A Historical Retrieval of the Methods and Functions of Monetary Policy

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SHERIF'S DEDICATION

To my fathers' soul
To Mai Afifi my wife 'Nothing is possible without you'

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Introduction

There exists a broad implicit agreement that steering the monetary policy has important consequences for the whole economy (Friedman, 1968). This book uses topic classification to present a historical retrieval of the main theories and applications of the monetary policy within different schools of economic thinking and across history. From Humes' automatic price-species flow in the 17th century, to the Keynesians, Monetarists and Austrians perspectives of the monetary dynamics in the beginning of the 19th century.

The second chapter provides a general overview about how the monetary authority can fine tune monetary indicators in response to business cycle shocks. This part will discuss the monetary transmission mechanisms that represent the different means of interaction between monetary tools together and their impact on the real economy. In this context, the concept of inflation targeting will be elaborated in details while explaining its main institutional and economic prerequisites.

The third and final chapter is devoted to giving an overview of the Egyptian monetary policy from 1990 to 2010 prior to the Egyptian revolution. The detailed analysis disaggregates this period into three eras: the first starts from 1991 till 1996 (ERSAP era), the second from 1996 till 2003 (Transitional era), and the third from 2003 till 2010 (towards Inflation Targeting era). This part of the book covers the broad changes occurred in the Egyptian monetary regimes and how well the successive governments used various monetary tools to achieve their policy goals and to mitigate real economic problems like unemployment and inflation.

Chapter one: the Evolution of Monetary Policy

1-1. A Historical Review of the Literature

My starting point is Blanchard's and Woodford's surveys of the history of macroeconomics written on the occasion of the turn of the century. Blanchard (2000) divided the history of macroeconomics into three stages: pre-1940, a period of exploration, from 1940 to 1980, a period of consolidation and since 1980, a new period of consolidation emerged. On contrary, Woodford (1999) found it useful to structure his account on the idea of revolutions and counter-revolutions. He starts with a few reflections on the birth of macroeconomics (i.e. the study of business fluctuations in the early decades of the 20 century) to move on with the Keynesian Revolution and the neoclassical synthesis. After a section on the great inflation and the crisis of Keynesian economics, he goes on towards studying the three successive counter-attacks against the Keynesian theory: the monetarism, rational expectations and the new classical economics, and, finally, the real business cycle theory.

Robert and Okun (1980) defined two methods of examining the evolvement of the monetary policy, either a chronological approach or a topic approach. In his paper, He uses the chronological classification to compare the behavior of aggregate economic variables and the developments of the conceptual framework across four sub-periods of the post-war era (1947-57, 1957-67, 1967-73, and 1973-79). Blinders' (1988) main focus was the Keynesian revolution. He postulates that the division of Keynesian economics into positive and normative components is central to understanding both the academic debate and its relevance to the policy. A positive Keynesian believes that both monetary and fiscal policies can change aggregate demand that in turn carry real economic effects and that prices and wages do not move rapid enough to clear markets. On the other side, normative Keynesians add both value and political judgments to the preceding list. Alternatively, Goodfriend and King (1997) compared four episodes of the development of macroeconomics: monetarism, rational expectations, real business cycles and, finally the new neoclassical synthesis.

After briefly reviewing how different works have structured the historical evolvement of monetary policy. In the next section, I proceed using the topic classification approach in realizing how the monetary policy has evolved over time and within different theoretical conceptualizations.

1-2.   Schools of Thinking: Waves and Counter Waves

1-2-1. David Hume (1711-1776) [1]

Hume was among the first to develop the automatic price-specie flow that contrasts with the mercantilism system. Hume argued that any surplus of exports would be matched with an increase in gold and silver imports, thus the increase in money supply would create inflationary pressures. The corrective action by the monetary authority as introduced by Hume was simply to decrease exports until balance with imports is restored. Hume also proposed the theory of beneficial inflation. He believed that the increase in the money supply would raise production in the short run. This phenomenon is created by a gap between the increase in the money supply and that of the price level. The result is that prices will not rise at first and may not rise at all. This theory was later developed by John Maynard Keynes (Hume, 1987).

1-2-2. David Ricardo (1772-1823) [2]

Ricardo made a distinction between the workers, landowners, and capitalists. The first group is characterized by their fixed wages at sustainable levels, the second group tends to earn above their sustainable levels by the means of the collected rents, and the final group possess the capital and in turn make profits. Because of the law of diminishing utility, the increase in population forces people to use more lands, whose fertility is lower than the lands already in use. This, in turn, raises the cost of wheat production, the price of wheat, and rents, which will be indexed to higher inflation (Ricardo and Sraffa, 1955).

1-2-3. Keynesians

The Keynesian monetary theory was presented to a wider audience with the publication of A C Pigou's "The value of money" in the quarterly journal of economics in 1917, and Alfred Marshal's "Money credit and commerce" in 1923 (Pigou, 1917; Marshal, 1923). These writings have dealt with the fixed exchange rate of the gold standard, but Keynes introduced his theory in the context of an inconvertible paper currency (Keynes, 1936). Keynes in his book concluded the following market clearing equation. He considered Money Supply (MS) as an exogenous variable which is controlled by the monetary authority:

$$N = P(K + rK^*) \qquad\qquad\qquad (1)$$

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[1] Hume was a Scottish philosopher, economist, historian and an important figure in the history of Western philosophy and the Scottish Enlightenment.

[2] Ricardo was an English political economist, often credited with systematizing economics, and was one of the most influential of the classical economists.

Where N is the number of currency notes in circulation, P is an index number of cost of living, K is the number of units of currency that public wishes to hold as a cash, K* is the number of currency units the public wishes to hold as a demand deposits against cheques, and r proportion of deposits liability bank wish to hold as a cash reserve (Robert and Okun, 1980). Keynes had related both K and K* to the real income and the cost of holding money. Hence, instead of considering interest rate as the cost of money, Keynes considered inflation as the real cost of holding money.

A. MS and Inflation

In periods of hyperinflation, Keynes noted that in Germany, MS increased 200 fold from December 1920 to June 1923, while price level raised 2500 fold with 92 percent decrease in demand for real money balances. He concluded from this observation that, first higher rate of monetary growth will raise the cost of holding money (inflation). The second is that the quantity of money is not the only mean in determining the value of money, and that the value of money is not exactly of inverse proportion to the quantity of money. Other factors such as income and the velocity of circulation relative to the volume of transactions play a role (Keynes, 1936). Hence, it's typical at the beginning of any inflationary phase to observe that the increase in prices is lower than the increase in MS, and the opposite is true at later stages of inflation (Dimand, 1988)

B. Effective demand and price level

The quantity theory of money according to Keynes is as follows "so long as there is unemployment, employment will change in the same proportion as the quantity of money; and when there is full employment, prices will change in the same proportion as the quantity of money" (Keynes, 1936)[3]. If effective demand rises with the same proportion to the quantity of money, then it will work first to restore full employment with no effect of wages and prices. And when full employment is reached; wages and prices start to rise proportion to the increase in effective demand.

He stated several complications that might face his theory. The first case when effective demand does not raise the quantity of money with the same proportion, he then divided the increase in effective demand partly into an increase in output and prices. Three factors tend to affect this partly division, (a) the schedule of liquidity-preference which tells us by how much the rate of interest will have to fall in order that the new money is fully absorbed by the willing holders, (b) the schedule of marginal efficiencies that indicates how much a given fall in the interest rate will increase investments, and (c) the investment multiplier that identifies

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[3] According to Keynes, effective demand denotes the total demand of goods and services (both for consumption and investment) by the people in a community. In a money economy, thus, effective demand is represented as the spending of income or the flow of expenditure.

how much a given increase in investments will increase effective demand (Keynes, 1936). Keynes realized in the case of the German hyperinflation that nominal interest rate was very high nearly 100 % per month. This rate lagged behind the rate of inflation and the depreciation of the local currency, which turns this rate in real terms into a negative value.

C. Updated theory of beneficial inflation

Keynes concluded that the increase in the quantity of money will not raise prices by the same proportion, actually, it may raise some prices more than others. So inflation could be an effective cure for unemployment. If we have a case of underemployment for any reason, say some wages are above the equilibrium wage, so when MS increases, wholesale and retail prices rise without a proportional increase in wage rates.[4] So this will increase the supply of goods without raising the cost of production and thus increases employment. In addition, the increase in the supply of goods will make prices rise even slower that would have been otherwise. So Keynes considers inflation as a dangerous remedy for unemployment, because if wages rose, unemployment endures leaving behind higher rates of inflation.

D. Introducing the government rule

Classical economists have believed in "say's law". This law indicates that the current supply will generate its own demand. Keynes concluded that aggregate demand for goods might be insufficient during economic downturns that may lead to increase unemployment and forces the economy towards a severe recession. So, in this case, the government intervention is essential through two policy responses, either by increasing government spending in infrastructure or lowering interest rates, both will lead to stimulating investment and increase the rate of income injection in the whole economy. This consequently, affects short run real output and employment.

In general, keynes believed in a larger role –compared to monetary policy- played by the fiscal policy in influencing aggregate demand, because the economy might enter a state of 'liquidity trap', which in turn makes the monetary policy inoperative (Blinder, 1986).

E. Liquidity trap

Keynesianism also introduced the idea of "liquidity trap", which describes a situation when the demand of money becomes infinitely elastic so that further increase in MS will not lower interest rates. So when an economy reaches this trap, the monetary policy become useless and concerns should be shifted towards the fiscal policy.

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[4] Keynes' models generally assume rigid prices or wages because monetary policy -before entering the liquidity trap- affects the level of output and employment only if some prices or wages are rigid. Because of this rigidity, say in nominal wages, changes in spending, investment, consumption causes output to fluctuate by a multiplied effect according to the Keynesian multiplier.

Some (such as Paul Krugman) viewed the occurrence of the liquidity trap in Japan during the 1990s[5]. Most economists agree that nominal interest rates cannot fall below zero. However, some economists -particularly those from the Chicago school- reject the existence of a liquidity trap. This concept was criticized by neo-classical economists, in the sense that an expansive monetary policy -even if interest rates failed to decline- would stimulate economic activity according to the "Pigou effect". Pigou effect describes a situation when the increase in the money supply raises aggregate demand and this will shift the IS curve to the right and in turn stimulates economic activity.

F. Cure for Inflation

Keynes advocated high taxes as a tool of mitigating inflation. According to the post-Keynesians, a major critique of the conventional Keynesian theory is the wrong diagnosis of inflation. Keynes considered excess demand as the main cause of the postwar inflation instead of being a consequence of the pressure on costs. As a result, the response by governments according to Keynes theory should be cutting demand by levying higher taxes. Such remedy might not be effective because it will reduce output and thereby raise unemployment while levying little or no impact on prices (Blinder, 1986).

G. Inflation tax

Keynes was the first to introduce the idea of "inflation tax", which is the effect of inflation rate on the demand for real money. Keynes realized that one of the costs of inflation was not the transfer of purchasing power from cash holders to the government, but is a reduction in the real quantity of money. As people opt to restore the real balances of their money, they cut off their purchases and consumption of goods and services and start to seek another medium of exchange rather than money. Other social costs of inflation are attributed to nominal contracts. For example, treasury bonds that are issued by the government on fixed rate of interest will transfer higher than the expected inflation from the lender to the borrower unless an indexation for the real commodity value is replaced with the fixed rate value. In addition to this such fixed nominal contracts will reduce the value of nominal wages, salaries and rents in periods of inflation until the contract expires (Dimand, 1988).

In summary, the conventional Keynesian models assumed the existence of sticky prices or wages to explain unemployment and to explain the demand side of the macroeconomic

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[5] The Pigou effect was first introduced by Pigou, (1943). Pigou hypothesized that falling prices would make consumers feel richer and hence they will react by increasing their spending, which would push the economy out of its stagnation. In the 1990s the Japanese economy fell into period of prolonged stagnation and deflation despite of the policy of zero interest rates. Similar incidences have emerged in the United States and Europe in 2008-2010. In reponse, Japanese central bank worked on the Pigou effect and applied quantitative easing or Open Market Operations (OMO) (Buiter, 2008).

policies. Keynes' economic theories designed for and are suited to tackle the main problem at this period, this is the mass unemployment. Consequently, Keynes ignored the supply side pressure on costs as a possible source of inflation, instead, he perceived inflation as a demand-side problem that could be simply solved by cutting down wages or levying higher taxes. He did not consider inflation as a problem rather than a remedy for unemployment. The constant MS expansion will generate demand forces that might drive the economy out of underemployment.

Keynes put a higher emphasis on fiscal policy relative to monetary policy, because in liquidity trap incidences, the latter become powerless. Keynes introduced another remedy for unemployment, which is running a government deficit to generate a sufficient level of output and employment. One of The main critics against the Keynesian theory of monetary policy was introduced by the neo-classical economists, because of not considering people behavior. These critics lead to several divergences from the Keynesians' conceptualizations towards the NAIRU and the theory of rational expectations that would be discussed later in this chapter.

Statistics in the next two tables show that neither of the two proposed remedies by Keynes solved the unemployment problem in the United States.

Table 1: Fiscal years deficits and the corresponding unemployment rates (1931-1940), USA.

Year	Deficit (billions $)	Unemployed (Millions)	Percentage of unemployment
1931	0.5	8	15.9
1932	2.7	12.1	23.6
1933	2.6	12.8	24.9
1934	3.6	11.3	21.7
1935	2.8	10.6	20.1
1936	4.4	9	16.9
1937	2.8	7.7	14.3
1938	1.2	10.4	19
1939	3.9	9.5	17.2
1940	3.9	8.1	14.6

Source: Halzit, (1959)

Table 2: Interest rates and the corresponding unemployment rates (1929-1939)

Year	Interest rate on commercial papers (%)	Percentage of unemployment
1929	5.85	3.2
1930	3.59	8.7
1931	2.64	15.9
1932	2.73	23.6
1933	1.73	24.9
1934	1.02	21.7
1935	0.75	20.1

1936	0.75	16.9
1937	0.94	14.3
1938	0.81	19
1939	0.59	17.2

Source: Halzit, (1959)

Table 1 shows the deficits for fiscal years ending on June 30 and the unemployment rate as an average for the full calendar year. The main conclusion from this table is that heavy deficits were accompanied by higher rates of unemployment. Table 2 describes the policy of cheap money suggested by Keynes and the corresponding changes in unemployment rates. The first column represents the annual average of daily prevailing rates of prime commercial paper with a maturity of four to six months. Over this period, low-interest rates did not eliminate unemployment. On the contrary, unemployment actually increased as interest rates went down.

1-2-4. Austrians

A. Austrian business cycle theory

In principal according to the Austrians, when central banks decide to expand credit and raise MS, they implicitly agree to create inflationary pressures. Mises (1966) articulated it differently, he stated that expanding credit will artificially lower interest rates below free market level and based on this basic assumption he introduced the business cycle theory.

The founding slogan of Misess' theory is the following statement "Without bank credit expansion, supply and demand tend to equilibrate through the free price system and no booms or bursts can then develop ". The interest rate is determined according to consumers' time preference, whereas they compare the opportunity cost of holding money in the present time and the premium of keeping the money for a future time. If their preference for future over present raises, people tend to consume less and save and invest more. Accordingly, interest rates start to fall and become a stimulus for economic growth. What really matters in the former mechanism is that the natural process of preference adjustment exists. But with the artificial lowering of interest rate due to credit expansion by the central bank, entrepreneurs and producers invest in lengthy and time-consuming projects that take too long to yield consumer goods. They react like if savings had increased but it did not, they were fooled by the low costly loans from banks represented in the low-interest rates. Austrians do not just consider that there will be overinvestment, but also mal-investments. And the newly injected money and malinvestments in the capital goods market will transfer into high wages and high rents that create inflationary pressures in the economy (Rothbard, 1983).

The real problem starts when workers receive higher wages because of the existing inflationary waves. However, because their real-time preferences have not changed, they consume much of the new income on consumer goods and sustain their savings and investments at the usual rate. The fact that they did not consume the newly capital equipment

or industrial raw materials, which producers hugely invest at because of the artificially low-interest rates, rather they spend their extra income on consumer goods. So an adjustment recession- as Mises call it- starts (Mises, 1912).

The liquidity injection has given the entrepreneurs the wrong interest rate signals. The shortage of consumer goods will raise the price of current consumption goods relative to future consumption goods, which corresponds to a rise in the market interest rate. Such a rise would get firms and entrepreneurs in trouble, simply because they had invested in long production processes on the basis of a lower interest rate, and a rise in rates would make these investments unprofitable, because of higher carrying costs. As soon as the excess liquidity is filtered and no more projects to invest at, the pricing and production distortions will take place to clear the markets and bring down the price levels to the proper levels (Jefferson, 2007).

B. Government rule:

Unlike the Keynesian thoughts of excessive government interventions in times of unemployment, Austrians see that the government should do nothing in recessions, as the economy does not need more spending but it needs more saving in order to validate the excessive investments of the credit boom, in other words, to maintain the 'Laissez-faire' of the economy. So the government shouldn't try to inflate again to fight this recession, shouldn't try to lend business firm in troubles, and not to raise wages or prices in the capital goods market. Any of these actions will only delay the conclusion of the depression-adjustment process and will cause indefinite and prolonged depression and mass unemployment in the capital goods industries (Rothbard, 2009).

C. Austrian theories and the latest financial crises

The economist Steve Hank considers the financial crises of 2007-2010 as the direct outcome of the FED interest rate policy, which was predicted by the Austrians' theory of business cycle. He postulated that the low-interest rates announced by the FED have stimulated borrowing and thus caused expansion in MS that created a monetary boom and inflation. These price hikes caused a widespread of mal-investments causing miss-allocation of resources into areas that would not attract investments in normal cases[6]. All Austrian theorists consider the unsustainable expansion of bank credit through fractional reserve banking as the driving feature of most of the business cycles. However, Murray Rothbard paid particular attention to the role of central banks in creating an environment of loose credit prior to the onset of the Great Depression, and the subsequent ineffectiveness of central bank policies, which simply delayed necessary price adjustments and prolonged market disorders (Rothbard, 2009).

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[6]For more info, See the following link Http://wallstreetpit.com/16928-why-the-volcker-plan-can't-prevents-boom- burst- cycles>

In 2005, Tyler Cowen said that if he believed in Austrian business cycle theory he would say that the U.S. economy is overinvested in housing and a massive shock will develop[7]. After the United States housing bubble began its decline in 2006, Peter Schiff one of the supporters of the Austrian school, made some predictions regarding a housing crash in the U.S.

Despite the technical independence of central banks from governments, Foldvary, (2008) stated that in practice when the economy is down, there is a political pressure for central banks to stimulate the economy with money expansion. He also pointed to the effect of MS expansion on those who borrow funds to buy more lands for speculative purposes. As a result, a real-estate bubble will emerge similar to the one happened prior to the financial crises of 2007-2010. During the boom phase, the demand for lands by optimistic speculators will pull up land prices, which combines with the increasingly interest rates to pull the economy towards a recession (Foldvary, 2008).

D. Free banking as a solution for business cycle distortions

Free banking means allowing the natural adjustment of interest rates to do its job of allocating public funds between consumption, saving and investment, without any central bank interventions (Briones and Rockoff, 2005).

With free banking, all the distortions predicted by the Austrians theory are avoided. The rate of interest is not distorted by monetary injections from the central bank or government but is pre-determined in the market for loanable funds. The supply of funds comes from savings, and the net demand (subtracting borrowing for consumption from savings) comes from those who seek funds for investment. The natural rate of interest is based on time preference. With free banking, there is no governmental restriction on branches. There is no governmental deposit insurance and there are no reserve requirements (Foldvary, 2008).

With free banking, money would not be a government monopoly but would be provided by competing for private banks. But there would be a common unit of account such as the US dollar. The bank currencies would all be in the same dollar units and be accepted at stores and by all banks. Only the notes of the largest banks with good reputations would circulate widely, although it would also be possible for there to be local currencies from trusted issuers[8]. Free banking is not just hypothetical, as it had been practiced in many economies

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[7]For extra details about Steves' interview, see Http://www.marginalrevolution.com/marginalrevolution/2005/01/if_i_believed_i.html>

[8]Eventually, if most of the economies of the world practiced free banking, there would be a demand for a global currency, and the most likely candidate is gold. With gold as a medium of exchange, the private bank notes as well as funds in accounts and bills of exchange would be money substitutes. One could convert any paper currency or bank notes into gold. A small amount of gold would back up the value of real life purchases, and most purchases would use electronic media. For extra details about practicing free banking and the possible outcomes, see Foldvary, (2008).

prior to the Great Depression. One example is the free banking practiced in Scotland until when the Bank of England took over in 1844 (White, 1984).

In summary, Austrians' business cycle theory incorporated both the classical and Keynesians perceptions of the economy. It drew heavily on the classical theory by stressing the tradeoff between consumption and investment, but also acknowledged the potential for the economy to operate beyond the PPF, as in Phillips-curve based theories. On contrary, Austrians assumed that the economy will not simply return to the PPF after the boom, but stays below the PPF because changes in investment were not based on natural preferences and thus create a mismatch between production and future consumption. This mismatch will trigger a change in relative prices, raise interest rates that end up with a depressed economy. Austrians' one more time returned to the classical theory of "laissez-faire" when suggesting a free banking system as a remedy for marker distortions.

Austrians assumed that inflation is a supply side problem. They considered the central bank as the main source of inflation via its monetary injections. When newly created bank credit is injected into the economy, the credit expands and thus enhancing inflationary effects. So inflation is a natural process in the Austrian business cycle that should occur especially in capital goods market due to the widespread of investments in this sector and the increase in wages. When inflation comes to an end, this would be the time for the adjustment recession to start. Austrians emphasize the return to the free banking system and allow interest rates fluctuations according to people natural preferences about saving and investing.

A complementary theory 'the debt-deflation theory' was introduced by Irving Fisher to complete the picture. Austrians' business cycle is concerned with the supply side and describes the period before the peak, while fisher's theory is concerned with the demand side and describes the period after the peak (Fisher, 1933). Austrian business cycle was criticized that it doesn't explain the presence of business cycles even before the establishment of the FED in 1913, for example, the panic of 1873 which created a long depression in the U.S. and much of Europe. Additionally, there were also severe market crashes in the United States of the magnitude of the 1929 crash in 1869, 1882, 1884, 1896, 1901, and 1907 even before the existence of a Monetary authority.

George Selgin criticizes Mises' argument about returning to the gold standard. Mises' theory states that inflation will persist under fiat money as long as monetary injections continue and as long as there are more investments to be invested at and seems profitable under the prevailing interest rates. On the other side, inflation will not persist under the classical gold standard with the free banking system. However, George says that Mises failed to make a convincing case for gold, under a gold standard, deflation becomes equivalent to a rise in the relative price of gold, which in turn means a greater diversion of resources to gold mining. Monetarists also didn't advocate the return to the gold standard, which has one major benefit that it will limit the growth of MS and prevents inflation. However, it also has a major

shortcoming that as population increase, the demand for liquidity increases and with the absence of momentary injections of fiat money to match this raise, a recession will be inevitable (Herbener, 2002).

1-2-5. Monetarism (Chicago school)

A. Revolution against Keynesians:

The tight policy by the Fed during the 1920s and 1930s and the decline in MS figures in the United States in the course of contraction have brought the country to a severe recession and failed to stop inflation hikes until 1980s with the uprising of the Monetarism (Table 3). These figures prove the fallacy of Keynes believes about the ineffective rule of money and proving Friedman's view that MS do have an effect on the economy (Nelson, 2007). Unlike Keynes who adopted the "money doesn't matter" slogan. Friedman and Schwartz, (1960) argued that managing MS -not the money demand- is what matters in fighting inflation. They explained their rationalization by a simple fact that people chose to hold money to suit their needs and when MS increases people would have more money in their pocket that exceeds their needs. Consequently, this surplus will be spent, pulling up aggregate demand, and the entire economy from a recession.

Table 3: Average inflation rate computed using CPI (1973-1986), U.S.

Year	Average Inflation rate (%)
1973	6.16
1974	11.03
1975	9.2
1976	5.75
1978	6.5
1979	7.6
1980	11.2
1981	13.5
1982	10.3
1983	6.16
1984	3.2
1985	4.3
1986	1.9

Source: Bureau of labor statistics

Friedman, (1968) has also developed a theory of MS targeting called "K-percent rule". He proposed that MS should increase by a constant rate every year to meet the cyclical domestic demand for money. He then attributed inflationary pressures to any fluctuations in the MS expansion rate. The Federal Reserve began a "monetarist experiment" in October 1979, when the chairman Paul Volcker adopted an operating procedure based on the management of non-borrowed reserves. This procedure aimed to control the growth of M1 and M2 and hence to

reduce the double-digit inflation rates. As shown in Table 3, the disinflation effort was successful and leached the low-inflation regime that the United States has enjoyed since then. However, after 1982 the FED discontinued the MS targeting and it would be fair to say that since this time, the monetary and credit targeting have not played a central role in the U.S monetary policy, because of the unstable relationship between monetary aggregates and other macroeconomic variables Bernanke, (2006). Even Milton Friedman acknowledged that money supply targeting was less successful than he had hoped, in an interview with the Financial Times (London, 2003).

B. Monetary policy limitations

Friedman, (1968) stated that the ability of the monetary authority to peg MS changes to interest rates and unemployment is limited. First, the negative relation between interest rates and MS has illustrated the following figures. He differentiated between the perspective of the monetary authority and people liquidity preferences when explaining this hypothetical relation.
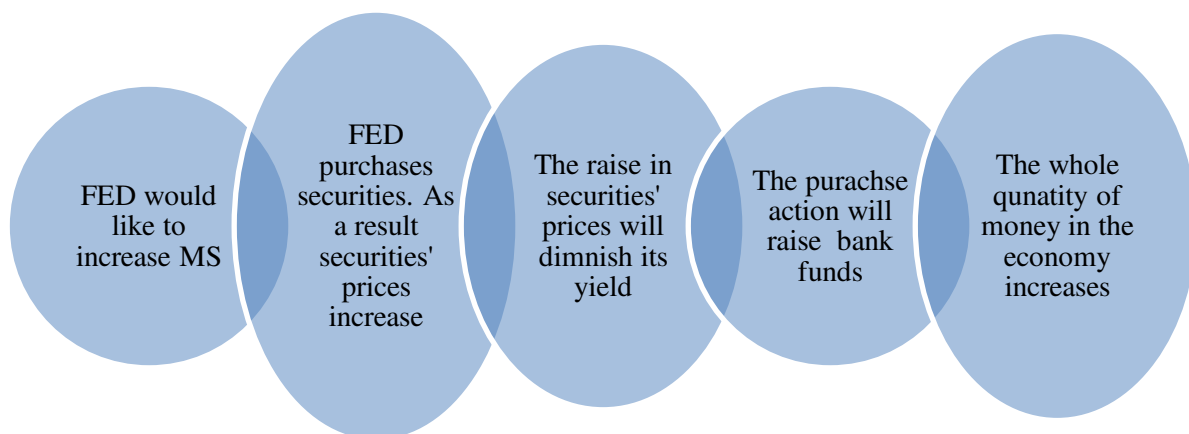

Figure 1: The negative relation between interest rate and MS according to monetary authority point of view
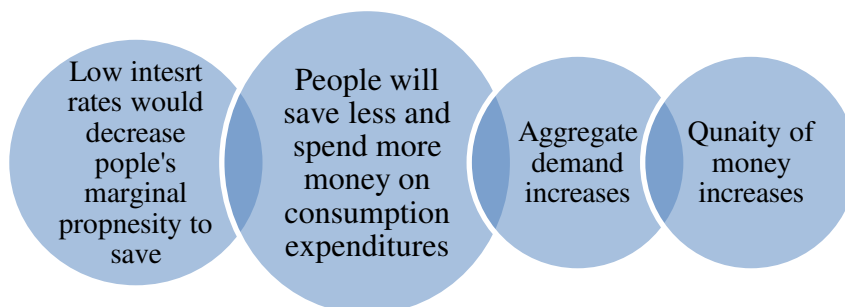

Figure 2: The negative relation between interest rate and MS according to people's liquidity preference
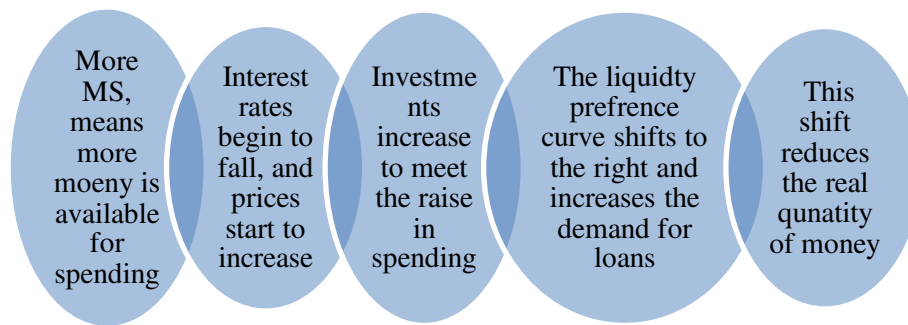
Figure 3: The temporary relation between interest rate and MS

The former illustrations not only explain why monetary policy cannot peg interest rate except for a limited time but also clarify why the interest rate is a miss-leading indicator for the tightness or easiness of the monetary policy. Hence, Friedman advice policy makers to consider the rate of change in the quantity of money (M2) instead of interest rates (Friedman, 1968).

The core of the second limitation between monetary policy and unemployment lies in fluctuations around the natural rate of unemployment. When unemployment is at its natural rate, any further reductions means there is an excess demand for labor that creates an upward pressure on wages, and contrarily any increase imply that there is a shortage of demand for labor and thus creates a downward pressure on wages. The relationship between unemployment and wage level is manifested by the 'Phillips curve', yet this curve has the major shortcoming that it does not consider the difference between nominal and real wages (Friedman, 1968). The following conjectural example elaborates further this limitation

  i.   Assume that people anticipate a high inflation rate of 75% a year.
  ii.   Real wages tend to increase with the anticipated inflation rate and supply of labor will increase.
  iii. Nominal wages start to increase but still below inflation rates.
  iv.   A deflationary monetary policy will be engaged to bring prices down.
  v.   Nominal wage rises will last longer and will not respond quickly to the deflationary policy, which increases the unemployment rate in the economy above the natural rate of unemployment.
  vi.   The economy targets an unemployment level below the natural rate of unemployment.
  vii. An expansionary monetary policy will be used to increase MS in the economy that will be translated into higher aggregate demand.
  viii. Interest rate began to fall in order to stimulate investment and spending. Output, employment and people income rise but prices have not started to increase yet.
  ix.   Producers respond to the increasingly demand by hiring more workers and engage in further productions plans. Unemployment decreases and workers accept the existing nominal wages.
  x.   Inflation starts in consumer products before production inputs. Real wages start to decline because of inflation; workers start to demand higher nominal wages.

xi. Before inflation, unemployment falls below natural rates. However, after demanding higher nominal wages, real wages tend to rise towards the initial level, unemployment also increases with the endurable increase in MS and real wages.

xii. For monetary authority to keep unemployment at its natural rate, it should maintain inflation and MS growth. So we conclude that the tradeoff between inflation and unemployment comes from unanticipated inflation shocks and that inflation hikes may decrease unemployment.

C. The quantity theory of money:

Friedman, (1987) introduced the famous "equation of exchange" or the "quantity theory of money" which describes the correlation between MS and the value of monetary transactions. It is an extension of Humes' "price species flow theory" that was explained earlier. The classic's version of the quantity theory postulates that the price level reacts proportionally to changes to the stock of money. It can be derived from the following equation:

$$MVY = PY_r \rightarrow P = (\frac{VY}{Y_r}) \quad P \rightarrow f \ (M) \tag{2}$$

Assuming an exogenous potential output and full employment, in the short term, Y_r can be treated as a constant. Assuming further that the income velocity of money VY is exogenous and constant, equation 2 can be specified as *P = AM*, where *A* is the proportionality constant. Under these assumptions, money is neutral meaning that real output is completely independent of the stock or changes to the stock of money, hence money affects only the price level (Micheal, 2008).

D. *Fisher's quantity theory of money:*

Fisher (1911) introduced his own version of the "equation of exchange" as follows:

$$MV = PY \tag{3}$$

Where M is the money supply, V is velocity, P is the price level and Y denotes the real output level. The right side of the equation *PY* is, therefore, nominal income or nominal output. We can rewrite equation 3 as M/P = V/Y, which states that real money supply (M/P), is equal to real money demand (V/Y). The following series of assumptions are then imposed: first, *M* is assumed to be exogenous and thus subject to the full control of the monetary authority. Second, *V* is constant, third, the aggregate nominal demand component cause changes in nominal income, i.e. causality runs from MV to PY. Fourth, movements in nominal output *PY* are driven by movements in M. and finally, Y is constant at the full employment level. So MS raises feeds entirely into higher price levels.

E- Cambridge approach:

Don, (1984) discussed another version of the quantity theory of money that was introduced by economists who are affiliated with Cambridge like Keynes and Alfred Marshal. This

version focused on money demand instead of the money supply. He argued that a certain portion of the money supply will not be used for transactions; instead, it will be held for the security of having cash on hand. This portion of nominal income PY cash is commonly represented as *k* as shown in Equation 4

$$M^d = k.PY \tag{4}$$

Assuming that the economy is at equilibrium ($M^d = M$), Y is exogenous, and k is fixed in the short run, the Cambridge equation is equivalent to the equation of exchange with velocity equal to the inverse of k:

M.1/ k=PY

The Cambridge equation led to Keynes's attack on the quantity theory and the Monetarist revival of the theory (Froyen, 1990).

E- Monetarist liquidity preference theory:

Friedmans' theory addressed the main weaknesses of the classical quantity theory, mainly ignoring the velocity of money and its determinants. Let us take a look at the updated monetarists' version of the "equation of exchange" after adding new variables. Friedman, (1956) expressed the money demand (M_d) function as follows

$$M_d = f(P, R_b, R_e, \langle (1/P)(\frac{dP}{dt}\rangle, Y, W, U) \tag{5}$$

i. Inflation rate: denoted by P, where a high price level implies a low 'price of money' so that $f'P > 0$.

ii. The prices of substitutive goods: here interpreted as the real return of other financial claims, such as yields on fixed-interest bonds R_b, and yield from holding real assets R_e, where $f'R_b < 0$ and $f'R_e < 0$. The yield from holding real assets rather than financial claims corresponds to the rate of inflation so that $f'(1/P)(dP/dt) < 0$.

iii. The budget constraint: here is expressed by the permanent income Y, where $f'Y > 0$ [9].

iv. The liquidity of total assets: here Friedman defines W, as the ratio of non-human assets to human capital. As human capital is less liquid as non-human assets, it follows that $f'w < 0$.

v. Preferences: here Friedman uses the term U to account for preference changes. Yet remains vague. It is more like a 'catch-all' term to make sure that this equation account for all possible variables.

Monetarism assumes the people are free from money illusion, the nominal money demand M_d is linearly homogeneous in nominal variables (here: P and Y), so that,

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[9] Permanent income is the expected average long-run income.

$$M_d/Y = \mathfrak{f}\left(P/y, R_b, R_e, \langle (1/P)(\tfrac{dP}{dt}), 1, W, U \right) \tag{6}$$

$$M_d = \mathfrak{f}\left(P/y, R_b, R_e, \langle (1/P)(\tfrac{dP}{dt}), 1, W, U \right)Y \tag{7}$$

Solving Equation 7 for Y and using the equilibrium condition M_d = MS, we get

$$Y = MS/\left[f\left(P/y, R_b, R_e, \langle (1/P)(\tfrac{dP}{dt}), 1, W, U \right] \tag{8}$$

With a stable money demand function and the exogenous nature of MS (predetermined by the monetary authority), nominal output Y can be directly controlled. Hence, from the monetarist point of view, the money supply is, or should be, the central variable of economic policy (Micheal, 2008)

In summary, Monetarists did not embrace the classical "laissez-faire" rule, rather they recommend controlling the money supply growth rate as a remedy for long and short run market distortions. They also asserted that nominal aggregate demand is affected by aggregate supply, therefore –unlike the Keynesians- emphasized the healing role of monetary policy in fiscal policy. Another departure from the Keynesians is the assumption of non- rigid of prices and wages. The quantity theory of money asserts the direct relationship between MS and price level.

According to Friedman's (1960) view of the monetary transmission mechanism, the increase in MS, will shift LM curve to the right, bringing down the interest rate and raising nominal output. However, the impact on the real output is limited due to the money velocity reduction. The former process constructs the biggest difference between the Keynesians and the monetarists. The monetarists argue that a complete effect on output will be realized, while the Keynesians argue that velocity absorbs a good part of the impact and thus the final effect on nominal output will be smaller.

During the 1980s the correlation between the excess supply of money and inflation had apparently collapsed. This eventually caused central banks in different countries to place less importance on the money supply as a target of monetary policy. Instead, they switched to having exchange rate targets, and lately to inflation targets as a monetary anchor (Micheal, 2008).

Samuelson and Nordhaus, (2004) returned the reason for the fall of monetarism to the sharp changes in M1 velocity during the period 1980s-1990s. Recall that, monetarists hold that velocity is predictable and changes in MS would be translated completely into changes in nominal output. However, the heavy reliance on monetary targeting during this period created severe unpredictable changes in money velocity. So by the early 1990s, the Fed had turned primarily to output, inflation, employment and unemployment as key indicators of the state of the economy.

1-2-6. Neo classical-Keynesian synthesis

A. A necessary introduction

Klein, (1946) was one of the first economists to use the term "macroeconomics", in his paper he stated that "Many of the newly constructed mathematical models of economic systems, especially business-cycle theories, are very loosely related to the behavior of individual households or firms which must form the basis of all theories of economic behavior ". How to reconcile the two visions of the economy was the main concern during this era. The microeconomic side based on Adam Smith's invisible hand and Alfred Marshall's supply and demand curves. And the macroeconomic side mainly founded on Keynes analysis of the aggregate economy. Early Keynesians, such as Samuelson and Tobin, thought they had reconciled these visions in what is sometimes called the "neo classical-Keynesian synthesis." Although this synthesis is coherent, it is also vague and incomplete. These shortcomings forced the neo-classical and neo-Keynesians to reject this methodology and develop a new approach (Manikw, 2006).

B. Neo- Keynesians main assumptions

This school of thought is developed partly as a response to the criticisms of the Keynesians macroeconomics by the neo-classical macroeconomics adherents. These critics revolve around the assumptions of several market failures and the price stickiness[10]. Still, neo-Keynesians agree with neo-classical about the neutrality of MS in the long run, but because of the price stickiness assumption, neo-Keynesians believe that MS fluctuations in the short run directly influence output and employment levels. However, they don't advocate the use of expansive monetary for short run gains in output and employment because inflationary pressures that will occur will be hardly removed unless the economy was subject to a recession or an external shock (e.g. fall in consumer confidence) (Olivier and Jordi, 2007). Studies of the optimal monetary policy in the neo-Keynesians' Dynamic Stochastic General Equilibrium (DSGE) models emphasized the use of nominal interest rate adjustments in adjusting inflation and output gaps. Eventually, stabilizing inflation will stabilize both output and employment, or what is known as the called this "Divine coincidence" (Blanchard and Gali, 2007).

C. Inflation

Lerner (1983) was the first Keynesian economist to stress the possibility and importance of inflation in the Keynesian models. In his theory the "functional finance", he stressed on the governmental role of controlling inflation and deflation and considered this as the primary

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[10] One explanation of price stickiness is given by Manikw, (2006) that changing prices is followed by externalities, for example menu costs that need to be adjusted in response to price changes, as a result of lowering MS, a particular firm would reduce its product price, but what it really does is raising people real income that will force them to purchase more (not necessarily from the same firm). So when the firm doesn't receive the full benefit of price reduction, this will reduce the firm response to macroeconomic events by adjusting its prices.

objective of the government policy. He later incorporated the unemployment-inflation tradeoff explained by "Phillips curve" and the possibility of stag inflation later before the emergence of neo-Keynesians. Samuelson and Solow, (1960) were the first to integrate the "Phillips Curve" into the Neo-Keynesian edifice. Keynes, (1940) have introduced the concept of the demand-pull inflation, which reasons inflationary waves to excess demand, that will bring about higher levels of supply and output by the multiplier effect until the economy reaches full employment. At this level, output stagnates and with higher aggregate demand levels, raising goods price will be the only way to clear the markets.
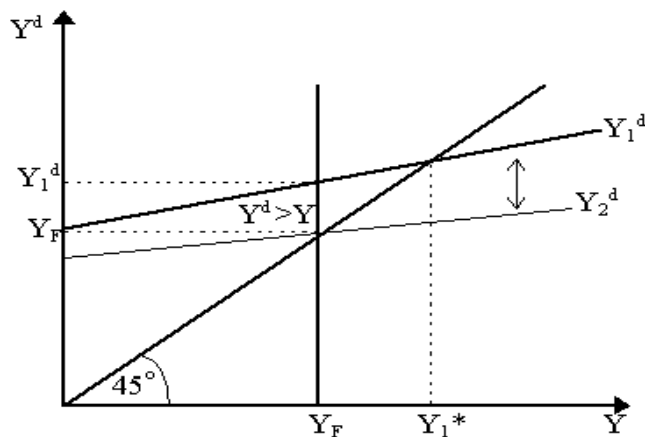

Figure 4: Demand-pull inflation (inflationary gap).

The demand pulls inflation is elaborated by the 45 income-expenditure diagram in Figure 4, where Y_F is full employment output and Y_1^d is aggregate demand. Note that the market-clearing level of output is Y_1^*, but it is not achievable – thus the "inflationary gap" is the difference between Y_F and Y_1^*. Keynes's, (1940) argument can be restated as follows: as money wages lag behind prices in adjustment, the rise in prices will, therefore, lead to a distribution of income away from wage-earners and towards profit-earners. He posited that, as workers have greater marginal propensities to consume than profit-earners, the redistribution of income induced by the inflationary gap will thereby lead to lower aggregate demand and thus close the gap, i.e. the aggregate demand curve flattens and falls in Figure 4 from Y_1^d to Y_2^d .

The problem persists as workers demand higher wages. The time lag for nominal wages to adjust depends upon the barraging power of their labor union and the flexibility of labor laws in their country. Once nominal wages increase, income redistributes away from profit-earners and towards wage-earners so that demand rises again (from Y_2^d to Y_1^d) and thus the inflationary gap re-emerges. But that inflationary gap, as noted earlier, leads to another price rise, redistribution of income to profiteers, etc. Thus, the whole process repeats itself continuously so that there will be, effectively, sustained, continual increases in prices.

Cost push theory of inflation (seller's inflation) also suggested in Keynes, (1940). In a perfectly competitive market; firms set the price of output according to a simple markup formula:

$$P = (1 + m)w \qquad\qquad\qquad (9)$$

Where P is price, m is markup profit and w is wages. Hence with the economy approaching full employment, unemployment starts to fall and with labor demanding higher wages by the help of their labor unions bargaining power, Employers set higher prices while sustaining the markup profit. Soon labor finds that their wage increase is not real and thus demand higher wages, this process continues to create a sustained increase in the price level in the economy. Lerner, (1974) stressed that the blame doesn't all fall on the workers' shoulders alone, seeking higher profit by owners also could create similar inflation, even in the presence of high unemployment i.e. Stag inflation. Also, Lerner and Colander, (1980) introduced a new remedy for stagflation, known as the Markup-Anti-inflation Plan (MAP). They proposed that the right to change prices should be assigned to firms in the form of a fixed supply of tradable vouchers, so that if a firm attempts to raise its prices, it would have to cash in its vouchers and thus abandon its right to further price increases and a firm which lower prices would gain vouchers in return. If a particular firm wanted to raise prices further, then it would have to purchase vouchers from other firms on the open market. In their view, these added costs would make profit-induced price rises less appealing to firms and thus help bring stagflation under control.

D. Phillips curve explained:
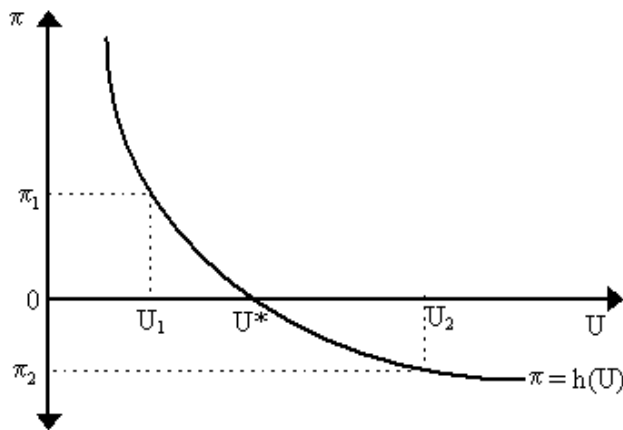
Figure 5: Phillips curve of a single industry.

Figure 5 shows the plot of Phillips curve for a single industry. The aggregated Phillips curve will look similar, however, it will be located above the single industry curve because of distribution of unemployment across several industries. Samuelson and Solow, (1960) asserted that if the Phillips Curve were seen as a stable empirical relationship between unemployment and inflation, then a policy-maker could find the particular rate of unemployment (U^*) needed for price stability ($\pi = 0$). Alternatively, if the policy-maker wanted to achieve a higher level of employment (thus lower unemployment, say at U_1 in Figure 5), then he would have to allow inflation to reach π_1. (The converse case of deflation and high unemployment are seen at U_2, π_2). In short, Samuelson and Solow (1960) argued

that there is a definite inflation-unemployment trade-off that could be managed by policy-makers.[11]

E. Natural rate hypothesis "Milton Friedmans' missing equation":

Milton Friedman couldn't decide what is the proper effect of MS increase, indeed it will raise aggregate nominal demand, but that could happen because of the rise in the price level or/and rise in output. This constitutes what is known as the "missing equation". As Phillips curve provided the neo-Keynesians with an empirical rationale for setting their dynamic nominal wage which was absent in their system, it has also provided the monetarists with their own missing equation. The theory of the "natural rate hypothesis" introduced by Friedman, (1968) compiled the missing parts. The original Phillips curve asserted that there is a negative relation between nominal wage inflation and unemployment rate. Figure (6) presents the transmission from wage into price inflation.

$$\pi = h(U)/(1-\beta)$$

$$\pi = h(U) + \beta\pi_2$$

$$\pi = h(U) + \beta\pi_1$$

$$\pi = h(U)$$
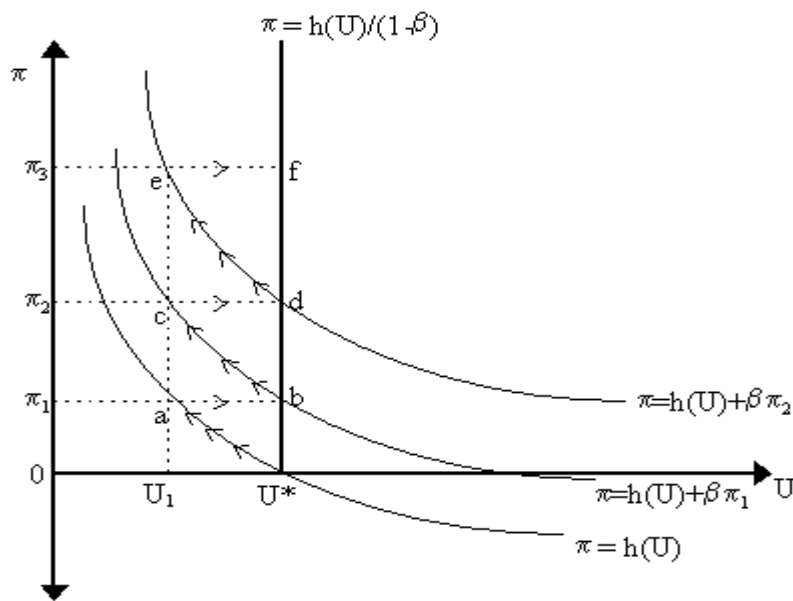
Figure 6: Natural rate hypothesis

Unemployment (U) estimated as the difference between labor supply and labor demand $(Ls - Ld)/Ls$, in neo-classical theory, household supply labor at a particular wage level (w/p), at this wage level there is a particular amount of labor supplied (LS*). Labor demand is established by profit-maximizing firm conditions. The natural rate of unemployment at a particular wage level (U*) equals (Ls*- Ld)/Ls*. Assume that U* is the actual prevailing unemployment level. Phillips curve $\pi = h(u)$ will pass through U* at zero inflation rate. Assume government is targeting unemployment level U1 which is below U *, by increasing nominal demand, firms will respond by increasing output and hiring more workers. To do so,

firms raise nominal wages to attract those workers out of leisure Gw>0 (at point a on the graph (U1, π1), but with the assumption that there is no productivity growth, then the increase in nominal wages will be inflationary. Workers realize that their real income has not changed, so they leave the market and unemployment jump back to U * however, at a higher inflation rate (at point b (U*, π1).

F- Theory of adaptive expectations:

Friedman (1968) and Phelps (1967, 1968) proposed that agents have some kind of adaptive expectations of prices that are extrapolated from their experience of past inflation. Agents increase their supply only if current inflation levels are higher than expected levels $\pi > \pi^e$. In other words, if they misperceive what actual inflation is and only if firms increase wages faster than expected inflation. Expectations-augmented Phillips curve in which can be expressed as follows:

$$\pi = h(unemployment) + \beta\pi^e \qquad\qquad (10)$$

Phillips curve is now related to inflation expectation, if $\pi^e=0$, then we revert to the original version of Phillips curve. However, if we have positive inflation expectation $\pi^e>0$, then each higher level of expectation corresponds to a higher short-run Phillips curve. In the long run, $\pi^e = \pi$, so expectations-augmented Phillips curve tends to be a vertical line at the natural rate of unemployment (Friedman, 1968). In other words, there is no stable long-run trade-off between inflation and unemployment.

G- The impact of unanticipated inflationary shocks:

According to the expectations-augmented Phillips curve, Abel and Bernanke, (1994) stated that unemployment will fall below the natural rate only when inflation is unanticipated. Neo-classical and neo- Keynesians diverge at this point. Classicals consider that policy (such as more rapid monetary expansion) that increase the growth rate of aggregate demand act primarily to raise actual and expected inflation together -because people are assumed to have rational expectations- which hinders the ability of the government to initiate unexpected shocks. Hence, any systematic attempt to affect unemployment will be thwarted by the rapid adjustment of inflation expectations and the government cannot keep actual inflation above expected inflation.

In contrast, the neo- Keynesians argue that policymakers do have some ability in the short-run to create unanticipated inflation shocks and thus are able to bring down unemployment below the natural rate. Because of the Keynesians assumption of sticky prices, when policymakers cause aggregate demand to rise above the expected level, time is needed for prices to fully reflect this raise. This lag creates a situation, where some prices reflect old information, which indicates higher actual inflation relative to the expected rate. Accordingly, unemployment could remain below the natural rate shortly.

In line with the neo-classical, Friedman, (1968) argued that the only way of maintaining unemployment below the natural rate is that the government continuously accelerate the rate of nominal aggregate demand growth. The inflation rate, of course, would spiral upwards to a high degree of hyperinflation. At any point, the government relented in its acceleration, the unemployment rate would jump right back to the natural rate, leaving a very high inflation rate and the government's accelerating efforts would have been wasted.

H- Expectations-augmented Phillips curve

The theory of the Phillips curve seemed stable. Data from the 1960's modeled the trade-off between unemployment and inflation well. However, data from the 1970's and onward did not follow the trend of the classic Phillips curve. For many years, both the rate of inflation and the rate of unemployment were rising. These findings pushed many economists to accept a central tenet of the Philips curve theory, which asserts that there is a specific rate of unemployment that, if maintained, would be compatible with a stable rate of inflation. Many call this rate the "No Accelerating Inflation Rate of Unemployment" (NAIRU).[12]

Figure 7 plots fluctuations in inflation against unemployment rate from 1976 to 2002. The expectations-augmented Phillips curve is the straight line that best fits the points on the graph (the regression line). It summarizes the inverse relationship. According to the regression line, NAIRU (i.e., the rate of unemployment for which the change in the rate of inflation is zero) is about 6 percent, while the slope of the Phillips curve indicates the speed of price adjustment. If the economy is at NAIRU with an inflation rate of 3 percent and the government would like to reduce the inflation rate to zero. Figure 7 suggests that contractionary monetary and fiscal policies that drove the average rate of unemployment up to about 7 percent (i.e., one point above NAIRU) would be associated with a reduction in inflation of about one percentage point per year. Thus, if the government's policies caused the unemployment rate to stay at about 7 percent, the 3 percent inflation rate would, on average, be reduced one point each year falling to zero in about three years (Kevin, 2007).

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[12]The natural rate of unemployment (sometimes called the structural unemployment rate) describes the long run unemployment rate, in which actual unemployment equal this natural rate regardless of the level of inflation rate maintained, this natural rate is changeable and not fixed. If U* is the NAIRU and U is the actual unemployment rate, the theory says that: if U<U* for a few years, inflationary expectations rise, so that the inflation rate tends to accelerate. While if U>U* for a few years, inflationary expectations fall, so that the inflation rate tends to slow (there is disinflation). And if U = U*, the inflation rate tends to stay the same, unless there is an exogenous shock.
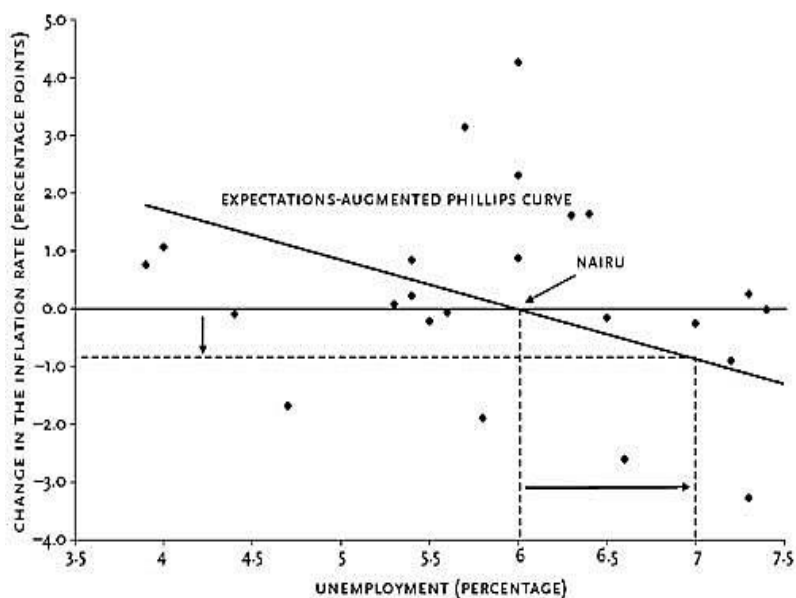
Figure 7: Expectations-augmented Phillips curve and NAIRU". #
Notes: Inflation is based on the Consumer Price Index.
Source: Bureau of labor statistics.

This theory created a controversy between a wide range of scientists about the existence of this NAIRU and the presence of the natural rate of unemployment. Some Neo-Keynesian and some free-market economists hold that there is only a weak tendency for an economy to return to NAIRU. They argue that there is no natural rate of unemployment to which the actual rate tends to return. Instead, when actual unemployment rises and remains high for some time, NAIRU also rises. The dependence of NAIRU on actual unemployment is known as the "hysteresis hypothesis". The hysteresis hypothesis appears to be more relevant to Europe, where unionization is higher and where labor laws create numerous barriers to hiring and firing than it is to the U.S (Kevin, 2007).

I.   *Neo-classical theory of Rational expectations "surprise money only matters":*

Lucas, (1973) and Sargent, (1973) postulated that a systematic monetary policy has no effect on output. Only policy shocks can influence output. Contrary to Friedman's "only money matters", the neo-Classical' raise the watchword of "only surprise money matters". Sargent, (1973) introduced a new theory that replaces Friedman's adaptive expectations with what they call "theory of rational expectations". This theory shows that not only there is no long-run trade-off between inflation and unemployment, but that there is not even a short-run trade-off. The neo-classical' objection was that Friedman's "adaptive expectations" assume that agents are making a systematic error of inferring future inflation rates based on current ones. On contrary, the rational expectations hypothesis argues that agents make full use of their information and do not make a persistent systematic error.

In the context of the natural rate hypothesis (Figure 6), workers would have expected there to be accelerating inflation from the outset and would have refused to supply more labor in response to the higher money wages offered by firms. In other words, they would not have

moved up the short-run Phillips Curve from the initial position (U = U*, π = 0) to point a (U = U_1, π = π_1) but rather would have jumped straight to point b (U = U*, π = π_1) on the long-run Phillips curve. In other words, the government would have been unable to lower unemployment to U_1 even temporarily.

This does not mean that unemployment cannot fall below U* as a response to monetary acceleration. But this acceleration would have to happen unsystematically or randomly so that agents would not be able to form expectations. In this case, then inflation expectations could not be properly constructed and agents would indeed move up to point a (U = U_1, π = π_1). But this is temporary: as soon as they realize what happened -similar to the Monetarist's scenario- they would leave the labor market again and unemployment reverts back to U*.

In summary, this section explained the nature of the term "synthesis" that combines both the classical and the Keynesian theories. This blended theory was developed by Hicks, (1937). Although this synthesis basically has quite many issues that are related to different aspects of macroeconomics and microeconomics, our discussion was mainly revolving around the theme of our book, monetary policy.

The neo-classical' main contribution to this synthesis, is their theory of rational expectations that contradicts with the idea of Phillips curve. It states that there is no tradeoff between inflation and unemployment neither in short run nor long run, unless the government was able to make aggregate demand accelerating shocks that agents would not expect. These shocks, in turn, could create a temporary trade-off in short time but only temporary, as when agents realize the government plan then this trade off will be exploited. Neo-Keynesians agree with the neo-classical about the nonexistence of this trade-off in long run, however, they defend its presence in short run. Using their theory of adaptive expectations that current inflation expectations are created from past inflation experience. On the other side, they raise doubts about the ability of the government to push down unemployment level below what is called the natural rate of unemployment, because of the money illusion- which tempted workers to leave leisure and get to work- soon will vanish and they will find that their real wages have not improved because of the higher price levels. Therefore, unemployment gets reverts back to the "natural rate of unemployment" forming the neo-Keynesians' version of Philips curve known as the expectations-augmented Phillips curve. This money illusion can endure and reduce unemployment, only when the government continuously increases aggregate demand, but this is a dangerous remedy because once the government for any reason stops this process, the economy will suffer from a hyperinflation. A group of opponents introduced the hysteresis hypothesis, which conditionals the existence of the natural rate of unemployment –as well the applicability of the expectations-augmented Philips curve- to labor laws and rigidity of hiring and firing rules in the country.

Friedman's missing equation was completed with the synthesis, emphasizing that monetary expansions are closely linked with price levels than with output. When the economy reaches full employment, output can't increase further unlike price levels. Therefore, if the government intent to conduct higher employment and output levels, they should expect to

every mean higher inflation. By the time the government reaches its full employment and become forced to stop the process of monetary expansion otherwise it will go bankruptcy or the money will lose its value as a medium of exchange. Eventually, it will stop the accelerating process and higher price levels will remain.

1-2-7. New-Neo classical synthesis

Our time-travel journey has finally come to an end. The new neo-classical synthesis (NNS) represents the current models which govern monetary policy actions today and the baseline of the coming chapters. They are complex since they involve intertemporal optimization, rational expectations, and monopolistic competition. Along with applications on inflation targeting wherein the rate of inflation (positive or near zero) is targeted by the monetary authority. The NNS sets four central monetary policy guidelines. First, their models suggest that the impact of the monetary policy on real economic activities is resilient, due to the slow adjustment of individual prices and the general price level. Second, even in settings with costly price adjustments, they suggest a low scaled long-run trade-off between inflation and output at the low inflation rate. Third, NNS models suggest significant gains from eliminating inflation, which stems from increased transactions efficiency and reduced relative price distortions, and finally, they assert that credibility plays an important role in realizing monetary policy actions (Goodfriend and King, 1997).

NNS models stress that economic fluctuations cannot be interpreted or understood independent of monetary policy. From a normative perspective, the NNS suggest that aggregate demand must be managed by the monetary policy in order to deliver efficient macroeconomic outcomes. The NNS defines two mechanisms for transmitting the monetary policy actions to the real economy. The First channel is through its influence on the goods' prices and the marginal cost of production (average markup), as monetary policies can raise aggregate demand and lowers the average markup that in turn create surges in output and employment. The second is attributed to the impact of MS fluctuations on aggregate demand, which trigger changes in aggregate supply (Goodfriend and King, 1997).

1-3. Connecting the dots:

Following Mabrouk and Hassans', (2012) tabulated summary of monetary developments in the history of macroeconomics. The section presents the main highlights from the previous sections while underlying the main theme or contribution of each school regarding monetary policy actions and its impact on the economy.

1-   The first form that describes the correlation between MS (gold or silver) and inflation were first introduced by David Hume with the name price species flow, then this theory was updated by Fisher who was the first economist to give it the name "quantity theory of money". Cambridge scientists with Keynes replaced MS with MD to express the Keynesians view of inflation as a demand side problem. The latest update to this equation was postulated

by the monetarists' theory of liquidity preference with more control variables like a budget constraint, preference, the price of related goods.

2-   Classical and Austrians put a great emphasize on the laissez-faire rule of non-government intervention.

3-   The market rigidness assumption was first used by the classical economist David Ricardo in his theory "beneficial inflation "which describe the gap between MS expansion and inflation, that could be used as a remedy for unemployment. Later the same concept was used by Keynes in his theory that viewed monetary policy as a remedy for unemployment that could push the economy towards full employment before indexed to inflation.

4-   According to the Keynesians, fiscal policies are more influential than monetary policies because the economy might enter a liquidity trap that blocks monetary changes from affecting the economy.

5-   Free banking –according to the Austrians- and natural adjustment of interest rates are their suggested policies to prevent market distortion problems like inflation and recession.

6-   Keynesians agreed with the Monetarists about the need for government intervention to clear the market distortions and solve problems like inflation and unemployment, but they disagreed on which policy action is required. Keynesians view inflation as a demand-side problem that is managed by fiscal policies, and monetarists considered inflation as a supply side problem that is controlled by the monetary authority.

7-   Friedman's K-percent rule was suggested by the Monetarists as a cure for high inflation and a catalyst for economic growth, through both reducing unemployment and increasing nominal aggregate demand.

8-   Monetarists postulated that the negative correlation between MS and interest rate exist for a limited period. After some time, interest rate gets back to its initial position, or even higher because of people expectations.

9-   Classical agreed with monetarists about the possibility of bringing down unemployment rate below the natural rate of unemployment via unanticipated inflation shocks.

10-   Neo-Keynesians agreed with the old Keynesians about the assumption of sticky wages and prices but neo-Keynesians started to consider inflation as a separate problem not just a remedy for unemployment. They revisited inflation sources in their new models as a cost push and demand pull sources in the context of the Phillips curve.

11- Neo-Keynesians believe in the short-run tradeoff between inflation and unemployment and its absence in the long run, while the neo-classical rejected the existence of this swap neither in the short nor in the long run.

Chapter two: the theory of optimal monetary policy

2-1. Monetary Transmission Mechanisms (MTMs)

Monetary policy is an effective and a powerful tool, but sometimes it has unexpected consequences. To conduct a successful monetary policy, the monetary authority should have an accurate assessment of the timing and the effect of their policies on the economy. MTMs describe how policy changes in nominal money stock or short-term interest rate affect real economic variables such as employment and aggregate output (Ireland, 2004).

2-1-1. Interest rate channel:

We start our analysis with the interest rate channel. This channel plays an important role in transmitting monetary changes to households and firms (Al Mashat and Billmeier, 2007). The traditional Keynesian interest rate channel in the IS-LM model can be disentangled into two steps: a- the transmission from short-term nominal interest rate to the long-term real interest rate. b- The impact of real interest rate developments on aggregate demand and production (Fabrizo et al., 2006). The following example clarifies how this channel works, suppose that the authority decided to conduct a tight monetary policy. This, in turn, raises short and long run nominal interest rate[13]. This appreciation leads to a decline in business and residual investments by households, which causes a decline in aggregate output. Changes in interest rates entail two conflicting effects, an income effect that is attributed to the income of the interest bearing asset holders. And the second is a substitution effect, which pushes people towards savings accumulation instead of consumption (Fabrizo et al., 2006).

2-1-2. Exchange rate channel:

There are two main methods of altering exchange rate of local currencies, the first is interest rate fluctuations, for instance when real interest rate rises, domestic currency deposits become more attractive compared with foreign currency deposits that lead to appreciation in the local

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[13] For any theory or model of MTMs, we assume some combination of sticky prices and rational expectations in an economy that works to prevent nominal prices from adjusting immediately, it works in a way that real value of monetary base become proportional to changes in the short nominal interest rates.

currency exchange rate. This higher value of the local currency will negatively affect the external competitiveness of domestic goods and beget a downward pressure on net exports account and aggregate output (Mishkin, 1995). The second is the direct intervention of the monetary authority in the foreign exchange market (Disyatat and Galati, 2005).

Price-exchange rate pass-through depends crucially on the pricing behavior of importing firms. If prices are set in the importer's currency then any change in the exchange rate will be automatically transmitted to the prices of the destination country. This implies complete exchange rate pass-through, which is sometimes also referred to as Grassman.s law. Alternatively, if the price of imported goods is fixed in the local currency, hence exchange rate movements are not reflected in domestic prices and the pass-through is zero (Jun and Roland, 1999). Another determinant of the price-exchange rate pass through is the macroeconomic environment wherein high inflation is conducive to a perfect pass-through compared to low inflation economies (Taylor, 2000). As well the degree of openness and the country size affects the functionality of this channel, wherein the higher the openness and the smaller a country is, the higher the pass-through tends to be (Soto and Selaive, 2003). The composition of trade profile and the country imports plays a role, as the pass-through is nearly complete for energy and raw materials and is considerably lower than unity for food and manufactured products. This kind of reasoning explains why the pass-through is higher for developing countries (which import higher pass-through goods) than for developed countries (which import more low-pass-through goods) (Fabrizio et al., 2006).

2-1-3. Asset price channel:

Monetarists have always criticized the Keynesians for analyzing MTMs in the light of either the interest rate or the exchange rate channel (Mishkin, 1995). On contrary, Monetarists do not commit themselves towards a specific MTM, rather they postulate that these channels change with the business cycle fluctuations. Nevertheless, two channels are often emphasized in the monetarist analysis of the MTMs, Tobin's q theory of investment and wealth effects on consumption (Mishkin, 1995).

Monetary transmission through Tobin's q is described in the following formula that represents how monetary policy affects the value of the firm's Tobin q and thus put downward pressure on investment and aggregate output.

$MS \downarrow, People\ spedning \downarrow, demand\ on\ equities \downarrow, equity\ prices \downarrow, tobin's\ q\ value \downarrow, I \downarrow, Y \downarrow$

While the monetary transmission through wealth is described as follows

$$MS \downarrow, demand\ on\ equities \downarrow, equity\ prices, wealth \downarrow, C \downarrow, Y \downarrow$$

This channel has been strongly advocated by Modigliani, (1971), wherein consumption spending is determined by the lifetime resources of consumers, which are made up of human capital, real capital and financial wealth. A major component of the financial wealth is

common stocks. When stock prices fall, the value of financial wealth decreases, thus decreasing the lifetime resources of consumers, and consumption should fall. Another alternative view to the wealth effect is the so-called liquidity effect. Mishkin, (2001) and Fabrizio et al., (2006) argued that spending on durable goods and housing is influenced by the consumer's perception of the likelihood of running into financial difficulties. The higher the ratio of liquid financial assets to debt is, the lower the probability of financial distress will be. Thus, an increase in equity prices decreases the danger of future problems related to debt and therefore encourages households to consume more goods and housing.

2-1-4. Credit channel:

This channel is divided into two main outlets: bank lending and balance sheet. The first is the bank lending channel, which affects small firms that can't deal with financial markets directly through equity and bonds. So they rely on banks and financial intermediaries to complete this missing link, the transmission effect of this channel could be summarized in the following formula that shows the negative impact of a contractionary monetary policy on the bank reserves, which decrease the account of loans available for individual agents and firms, thus investment and output decrease (Al Mashat and Billimeier, 2007).

$$MS \downarrow, Bank\ reserves \downarrow, bank\ loans\ fund \downarrow, I \downarrow, Y \downarrow$$

The second is the balance sheet channel that affects firm's net worth. A decrease in firm's net worth lead to two effects: the first one increases in moral hazard as the owners have low equity in firms so they might engage in riskier investment decisions that may end up for the lenders to lose their money. The second one is that lenders may have less collateral for their loans so they will decrease their lending (partnership or through equity and debt markets) that negatively affect financing investment decisions of the firms (Mishkin, 1995).

$$MS \downarrow, Equity\ price \downarrow, net\ worth \downarrow, I \downarrow, Y \downarrow$$

2-1-5. Expectations channel:

The conductivity of this channel depends mainly on the credibility of the monetary authority. It functions by steering expectations of market participants about future economic conditions. It also interacts with all others monetary channels (Al Mashat and Billimeier, 2007).

2-2. Theory of optimal monetary policy and Inflation Targeting (IT)

2-2-1. The need for a new nominal anchor

A nominal anchor is considered useful for central banks when conducting their monetary policy actions. It helps to clarify both within the central bank and to the general public the (intermediate or final) objective of the central bank in carrying out its policy. A publicly

announced policy anchor also helps the central banks to communicate externally both its policy goals and changes in their policy instruments. Finally, a credible nominal anchor helps to focus the expectations of the public on the policy goal and thereby facilitates the achievement of the goal. The fixed exchange rate was the principal nominal anchor in the first two to three decades of the postwar period. After the collapse of Bretton Woods and the sharp increase in worldwide inflation in the first half of the 1970s, both have triggered the need for an alternative nominal anchor. Many countries tried to anchor their monetary policy by targeting a monetary aggregate. Unfortunately, money targeting proved unsuccessful for a number of reasons, the most important is the lack of stability in the money demand function. This instability was largely the result of a combination of deregulation (in some countries) and a wave of financial innovation by banks and other financial entities that resulted in important changes in the way that the public held their financial assets. By the mid-1980s, it was clear that monetary targeting has failed as a nominal anchor for many central banks (Freedman and Laxton, 2009; Abd El Ghaffar, 2007).

In some countries that had earlier adopted a floating exchange rate, the inability to use either of the traditional nominal anchors (fixed exchange rate and monetary aggregate targets) left a vacuum, which was sometimes filled by a qualitative commitment to low inflation on the part of the central bank. In the first half of the 1990s, a number of other countries also had unfavorable experience with exchange rate targets. For example, the United Kingdom, Sweden and Finland, since they could no longer use the fixed exchange rate as the anchor for their policy and since their monetary aggregates were insufficient, they chose to introduce IT as the central element of their policy framework (Abd El Ghaffar, 2007).

The situation in emerging economies is more varied. Some still use monetary aggregates as a policy anchor, perhaps because they feel that no another option is available or feasible. Others use some form of fixed exchange rate. In some cases, especially smaller economies, they use harder versions of the fixed exchange rate regime, involving the use of another country's currency for much of their transactions (dollarization or euroization), a currency board, or participation in a monetary union. In other cases, a softer version of the fixed exchange rate regime, involving some variant of the classic adjustable peg, with or without fluctuation margins, is still used. Several emerging economies, typically midsized or larger, have adopted IT framework and are using inflation as their nominal anchor.

In the early 1990s, a number of industrial countries adopted a framework for carrying out monetary policy that became known as inflation targeting (IT). New Zealand was the first to adopt IT in 1989, and then it was followed by twenty-nine countries and several other central banks, including the European Central Bank (ECB), the Swiss National Bank, and the Federal Reserve in the United States. Through the 1990s, IT was almost entirely confined to advanced "industrial" countries. Since the late 1990s, however, an increasing number of emerging market and developing economies have adopted the framework in response to the difficulties that they had encountered in conducting their monetary policy. At the same time, they saw the move as a way to improve their record of controlling inflation and to make their monetary policies more transparent and accountable (Scott, 2009).

Bernanke and Fredric (1997) asserted that inflation targeting is a framework for monetary policy that characterized by (i) the public announcement of official quantitative targets (or target ranges) for the inflation rate over one or more time horizons, and (ii) the explicit acknowledgment that low, stable inflation is monetary policy's primary long-run goal. Among other important features of inflation targeting are (iii) vigorous efforts to communicate with the public about the plans and objectives of the monetary authorities, and, in many cases, (iv) mechanisms that strengthen the central bank's accountability for attaining those objectives. Mishkin, (2001) defined inflation targeting in the same way but added one more element that inflation targeting is an information inclusive strategy in which many variables, and not just monetary aggregates or the exchange rate, are used for deciding the setting of policy instruments.

On a practical level, the decision to pursue IT is directly resulted from the failure of indirect approaches, based on either monetary or exchange rate targeting, to yield acceptable results[14]. The case for inflation targeting begins with the premise that the main goal of monetary policy in any country must be to attain and preserve a low and stable rate of inflation. Although this premise was the subject of controversy among economists not too long ago, it is widely accepted today because of general agreement on the following basic propositions (Masson et al., 1998; Scott, 2005):

i. An increase in the money supply is neutral in the medium-to-long run. This means that money supply increases have lasting effects only on the price level, not on output or employment.

ii. High and variable inflation is costly, in terms of either the allocation of resources or long-run growth in output or both.

iii. Money is not neutral in the short run. In other words, monetary policy has important transitory effects on a number of real variables, including output and unemployment. There is, however, still an imperfect understanding of the nature and size of these effects.

iv. Monetary policy affects the rate of inflation with lags of uncertain duration and varying strength. These lags make it difficult, if not impossible, for the central bank to control inflation on a period-by-period basis.

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[14] In the case of monetary targets, instability in money demand relationships—commonly associated with financial system reforms and opening of capital markets—undermined the usefulness of monetary aggregates as policy guides. In the case of exchange rate pegs, real exchange rate targets provided no nominal anchor, while nominal exchange rate pegs left both prices and activity vulnerable to shocks affecting equilibrium real exchange rates Scott, (2009).

Building on these generally agreed principles, it is widely argued that inflation targeting as a framework can improve the design, implementation, and performance of monetary policy (Scott, 2009).

2-2-2. IT prerequisites

First, the central bank should have a considerable degree of independence. Even though it is not necessary for the central bank to have full legal independence, the monetary authorities must have the freedom to gear the instruments of monetary policy toward some nominal objective. Since policy makers are often tempted to use monetary policy to achieve quick but temporary objectives, such as financing of the budget deficit, high employment or low-interest rates to reduce the government's financing costs, they are likely to induce increases in inflation expectations and in actual inflation that persist after the desirable effects of monetary expansion have disappeared (Freedman and Laxton, 2009).

Second, a country must not show any of the symptoms of "fiscal dominance", in other words, the conduct of monetary policy should not be dictated or constrained by purely fiscal considerations. This implies that the public sector borrowing from the central bank and the banking system should be low or nonexistent; the government should have a broad revenue base and should not rely on the revenues from seigniorage generated by excessive currency issuance (Masson, et al., 1997).

Third, authorities should refrain from targeting the level or path of any other nominal variable, such as wages or the nominal exchange rate. A country that chooses a fixed exchange rate system subordinates its monetary policy to the exchange rate objective and is not effectively able to target directly any other nominal variable, such as the rate of inflation. And the fourth point involves ensuring the presence of a wide degree of Accountability. Scott, (2009) lists the main important mechanisms to ensure accountability which include, publication of regular inflation or monetary policy reports, publication of special reports or open letters in the event of significant misses of the target, the use of "escape" clauses to limit central bank accountability in particular circumstances, as well as to indicate, in advance, how policy will react to certain kinds of shocks, parliamentary testimony by the central bank governor, publication of minutes of policy meetings within a reasonable time frame, and Press conferences and analyst briefings following release of policy decisions and monetary policy reports.

2-2-3. How does IT work?

A country that satisfies those basic requirements could conduct its monetary policy in a way that is consistent with IT. To do so the authorities would need to set up a monetary policy framework while taking into consideration the following elements (Abd El Ghaffar, 2007).:

i. Specification of explicit inflation targets for some periods or periods ahead. The target is usually specified as a point -with bands of plus or minus one %- or targets are defined as a range.

ii. In almost all IT countries, the target is specified in terms of the 12-month change in the headline CPI. The importance of the CPI lies in its role in the formatting of inflation expectations and wage determination and the fact that it is calculated by the statistics agency, and is typically the best quality of the price measures available.

iii. Clear and unambiguous indications that attaining those inflation targets is the overriding objective of monetary policy.

iv. A model for forecasting inflation that uses relevant variables and information indicators.

v. a forward-looking operating procedure in which the setting of policy instruments depends on assessing inflationary pressures and where inflation forecasts are used as the main intermediate target of monetary policy.

vi. Reporting on a range of measures of core inflation (instead of the headline). Typically, these include exclusion-based measures (most commonly excluding exceptionally volatile prices, such as those for fresh fruit and vegetables, fuels, and non-market-determined or administered prices).

2-2-4. How does IT come in line with the theory of optimal monetary policy?

The central question of the theory of optimal monetary policy is how should the monetary policy react to shocks?. Clarida et al., (1999) stated that the theory of monetary policy relies on the assumption that decision makers are well-meaning central bankers who aim to accomplish two goals: 1-to maximize the utility of representative households and 2-to minimize expected future welfare losses, which result in deviations of output and inflation from their preset targets. The target function of the central banks translates the behavior of target variables into a measure of welfare, which is used by policy makers in their decision process (Walsh, 2001).

The concept of IT is at the core of the theory of optimal monetary policy. IT has some important features that ensure the transparency and coherency of the monetary policy and in turn, eliminate uncertainties concerning future inflation rates. These are the announcement of an official numerical inflation goal for a specified period of time (established for multiple horizons between one to four years) and the explicit acknowledgment that low and stable inflation rate is the primary goal of the central bank (Walsh, 2001).

For the central bank to determine the optimum inflation target, it should keep an eye on the following three principles: the output gap, Taylor rule, and the forward-looking manner (Walsh, 2001). First is the output gap which describes the deviation of output from its potential (target) output. The output gap is one of the major causes of inflation rate variations, because if the central bank is too ambitious concerning the targeted output, this will raise the marginal cost and increase inflation rate, so central bank should try to reduce the deviation of output from its goal as possible. The second point is Taylors' principle. It assumes there is no long-run tradeoff between inflation and output average levels, but there is a short-run tradeoff between inflation and output variance (variance; deviations around the potential or targeted level). The inflation/output variance tradeoff implies that efforts to keep inflation too low and stable will accompany by larger output and employment fluctuations (Nadal-De simone, 2001)

Nadal-De simone, (2001) conducted a study on a sample of six non-inflation targeters and six inflation targeters during 1976-2000. He showed that there is some evidence that reduction in inflation rates was not accompanied by an increase in output variance in (i.e. Canada), either output variance has not changed in the 1990s in (i.e., Singapore and Korea) or has fallen in (i.e., Australia and New Zealand). Since the monetary policy influences the real side of the economy with certain lags, therefore the importance of the final principal of the forward-looking manner of the monetary authority is crucial in analyzing these lags. For instance, a change in interest rate has its maximum impact only 12-18 months later, which delays its impact on the inflation rate. So central banks who pursue a forward-looking strategy will be able to react accordingly even before the actual inflation starts to rise (Zimmerman, 2001).

When it comes to determining the optimum inflation target, it is argued that the fact that there is no long-run tradeoff between output and inflation, suggests aiming at zero inflation rate (Goodfriend and King, 1997). Others suggest aiming for an inflation target between zero and two is optimum to allow for measurement errors (Zimmerman, 2003)[15].

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[15] If the central bank aims to stabilize inflation not targeting a specific number, this describes a lighter version of IT, known as flexible IT. On contrary, within the the strict IT, central banks strive to achieve the inflation target too rapidly, because of the high cost of temporary output losses.

Chapter three: A review of monetary policy in Egypt

3-1. A glimpse of the Egyptian monetary policy

Egyptian economic policy has been subject to major changes during the past 20 years, these changes have been reflected on the overall economic performance and on the applied monetary policy. Abo El Oyoun, (2003) divided the Egyptian economic history into three eras, pre 1973 which was characterized by the maximized government rule of controlling the economy, from 1974 to 1991: the era of liberalization and the free market forces, and finally from 1991 to 1996 was the Egyptian Economic Reform and Structural Adjustment Program (ERSAP) era.

The Central Bank of Egypt (CBE) during the second era set the money supply as its ultimate target (Money targeting) and for this purpose, the central bank used various tools like interest rate, discount rates, and credit ceiling. Abo El Oyoun, (2003) postulated that the monetary policy during 1974 till the date of launching the ERSAP was characterized by high and unstable inflation rate, distorted and un-stabilized interest rates, fiscal dominance, and large bank credit (nearly 74%) devoted to supporting government and public sector organizations which minimized the role of private sector in Egypt. In the same line, Korayem, (1997) added that during the second era rapid economic growth was evident by an average growth of 8.5% due to the inflow of foreign investments. In the second half of the 80s, the economic growth and investment have declined with an accumulated debt reaching 11.4 billion in 1990.

In 1991 the government has signed an agreement with the IMF and the World Bank that created the founding roles for the launching of the ERSAP. Nasser, (1997) divided ERSAP into three basic groups: The first group of ERSAP aims to create an economic stability through controlling inflation rates and the budget deficit by reducing public expenditures. The second group of ERSAP aims to realize a strong economic growth through diverging public expenditures from the services to the productive sectors and from consumption to investment. The third group includes the policies which aim to achieve further liberalization such as trade liberalization policies, money and capital markets developments and the establishment of a free pricing system.

On the other hand, Korayem, (1997) divided the ERSAP into 6 groups, public sector reform, investment policies, external policies, pricing, monetary and fiscal reform and social policies. The author also stated that there are three approaches that have been used to assess the success of the ERSAP, the internal approach which examines the extent of a target achievement, the before-after approach that compares the economic performance before and after launching the program and the counterfactual approach which compares the program result with what would happen in its absence. The author covered the period from 1985 to 1995 while using the before and after approach, the summary of the authors' evaluation can be summarized into the following "ERSAP succeeded to accomplish some pre-set targets and failed to achieve others". Regarding the monetary policy goals, inflation rate reduction

considered to be one of the goals that ERSAP failed to accomplish, despite the official data of CPI announcement, Korayem stated that CPI is biased downwards because of the commodity basket was chosen and the unrealistically low prices used for calculating the price of some goods and services like house rents, education, and health care. She postulated that "ERSAP has effectively restrained the causes of demand pull inflation, yet it activated the causes of cost push inflation (Korayem, 1997).

Hassan, (2003) stated that ERSAP succeeded in bringing down inflation rate to around 2-4 % along with achieving a growth rate of 5% during the mid-1990s. On the other hand, it resulted in overvalued real exchange rate. Since the late 1990s, the government allowed budget deficit to grow in order to re-activate the economy and moved slowly and gradually towards a flexible exchange rate.

There are three levels of the monetary policy, the first is an operational target that is controlled by the monetary authority. The Second is an intermediate target which is the link between the operational target and final level which is the monetary anchor (Abo El Oyoun, 2003). Since the conclusion of the ERSAP in 1996, the CBE was concerned with achieving multiple objectives which were in several instances conflicting, high economic growth, low inflation and stable exchange rate (Rania and Andreas, 2007). Between 1996 and 2005, the operational target was excess reserves of bank credit and nominal interest rates the intermediate target was M2 that was selected because of its strong relation with monetary aggregate and inflation. CBE used various indirect tools to achieve this target such as; Required Reserve Rate (RRR), Open Market Operations (OMO), treasury bill rate, and the 3 months deposit rate (Al Mashat, 2008).

Starting January 2001, Egypt replaced the de facto Egyptian pound to the US dollar peg with an adjustable currency band. The Egyptian pound after this policy lost 48% of its value during 2001-2003. This peg system was replaced by a floating exchange rate regime. Despite the Egyptian pound liberalization, CBE continued to maintain exchange rate stability as one of the key objectives during 2004-2005. At the end of this decade, CBE shifted its main anchor towards reducing inflation rates and accordingly announced its intention to adapting Inflation Targeting (IT) regime (Mousri and Mossallamy, 2010).

In the following sections, we cover monetary advances during the period from 1990 to 2010. We follow Mabrouk and Hassan, (2012) and disentangle this time phase into three eras, the first era starts from 1991 till 1996 (ERSAP era), the second extends from 1996 till 2003 (transitional era), and the third ranges from 2003 till 2010 (towards inflation targeting era).

3-2. ERSAP (1990-1996)

Since the end of 1973, Egypt has been making limited progress in moving from a centrally planned economic model towards a market-based, wherein the private sector plays a stronger role in leading and propelling a more rapid and sustained growth. Over that period, Egypt has

turned to the IMF for financial assistance and signed a number of agreements all of which has failed.

The First agreement was in 1977 for a one-year standby arrangement in which Egypt utilized 105 million $ out of a total 125 million $. The second one was in 1978 with an extended facility arrangement that allowed Egypt to draw 600 million $. In 1987 Egypt was able to pay down most of the IMF debt. The Third agreement was a one-year arrangement for 250 million $, again Egypt failed to meet the required policy conditions and the total loan was not granted.

The economic growth and liberalization were very slow and gradual especially in the second half of the 1980s. During this period - despite of the debt relieves and the foreign aid inflows- the Egyptian economy suffered from major imbalances, reflected in growing deficits in balance of payments, high inflation rate that ranged from 20% to 30%, reduction in investment and GDP growth, accumulated debts that reached 11.4 billion$ by 1990. IMF concluded that Egypt by mid-1990 will not be able to finance its food imports or the compulsory debt service obligations. Accordingly, the IMF cooperatively with the World Bank has launched the ERSAP. In the next sections, We use the before and after approach to evaluating the success of ERSAP in terms of monetary adjustments.

3-2-1. Monetary policy reforms:

Regarding the ERSAP monetary adjustments, The IMF recommended setting a ceiling on the CBE net domestic credit not the MS of the monetary base. This is the best way to protect the balance of payments from excessive money creations. Ceilings are set by first estimating a growth rate of the monetary base consistent with program expectations regarding the growth rate of output, the inflation rate, the exchange rate and the behavior of velocity and money multiplier. From this estimated path, the floor of the net international reserves is subtracted which yields the ceiling on net domestic credit (Mussa and Savastano, 1999). The IMF justified this approach on two grounds: first as a developing country, deficits in the balance of payments -as a result of expansionary monetary policy- could happen by the sharp drop in capital inflows or capital flight, which forces the monetary authority to cover these losses by allowing net domestic credit to grow at a faster rate. Second, the monetary data should be accurate and available as it has a vital role in performance criteria and allow the fund to determine whether the program conditions are met or not[16]. As a result, a group of monetary reforms that come in line with the former recommendation has been adopted by the CBE (IMF, 1992). These can be summarized into the following:

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[16] However, promoting sharp reductions in the level of net domestic credit will lead to high level of interest rate that will lead to raise cost of capital formation for small and medium projects. Although will lead to appreciation of exchange rate that will affect negatively country's export balance and raise the cost of country internal debt and put an upward pressure on price on long run (Ramirez, 1997).

I. Terminating most of the policies that distorted capital markets (such as. interest rate ceiling, compulsory credit allocation, and high liquidity ratios) to ensure an efficient allocation of financial resources.

II. Restructuring and strengthening the financial position, as well as increasing the competition in the banking system to help mobilize domestic savings through competitive positive real interest rates. Among these steps, the government injected funds to re-capitalize the public sector banks to the tune of 5.5% of GDP, reduced their foreign currency exposure and instituted a number of important regulatory changes to strengthen their financial position.

III. A market for government securities was developed that provided a substitute for treasury borrowing from CBE and constituted an effective tool in gauging monetary stance.

3-2-2. Inflation under ERSAP

ERSAP activated cost push inflation factors and restrained demand pulls inflation factors. Cost push factors had an indirect impact on raising prices of other goods and services since producers have to raise their income to maintain their profit margins. The rise in CPI was 19.66% in 1990 compared to 16.7% in the previous year, and relative to an average annual increase in CPI of 21.35% in 1989. However, inflation started to fall again in 1996 reaching 7.2% as shown in Table 4.[17] The following actions have contributed in stimulating cost push inflation,

i. **The increase in indirect taxes:** introducing the sales tax in 1990/1991 and boarding its base to cover the wholesale trade. Also introducing the value-added tax in 1995, while increasing the excise tax on cigarettes and other items.

ii. **Adjustment in prices of selected goods and services:** several price adjustments have taken place during the first half of the 1990s. Mainly increasing the prices of cigarettes, flour, telephone subscriptions, electricity, petroleum products, rail passenger prices and rail freight tariffs. Also reducing subsidies on fertilizers and pesticides and increasing and elimination of subsidies on tea.

iii. **Exchange reforms:** Egyptian pound devaluation in February 1991 raised the cost of imported final goods and production inputs.

iv. **Interest rates escalation:** the sharp increase in interest rates played a major role in increasing the cost of borrowing capital and hence raising production costs.

Demand pull factors can be summarized into the following

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[17]According to Korayem, (1997) Inflation rate reduction considered to be one of the goals that ERSAP failed to accomplish, despite the official data of CPI announcement, Kraima stated that CPI is biased downwards because of commodity basket chosen and the unrealistically low prices used for calculating the price of some goods and services like house rents, education and health care.

i. **Reducing budget deficit:** ERSAP advocated a tight fiscal policy that reduced the government deficit to reach 0.34% of GDP in 1993/1994. The deficit has been lowered by selling government securities to the public and banks, with less seignorage, domestic bank financing of the budget deficit was negative in 1991/1992. So after the ERSAP budget deficit is no longer a factor of demand pull inflation.

ii. **Domestic credit:** ERSAP had a strong impact on domestic credit, begetting a reduction in its annual growth rate from 25% in 1989/1990 to only 1.5% in 1991/1992. This had a strong mitigating effect on growth rates of output and employment, GDP growth rates fell from an annual average of 2.3% in 1990/1991 to 0.3 and 0.5 in 1991/1992 and 1992/1993 respectively (CBE, 1994).

As a result, the final impact of the ERSAP monetary actions is

i. Reduction in net foreign assets has contracted the base money, contrarily the increase in government expenditures expanded the monetary base and money supply which in turn increased the level of deficit in the balance of payments.

ii. Treasury borrowing didn't just sterilize the effect of reduction in net foreign assets, it also provided commercial banks with reserves that could be lent to private and public borrowers and this explains the small expansionary effect of monetary base prior to 1991.

iii. The sharp reductions in government overall deficit –the key element of financial reform- was met.

iv. The credit availability to public banks declined sharply during 1991-1993, while credit was extended to private banks.

v. The real interest rate in the late 1980s was negative and financial instability eroded confidence in the domestic currency. Prior to 1991, the increase in the demand for US dollar reached 39% of total demand deposits and 51% of total saving accounts. When ceiling on interest rates was removed in 1991, this leads to the sharp rise in the domestic currency real interest rate that encouraged the reduction of dollar holding in favor of tax-free high-interest rate paying in domestic currency. This, in turn, leads to the appreciation of domestic currency exchange rates that negatively affected Egypt's' external competitiveness[18].

vi. CBE engaged in massive sterilization interventions (Such as, the CBE foreign exchange purchases that were offset by sales of domestic denominated securities) to support fixed nominal exchange rate regime. The result has been an increase in fiscal burden in terms of size and interest payments on the stock of internal debt.

vii. Reduction of tariff and non-tariff barriers that established a market-based exchange rate and promoted exports.

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[18]Real exchange rate appreciation reached 40 % during 1991-1996. The World Bank (1998) concluded that real exchange rate was overvalued in 1991-1993, however it moved closer to equilibrium rate in next year (Zaki, , 2001).

viii. Under ERSAP, domestic currency was pegged to the US dollar. However, korayem, (1997) studied the Egyptian balance of imports and exports in the period of 1991-1994 and reached to an outstanding conclusion that Egyptian exports to the European Union averaged 34% of total exports and 31% of total imports while for the US. It averaged only 12% and imports only 16%. Hence EU countries rank first for both exports and imports (CBE 1994-1995). So pegging the Egyptian pound to the US dollar lead to unfavorable effects on the balance of payments, as any Dollar-Euro fluctuations hurt the Egyptian competitiveness in the EU market[19].

ix. At the beginning of the 1990s, Egypt officially implemented a managed float regime, with the exchange rate acting as a nominal anchor for monetary policy. Yet, in reality, the country had adopted a fixed exchange rate regime with the authorities setting the official exchange rate without regard for market forces. This resulted in a highly stable exchange rate for the Egyptian pound against the US dollar and a black market for foreign exchange (Al Asrag, 2003). In February 1991, a dual exchange rate regime, which included a primarily restricted market and a secondary free market, was introduced to raise foreign competitiveness and to simplify the exchange rate system. The two markets were unified in October 1991. Since then up until 1998, the Egyptian pound was freely traded in a single exchange market with limited intervention by the authorities (Mousri and Mossallamy., 2007).

Table 4: Selected economic indicators under the ERSAP phase (as a percentage of GDP).

	Pre-Program					Post-Program					
	86	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**
Real GDP [a]	-7.8	1.3	1.5	2.7	7.2	-3.3	10	0.9	2.8	1.2	3.8
Per capita GDP	10.	-1.2	-0.9	0.3	4.7	-5.5	6.4	-0.4	0.4	-1.1	1.5
Inflation	24	19	17	21	16	19	13	12	8	15	7
Total revenue and grants [b]	373	34	33	30	25	34	38	39	40	34	27
Total expenditure	48	39	40	36	31	35	41	38	40	36	31

[19] It's favorable for a country to peg its currency to a basket of currencies of its main trading partners, with weights reflecting relative shares in the country trade (Eric, 2002).

and net lending										
Overall deficit	-10	-5	-7	-5	-5	-0.9	-3.4	1.7	0.3	0.8	-1.9
Exports	-8.5	7.7	-64.6	28.9	40.5	59.7	30.3	7.67	-7.82	12.4	7.43
Imports	-0.6	10.7	85.4	14.2	26.6	26.7	11.3	8.80	2.07	1.22	18.6
Gross investment	30.7	26.1	33.2	31.2	29.4	23.9	19.7	19.7	20.3	19.1	19.1

Source: Mabrouk and Hassan, (2012)

Notes: [a] GDP deflator didn't have a consistent time series, therefore the CPI was used as an inflation indicator and to deflate nominal GDP. [b] includes tax, tax revenue, and capital revenue.

3-3. Transitional era (1996-2005)

During 1990 through 2005, with the exception of 1996/1997, the CBE has continually focused on achieving two principal objectives, namely, price stability and exchange rate stability. Also, frequent changes have occurred in the management of the monetary policy in Egypt. These involve modifications in the operational and intermediate targets of the CBE as well as the choice of the monetary instruments (Mousri and Mossallamy, 2007).

Since the conclusion of ERSAP in 1996, the CBE were concerned with multiple objectives that in many instances seemed conflicting, such as attaining an economic growth while maintaining low inflation and preserving stable exchange rates (Al Mashat and Billimeier, 2007). In 1992/1993, besides price and exchange rate stability, the CBE planned to apply contractionary policy by reducing the interest rate on the Egyptian pound to encourage investments and promote economic growth (CBE, 1993).

During the period under investigation, the CBE operational target was the excess reserves of banks and nominal interest rates, while M2 (broad money) was chosen to be the intermediate target to express the annual domestic liquidity. During the second phase -save 2004/2005- the two operational target components remained unchanged. However several problems are attributed to the selection of these operational targets, 1- excess reserves were very volatile because of the domination of state-owned banks and the weak competition in the banking sector. This created rigidities in interest rate structure and the existence of Non-Performing Loans (NPLs) all intensified the disconnecting between price measures and macroeconomic outcomes. 2- After the liquidity problems that surfaced in the market during 2000 and 2001, the CBE supported the launch of a domestic currency interbank market. The CBE's monetary policy change in 2001 enhanced the degree of market determination of the short-term interest rate. Before 2001, the short-term policy rate only moved within a very limited range, which

proves it was a poor measuring tool of the monetary policy stance. 3- The 3-month treasury bill rate could be considered, to some extent, a short-term policy rate given that the securities were issued in coordination with the CBE to sterilize capital inflows, with the amount issued substantially exceeding the financing needs of the government (El Refaie, 2001; Al Mashat, 2008) [20].

3-3-1. CBE market instruments:

i. **Discount rate:** The CBE relied on the Discount Rate (DR) as a monetary policy instrument during 1990 to 2005. During this period DR lowered -from 19.8 % in 1992 to 9 % in the beginning of 2006- for the hope of promoting investment. In order to reduce the rigidity of DR, it was linked to TB interest rates, this result in a steady decline in treasury bills interest rates which decreased from 1992 through 1998 and began to recover again in 2002 [21].

ii. **Interest rates:** By January 1991, CBE liberalized interest rate on loans and deposits, with constraining the 3-month interest rate on deposits for not falling below 12% per year. This ceiling was canceled during 1993/1994, however, with the continues reduction in discount rates, the interest rate on loans after one year or less also fell during 1995 to 1999 before they started to rise again in 2000. However the demand for local currency deposits wasn't affected significantly because the interest rate on Egyptian pound was slightly higher than other foreign currencies (Al Asrag, 2003).

iii. **OMO:** It was considered a highly important instrument to control liquidity level and it also affects the short-term interest rate. In Egypt, it depends on various tools of re-purchasing of TBs, final purchase of TB, government bonds, foreign exchange swaps and debt certificates. The primary dealer's system, which became effective in July 2004, increased the importance of the open market operations as an instrument of monetary policy.

iv. **Repos:** were used by the CBE to provide liquidity and stimulate economic growth. The value of these operations increased to reach 209 billion LE in 1999/2000.however relying on reports have declined till it was replaced with CBE notes in Aug. 2005 (Mousri and Mossallamy, 2007).

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[20] During this period, interest rates on TBs provided some indication of market conditions as they served as a basis for OMO, but given their role in fiscal policy, relying on it could be misleading as a monetary policy instrument.

[21] The discount rate is typically considered a poor operational monetary policy instrument because it is usually subjected to strong administrative control, and also given the role of treasury bills interest rates in fiscal policy, it would be misleading to consider them as a monetary policy instrument. Thus, shocks in the discount rate do not always account for variation in the monetary stance, see Al Mashat and Billimeier, (2007).

v. **RRR on local and foreign currencies:** during the period of 1990 to 2005, the domestic and foreign RR ranged between 14-15% and 10-15% respectively. Changes in RRR alone have not been sufficient to determine the variance in the reserves as the formula employed in the calculation of RRR was subject to several revisions during 1990/2005 (Mousri and Mossallamy, 2007).

vi. **Exchange rate:** At the beginning of the 1990s, Egypt officially implemented managed float regime, with the exchange rate being the nominal (monetary) anchor for monetary policy. In Feb. 1991 a dual exchange rate market which included a primarily restricted market and a secondary free market were introduced to raise foreign competitiveness and to simplify exchange rate system with the purpose of elimination or limiting black market operations. The two markets were unified in Oct. 1991. This result in highly stable appreciated exchange rate for the Egyptian pound against the US during the mid-1990s that led IMF to ask for 20-30% devaluation of the exchange rate. However, the Egyptian government refused to perform any devaluation to avoid the resurgence of inflation. Since then up to 1998, the exchange rate was freely traded in the market with limited intervention by the authorities to keep exchange rate against the US dollar within acceptable limits.

3-3-2. Internal and external shocks

The second phase was characterized by a tight monetary stance. By 1997 the Egyptian economy has started to feel this crunch in liquidity owing to external and internal shocks. Internal shocks were due to the extension of bank lending especially to real estate investments in the absence of matching demand, for instance, conducting huge projects (such as, Toshka and Salam) at the same time while their financing was mainly based on bank deposits that intensified and leveraged the fiscal debt. External shocks were attributed mainly to the Asian financial crises in the beginning of 1997 that lead to several negative outcomes such as, flight out of foreign currencies that lead to sharp fall in stock market rates and transactions, reduction in foreign investments, reduction in exchange rates of some of Asian currencies that lead to stimulate importing from these countries (Hassan, 2003).

As a result of these shocks, a) domestic credit continued to grow at a high level, while interest rates remained flat. Notwithstanding the continued credit expansion and the real GDP growth that started to slow after 1997/98 due to the collapsing share of investment in GDP. The Central bank first response was to let commercial banks absorb the increase in foreign exchange demand and let domestic credit accelerates to higher levels than that were prevailing before shocks rates (around 25 percent annually through end-1999) (Panninza, 2001). b) The demand for US dollars has increased that lead to a shortage of US dollars, which in return created losses in reserves by almost one-fourth in during 1998/2000 period (from 18 billion to 14 billion US dollars) (Panninza, 2001). c) Adopting an expansionary fiscal policy that led to a budget deficit of 4% of GDP. d) On January 2001, Egypt replaced the de

facto Egyptian pound to US dollar peg with an adjustable (crawling) currency band (a band of ±1 percent was established around the central rate but it was eventually widened to ±3 percent in August 2001.). Egyptian pound after this policy action lost 48% of its value against US dollar over the period 2003/2004 (Panninza, 2001). In January 2003, the adjustable peg was swapped with a floating exchange rate regime. Under free float, banks were permitted to determine the buy and sell prices of the exchange rate and CBE intervention only occurs to correct major imbalances and sharp swings. However, the lack of credibility in this new system and public expectations of a further depreciation led to the hoarding of foreign exchange receipts and speculative activities in face of an inoperative interbank market. This, in turn, caused shortages of foreign exchange in the official channels which led to the reemergence of the parallel (black) market (Hassan, 2003) [22].

3-3-3. Inflation during the transitional era

As an outcome of the economic reforms during the first years of the 1990s, inflation rate declined sharply from over 20% in 1990/1 to only 4.1% in 1997/8. There was also a significant decrease in the budget deficit as a percentage of GDP over the period from 1990/1 to 1997/8, declining sharply from about 18.2% to around 4% (Abd El Ghaffar, 2007). However, between Jan. 2001 and Dec. 2001 the consumer price index (CPI) and the wholesale price index (WPI) inflation rates were relatively low, hovering around 2.5 percent % and 4 % respectively, with minimal signs of volatility (Figure 8). The low and stable inflation rates during this phase can be traced back to the prevalent exchange rate regime at the time, which in a way insulated domestic prices and in turn inflation from exchange rate shocks that could have been transferred to the WPI through import prices. Consequently, given the clear association between the WPI and the CPI, these changes would have been transferred to the CPI. The exchange rate regime, however, limited the degree of exchange pass-through to domestic prices (Al Mashat, 2007).[23]

The situation started to change with the beginning of 2002 and the aftermath of the first attempt of floating the exchange rate in January 2003. Between January 2002 and April 2004, CPI and WPI inflation followed a steep upward trend to reach a peak of 17.2 % and 21.1 % respectively. The higher inflation reflected the lagged pass-through pressures from a series of step devaluations, amounting to a cumulative depreciation of 29 % in the nominal EGP/USD exchange rate that took place between January 2000 and December 2001 and was yet

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[22] Despite liberalization of Egyptian pound, CBE continued to maintain exchange rate stability as one of the key objectives during 2004-2005.

[23] The effect of depreciation in second half of 2000 was followed by a reduction in inflation and lead to an exports boom, then in the beginning of 2001, the central bank rate was adjusted by approximately 1%, while black market transactions reported to be almost 10% above the bank rate, the depreciation of august 6 help to make the official exchange rate in line with market rate. For a detailed graphing of exchange rate regimes and their corresponding prevailing inflation rates, see Al Mashat and Billimeier, (2007).

amplified by the shifting to a managed float exchange rate regime in 2003 (Figure 9). However CPI inflation rate showed a mild increase compared with WPI, as a result the Central Agency for Public Mobilization and Statistics (CAPMAS) acknowledged that CPI underestimated the actual rate of inflation and conducted a revision of the series, after this revision CPI reached a double-digit inflation rate, although still lower than the WPI rate (Noureldin, 2005; Panninza, 2001)[24].
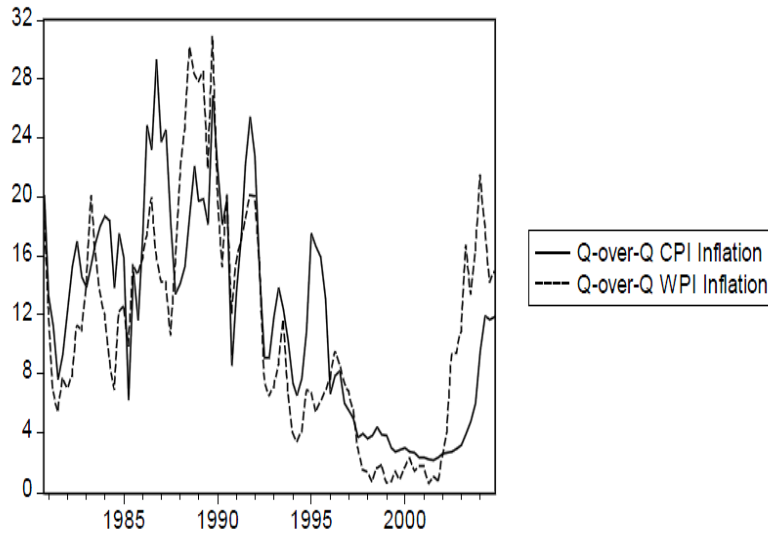

Figure 8: Quarter-over quarter WPI and CPI in Egypt (1980-2004)
Source: Noureldin, (2005).

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[24] Rabanal, (2005) reasoned the divergence between the WPI and CPI as the wholesale price index (WPI) reacts significantly to changes in the nominal exchange rate after 6–12 months, whereas the consumer price index (CPI) reacts after 12–24 months, but not significantly. This result is interpreted as evidence of specific structural weaknesses of the CPI measure used until 2003.
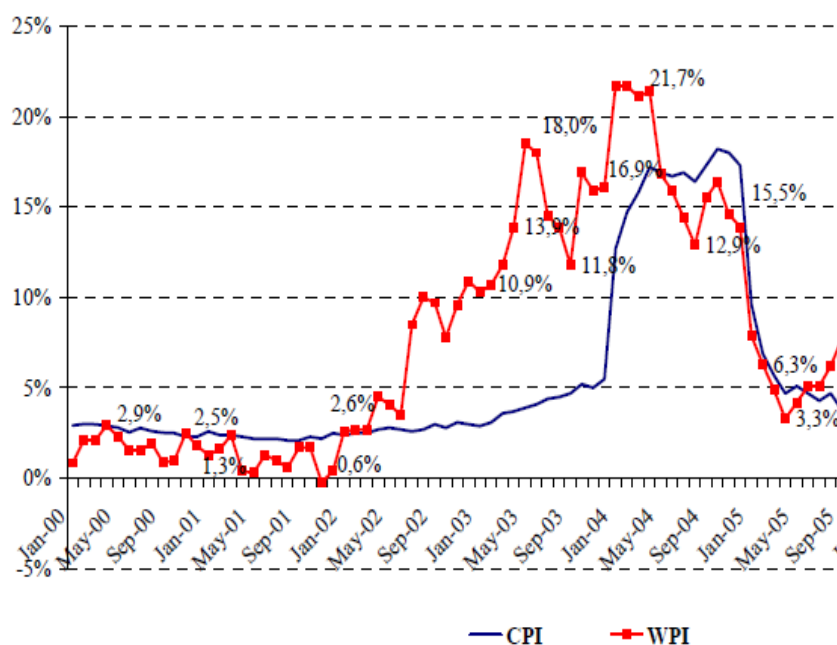
Figure 9: CPI and WPI inflation rates (Jan.2000-Sep.2005)
Source: Mabrouk and Hassan, (2012).

During 2004 and the beginnings of 2005, CBE tightened the monetary policy to slow down inflation rates. It succeeded in bringing down inflation rates to single digits, moreover as the effects of the depreciation of the Egyptian pound in early 2003 gradually cleared away and confidence in the CBE was restored, CPI and WPI inflation rates dropped significantly between mid-2004 and early 2006, averaging 7.5 % 8.1 %, respectively. In 2005, with the continuing monetary expansion that was reflected in the average growth rates of 14 and 17 % in M2 and M2D, respectively, one would have expected inflation to shoot up again like it did before following similar growth rates of the money supply. This was not the case, however, as inflation fell from 7.9 percent to 2.7 percent over 2005. The stabilization of the nominal exchange rate -after introducing the interbank exchange market certainly has played a key role in reducing inflation (Al Mashat, 2008).

3-4. towards inflation targeting (2005-2010):

Several institutional and operational changes were initiated by the CBE to help facilitate monetary policy formulation, assessment and laying the ground for formally adopting IT in the medium term.

These reforms include institutional and operational reforms (CBE, 2005). The institutional reforms are as follows: 1- The coordinating Council on Monetary Policy headed by the Prime Minister was established in January 2005 to ensure that government policies are consistent with the objectives of monetary policy. In its first meeting, the objectives of monetary policy and the importance of CBE independence were discussed. The CBE sets and implements a comprehensive inflation-targeting framework to anchor the monetary policy, once the fundamental prerequisites are met. This will further enhance the predictability and

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transparency of the monetary policy in Egypt. 2- CBE established a Monetary Policy Committee (MPC), which convenes on Thursdays every six weeks to decide on key policy rates. The MPC consists of nine members: the Governor, the two Deputy Governors, and six members of the CBE's Board of Directors. 3- The Monetary Policy Unit was established as a satellite unit within the CBE to play a key role in providing objective monetary policy analysis, assessment, and modalities of communication with the market through its research and other functions. 4- For enhancing transparency, bolster the credibility of the CBE, and help anchor inflation expectations, MPC's decisions are communicated to the market through a monetary policy statement, which is released on the CBE's external web-site after each meeting.

On the other side, operational reforms are, 1- introducing the overnight interbank rate on June 2005 as a new operational target for the monetary policy, instead of the excess reserve balances of banks. The CBE provides the outer bounds of the corridor, within which the ceiling is the overnight lending rate and the floor is the overnight deposit rate at the Bank. 2- Issuing the Purchasing Price Index (PPI) instead of WPI on Sep. 2007 using 2004/2005=100 as the base year. 3- Introducing a new series of CPI was introduced in August 2010. The weights involved in the formation of the Index were taken from the results of the 2008/2009 survey of income, expenditure, and consumption using January 2010 as a base period. 4- Introducing new monetary instruments are known as "CBE certificates of deposits (CDs)", with maturities of one year and less, and "CBE notes" with maturities over one-to-two years. 5- Releasing a core inflation index that excludes (fruits, vegetables, and highly volatile components as well as items in which prices are regulated by government).The new index will help to distinguish underlying trends of inflation from transitory movements (Figure 10&11).
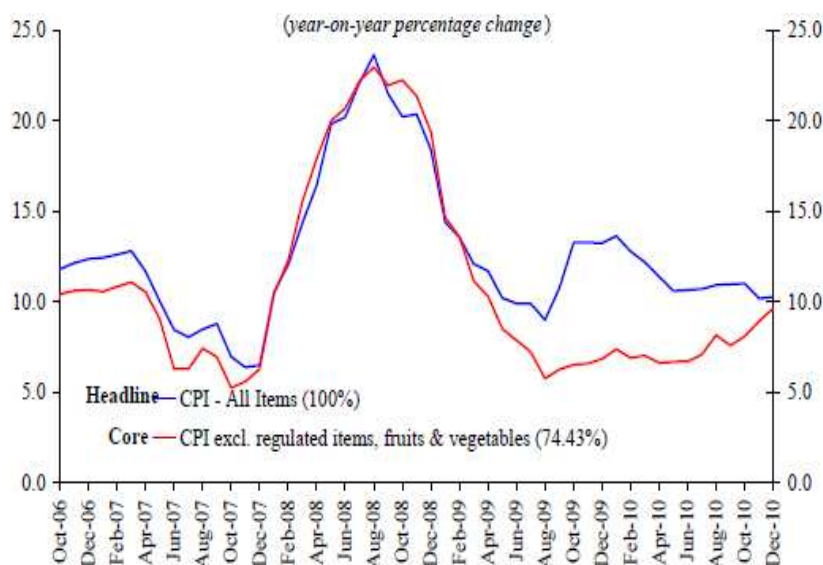

Figure 10: Annual Core and headline inflation during the last phase
Source: (CBE inflation note, 2010)

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Food	Retail	Paid Services	Other Services
Bread and cereals	Clothing	Tailors, laundry & shoe repair	Rentals (new law)
Meat	Fabrics	Dwelling maintenance services	Rental value of owner occupied housing
Fish and other seafood	Footwear	Portman & gardener's services	Hospital services
Eggs & Dairy products	Products related to dwelling repairement	Cook & maid's services	Transportation Services
Oils and fats	Furniture	Technicians to HH appliances	Mobile & internet services
Dried fruits	Carpets and other floor covering	Repairs of Audio-visual equipment	Recreational & sporting services
Processed vegetables	Household (HH) textiles	Physicians	Cultural services
Pulses	HH appliances	Mechanics	Hajj & Omra trips
Sugar and confectionery	Glassware, tableware and HH utensils	Teachers	Restaurants and Cafes
Other food products	HH small tools & supplies	Hairdressers	Accommodation services
Beverages	HH cleaning products		Private schools
	HH miscellaneous products		
	Purchase of vehicles		
	Spare parts		
	Motor oil		
	Telephone & telefax equipment		
	Home entertainment equipment		
	Recreational equipment		
	Personal care supplies and products		
	Personal effects		
	Books		
	School supplies		
	Medical care goods		

Figure 11: Components of the core price index
Source: (CBE inflation note, 2010).

3-4-1. Inflation during the towards inflation targeting era

In 2007, a sharp increase in both core and headline inflation is shown in Figure 10. These hikes were attributed to the second round effects of supply shocks of oil subsidy cuts and the avian flu (that led to a decrease in poultry supply and a surge in its prices) and the spillover effects in the prices of meat and fish, and many other goods. The rise in inflation during the year was also ascribed to raising the prices of some oil products (including benzene 92 and 90) by virtue of May 2008 decrees. This was associated with a pickup in the prices of electricity, gas and fuel by 11.5 %, and transportation by 20.1 %. Most of the (PPI) increase was in the prices of cereals and legumes; rice; oils & fats; crude oil; stone, sand & clay; iron & steel; cement manufacturing; wood & products; cement and other main commodities.

The moderation of inflation during FY 2008 was largely a result of the decrease in the prices of the group of food and beverages n headline inflation, driven by the successive declines in the world prices of several food commodities during July/Dec. 2008. Nevertheless, this global trend had not been fully reflected in domestic prices due to the downward price rigidities in the domestic market. Thereafter, as of Jan. /June 2009, this downward trend was reversed and the increase in the inflation rate was particularly pronounced in the prices of food and non-alcoholic beverages that added 5.5 % points to headline inflation (compared

with 3.1 points in the corresponding quarter a year earlier). Contrary to the downtrend of international prices of food and non-alcoholic beverages during Q1, domestic prices climbed to 11.5 % (from 6.5 %), reflecting their then weak response to international price trends. Core inflation has risen from 5.9 in Aug. 2009 to 6.6% in Nov. 2009, but still remains within CBE comfort zone (6-8%).

3-4-2. what are still missing for the successful implementation of IT in Egypt?

In its monetary policy statement issued in June 2005, the CBE clearly indicates its intention to "put in place a formal inflation targeting framework to anchor monetary policy once the fundamental prerequisites are met. While during the transitional period, the CBE will continue targeting M2 growth rate". Law No. 88/2003 and its amendment regulated the activities of the CBE. According to this decree, the bank shall, in agreement with the government and through a coordinating council, "set the targets of the monetary policy in a way that realizes price stability and banking system soundness, within the context of the general economic policy of the State"[25]. Other functions include the CBE's responsibilities for the supervision of payment systems, management of liquidity, international reserves and external debt.

Under this "unified banking law" approved by the People's Assembly in April 2003, the Governor of the Bank reports to the State President rather than to the prime minister, which should strengthen central bank independence. However, the same law states that the monetary policy decisions are taken by the CBE's Monetary Policy Committee (MPC), which has nine members: the Governor of the CBE, the two Deputy Governors, four representatives of the government, a representative of the Capital Market Authority and for a representative of Misr Bank - a state-owned bank. This composition of the MPC raises a major concern. While the involvement of 'outsiders' in the committee seems to be a good idea (provided members have sufficient expertise and are truly independent), the official representation of the government make some doubts on the decision making, the extent to which it is influenced by the government and the level of government interference in the Bank's policies (Abd El Ghaffar, 2007).

In addition to the MPC composition, there are some articles in the CBE law and its amendments that suggest that the bank is only partially independent. For instance, Article 39states that the CBE "shall extend financing to the government, upon its request, to cover the seasonal deficit on the general budget" [26]. It also states that "the net profit of the Bank shall be transferred to the Public Treasury of the State, after deducting the workers' profit share as determined by the Board of Directors of the Bank and the reserves it determines to form", which is an implicit sign of fiscal dominance. Besides, some articles, which are

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[25]Presidential Decree No. 17 for 2005

[26]Presidential Decree No 64 of the Year 2004

written using ambiguous words that leave a wide room for different interpretations and raise debates on the conducting of the current monetary policy.

Regarding the management of the Central Bank, The board members (Governor, deputies and nine experienced persons) are nominated by a decree of the President of the Republic, the remuneration and attendance allowances of the nine members are determined by decree of the Prime Minister, upon a proposal from the Governor[27].This is another critic for the management because of the subordination of the board members' remuneration to the head of the government. Some changes that have been introduced recently, such as the removal of the article which prohibited the dismissal of the CBE governor before the end of his mandate, can be considered as a wrong step.

Regarding the degree of CBE transparency, an effort has been made recently to strengthen communication with the public through the regular publication of monthly, quarterly and annual reports. Press releases on the main considerations underlying monetary policy decisions are also available on the CBE's website. The country's general economic situation is analyzed in the bank's regular publications, but these reports do not compare the outcomes of the monetary policy against the initially declared objectives and this loosens the degree of credibility.

In the current state, there is concern about the quality of available data (coverage, periodicity, timeliness, integrity and access by the public). One of the positive steps in this direction was Egypt's subscription to the IMF's Special Data Dissemination Standard (SDDS), which aims at implementing international standards in statistics. However, the Egyptian authorities still have a lot to do on this front to harmonize data, methodologies and compilation practices from different sources. Besides, the absence of an Egyptian statistical office that is fully independent have negative effects on the degree of credibility of the CBE announcements.

Regarding the economic prerequisites of adopting IT, that start with abounding any other nominal anchors i.e. exchange rate. Like many other developing countries, Egypt had multiple exchange rate systems. And for since the beginning of the 1990s, stabilizing the exchange rate was the main objective of the monetary authority. However, now with the pursuit of the Egyptian government to adopt IT, exchange rate targeting can no longer prevail. Yet it is still possible to use the exchange rate –not as an anchor- as an instrument that goes in line with IT goals. The authorities can maintain a depreciated real exchange rate, this, in turn, will boost exports and bring down inflation. The CBE has moved in this line and followed a gradual transition to a floating exchange rate system with the adoption of a widening exchange rate band in December 1998. After ten months in which the band's width was increased from 7% to 16% of the central parity, the CBC announced in September 1999 that the band was no longer part of the policy framework, however the CBC reserved the right to intervene in "exceptional circumstances": when there is an overreaction of the exchange rate and that this overreaction could be damaging for the economy.

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[27]Presidential Decree No 64, Article 18 of the Year 2004

3-4-2. Guideline and recommendations

In the meantime the CBE is still assigned with multiple tasks besides maintaining price stability, some are explicit like maintaining adequate levels of investment and promoting economic growth and others are implicit like controlling MS growth and intervening in the exchange rate market (CBE, 2008). In addition, the CBE can still be seen as partially independent, with some indicators pointing to a fiscal dominance. For a better performance on the pass through towards IT, The CBE should take into account the following points:

i. Having a full capacity for using the required instruments to maintain price stability.
ii. Publicly announcing an explicit inflation target and describing possible deviations from the target due to changes in the terms of trade, interest rate, and indirect taxes.
iii. Prioritizing inflation stabilization over other goals.
iv. Making sure that central bank does not act in an excessively discretionary way and that inflation forecast is not biased, it is important to achieve the greatest share of transparency with respect to the numeric inflation goal and the weight of the output gap in the loss function of the central bank.
v. Establishing strict provisions on the central bank board members, that they will be dismissed if they fail to achieve the announced goals without proper justification for public and legislature.
vi. Enhancing the CBE transparency and credibility by issuing an inflation report over a fixed period of time that includes an assessment of the current and future economic developments for the public.
vii. Establishing a well-developed financial to maximize the effectiveness of the monetary policy.
viii. Attaining regular communication with the public to explain the process and the importance of inflation targeting. Because insufficient communication can lead to loss of credibility that may hamper the proper conducting of the monetary policy.
ix. Keeping a close eye on the exchange rate and M2 growth rate until the Egyptian productivity and export sectors is enhanced. This, in turn, decreases the sensitivity of price rates to variations in exchange rate.

3-5. connecting the dots

The main findings of this chapter is summarized in the following points,

1- The exchange rate was the nominal anchor during the first two phases, and then during the third phase, it was replaced with price stability.

2- Since the beginning of the 1990s till 2010, Egyptian fiscal and monetary policy seems inseparable. However, since 2005, the CBE took serious steps towards ensuring a considerable not a full- independence of CBE, and an appropriate degree of accountability and transparency via continuously communicating policy changes with the public.

3- At the beginning of the 1990s till 1998, Egypt officially implemented a managed float regime, with the exchange rate being the nominal anchor. Then it adopted a dual exchange rate regime, wherein the Egyptian pound was freely traded in a single exchange market with the limited intervention of the authorities. In Jan. 2001 Egypt adopted a crawling (adjusted) currency band, that led to Egyptian pound/US$ exchange rate depreciation. Then in 2003 it was replaced with a floating exchange rate and finally in 2004 an interbank exchange market was established.

4- Short term interest rates and excess bank reserves were the operational targets during the first and second phases. Starting the third phase overnight interbank interest rate was used as the operational target. Domestic liquidity (M2) was and still the intermediate target of the monetary policy.

5- During the first phase, inflation rates were reduced to single digits. Then during the second phase, inflation rate jumped to double digits till 2004 (date of launching interbank exchange rate). After 2004 inflation rates started to fall again to reach its minimal level in beginnings of 2005, then it started to recover again reaching to double digits during FY 2007/2008 because of the subsequent supply shocks.

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