

# MODERN MONETARY THEORY AND PRACTICE IN MEXICO

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## RESUMEN

Los desarrollos de la teoría monetaria moderna han delineado la política monetaria de la banca central en México en las últimas décadas. Este trabajo tiene el objetivo de evidenciar cómo las investigaciones desarrolladas sobre la tasa natural de desempleo, la hipótesis de expectativas racionales, el problema de la inconsistencia dinámica, la proposición de ineffectividad, el enfoque blanco de inflación y las reglas de política, entre otros, delinearon la política monetaria del Banco de México. Mediante una revisión de literatura monetaria especializada y de informes del Banco de México se muestra cómo los postulados de la teoría monetaria moderna permearon el nuevo rumbo de la práctica monetaria en nuestro país. El trabajo está organizado en tres partes: la primera es la metodología utilizada, la segunda refiere a un análisis de los principales desarrollos de la teoría monetaria y la tercera aborda el cambio estructural que experimentó la política monetaria. El trabajo cierra con las conclusiones.

**PALABRAS CLAVE:** Banco de México, teoría monetaria, política monetaria, blancos de inflación, tasa de interés e inflación

## ABSTRACT

The developments of modern monetary theory have delineated the monetary policy of the central bank in Mexico in recent decades. The objective of the work is to show how the research developed on the natural rate of unemployment, the hypothesis of rational expectations, the problem of dynamic inconsistency, the proposition of ineffectiveness, the white inflation approach and the policy rules, among others, they outlined the monetary policy of Banco de México. Through a review of specialized monetary literature and some reports from Banco de México, it is shown how the postulates of modern monetary theory permeated the new course of monetary practice in our country. The work is organized in three parts, the first is the methodology used, the second refers to an analysis of the main developments of monetary theory and the third deals with the structural change experienced by monetary policy. The work closes with the conclusions.

**KEYWORDS:** Bank of Mexico, monetary theory, monetary policy, inflation targeting, interest rate and inflation

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Economic policy changed in different parts of the world. Economic theory was influenced by studies on the quantity of money, rational expectations, the problem of dynamic inconsistency, the credibility of economic policies, inflation targets, policy rules and the long-term Phillips curve was questioned. Again, the money mattered and even more the amount that existed in the economy. Inflation was conceived as a monetary phenomenon. Under this new theoretical paradigm, fiscal policy must be balanced budget or sound public finances and monetary policy focuses on combating inflation primarily.

In Mexico this new paradigm arrived in 1982, giving way to a structural change of the economy and all its institutions. Public spending as a percentage of the product systematically low. The supply of primary credit to the government decreased until it disappeared. The Bank of Mexico (BM) began a change that would have no return, it was granted administrative and management autonomy and for the first time in its history, the fight against inflation became its primary objective and the possibility of financing the government through the creation of money, the financial system was liberalized, and a public and private debt market was created as a mechanism to finance the work of the government and private companies.

In the 1990's, with the arrival of the second liberal-leaning Mexican government, the central bank transformed itself, centering its efforts on salvaging the acquisitive power of currency, in other words becoming an inflation fighter. Undoubtedly the moment which marked the most transcendental change in the management of monetary policy came when article 28 of the constitution was reformed, giving autonomy to the BM, an unthinkable situation 60 year earlier. With these changes, the central institute would focus fundamentally on controlling inflation, it would restrict financing with primary credit and it would obtain autonomy, which is to say the government would not interfere in any way with its' decisions.

The developments of modern monetary theory have delineated the monetary policy of the central bank in Mexico in the last decade. This paper shows how the research developed on the natural rate of unemployment, the hypothesis of rational expectations, the problem of dynamic inconsistency, the proposition of ineffectiveness, the Inflation Targeting Approach and policy rules, among others, they outlined the monetary policy of Banco de México. The research shows that the postulates of modern monetary theory permeated the new direction of monetary practice in our country. The paper is organized in three parts, the first is the methodology used, the second refers to an analysis of the main developments of monetary theory and the third deals with the structural change experienced by monetary policy. The investigation closes with the conclusions.

## 1. METHODOLOGY

The methodology used is of a qualitative nature. Two important elements are considered. The first is a review of well-known literature on monetary economics worldwide, which shaped what is now known as standard monetary theory and which outlined the monetary policy of the main central banks of the world including Mexico. To address the first element, the most important developments in modern monetary theory were considered, such as: the natural rate of unemployment (Friedman, 1968), the non-existence of the long-term trade-off between real and nominal variables (Friedman, 1976), inflation as a monetary phenomenon (Friedman, 1976), the hypothesis of rational expectations (Lucas Jr., 1972), the Lucas Critique (Lucas Jr., 1976), the problem of dynamic inconsistency (Kydland and Prescott, 1977), the proposition of ineffectiveness of monetary policy (Sargent and Wallace, 1976), the Taylor curve (Taylor, 1979), the Taylor rule (Taylor, 1993), the Taylor tripod (Taylor, 2000) and the Inflation Targeting Approach (Bernanke, Laubach, Mishkin and Posen, 2001).

The second element is a review of the main changes experienced by monetary practice in Mexico through the reports of the Bank of Mexico. The investigation shows how the developments of the modern monetary theory delineated the main guidelines of the monetary policy of the central bank of Mexico in the last decades. To address the following element, the following is analyzed: the change in the economic institutions of the eighties and nineties of the twentieth century (Aspe, 1993; Solís, 1997), the change of regime from a fixed exchange rate to a flexible one (Carstens and Werner, 1999; Baqueiro, Díaz and Torres, 2003), the autonomy of the central bank, the control of inflation as the main objective of Bank of Mexico, inflation as a monetary phenomenon, the prohibition of the central institute to grant net domestic credit to some authority, the calculation of inflation by the Instituto Nacional de Geografía y Estadística (INEGI) (CPEUM, 23-08-1993; Banco de México, 1994; Banco de México, 1995), the adoption of the Inflation Targeting Approach, the establishment of the interbank interest rate as the main instrument of the Bank of Mexico to communicate its monetary policy stance and the presentation of the transmission mechanism of monetary policy to disseminate price formation (Banco de México, w/d,a; Banco de México, w/d, b).

## 2. THE ANALYTIC FRAMEWORK OF MODERN MONETARY POLICY

Economic theory based on the neoclassical synthesis, which had dominated the science of economics since the Second World War, entered into crisis in the 1970's. The theory, supported at the deepest structural levels by the postulates of Keynes, proved incapable of explaining the null economic growth and high inflation experienced by the United States (U.S.) and England, which became known as stagflation. The growing wave in prices could not be stopped by the fiscal and monetary actions of governments. The response came from the Chicago school economists, the monetarists, who offered an economic analysis strengthened by

rigorous quantitative methods, and which began what came to be known around the world as the monetary counter-revolution (Friedman, 1991).

The foremost representative of this group was Milton Friedman, who was awarded the Nobel Prize in Economics in 1976. His seminal work "Inflation and Unemployment" proposed the existence of a natural rate of unemployment in the economy, which was independent of monetary factors and which changed over time in relation only to real factors such as education, inventiveness, frugality and labor market frictions, among others. The presence of this natural unemployment rate of the economy came to revolutionize the study of the science of economics and the form in which fiscal and monetary policies were formulated, because it nullified the stable and long-term trade-off between inflation and unemployment proposed by Samuelson and Solow (1960) years before. What did in fact exist, on the contrary, was a trade-off between those two variables in the short-term always and whenever the variations in the quantity of money were not anticipated by individuals.

The research by economists on the quantity of money –also known as monetarist theory– openly contradicted the objectives which had been pursued by the central bank during the 1970's in diverse parts of the world including Mexico. According to Friedman (1968) monetary policy can only fix nominal interest rates for short periods of time, due to the fact that upward variations in the quantity of money in the economy drives prices, which results in pressuring the rise of nominal interest rates. Moreover, monetary policy can only maintain fixed unemployment rates in the short-term. Inflation, understood as a generalized and sustained increase in all prices, was always and everywhere a monetary phenomenon in which money was indeed important, as was the quantity of money in the economy. Hence the best that monetary policy could do was to prevent money from becoming a source of disturbance to economic activity.

The executors of monetary policy in diverse parts of the world began to accept that the driver of economic activity and employment was not fiscal policy but rather monetary policy, given that fiscal policy proposed exercising a considerable amount of public spending, a good part of which was financed through primary credit from the central bank, which is to say the creation of money. This fact led to an increase in the rate at which the quantity of money in the economy varied. If this event was not anticipated by individuals, the variation in the quantity of money would drive the output and employment in the short-term. However, over the long-term, once the monetary effects were diluted, prices increased, and unemployment and output returned to the levels of their natural rates and their output potential, respectively. This was evidence of null effects in the output and employment in the long-term, due to the neutrality of money (Friedman, 1991).

The pinnacle of the investigations which incorporated rational expectations into the science of economics generated profound changes in the field and in monetary policy. Expectations, which are predictions of future events, are rational if given the economic model—values are generated which are equal to the average of expectations. Uncertainty is the only factor that leads to the divergence of expectations from their real values, which is to say, there would be perfect forecasting (Muth, 1961). In the monetary ambit, Robert Lucas Jr., awarded the Nobel Prize in 1995, asserted that if economic agents are free of monetary illusions, given that they have rational expectations, if central banks realize a monetary expansion, such action would not result in real variables such as the output and employment in the short-term (Lucas, 1972).

Subsequently the problem of the inconsistency dynamic was analyzed by Kydland and Prescott, winners of the Nobel Prize in Economics in 2004. They asserted that a temporally inconsistent monetary policy emerges when a central bank announces a certain level of inflation for the following period, and the economic agents then establish prices and salary contracts taking into

consideration this information. However, the central bank fails to achieve their initial pronouncement due to the search for lower levels of unemployment. Those rational agents—who are aware of the incentive of the central bank to take recourse to such measures to diminish unemployment—anticipate and adjust the rise of expectations of prices and salaries of the economy. The result will therefore be a hoped-for level of inflation distinct from the announcement made previously by the central bank and a level of unemployment situated at the level of its natural rate.

In other words, dynamic inconsistency arises because for the authorities it proves convenient (optimal) to exploit the surprise factor. Nevertheless, the existence of rational individuals impedes the authorities from exploiting the unexpected element in a permanent manner. The authorities, realizing that they cannot trick the public constantly, undertake a new valuation of their objectives, applying changes to their policies. This permits central bankers to recuperate the effects of surprise policies.

On the contrary, if the central bank achieves its announcement of inflation across the entire horizon of planning, then there should not be losses associated with a greater inflation. For their part, the rational agents would formulate an expectation of equal inflation for the whole period, which would eliminate all possibility of inflationary surprise and assure that the result would be inflation equal to its' objective and unemployment at the levels of their natural rates at all moments. Such action is evidence that an optimal policy is consistent if the level of inflation is fixed always. The problem of dynamic inconsistency arises under discretionary policies which give way to inflationary surprises. To contain them, the authority must then adopt monetary actions based on rules for obtaining improved results, which in turn translate into social well-being (Kydland and Prescott, 1977).

The domain of research on rational expectations in economics theory bolstered the proposition of ineffec-

tiveness of monetary policy (Sargent and Wallace, 1976). This suggests that variations in the quantity of money have null effect on the output and on employment in the short and long-terms, given that the agents who formulate rational expectations anticipate such events, resulting in an increase in prices in the economy. The individuals thus do not respond to the monetary veil, which is to say the neutrality of money is present always.

However, these results were contested by a group of economists who believed that the central bank could undertake actions tending to stabilize not only inflation but also the output. The new Keynesians –as this group of professionals have been titled– formulated models which assumed some degree of rigidity of prices, for example of salaries, to prove the existence of a trade-off in the short-term between the size of fluctuations in inflation and the size of fluctuations in the real output. This suggests that the efforts of the central bank, using policy rules, can generate actions tending to stabilize both the inflation around a target, as well as the output at its' output potential (Taylor, 1979).

The use of policy rules was asserted to delimit the attributions of the authorities and of governments, in other words to avoid discretionary actions. The policy rules arose from the classical assumption to limit the power of the State. Friedman proposed the rule of  $k\%$ , which asserts that the most efficient monetary aggregate raises a certain percentage to a constant rate approximately equal to the nominal trend GDP. There is also the McCallum rule as well as the Taylor rule. According to Taylor a policy rule is “is nothing more than a contingency plan that describes as precisely as possible the circumstances in which a central bank changes the instruments of monetary policy” (Taylor, 2000, p. 2) or in other words as: “the destination points of a sailboat. The policy rule indicates how to run the ship to reach the destination. This necessitates establishing the angle of attack, choosing the ship's crew and predicting contingencies such as changes in wind” (Taylor, 2000, p. 11).

A frequent problem facing economic policy-makers is the disjunction between operating according to the application of the rules versus acting with discretion, with the objective of obtaining certain favorable effects. Acting with discretion does not, however, always bring favorable results over the variables with which economic authorities are concerned, nor over the efforts of those charged with implementing the policies. Discretion can represent an advantage for any authority because it grants a certain degree of flexibility to its' performance and it permits considering a wide gamut of elements of choice, which is to say new information, in decision-making.

However, the policy rule that has been most widely accepted in the economics literature and in the practice of the central bank is without a doubt the Taylor rule (Taylor, 1993). This describes monetary policy by fixing a short-term interest rate in response to the deviation of inflation from its' desired level or target (the inflation interval) and the deviation of the output from the level of its' natural rate (the output interval). This rule was construed through observation of the following developments in the science of economics: *i)* natural employment rate (Friedman, 1968), *ii)* rational expectations (Muth, 1961), *iii)* the Lucas critique (Lucas Jr, 1972), *iv)* dynamic inconsistency (Kydland and Prescott, 1977), *v)* the Taylor curve (Taylor, 1979), *vi)* invalidity of the proposition of ineffectiveness (Taylor, 1993) and *vii)* cooperative games models (Barro and Gordon, 1983), *viii)* Taylor rule (Taylor, 1993) and *ix)* Inflation Targeting Scheme (Bernanke et al, 2001) (see Table 1).

**Table 1.** Monetary theory developments

Natural employment rate	Friedman, 1968
No long-term trade-off between real and nominal variables	Friedman, 1976
Inflation as a monetary phenomenon	Friedman, 1976
Rational expectations	Lucas Jr., 1972
The Lucas Critique	Lucas Jr., 1976
Dynamic inconsistency problem	Kydland and Prescott, 1977
Infectivity proposition of the monetary policy	Sargent and Wallace, 1976
Taylor curve	Taylor, 1979
Cooperative games models	Barro y Gordon, 1983
Taylor rule	Taylor, 1993
Inflation Targeting Scheme	Bernanke et al, 2001

**Source:** elaborated using Friedman (1968), Friedman (1976), Lucas Jr. (1972), Lucas Jr. (1976), Kydland (1977), Sargent and Wallace (1976), Taylor (1993), (Bernanke et al, 2001).

On the other hand, Taylor (1993) asserts that the fact that policy rules can be expressed as mathematical, apparently mechanical, equations does not imply that central banks must apply those rules as mere formulas. On the contrary, they must be used as guides for general policy structures. In this sense, the mathematical form of the rule is converted into an “average approximation”, since instrumentation of the policy rule requires a certain degree of discretion.

The aforementioned developments gave rise to the assertion of the autonomy of the central bank, due fundamentally to the fact that inflation is a monetary phenomenon and no long-term trade-off exists. In other words, money is neutral and monetary actions provoke the problem of dynamic inconsistency. As such, the central bank must be isolated from factors related to political order. The greatest contribution that monetary policy can make to the economy is the maintenance of the acquisitive power of money. Independence reinforces credibility—an element of almost importance—so that the monetary authority can better achieve its’ goals given that the public, who formulate expectations in a rational manner, adjust their prices according to the announcements of the central bank.

Subsequently the assertion was put forth that a successful monetary policy would be one which was based on the Taylor tripod (Taylor, 2000) which combines: *i)* a regimen of free exchange rate, *ii)* an inflation target, and *iii)* a monetary policy rule. With respect to the first element, the exchange rate needs to fluctuate in market conditions and its’ price is determined by supply and demand. As for the inflation target, this is an objective around which the authority would want observed inflation to fluctuate. The inflation target becomes the nominal anchor for internal prices. Establishing a target for inflation helps to prevent policy actions from generating higher inflation and from causing economic instability. Nevertheless, an inflation target is insufficient if not backed by a policy rule. It will be easier for the private sector to form expectations if the central bank is clear with respect to its’ intentions through the adoption of an action plan.

The focus on Inflation Targeting Approach which represent the best monetary practices at the international level. The principal characteristics of these monetary regimens are the following: *a)* the principal object of monetary policy is the stability of prices,

*b)* mid-term announcements of inflation targets, *c)* an authority with autonomy in the execution of its' instruments, *d)* the application of a monetary policy marked by transparency, in which a communication strategy for the authorities' objectives, plans and decisions is maintained, *e)* an analysis of all the sources of inflationary pressures, with the goal of evaluating the future trajectory of growth in prices (said analysis is the principal reference for monetary policy decisions), *f)* the use of alternative measurements of inflation, such as sub-jacent inflation, to separate those phenomena which impact inflation in a transitory manner and identify the mid-term tendency of growth in prices (Bernanke et al, 2001).

### 3. THE STRUCTURAL CHANGE OF THE CENTRAL BANK OF MEXICO

The developments of the modern monetary theory delineated the main guidelines of the monetary policy of the central bank of Mexico in the last decades. At the beginning of the 1980's Mexico experienced the start of a transformation of its' economy, which signified a real change across all its' economic, political and social institutions, among others. The new liberal-style economic model aimed at the construction of a market economy, which in principle meant controlling inflation and decreasing debt and public spending. Highlights of these structural changes included: the opening of

the economy to the global market, the disincorporation and sale of public companies, the liberalization of prices of goods and services administered by the government, the elimination of subsidies and transfers for productive sectors, and the liberalization of nominal interest rates. In synthesis, the import-based model was dismantled to make way for a new export-based model (Banco de México, 1994; Aspe, 1993).

**Image 1.** Central bank of Mexico main building



Source: taken from [www.guiadelcentrohistorico.mx](http://www.guiadelcentrohistorico.mx)

The mandate of Salinas de Gortari continued and, in many cases, reinforced the changes undertaken by De La Madrid Hurtado in 1982 in terms of fiscal, monetary and exchange rate matters. Regarding the latter, given the strained relation observed between the movement of the type of change and the behavior of prices in the economy, the government opted for a regiment of fixed or predetermined exchange, which would act as a nominal anchor for controlling prices. A re-negotiation of the external debt was achieved, alongside disciplinary fiscal actions, privatization of public companies and of the banking system, as well as liberalization of tariffs and prices in the public and financial sectors. The process of commercial opening was consolidated with the negotiation of a free trade agreement between the U. S., Canada and Mexico (Cabrera and Rojas, 2006). This deal, which began to take force in 1994, was without a doubt the greatest economic change since the nationalization of the oil industry in 1938 (Banco de México, 1995; Solís, 1997).

In 1993 a reform initiative was presented which contemplated changes to the Constitution and the creation of a new law for BM. Notable among the explanation of motives was the following:

To make manifest in constant form the concern for moderating in some manner the flow of credit of the central bank. This, due to two clear reasons. First, that over a long time there has been perceived the existence of a linkage between said flow and the evolution of prices. Second that the laxity in the control of credit of the central institute has resulted in overly bitter inflationary experiences. In this respect, it is important to remember the innumerable damages that the inflation has brought with it, which remain very alive in our memory (Banco de México, 1995).

The existence of a central bank with the mandate to procure, first and foremost, the stability of prices, allows for the presence within the State of an institution with a long-term promise to this objective. In this sense, the central bank could act as a counterweight for public administration, with respect to actions that could precipitate inflationary situations. But it could also act as a counterweight for the particulars, when these are considered to spark actions conducive to increases in prices or in costs, with the expectation that the authorities would bring to bear a monetary expansion sufficient to accommodate such increases (Banco de México, 1995).

With the reform put in place, article 28 of the Constitution, sixth paragraph, was left as follows:

“The state will have a central bank that will be autonomous in the exercise of its functions and in its administration. Its primary objective will be procuring the stability of the acquisitive power of the national currency<sup>1</sup>, thereby fortifying the control over national development which corresponds to the State. No authority will order the bank to concede financing [...]” (CPEUM, 23-08-1993).

1. Underlines by the author.

The reform principally outlines why the primary mandate of the BM would be the control of inflation rather than the growth of the economy. It conceded full authority over the management of net internal credit, which entailed that no other authority could order the central institute to concede financing by whatever means. Moreover, its’ institutional redesign included eliminating discretion in the removal of its’ functionaries. BM would thus cease to be an entity with a mercantile character and the calculation of prices would become a task for the National Institute of Statistics and Geography from 2011. It should be noted that the institute was granted administrative and managerial autonomy, but not independence in terms of its’ objectives. These remained embedded in article 28 of the Mexican Constitution (Banco de México, 1994; Sánchez, 2011).

The policy of fixation of the peso to the dollar finally concluded with the devaluation which occurred in December 1994. There had existed a commitment by the authorities to maintain a fixed or predetermined exchange rate. However, the central bank was facing a credibility problem and as such had established a type of predetermined exchange which provided it with a nominal anchor through which it could import currency credibility fixed to its’ parity (the dollar). This action had an extremely high cost, especially given the lack of public faith that the authority could support the fixed exchange rate. Although this strategy was successful in combating inflation for several years, the rigidities imposed under this regimen ultimately worked against it. Subsequently when the international reserves were exhausted, and in the presence of significant shocks, the country was forced to devaluate (Banco de México, 1995; Banco de México, 1996; Carstens and Werner, 1999).

Following the crisis of 1994, Mexico moved from a regimen of fixed exchange rate to one of a flexible character. Under this new regime the exchange rate ought to have been fixed by free market forces, although this was not entirely the case. The fear over flotation on

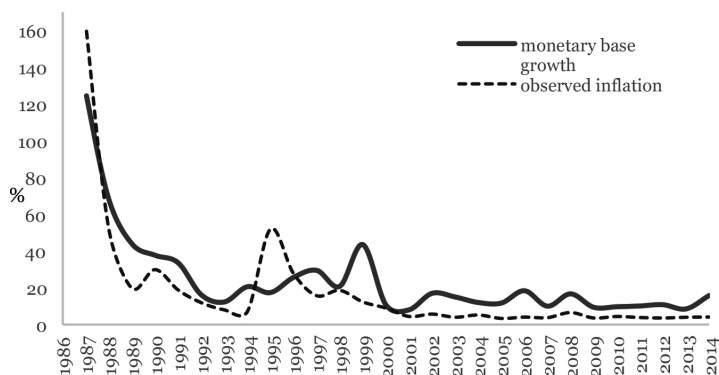


behalf of the monetary authorities provoked increases in reference interest rates, and even direct interventions in the foreign exchange market. Both measures were employed in an effort to influence the parity of the peso with respect to the dollar. According to the authorities it was not fear over free flotation but rather the effects of brusque depreciations of the peso which influenced the inflation rate through internal price transfers (Banco de México, 1995; Banco de México, 1996; Baqueiro, Díaz and Torres, 2003).

According to Calvo and Reinhart (2002), in developing economies such as Mexico there are high levels of correlation between the exchange rate and inflation. As such, central bankers are afraid of making their exchange rates completely flexible. However, the monetary authority in Mexico defined it as fear of inflation rather than fear of flotation. For Calvo and Reinhart, the reasons why countries fear allowing their currencies to float are various, including notably the assertion that when emerging economies experience powerful currency depreciations, the associated consequences of such processes cannot be predicted. In other words, exports, investment and the output do not grow. This may be due to the possibility that the country has a considerable debt in foreign currency, a lack of access to international markets, or that the institutions charged with managing these policies have little or none of the reputation and credibility which would bolster the validation of their actions.

One way of correcting such problems is the introduction of a monetary policy scheme based on a rule. With a flexible parity, it is possible to adopt any monetary policy scheme, including falling into discretionary behavior. Notwithstanding the monetary framework, the primary consequence of the adoption of a regimen of floating exchange rate is the loss of the nominal anchor which lends support to fixed exchange rates. The solution to this is to implement a focus on inflation targets for attacking credibility problems. The process of strengthening credibility is supported through the use of a policy rule (such as the Taylor rule, for example), which becomes the reference for the behavior of the central bank, and which includes the inflation rate. This in turn comes to function as the new nominal anchor. It is generally accepted that inflation, understood as the generalized increase of prices, is always and everywhere a monetary phenomenon. This implies that variations in the quantity of money have a close relation with variations in prices (see Graph 1). In the case of Mexico, a close relationship exists between the rate of growth of the monetary base and the rate at which prices varied during the period from 1987 to 2014. This highlights that the high association between these two variables was clearer in the last fifteen years. For most economists, no other coincidence such as this exists in the science of economics. As such the authority—in its’ effort to control inflation— focused a great deal of attention on the evolution of the monetary base.

**Graph 1.** Monetary base growth and observed inflation from 1987 to 2014



Source: elaborated by the author using data from BM and INEGI.

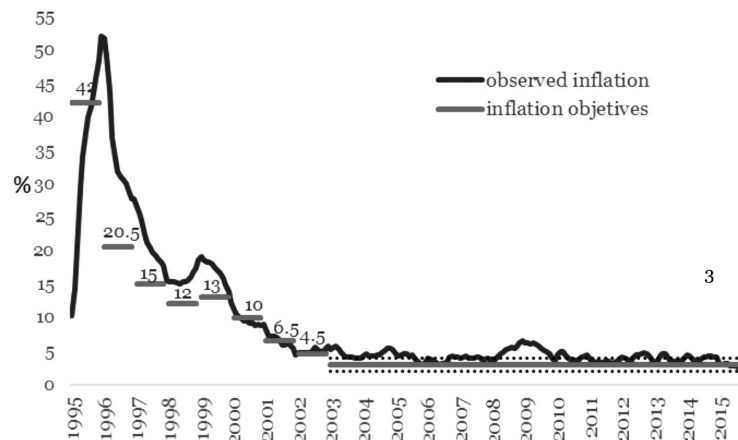
In the years that followed, monetary policy was based on a policy rule which supported the quantitative growth of the monetary aggregates and discretionary actions to fix interest rates in a direct manner via the operation of a regime of Zero Average Accumulated Wages (Sal-dos Acumulados Promedio Cero), also known as Zero Average Reserve (Encaje Promedio Cero). This operated from March 1995 until January 2008. For most of those years during which this monetary policy mechanism was operative, it imposed a limit to the growth of internal net credit. This imposed limit to growth was called ‘cut’ (corto). This mechanism immediately generated an increase in short-term interest rates, which signaled the change of posture of BM from neutral to restrictive or very restrictive, depending on the case in question (Carstens and Reynoso, 1997).

With inflation at the single-digit level at the beginning of the 21<sup>st</sup> century, Mexico adopted in 2001 –as an additional effort to consolidate low price levels– the Inflation Targeting Scheme. This symbolized at the time the culmination of elements which were characteristics of proven and successful monetary policy across diverse parts of the world. Added to the autonomy of the central bank and the understanding that the principal objective of monetary policy was the control of prices were the announcements of short and long-term inflation goals. These inflation goals were officially set

at 10% in 2000, 6.5% in 2001, 4.5% in 2002 and 3% in 2003. To maintain the latter as a long-term goal with an interval of variability of +1 and –1, a national consumer price index was adopted with an emphasis on subjacent inflation as the official indicator of compliance with the inflation goals (Banco de México, w/d, a; Banco de México, 2001; Sánchez, 2011).

Prices have had a less volatile and more predictable behavior over the last 20 years. Inflation tended to decrease towards the middle of the 1990’s, consolidating this low tendency in the ensuing years, which coincided with the adoption of the Inflation Targeting scheme by BM. It is worth noting that from 1995 to 2000 observed inflation was greater than the authority’s fixed goal, although the difference was diminishing. Nevertheless, from 2001 when the announcements of short and long-term target were made official, observed inflation tended to situate itself close to the goal. This situation was consolidated after 2003 when inflation rounded 3% and came to rest within the interval of +/-1, except for 2009 when the international crisis impacted the Mexican economy (see Graph 2). For the moment, the autonomy of the central bank, the regimen of a type of flexible exchange and the inflation target characterize monetary policy in Mexico (Banco de México, 2003; Guzmán, 2015; Villagómez and Orellana, 2009).

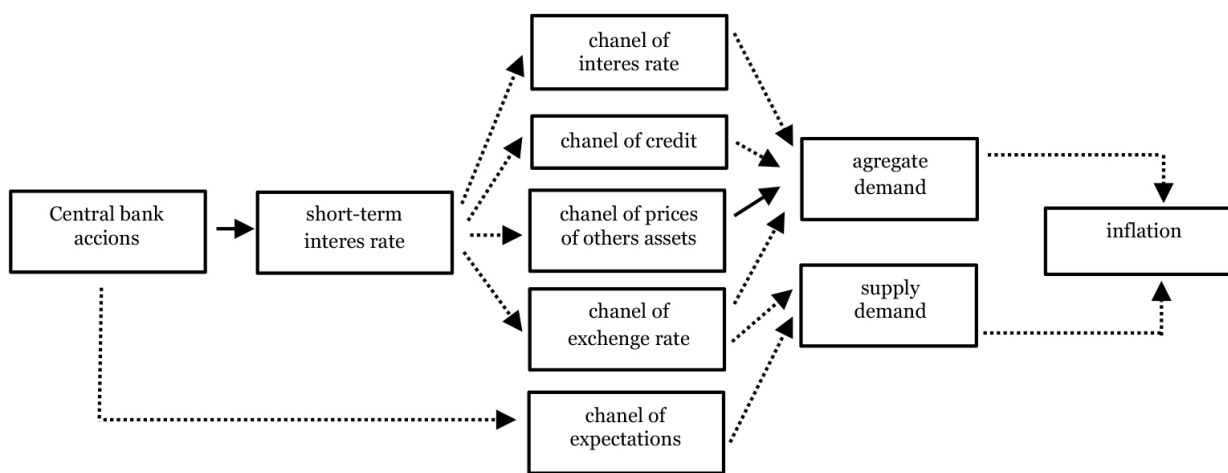
**Graph 2.** Inflation objectives and observed inflation from 1995 to 2016



Source: elaborated by the author using data from BM and INEGI.

The adoption of an Inflation Targeting scheme also included measures of communication, transparency and performance accounts. In 2001 the Trimestral Report was added to the existent publications and in 2002 a calendar was expedited to communicate matters of monetary policy. Nonetheless, perhaps the most significant measure came in 2008 when the authority began to fix the interbank interest rate (IIR), which would move at the rate of 25 base points (BP), substituting the net zero target and becoming the principal instrument of the BM for exercising and communicating its' monetary policy position. Similarly, the transmission mechanism of the monetary policy of the BM determines how BM publically communicates the effects that its' policies have on the economy in general, and particularly on the process of price determination (Banco de México; w/d, b; see Diagram 1).

**Diagram 1.** Transmission mechanism for monetary policy



Source: Banco de México (w/d, b).

According to Diagram 1, the monetary authority perceives that inflation can come from demand pressures (aggregated demand) and/or supply pressures (aggregated supply). BM may fix its' monetary posture, either increasing or decreasing—depending on the case—the IIR at the rate of 25 BP, or it can leave it unchanged. This action is then transmitted to the economy via distinct channels: *i)* interest rate channels, *ii)* credit channels, *iii)* price or other asset channels, *iv)* exchange rate channels and *v)* expectation channels. The first three impact aggregate demand and the last two impact aggregate supply.

For example, if BM perceives greater inflation in the future it will respond by increasing the IIR to the rate of 25 BP. This action provokes rises in short, mid and long-term interest rates, affecting the entire rate curve, producing a fall in consumption and investment. The rise provokes an appreciation of the peso with respect to the dollar, which translates into greater imports and lower internal prices. Moreover, the rise in the IIR makes investment in bonds more attractive and diminishes the demand for assets as well as impacting expectations for the future performance of the economy. All these operations disincentive spending and production in the economy, provoking lower inflation. The expectation channel plays an increasingly important role in the control of inflation, due to the fact that a single declaration can communicate future actions which impact price and contract determinations in the present.

## CONCLUSIONS

The developments of modern economic theory suggested the existence of a natural rate of unemployment in the economy, which was independent of monetary factors and which changed over time in relation only to real factors such as education, inventiveness, frugality and labor market frictions, among others. The presence of this natural unemployment rate of the economy came to revolutionize the study of the science of economics and the form in which monetary policy

were formulated. Inflation, understood as a generalized and sustained increase in all prices, was always and everywhere a monetary phenomenon. The best that monetary policy could do was to prevent money from becoming a source of disturbance to economic activity.

The incorporation of the hypothesis of rational expectations into the science of economics generated profound changes in the field monetary policy. The problem of inconsistency dynamic, that arises because for the authorities it proves convenient to exploit the surprise factor. Nevertheless, the existence of rational individuals impedes the authorities from exploiting the unexpected element in a permanent manner. The problem of dynamic inconsistency arises under discretionary policies which give way to inflationary surprises. To contain them, the authority must then adopt monetary actions based on rules for obtaining improved results. The proposition of ineffectiveness of monetary policy was raised in a scenario where individuals have rational expectations and monetary surprises have no effect. The individuals thus do not respond to the monetary veil, which is to say the neutrality of money is present always.

However, these results were contested by a group of economists who believed that the central bank could undertake actions tending to stabilize not only inflation but also the output with the use of policy rules, and the most widely accepted in the economics literature is without a doubt the Taylor rule. The greatest contribution that monetary policy can make to the economy is the maintenance of the acquisitive power of money. The monetary theory presented the Taylor tripod, which combines: *i)* a regime of free exchange rate, *ii)* an inflation target, and *iii)* a monetary policy rule. Finally, the focus on Inflation Targeting Approach which represents the best monetary practices at the international level.

At the end of the twentieth century Mexico undertook a change in its economic model. This was continued and reinforced in the twenty-first century, generating

a structural change of the economy and all its institutions. The supply of primary credit to the government was reduced to the point of disappearing. The central bank started a change from which it would not turn back. It was granted administrative and management autonomy and for the first time in its history, combating inflation came to be its main objective and cancelled the possibility of financing the government through the creation of money. Inflation was considered a monetary phenomenon. The financial system was liberalized, a market for public and private debt was created, and a mechanism for funding the work of government and private enterprise was provided.

The structural change continued in the decade of the nineties of the past century. The fixed exchange rate regime gave way to a flexible one with monetary authority interventions fearing to float due to abrupt transfer of depreciation of the peso to domestic prices. The actions of monetary policy rested on the growth of monetary aggregates and discretionary actions to set interest rates in a direct manner through the regime of Zero Average Accumulated Wages (Regimen de Saldos Acumulados Promedio Cero). With inflation at single digit levels, BM adopted the Inflation Targeting Approach that represents “good monetary policy” among the central bankers of the world. It made official a target for long term inflation of 3% and made the actions of the monetary authority even more transparent. Inflation has been low. The primary objective is to safeguard the purchasing power of the peso.

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