition beyond the decision to float the Egyptian pound can be traced back to the following:

The Egyptian government, the CBE and IMF have an agreement on a three year economic program under the IMFs extended fund facility worth 12$ billion, where this agreement has stated the following:

• Repair macroeconomic stability, through minimizing external and budget deficit and reduce inflation

• Increase economic growth and create jobs

The program main prerequisites are as follows:

• Attain extra finance of $6 billion to support the IMF loan and financing from other international financial institutions.

• Lessen the fiscal deficit via a combination of tax reforms and reduce in government expenditures especially subsidized

• Embracing exchange rate flexibility, thus the Egyptian pound can respond to market forces of demand and supply of foreign exchange Lessing the pressure in the country's foreign exchange reserves

Accordingly, Egypt has pursued the following actions to meet the prerequisites of the IMF:

• Egypt has collected external finance in the form of deposits placed in the CBE by the United Arab Emirates and Saudi Arabia.

• The parliament has passed the Value-Added Tax (VAT) law, in addition to Cutting subsidies on fuel, electricity, and particularly food.
Although Egypt exchange rate system has been classified by the IMF as a managed floating, government and CBE are averse to floating preferring to manage the rate within a certain boundaries, nonetheless in March 2016, the CBE has devaluated the pound by 13% to EGP 8.85/dollar while announcing that it was planning to shift to a more flexible system informing that a more depreciated pound would augment exports making them more competitive, lessen imports through rising their costs as well as attracting foreign investments, albeit the CBE didn’t pursue any action from March regarding exchange rate, however it kept relying on a mixture of foreign exchange intervention, increase interest rate, in addition to controlling foreign exchange purchase and transfers to keep the US dollar value of the pound, nonetheless due to the lack of sufficient foreign exchange reserves and the IMF insistence on floatation has obliged the CB to float the pound which took place on November 3, 2016 as aforementioned.

After the pound floatation, on November 2016 the IMF approved the three-year loan to Egypt, which worth USD 12 billion to assist the government economic reform program.

This high inflation has negative effects on the economy such as:

- It entails welfare costs on the society
- Hinder efficient allocation of resources through obscuring the indicator role of relative price changes
- Restrain financial development through making intermediation costly
- Harm the poor since they don't have financial asset that can be a hedge for them against inflation
- Lessen long term economic growth
Noteworthy that studies have pointed out that double-digit inflation has severe negative results, thus for many reasons Egypt has to bring its inflation rate into single digits.

Previously, the main objective of Egypt's monetary policy was to keep the steadiness of the pound and a sufficient stock of foreign reserve while controlling inflation was deemed to be a second priority.

However in a floating exchange rate system, the priorities should be drifted towards making inflation as the chief objective, since the exchange rate will be determined in the market and therefore there will be no stress on foreign exchange reserve as the exchange rate will be the factor that will equilibrate the supply and demand for foreign exchange, accordingly there is a quick need for altering the monetary policy regime.

The CBE has to move to an explicit inflation-targeting framework that many developed and developing countries have successfully implemented.

This means selecting a target for inflation, then conducting monetary policy through altering interest rate to reach the target.

**The inflation targeting monetary policy framework will have a number of advantages:**

- Facilitating pressure on foreign exchange reserves
- Encourage efficient financial sector reforms
- Improve CBE transparency of operations
- Eliminate the government role in conducting monetary policy

**In addition, the success of the CBE depends on:**

- Full independence of the CBE
- Full freedom to use its tools.
- A mandate to achieve its objectives;
A clear and strong coordination system between financial, monetary, and investment policies;

Transparency of the procedures.

Worth stressing that the new monetary policy framework will not reduce inflation solely, however the government on the other side has to control budget deficit, which creates more demand burden in the economy.

Therefore, it is expected that the combination of adopting inflation-targeting framework as well as reducing fiscal deficit will bring the Egyptian inflation rate to a more sustainable level, considering that this action should be persuade as soon as possible because the longer the delay, the more hard it will be to tackle inflation since it will become rooted in the system.

4.2 History of the Monetary policy developments in Egypt since 1990's

Since 1950s, the very essential alterations that took place in Egypt macroeconomic policy was in the beginning of 1990's when the Egyptian government endorsed an agreement with the IMF and the World bank, recognized as the economic reform and structural adjustment program (ERSAP), where this agreement has been initiated after the aftermath of the significant economic performance of the Egyptian economy in the late 1980s, where the external debt ratio (% of nominal GDP) reached 131.7% in 1988 and 115.23% in 1989.

ERSAP program has entailed two main objectives, which are:

1. Changing the Egyptian economy into a market based economy through 4 channels:
   - Liberalizing the prices
   - FX rate
   - Interest rate
   - Trade
2. Stabilizing the Egyptian economy and correcting the macroeconomic policies.

Before 1990's, the Egyptian economy was described as a centralized economy; meaning that there is central planning and the public sector was controlling the whole economy, therefore the economic policies were executed through direct orders.

Since the government was controlling and managing most of the prices, so the prices role as a leading factor for economic activities was interrupted in all the economy.

Regarding the private sector role, it was not fully ignored albeit it was very restricted (Awad, 2002).

Abu-Elayoun (2003) stated that the monetary authorities have followed monetary targeting regime in the period prior ERSAP to attain the price stability goal, however, the relation between the intermediate target "M2" and the main goal of monetary authorities which is "price stability" was not robust.

Moreover, during these periods (which is before ERSAP).

- The CBE hasn’t declared any targets for the monetary growth,
- Beside that, the foreign exchange rate was anchored against the US dollar.
- The government was managing most of the prices of goods and services in the economy
- In addition there was fiscal and financial domination practiced during these

After the introduction of the ERSAP, the main goal of the monetary goal of the monetary policy was to attain both internal and external stability of the domestic currency aligning with the national objective of stimulating economic growth and creating more jobs chances

In the period from 1990 until the start of 2003 and for long periods, the CBE was targeting the FX rate.
4.2.1 ERSAP -First Phase- (1990-1996)

The main goals of monetary policy reforms during this phase were as follows:

1- To put an end for the policies that have damaged the capital markets this is represented in the interest rate ceiling aiming to create an efficient allocation of financial resources.

2- Restoring and enhancing the financial position, in addition to boosting competition in the banking system to assist in the moving of more local saving via competitive positive real interest rates.

3- Isolating the CBE rule from financing treasury deficits through awarding the CB more independence and effective monetary policy, accordingly a market for government securities was enhanced; this market for treasury bills gave a significant alternative for treasure borrowing from CBE and this was regarded as a significant monetary instrument (Korayem, 1997).

However, the main obstacles that have encountered the monetary authority during this phase were as follows:

1- Severe lessening for credit, leading to several consequences, represented in:

- Boosting the interest rate level,
- Thus increasing the cost of pilling up capital for small and medium enterprises,
- Ending up with the appreciation of exchange rate that will affect a country's export balance in a negative way,
- Hence, increases a country's cost of internal debt beside imposing an upward pressure on prices in the long run, so the funds program strictly stressed the importance of the monetary authority in managing money and credit.
2- The instability of money demand in the majority of developing countries, in addition to the difficulty in managing money supply in an immature financial system were acting as a block for a better execution of program policies.

3- Too much dependence on seigniorage was a reason behind conducting an independent monetary policy (Zaki, 2001).

**Inflation under ERSAP - First phase**

Korayem (1997) has classified that the major elements beyond the existence of severe inflation during this phase into demand-pull and cost push factors.

1- Cost push elements entail:

- Indirect taxes represented in sales tax (1990/1991), the value added tax (1995) and excise tax on cigarettes and other items
- Change in prices of some goods and services (for instance the cigarettes prices, flour, telephone subscription, electricity, petroleum products, rail passenger prices and rail freight tariffs, in addition to minimizing subsidies on fertilizers and pesticides.
- Egyptian pound devaluation in Feb. 1991, which had an effect on augmenting price of imported goods and increased domestic production, cost of many other goods and services.
- Severe increase in interest rate that augmented cost of production and borrowing capital (IMF, 1992, and World bank, 1991b).
2-Demands pull elements represented in:

- Severe fall in local credit, where annual growth rate declined from 25% in 1989/1990 to 1.5% in 1991/1992, then lately increased to 11.7% in 1993/1994 (CBE, 1994)

- Concerning the expected inflationary effects on aggregate demand, real wages in the government sector have been declining in Egypt since seventies, considering that the private sector wages is proportionally linked to public sector, accordingly wages could not be deemed an inflationary element in Egypt during the first era (IMF, 1992 and World bank, 1991b).

ERSAP paid its efforts towards cost push inflation factors and delayed demand pull inflation factors, since cost push inflation elements are having an indirect effect on augmenting prices of goods and services because producers have to increase their profit margin in response to the increase on cost of production.

It can be inferred that hindering inflation was one of the faults of ERSAP Program, since inflation rate during this phase was around 13%, despite the success of fiscal reforms in diminishing deficit ratio of GDP from -2% to 3.4% in 1195 as well as it success in augmenting exports (as a % of GDP) from -10.56% in 1988 to 10.562 % in 1995.

The main monetary goals of the CB from the period 1990 until 2005 except for 1996/1997 were:

- To attain price stability
- As well as exchange rate stability
- In addition to entailing another goals such as augmenting the output level, managing liquidity growth, enhancing foreign competition, fostering exports and creating trust in the local currency (MMZ, 2007).

To attain monetary policy objectives, the CB has used various tools which are:

1-First tool: Decreasing Discount rate from 19.8 % in 1992 to 9 % in the beginning of 2006 to motivate investment


3- Third tool: open market operation (OMO) which is a good tool to manage liquidity level in addition to its effect on short-term interest rate

4-Fourth tool: Repurchasing operations of treasury bills (REPOs) to raise liquidity and to enhance economic growth, the value of these operations augmented to reach 209 Billion LE in 1999/2000, and then depending on it has decreased until it was substituted by CBE notes in Aug. 2005.

5-Fifth tool: Required reserve ratio on domestic and foreign currency was used during this era, the local RRR ranged between 14-15% and foreign RRR ranged between 10-15% (MMZ, 2007).

6-Six tool: Exchange rate, Starting from 1990's, Egypt applied a managed float regime, where the exchange rate was the nominal anchor for monetary policy.
In Feb. 1991 a dual exchange rate market which comprised two markets one restricted market and another free market were introduced to create foreign competitiveness and to ease exchange rate system aiming to minimize or limit black market operations, then these two markets were unified in October, 1991 leading to stagnant appreciated exchange rate for the Egyptian pound against US during mid 1990's resulting in that IMF has requested to devaluate 20-30% of exchange rate, albeit Egypt government refused to avoid that appearance of severe inflation.

Since then and up to 1998 exchange rate was traded freely in a single exchange market with minimal intervention from authorities to maintain exchange rates against the US dollar within a suitable limits.

Worth highlighting that, the second phase was described by tight monetary policy due to the slowdown in the growth of M2 and the reserve.

By 1997, the Egyptian economy embarked to feel this squeeze I liquidity due to external and internal shocks which are detailed hereunder:

Internal shocks happened due to:

- Bank lending real estate investment with no matching demand and increase in housing supply resulting in difficulty of loans repayment.
- Conducting mega projects "such as Toshka" that were financed from bank deposits resulting in magnifying the fiscal debt.

External Shocks were:

- Asian financial crisis in 1997 leading to reduction in exchange rates of some Asian countries thus spurring importation from these countries
- Terrorist attack in 1996/1997 resulted in lessening tourism return from 3.6 billion to 2.9 billion
- Decrease in oil prices from 15.6$ per barrel to 9.7$ affecting negatively petroleum exports
- Reduction of worker remittances from abroad. (Hassan, 2003).

**Inflation during ERSAP - Second phase**

From Jan. 2001 to Dec. 2001, the inflation rate according to the CPI and WPI was quite low around 2.5% and 4% respectively, accompanied by some volatility.

The low and stagnant inflation rates during this period can be attributed to the prevailing exchange rate regime at that time, where this regime isolate local prices and accordingly inflation from exchange rate shocks that could be moved to the WPI via import prices, and since there is link between WPI and CPI, any changes in WPI can be moved to CPI.

Although the prevailing exchange rate has been enjoying a limited degree of exchange pass through to local prices (Al Mashat, 2007), this situation has been altered with the beginning of 2002 and in the aftermath of the first trial to start floating the exchange rate in January 2003.

Between January 2002 and April 2004, CPI and WPI inflation pursued a sharp rising trend reaching a peak of 17.2% and 21.1% respectively.

The higher inflation reflected the lagged pass- through forced due to a sequence of step devaluations resulting in a cumulative depreciation of 29% in the nominal EGP/USD exchange rate that occurred between January 2000 and December 2001 which was witnessed a further amplification owing to the shift to a managed float exchange rate regime in 2003.

Even though CPI inflation rate has witnessed a moderate increase compared with WPI, Central agency for public mobilization and statistics (CAPMAS) informed that CPI under evaluated the
actual rate of inflation and started a revision for the series, where after this recapping, CPI reached double digit inflation rate, however still less than WPI rates (Noureldin 2005 and Ugo 2001)

Between 2004 and the beginnings of 2005, CBE made the monetary policy more tighter to reduce inflation rates and it succeeded in lowering inflation rate to single digits, since the depreciation effects that took place in early 2003 gradually disappeared and confidence in central bank was enhanced.

Between mid 2004 and beginning 2006, CPI and WPI inflation rates have declined reaching 7.5% and 8.1% respectively.

It can be summarized that the economic performance under the ERSAP was as follows:

Even though Egypt has succeeded to lessen the inflation rate after the introduction of the ERSAP, the unemployment rate has increased and growth rate of real GDP has declined.

Accordingly, ERSAP program has not stabilized the economy and the reason beyond ERSAP failure in attaining price stability can be traced back to two factors, which are:

- The conflict between monetary policy goals (pegging the FX rate on one hand and the usage of an independent monetary policy to attain some other goals, which are price stability and economic growth).

- severe deficit in the public budget financed via printing new money.
4.2.3 Towards inflation targeting-third phase-(2005)

In Egypt, the CBE is the state entity that is responsible for conducting monetary policy as stated at the CBE website:

“Law No. 88 of 2003 of the "Central Bank, Banking Sector and Monetary System” entrusts the Central Bank of Egypt (CBE) with the formulation and implementation of monetary policy, with price stability being the primary and overriding objective. The CBE is committed to achieving, over the medium term, low rates of inflation, which it believes are essential for maintaining confidence and for sustaining high rates of investment and economic growth. The Government’s commitment to fiscal discipline is important to achieve this objective.”

In 2005, the central bank of Egypt has declared its intention to adopt inflation targeting as a framework for its monetary policy over the medium term once IT prerequisites are met.

"To Put in place a formal inflation targeting framework to anchor monetary policy once the fundamental Prerequisites are met” (CBE monetary policy statement, 2005).

The idea beyond adopting inflation targeting as a framework for the Egyptian Monetary system has aroused because of two reasons:

First, The Egyptian foreign exchange markets are facing a lot of problems, thus using exchange rate target as a framework for monetary policy will not be a successful policy.

Second, although using monetary policy target is possible framework, IT framework has ruled it out because of the following:

- IT presents a better tool for communication with the public
- IT presents an easy measure for CB transparency and accountability.
• These factors which are communication Transparency and accountability are very essential factors to enhance CBE credibility regarding its commitment to lessen inflation and to attain price stability in Egypt.

• In addition, monetary targeting has some problems in acting as a nominal anchor because the relation between money and inflation is unsteady, *Martinez (2008)*. Where Mishkin *(2000)* has summarized the lessons learned from monetary targeting in three points as follows:

  1- The major reason for the failure of the monetary targeting is the unsteady relationship between the monetary aggregates and the goal variables "i.e. inflation and nominal income"

  2- The way for a successful monetary targeting is communication with the public which improves CB transparency and accountability.

  3- Since the monetary targeting approach is rigid, thus it is not a must that it leads to robust inflation results

In general, *Mishkin (2000)* has stressed that IT is much better than monetary targeting.

To understand what the CBE has been doing to start implement the IT, the CBE website stated the following:

“The CBE intends to adopt a full-fledged inflation targeting regime once the fundamental prerequisites are met. Towards that end, the CBE has achieved the following: Moving from a quantitative operational target (excess reserves) to a price target (overnight inter-bank rate), and launching a Corridor system in June 2005; issuing CBE instruments for the first time in August 2005 as the primary instruments for liquidity management through open market operations; enhancing the role of monetary policy operations to absorb or inject liquidity in the
market through a publicly announced auction schedule; using a small open economy gap model with forward looking expectations and endogenous monetary policy response. The model's equations have clear micro-based motivation, derived from first order principles of rational agents; devising the core inflation measure.

In the transition period, the CBE meets its inflation objectives by steering short term interest rates, keeping in view the developments in credit and money supply, as well as a host of other factors which may influence the underlying rate of inflation.”

Worth highlighting that, the CBE issues two categories of data regarding inflation based on consumer price index detailed hereunder:

- First is the headline inflation, which measures the increase in the price of goods and services in the consumer basket.
- Second is the core inflation, which is the headline inflation after removing items that their prices are controlled by the government, in addition to removing food items that their prices are volatile because their supply depends on weather and harvest conditions (e.g. fruits and vegetable”.

4.3 Inflation targeting Prerequisites.

In order to start adopting inflation targeting as a framework for monetary policy, there are various prerequisites that have to be satisfied, among them there are three major prerequisites that have to fulfilled first which are :

- First, Central bank independence
- Second, price stability should be the main goal of the monetary policy
- Third, Forecasting capabilities
Beside the aforementioned prerequisites, developing countries must pay attention towards them lessening public debt, Martinez (2008), besides improving their financial systems to enable their governments to finance their public deficits without leaning on the central bank to finance the deficit.

If Egypt can satisfy the main prerequisites for an IT framework, it will be able to embrace IT as a framework for its monetary system and as a result reaping its fruitful results, these prerequisites can be demonstrated as follows:

4.3.1 First prerequisite: Factual independence of the central bank which can be attained through fulfilling the following three main pillars which are:

4.3.1.1 Independence of the central bank legal instruments

The new legislation sets that the main objective of the monetary policy is attaining the goal of price stability, in addition to banking system reliability within the circumstances of the general economic policy of the state.

As per agreement between the government and the central bank of Egypt, the CBE is responsible for determining the goals of its monetary policy through a coordinating council created by a decree of the president of the republic.

The CBE governor is selected by a decree of the president based on a nomination from the prime minister for a renewable period of 4 years and is treated as a minister in terms of his income.

The CBE resignation is approved by a decree of the president.

The CBE governor has two deputies assigned by a decree of the president based on the governor nomination for a renewable period of four years.
The CBE has independence of instrument, since the board of directors (BOD) or MPC of the CBE is the authority in charge of noticing the goals of the monetary policy via executing monetary, credit and banking policies.

In addition, the MPC also sets the needed tools to attain the goals represented in the tools that the monetary policy has to pursue, the organization of credit and discount rates, the regulatory and supervisory standards to assure the reliability of the financial position of banks, and the organization of auctions and tenders.

4.3.1.2- Government representatives as a voting members in the MPC

Egypt MPC entails government representatives as voting members, as it comprises 14 members, including:

- 2 deputy governors
- Chairman of the capital market authority
- 3 members representing the ministries of finance, planning and foreign trade
- 8 experts in monetary, financial, banking, legal, economic affairs appointed by the president of the republic for a renewable period of 4 years
- Non existence of fiscal domination meaning that the central bank is not obliged to finance the government budget deficits, at the same time the financial market should be more profound to absorb the public debt represented in treasury bills

4.3.1.3-The CBE responsibility to finance budget deficits:

The CBE is acting as a financial consultant and agent for the government, therefore the CBE implements banking transactions related to the government and public legal representatives, in addition to executing internal an external finance with banks based on the conditions determined by the MPC.
The CBE presents finance to the government based on their demand to cover the seasonal deficit of the general budget with amount not exceeding 10% of the average revenues of the budget. The duration of this finance is three months and can be renewed for additional similar periods, with a max. of 12 months.

The finance conditions are set based on an accord between the ministry of finance and the CBE, in addition, the CBE has to guarantee the finance and credit facilities granted to the public legal representatives from banks, financial institutions and international institutions.

For the time being, the main shortcoming of the macroeconomic policy in Egypt is the performance of the general budget, though Egypt budget deficit (% of GDP) was acceptable in the period from 1995-1998, it has been amplified during the consecutive periods after 2002. Accordingly, The higher ratio of budget deficit in coincidence with the the presence of government representatives in the MPC, beside the legal commitment of the CBE to finance budget deficits represented the highest danger for both the CBE's independence and the macroeconomic stability in Egypt.

In a nutshell, even though the new legislation set the main goal of the monetary policy to be the attainment of the goal of price stability and awarded the CBE legal instrument independence, the presence of of government representatives as a voting members on the MPC in addition to forcing the CBE to present finance to the government are two enough factors to weaken the de facto independence of the CBE, hence, the legal instrument independence awarded to the central bank of Egypt is shallow and haven't exceeded the de jure independence.
4.3.2 Second prerequisite price stability should be the main goal of the monetary policy which entails two main factors:

4.3.2.1 CB should not target any other variables than the rate of inflation because if the CB targets any other variables beside inflation, the CB will not be able to achieve the inflation target due to:

- Either the goals will be contradicting in the short term
- Or due to the inflationary expectations resulting from the uncertainty vaporizing from the lack of credibility of the CB in attaining inflation targets.

4.3.2.2 CB should be transparent and clear to the public regarding the exceptions of the inflation targeting "the CB should declare inflation targeting escape clauses"

There are various alternatives available to CBE to declare IT escape clauses when deciding to adopt IT, which are:

- Explicit declaration of escape clauses for IT as in the case of Czech Republic
- Defining shocks and setting the range and the length of a shock that will make the CB react, as in the Poland
- Using wide range for its inflation targets with no need to declare any escape clauses like Brazil

4.3.3 Third prerequisite: Capability of Egypt to forecast inflation targeting:

Forecasting capabilities entails three main elements, which are:

- A model for inflation foreseeing and inflation projection has to be prepared
- The CB has to have an obvious idea about monetary policy transmission mechanism and their related lags
- Comprehensive, modernized and high quality data have to be on hand
Concerning the first and second elements

Al-Mashat, 2008 (pp. 25-26) introduced data about the situation of inflation modeling and foreseeing inside the CBE, and since this information is not accessible to any researcher in a normal way, thus it raises a question concerning the degree of disclosure in the CBE which is a keystone of a successful IT regime.

In addition, the structure of the CPI core inflation by CBE may act as a valuable tool for the MPC to follow up and appraise the inflation behavior; however, it will be risky if the CBE is intending to use it for the purpose of IT, since the CBE does not have a track record of credibility.

The CPI core inflation or any other price index that will be used for the purpose of IT has to be estimated by a separate entity which is CAPMAS in the Egyptian case.

These issues entails the relationship between money supply and prices, the stability of the demand for the money function n, the exchange rate pass through effect, the exchange rate trend, the relative significance of monetary policy transmission channels and the related time interval, the inflation rate that have to be targeted without resulting in an outbreak of public debt, inflation foreseeing, and inflation projection under various scenarios for supply and demand shocks.

The CBE should have various models under various methodologies for each separate issue to compare and conclude precise data.

Concerning the third element:

Through depending on the data quality assessment framework (DQAF), the IMF (2005) evaluated the quality of data in Egypt, where their evaluation included the national accounts, the price indices, the public finance, the money and the balance of payment statistics.
Although there were different drawbacks in many areas, the most defects in the Egyptian data were noticed in the accuracy and reliability, serviceability and the accessibility.

Regarding data accuracy and reliability this was connected to the national accounts and the price indices organized by the ministry of planning and the CAPMAS.

For data serviceability, this issue entailed the fact that the distribution of macroeconomic statistics does not in all cases match with the users needs and there is no general control concerning the progress and coordination of macroeconomic statistics.

Concerning data accessibility issue included the hardness of the availability of data between all interested parties similarly and instantaneously.

From the aforementioned main prerequisites, we can conclude the following:

1- The CBE is not factually independent albeit the new legislations which stated that the main objective of monetary policy is to attain price stability and accordingly the CBE was granted legal instrument independence, however the presence of government representatives as a voting members on the MPC and the enforcement of the CBE to present finance to the government are two sufficient factors to weaken the meaning of de facto independence of the CBE.

2- There are many evidences that support that the attitude of CBE in adopting IT is quiet similar to the attitude of most of the emerging countries as Egypt will be adopting IT framework while implicitly targeting FX rates, so under this scenario, there is great probability that inflation targets will be missed specifically in the first stages of applying IT framework.

3- The current level of information of CBE about some significant issues that have to be tackled prior adopting IT regime is not pleasing and the quality of the current available information is not likely to sustain the adoption of an IT framework.
In that respect, we can conclude that the fulfillment of IT prerequisites for an IT regime in Egypt is still unfavorable, therefore Egypt still not ready to adopt an IT framework.

4.4 Inflation targeting implementation.

To implement IT, the central bank must follow the following steps:

Step (1) the mandate of the central bank has to explicitly declared to the public and it must be achieving price stability as the main goal of monetary policy

- The central bank must explicitly announce that its mandate is to achieve price stability as a primary goal for monetary policy.
- The central banks have to create credibility to achieve an effective monetary policy.
- Worth highlighting that price stability doesn’t mean zero inflation, nonetheless it I the ability of a central bank in controlling inflation

Step (2) Determining which price index will be utilized.

- Most common price indexes used by the central banks use either CPI and Core inflation, which is the CPI after removing some elements such as food prices and energy prices.
- The used CPI has to enjoy two features which are precise, timely, and easily understood by the public, in addition it has to permit for price shocks or one time shifts that don’t affect the inflation trend.

Step (3) Determining the inflation target.

There are three ways for CB to determine their inflation targets which are:

- First: The point target which means setting the inflation target at a certain number
- (For instance, in Canada, Norway, and United Kingdom place their inflation targets at 2%, 2.5%, and 2%, respectively).
Second: The point interval of inflation, in this way the CB determines inflation target at a certain point with a certain interval (For example, in Sweden, Brazil, Chile, Czech Republic, Hungary, Peru, and Poland the inflation targets were set at 2(+/-1), 4.5(+/-2), 3(+/-1), 3(+/-1), 3(+/-1), 3(+/-1), 2(+/-1), and 2.5(+/-1), respectively.)

Third: The tolerance range, in this way the CB determines the inflation target between two points For example, in Australia, New Zealand, Philippines, and South Africa inflation targets were set at 2-3, 1-3, 5-6, and 3-6, respectively. *Martinez (2008).*

Step (4) Determining the time horizon of the target

Based on historical experiences, it is essential for the central banks that adopt IT to follow it in a flexible form.

**Step (5) anticipating the inflation rates.**

Central banks have to pursue models through which they can anticipate the inflation rates in the future.

This step is very crucial in the process of executing IT as a framework for monetary policy due to the time lag between the monetary policy actions and their effects on price levels .

The core element of IT is that it is not based on addressing the price level, instead it is based on addressing the expected price level.

Step (6) setting the policy action.

Central banks have to pursue policy actions to be used if anticipated inflation diverges from the targeted inflation, here the central banks should be independent in choosing the policy tools to attain the inflation target that is known "CB tool independence".
Step (7) deciding the channels through which the public will be communicated.

CBs have to decide how they will communicate with public in order to create credibility, considering that compromising flexibility with credibility is very crucial issue that the success of IT depends on,

Monetary policy committees, policy releases and news briefs are the most famous instruments to communicate with public

4.5 Policy Recommendations for Egypt to embrace IT as a framework for its monetary system.

1- The CBE must communicate its mandate in an efficient way with the public to convince them that its main goal is achieving price stability as the main goal for its monetary policy, thus paving the way for achieving credibility

2-CBE has to use the core inflation instead of headline inflation while adopting it inflation targeting to hedge the the severe fluctuations in the headline inflation due to temporary and unexpected movements in some elements of the CPI components.

3-It worth recommending the CBE based on international experience has to use a point interval or tolerance range instead of certain point as an inflation target, since the former grants flexibility for the CBE to attain other targets such as output growth and exchange rate stability over the short term. Nonetheless, in order to attain credibility, in case the CBE has to amend the short term inflation targets to adopt some shocks in the economy, the CB must clarify that for the public through stating that it still commits to attain the inflation target over the medium term while making it clear why inflation diverges from the target, in addition to stating the actions that will be taken to attain the target over the medium term.
4-Once the CBE fully adopts IT, it has to collaborate with the Egyptian government in setting the inflation targets, but the CBE has to be independent in executing the monetary policy measures that attain inflation target, the essentiality of the coordination between the CBE and the Egyptian government in setting the inflation target comes from the essence of the agreement between monetary policy and fiscal policy.

5 According to the international experience, it is recommended for the CBE when it fully adopt IT to set the inflation target over the medium term, which gives flexibility for the CBE in supporting the government in attaining other economic goals such as output growth and employment.

6-Although it is not recommended to alter the inflation target over the medium term, the CBE may need to alter its medium term inflation target. in case the CBE needs to do so, it must have justifiable reasons for doing so and it has to convince the public that the inflation targeting alteration is due to alteration in the baseline fundamentals noting that price stability is the main goal of the monetary policy, if the CBE fails to do so, its credibility will be damaged and the whole policy of IT will fail.

7- Before the CBE adopts IT over the medium term, it is recommended that a new law has to be issued to compromise some measures that assure accountability of the CBE towards achieving inflation target; at least three measures have to state in the new law.

- First, the appearance of the CBE governor before the Egyptian parliament to discuss the monetary policy and the situation of inflation target, where this appearance has to be at least once every quarter.
- Second, the CBE has to write to the prime minister at least one open letter every quarter to clarify the current situation of inflation target and the future plan to achieve inflation within its target.

- Third, the CBE governor maintain in his position based on the CBE ability in achieving the inflation target and it sufficient communication with the the public

8-For better implementation for IT, the Egyptian government must enhance the budget deficit, which means the collaboration between the CBE and the Egyptian government is very crucial for the success of IT policy

9- Another recommendation is enhancing the the financial market infrastructure, as the current financial market infrastructure in Egypt is not robust enough to widen the scope for the independence of the monetary policy.

10- Improvement of data availability and credibility to be used as a precise guidance in conducting inflation targets expectations.

**Section 5: Data and Methodology:**

This section will examine whether Egypt has a great probability to start adopting Inflation targeting or not?

To examine this, this paper employs three models, which are a probit model - Logit model - extreme value model.

Where the dependent variable \((Y)\) is inflation targeting which is a dummy variable that records the value of one for countries that are adopting inflation targeting and zero for non-inflation targeting countries.
This model employs 5 variables which are (Past inflation - Openness of the economy - Fiscal deficit- Exchange rate and GDP) to investigate which variable has a significant effect on embracing inflation targeting.

**The equation of our model can be elaborated as follows:**

Inflation Targeting \( (Y) = \beta_0 + \beta_1 \text{Past inflation} + \beta_2 \text{Openness of the economy} + \beta_3 \text{Fiscal deficit.} + \beta_4 \text{Exchange rate} + \beta_5 \text{GDP} + \epsilon \)

**In this model,**

- Past inflation is measured through using CPI
- Openness of the economy is calculated via this equation:
  \[
  \frac{\text{Export} + \text{Import}}{\text{GDP}}
  \]
- Fiscal deficit: it is calculated through this equation= Government Revenues - Government Expenses

**Data Source:**

Data used in this model has been extracted from the World Bank (WB) and international monetary fund (IMF).

Data set consists of 93 developing and developed countries that are examined for the years 1980 until 2018

In this model for each country that have adopted inflation targeting, we define the starting year of the applying inflation targeting to be the year of IT adoption.
The treatment group comprises 28 industrial and emerging countries that have adopted inflation targeting, where those countries and the date of their adoption to inflation targeting can be illustrated in the following table:

<table>
<thead>
<tr>
<th>#</th>
<th>Country</th>
<th>Year of Adoption</th>
<th>#</th>
<th>Country</th>
<th>Year of Adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Albania</td>
<td>2009</td>
<td>15</td>
<td>Korea</td>
<td>1998</td>
</tr>
<tr>
<td>2</td>
<td>Armenia</td>
<td>2006</td>
<td>16</td>
<td>Mexico</td>
<td>2001</td>
</tr>
<tr>
<td>3</td>
<td>Australia</td>
<td>1993</td>
<td>17</td>
<td>New Zealand</td>
<td>1990</td>
</tr>
<tr>
<td>4</td>
<td>Brazil</td>
<td>1999</td>
<td>18</td>
<td>Norway</td>
<td>2001</td>
</tr>
<tr>
<td>5</td>
<td>Canada</td>
<td>1991</td>
<td>19</td>
<td>Peru</td>
<td>2002</td>
</tr>
<tr>
<td>6</td>
<td>Chile</td>
<td>1991</td>
<td>20</td>
<td>Philippines</td>
<td>2002</td>
</tr>
<tr>
<td>7</td>
<td>Colombia</td>
<td>1999</td>
<td>21</td>
<td>Poland</td>
<td>1999</td>
</tr>
<tr>
<td>8</td>
<td>Czech Republic</td>
<td>1997</td>
<td>22</td>
<td>Romania</td>
<td>2005</td>
</tr>
<tr>
<td>9</td>
<td>Ghana</td>
<td>2007</td>
<td>23</td>
<td>Serbia</td>
<td>2006</td>
</tr>
<tr>
<td>10</td>
<td>Guatemala</td>
<td>2005</td>
<td>24</td>
<td>South Africa</td>
<td>2000</td>
</tr>
<tr>
<td>11</td>
<td>Hungary</td>
<td>2001</td>
<td>25</td>
<td>Sweden</td>
<td>1995</td>
</tr>
<tr>
<td>12</td>
<td>Iceland</td>
<td>2001</td>
<td>26</td>
<td>Thailand</td>
<td>2000</td>
</tr>
<tr>
<td>13</td>
<td>Indonesia</td>
<td>2005</td>
<td>27</td>
<td>Turkey</td>
<td>2006</td>
</tr>
<tr>
<td>14</td>
<td>Israel</td>
<td>1997</td>
<td>28</td>
<td>United Kingdom</td>
<td>1992</td>
</tr>
</tbody>
</table>

The Control group: entails 65 countries from developed as well as emerging countries that have not adopted non-inflation targeting.

The Model Hypothesis:

Null hypothesis: $\beta = 0$ (meaning no effect so it is insignificant)

Alternative hypothesis: $\beta \neq 0$ (has an effect so it is significant)

Worth highlighting that: $\beta$ is a set that comprises $\beta_0 - \beta_1 - \beta_2 - \beta_3 - \beta_4 - \beta_5 - \beta_n$
Model Results:

1-Binary Probit Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.146070</td>
<td>0.098276</td>
<td>1.486321</td>
<td>0.1372</td>
</tr>
<tr>
<td>Openness of economy</td>
<td>-6.87</td>
<td>1.01</td>
<td>-6.797197</td>
<td>0.0000</td>
</tr>
<tr>
<td>Fiscal deficit</td>
<td>-6.71</td>
<td>4.84</td>
<td>-1.386499</td>
<td>0.1656</td>
</tr>
<tr>
<td>Past inflation</td>
<td>-4.452418</td>
<td>0.695872</td>
<td>-6.398326</td>
<td>0.0000</td>
</tr>
<tr>
<td>GDP</td>
<td>-0.161614</td>
<td>0.288384</td>
<td>-0.560412</td>
<td>0.5752</td>
</tr>
<tr>
<td>Exchange rate</td>
<td>4.95</td>
<td>3.65</td>
<td>1.353866</td>
<td>0.1758</td>
</tr>
</tbody>
</table>

Result of the model:

Inflation Targeting (Y) = \( \beta_0 + \beta_1 \) Past inflation + \( \beta_2 \) Openness of the economy + \( \beta_3 \)

Fiscal deficit. + \( \beta_4 \) Exchange rate + \( \beta_5 \) GDP + \( \varepsilon \)

=0.14 -4.45 past inflation - 6.87 Openness of the economy -6.71 fiscal deficit +4.95 exchange rate -0.16 GDP

2-Logit Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.278683</td>
<td>0.169912</td>
<td>1.640161</td>
<td>0.1010</td>
</tr>
<tr>
<td>Openness of economy</td>
<td>-1.18</td>
<td>1.81</td>
<td>-6.500237</td>
<td>0.0000</td>
</tr>
<tr>
<td>Fiscal deficit</td>
<td>-1.08</td>
<td>8.48</td>
<td>-1.277828</td>
<td>0.2013</td>
</tr>
<tr>
<td>Past inflation</td>
<td>-7.343023</td>
<td>1.212244</td>
<td>-6.057379</td>
<td>0.0000</td>
</tr>
<tr>
<td>GDP</td>
<td>-0.242159</td>
<td>0.498346</td>
<td>-0.485925</td>
<td>0.6270</td>
</tr>
<tr>
<td>Exchange rate</td>
<td>8.16</td>
<td>6.14</td>
<td>1.329057</td>
<td>0.1838</td>
</tr>
</tbody>
</table>
**Result of the model:**

Inflation Targeting \((Y) = \beta_0 + \beta_1 \text{Past inflation} + \beta_2 \text{Openness of the economy} + \beta_3 \text{Fiscal deficit} + \beta_4 \text{Exchange rate} + \beta_5 \text{GDP} + \varepsilon\)

\[= 0.27 - 7.3 \text{ past inflation} - 1.18 \text{ Openness of the economy} - 1.08 \text{ fiscal deficit} + 8.16 \text{ exchange rate} - 0.24 \text{GDP} \]

3- **Binary Extreme Value**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.455061</td>
<td>0.096963</td>
<td>4.693137</td>
<td>0.0000</td>
</tr>
<tr>
<td>Openness of economy</td>
<td>-6.27</td>
<td>9.25</td>
<td>-0.6782586</td>
<td>0.1894</td>
</tr>
<tr>
<td>Fiscal deficit</td>
<td>-6.53</td>
<td>4.98</td>
<td>-1.312346</td>
<td>0.0000</td>
</tr>
<tr>
<td>Past inflation</td>
<td>-4.355539</td>
<td>0.657897</td>
<td>-6.620397</td>
<td>0.0000</td>
</tr>
<tr>
<td>GDP</td>
<td>-0.203333</td>
<td>0.272386</td>
<td>-0.746486</td>
<td>0.4554</td>
</tr>
<tr>
<td>Exchange rate</td>
<td>4.71</td>
<td>3.68</td>
<td>1.281554</td>
<td>0.2000</td>
</tr>
</tbody>
</table>

**Result of the model:**

Inflation Targeting \((Y) = \beta_0 + \beta_1 \text{Past inflation} + \beta_2 \text{Openness of the economy} + \beta_3 \text{Fiscal deficit} + \beta_4 \text{Exchange rate} + \beta_5 \text{GDP} + \varepsilon\)

\[= 0.45 - 4.35 \text{ past inflation} - 6.27 \text{ Openness of the economy} - 6.5 \text{ fiscal deficit} + 4.7 \text{ exchange rate} - 0.20 \text{GDP} \]
From the estimated results in our three model, it can be concluded that:

The relation between inflation targeting and past inflation is negatively correlated and significant as expected, indicating that as long as past inflation is high, thus the probability to adopt inflation targeting will be much harder, thus it will be hard to target inflation that was already high in the past.

The relation between inflation targeting and openness of the economy is also negatively correlated and significant, which means that the more is the openness of the economy, the less will be the probability of the success of adopting inflation targeting, because as long as the economy of a country is more open, that’s mean that the economy is more competitive and accordingly subject to the exchange rate pass through effect, so it will be difficult to target inflation.

The relation between inflation targeting and government deficit is negatively correlated and insignificant meaning that government deficit doesn’t have an effect on the decision of adopting inflation, in addition the negative relation means that the more is the government deficit, the less will be the probability of the success of adopting inflation targeting, because as government deficit increases it may lead the government to increase the money supply through printing money to pay the debt leading to more inflationary effects.

The relation between inflation targeting and exchange rate is positively correlated as per model results and insignificant meaning that exchange rate doesn’t have an effect on the decision of adopting inflation, beside that the positive relation indicates that as exchange rate increases, the possibility of embracing inflation targeting increases.
The relation between inflation targeting and GDP is negatively correlated and insignificant meaning that GDP doesn’t have an effect on the decision of adopting inflation.

To sum up, the estimated results show that the openness of the economy and past inflation are the only significant two variables having an effect on the decision of adopting inflation targeting with negative correlations, which means that as they increases, the possibility to adopt IT decreases.

For Fiscal deficit, exchange rate and GDP growth rate, they are having insignificant effect on the adoption of inflation targeting, accordingly inflation targeting adoption is not affected by the fiscal deficit and exchange rate effect as well GDP.

**Egypt's probability to adopt IT as a framework for its monetary system**

**1-Probit Model**
The three above graphs illustrate that the probabilities of all the countries under study in adopting inflation targeting, while focusing on Egypt, where we have indicated that the probability that Egypt can adopt inflation targeting is less than mainly less 40%, which is very weak.

Egypt likelihood regarding adopting IT

<table>
<thead>
<tr>
<th></th>
<th>Egypt</th>
<th>Target Countries</th>
<th>Non-target countries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Logit Model</strong></td>
<td>0.411021</td>
<td>0.972253</td>
<td>0.616448</td>
</tr>
<tr>
<td><strong>Probit Model</strong></td>
<td>0.408857</td>
<td>0.985646</td>
<td>0.609608</td>
</tr>
<tr>
<td><strong>Gompit Model</strong></td>
<td>0.406671</td>
<td>0.917172</td>
<td>0.580716</td>
</tr>
</tbody>
</table>

This table has illustrated the probabilities of inflation targeters countries as well as non-inflation targeters countries and compare Egypt to them to conclude whether it is much closer to targeters or non targeters using our three models which are Logit, Probit and Gompit.

It is concluded that estimated indicators have shown that Egypt willingness to target inflation is less likely to happen, since it is estimate probability is around 40%, which is even less than the probabilities of non inflation targeters countries thus it much closer to non-target counties than targeters countries.
Conclusion:
The conclusion of this study is that inflation targeting has become the mastering remedy for monetary policy that most of the developing and developed countries have adopted to reduce inflation and foster economic and price stability. Although there is no clear evidence proving that inflation targeting regime is the effective monetary policy framework for attaining price stability.

By having a closer look at the Egyptian case to answer our research question which is "Is Egypt ready to embark inflation targeting as a framework for its monetary policy", we concluded that Egypt is not ready yet to embrace inflation targeting because it still hasn't fulfill any of the main prerequisites of IT represented in 1-the CBE is not factually independent albeit the new legislations has set that price stability should be the primary goal of the monetary policy and granted the CBE legal instrument independence but due to the existence of government representatives in the MPC and CBE finance to the government deficit have underpin the meaning of de facto independence of the CBE, 2-in addition the CBE may announce that it is explicitly adopting IT while implicitly they are targeting FX rates which leading to the missing of inflation targets especially in the first stages of applying IT 3-the current level of CBE knowledge about some significant issues that have to be handled before adopting IT is not satisfactory in addition the poor data quality that is not likely to assist the adoption of IT regime.

Beside that that our three models results have assured that, as the estimated results have shown that the probability that Egypt can embrace IT is less than 40% which is very low percent comparing to the probability of inflation targeters countries which is around 90%. In the light of these results, the study concludes that the Egypt willingness to embrace inflation targeting still unsatisfactory.
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