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Chapter 3

Causes of Inflation in Turkey:
A Literature Survey with Special
Reference to Theories of Inflation[*]

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Abstract: Turkey has experienced high and persistent inflation for more than twenty years. This chapter attempts firstly to survey the extremely broad literature on theories of inflation, in order to be able to classify, understand and discuss the dynamics of inflation more carefully. In this chapter, it is mainly argued that inflation may be interpreted as a net result of sophisticated and continuous interactions of demand-side (or monetary) shocks, supply-side (or real) shocks, price-adjustment (or inertial) factors and political processes (or institutional factors). The second aim of the chapter is to compare the existing empirical studies on Turkish inflation, by considering their sample period, data frequency, empirical methods, modeled macroeconomic variables and main results. Most of the studies reviewed here seem to have focused primarily on demand-side determinants (e.g., monetary growth and budget deficits), and partially on some supply-side factors (e.g., nominal exchange rates and oil prices). On the other hand, the components, degree and effects of inflation inertia need to be investigated in more detail. In the future, the modeling attempts of the inflationary dynamics in Turkey would profit from the so-called "new political macroeconomics" because the role of the political process and institutions is not a weak explanatory factor of Turkish inflation.

1.   Introduction

High and persistent inflation has been a major characteristic of the Turkish economy for more than two decades (see Figure 1), and several disinflation attempts since 1980 seem to have failed. There exists still a number of potential causes for ongoing inflationary process.

In Turkey, it is *commonly* argued that sustainability of high and persistent inflation rates since the late 1970s has been "fed" by:
(1) high public sector budget deficits,
(2) monetization of public sector budget deficits,

(3) massive infrastructure investments of the various governments, such as for the Southeastern Anatolian Project,

(4) high military expenditures associated with geopolitical reasons,

(5) political instability which results in inflationary pressures due to populist policies that have ensued prior to each general election,

(6) persistent inflationary expectations of economic agents,

(7) inflationary effects of changes in exchange rates via increases in prices of imported inputs,

(8) occasional increases in world prices of major imported inputs (particularly, crude-oil),

(9) increases in regulated prices of public sector products which are mainly used as input by the domestic private sector, and/or

(10) rising interest rates resulting from the crowding-out effect of public sector borrowing in a shallow domestic capital market.
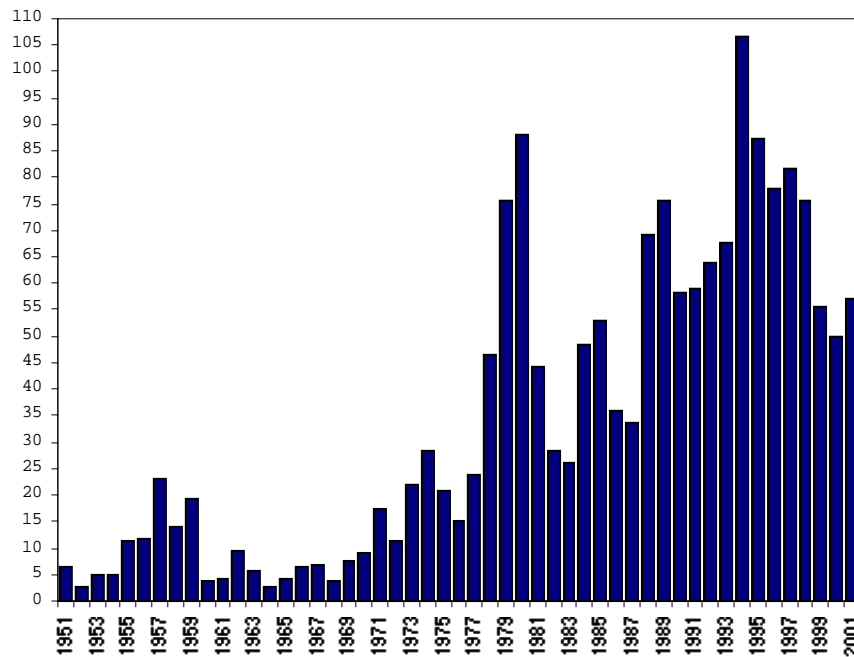

Figure 1: Inflation in Turkey (annual percent changes in the GDP deflator, 1951–2001)
Source: State Institute of Statistics and State Planning Organization; author's own calculations.

In reality, however, most of these "possible" causes discussed *publicly* may be condensed into a smaller number of determinants in order to better understand the dynamics of inflation in Turkey. There are many reasons to do so. First of all, some of these factors are closely interrelated, or may be seen as stemming from the same macroeconomic category. Some other factors cannot be accepted as real causes of inflation if we consider the relevant debates in the theory. Furthermore, to be able to propose a successful disinflation program, one should rank these broader factors according to their relative importance. Given the current focus on disinflation in Turkey, it seems very timely to survey both the main developments in inflation theories and the empirical studies on sources of inflation in Turkey. This type of a study may also be illuminating for the formation of a new agenda for future research on analyzing the current dynamics of inflation and/or disinflation in Turkey.

In this chapter, I mainly attempt selectively to review the existing large body of empirical literature on causes of Turkish inflation. Since every empirical study must be based on a theoretical background, I firstly present a brief history of theories of inflation in Section 2. Following this review of competing or complementary theories of inflation, in Section 3, I compare selected empirical studies of Turkish inflation in terms of their sample period, data frequency, empirical methods, modeled macroeconomic variables, and main results. Finally, Section 4 is devoted both to summarizing the main conclusions of the survey and to discussing briefly possible directions of further research with special reference to recent developments in inflation theory.

Note that the emphasis in this study will be, in general, on "causes" of inflation rather than on possible "costs and cures" of inflation. That is to say, a number of highly relevant topics, such as disinflation, core inflation, inflation targeting, policy credibility and inflation variability, remain outside the framework of the present study.

2. A Brief History of Inflation Theories

Inflation is usually defined as sustained increases in the general price level for goods and services in an economy. Note that this definition excludes clearly *one-time* increases in the price level.[1] If equilibrium price level in a domestic market for goods and services rises continuously as a result of continued excess demand conditions in successive time periods, then economists speak in general from *demand-pull inflation*. In this case

aggregate demand grows faster than the level of aggregate supply and "pulls" prices higher. But if firms' costs increase continuously as in the cases of rising wages, interest rates, taxes, imported input prices, or exchange rates, then some economists prefer to use the term *cost-push inflation* to describe this phenomenon.

In practice, however, it is not always easy to decompose the observed inflation into its demand-pull and cost-push components. The process is dynamic, and the shocks to prices are mixed. Furthermore, inflation itself, or inertia in inflation, may also cause future inflation. Finally, some theories include both demand-side and supply-side channels of feedback in explaining inflation. Therefore, we need other criteria, besides demand-pull and cost-push, to classify theories of inflation. There are many alternative possibilities to distinguish various types of inflation theories. For example, we may differentiate between short-run vs. long-run inflation theories, closed vs. open economy models of inflation, theories of low-, high- or hyper-inflation, perfect competition (market-clearing) vs. imperfect (monopolistic) competition models, theories with assumptions of perfect or imperfect information, fiscal vs. monetary theories of inflation, etc. For the purposes of the present study, it seems to me more appropriate to classify and compare theories of inflation according to major debates between competing schools of economics in a more or less chronological order.[2] This section ends with a four-blocked categorization of the causes of inflation.

2.1 Monetary vs. Keynesian Inflation Theories

Classical (e.g., David Hume, Adam Smith, David Ricardo and John Stuart Mill) and *neoclassical* (e.g., Leon Walras, Alfred Marshall and Arthur C. Pigou) economists all used mainly the so-called *quantity theory of money* (QTM) to explain inflation. In its transactions version, the QTM states that the value of all sales of goods must necessarily equal the value of all purchases:

$$M \cdot V = P \cdot T \tag{1}$$

where M is money supply, V is the velocity of money, P is the general price level, and T represents the real volume of transactions. In this framework, aggregate supply in the goods market is given while aggregate demand is defined as follows:

$$AS = T. \tag{2}$$

$$AD = (M \cdot V)/P. \tag{3}$$

Now, T may be interpreted to represent real output which is determined according to the production function in the long run. Equilibrium in the goods market requires here that $AS = AD$, and hence,

$$T = (M \cdot V)/P. \tag{4}$$

If one assumes, following the classical economists, that V and T are constant in the short run, the transactions equation in (4) can be rewritten to yield a price equation for the economy as follows:

$$P = (\overline{V}/\overline{T}) \cdot M. \tag{5a}$$

Equation (5a) states simply that doubling the money supply doubles *ceteris paribus* the price level. That is, the general price level is solely an increasing function of money supply, or in other words, an excess supply in the money market causes, other things being equal, an excess demand in the goods market. It should be added that the relative version of the equation (5a) can simply be interpreted as the *inflation equation* of the QTM:

$$\pi \approx (v - g) + m \tag{5b}$$

where π, v, g and m represent the percentage changes in P, V, T, and M, respectively, while v and g are assumed to be zero.

In its extreme interpretation, this simple classical or neoclassical relationship states that inflation is *only* a monetary phenomenon if one ignores the possible changes in V and T. Therefore, in a classical or neoclassical economy, the money supply should be reduced to fight against inflation.

O'Brien (1975) argues that there are some differences between transmission mechanisms in classical and neoclassical versions of the QTM. The neoclassical model is based on the assumption of full employment, and it is characterized by a dichotomy between the real and monetary sectors. Real wages will be determined in the real sector (labor

market) while nominal prices are a function of the money supply. Therefore, increases in the money supply increase the general price level by leaving the volumes of goods demanded and supplied, and hence, real output unchanged. On the other hand, O'Brien writes, some classical economists like David Hume do not assume full employment and there is no room for a dichotomy. According to Hume, an increase in the money supply does increase the general price level through a different transmission mechanism. The increase in nominal cash balances of economic units initially results in higher expenditures for goods, and hence, in higher production. Then, under the assumption of underemployment, prices start to adjust to risen money supply. As a result, money is not neutral as in the neoclassical model; it has also some real effects in the short run. In other words, Hume's monetary approach differs in describing the process of inflation in the short and long run by allowing to some price rigidities in the short run.

John Maynard Keynes' (1936) revolutionary book, *The General Theory of Employment, Interest and Money*, was based mainly on the assumption of underemployment equilibrium with a fixed general price level. That is, it was not designed to analyze the dynamics of inflation. As an alternative to monetary model of inflation, Keynes (1940) developed a different demand-side model of inflation with *price rigidities* mainly in the labor market. In his model of "inflation gap", Keynes describes a *redistribution* process in which "inflation acts like a pump that transfers income from wage earners who have a low propensity to save and a low marginal tax rate to the entrepreneurial sector with a higher propensity to save and a higher marginal tax rate" (Frisch, 1983: 230). An unexpected increase in aggregate demand (inflationary gap), as in the case of a war, leads to a price increase under full employment conditions, and this, in turn, creates unanticipated profits for firms while nominal wages remain temporarily constant. Rising profits create an additional excess demand in the goods market. However, the lagged attempt of firms to satisfy the initial excess demand in the goods market creates an excess demand in the labor market. Resulting competition among entrepreneurs for fully employed labor pushes nominal wages higher until restoring real wages to their initial level. The increase in real wages induces a new demand pressure in the goods market. Prices increase again. If the wage-lag mechanism still continues to work, an inflation spiral occurs which can be defeated only by reducing aggregate demand (e.g., tax increases and/or cuts in government spending) and/or reducing rigidities by, for example, implementing an appropriate income policy.

2.2 Neo-Keynesian vs. Monetarist Approach to Inflation: The Philips-Curve Debate

Keynes' (1940) inflationary gap model was mainly a demand-side model with wage rigidities in the short-run but without any explicit remarks about the money market developments as in the QTM. Furthermore, his non-monetary, demand-pull approach to inflation was influenced also by some cost-push arguments for inflation, even in his some earlier studies as mentioned by Humphrey (1981). In spite of accepting the possibility of inflationary effects originating from supply-side shocks, most *Keynesian* economists such as A. Smithies, G. Ackley, S. Maital and J. A. Trevithhick treated demand-side shocks as the primary cause of inflation. Arthur Smithies (1942) and the others formalized Keynes' verbal analysis of inflationary gap and their explanations prevailed until the mid-1970s. In Section 2.3, I will return to the Keynes-Smithies line of theories with special emphasis on the role of distributional effects in the process of inflation when summarizing the cost-push theories of inflation developed by structuralists, post-Keynesians, disequilibrium economists and neo-Marxian economists.

The Neo-Keynesian macroeconomics, or so-called *Keynesian neoclassical synthesis*, is based primarily on

(1) the *IS-LM* closed-economy model developed mainly by John R. Hicks and Franco Modigliani in the late 1930s and 1940s,

(2) the *Phillips curve* developed by Alban W. Phillips and Richard Lipsey in the late 1950s, and popularized by Paul Samuelson and Robert Solow in the early 1960s,[3] and

(3) the *Fleming-Mundell* (F-M) small-open-economy model developed in the 1960s.[4]

The proposed income redistribution mechanism, which fed sustainable price increases in the Keynes-Smithies model, was not included in the standard IS-LM context. That is, there was no room for *continuous* price increases, or inflation, in the neo-Keynesian IS-LM world. On the other hand, the difference between Keynesian and classical theories of income determination was reduced to differences in interest-rate sensitivity of money demand, and hence, to the shape of the curve for money market equilibrium (LM). Therefore, the Keynesian neoclassical synthesis incorporated labor market dynamics into the IS-LM model by taking into account the so-called Phillips curve (PC) to eliminate the missing wage/price block, or inflation equation, in the system:

$$\pi = \alpha \cdot U \qquad\qquad\qquad\qquad\qquad\qquad (6a)$$

where π represents the inflation rate and U is the unemployment rate. The trade-off, or negative correlation, between inflation and unemployment was stated by $\alpha < 0$. That is, the higher the inflation rate the lower is the unemployment rate, and *vice versa*. Furthermore, an increase in the inverse of U, or simply a decrease in U, was interpreted as an indication for *excess demand* in labor and hence in goods markets, following the tradition of the demand-pull explanation for inflation.

The demand-side determination of inflation within the IS-LM-PC framework, however, failed to explain *stagflation* in the late 1960s and 1970s. Particularly, the dramatic oil-price shocks in 1973–74 and 1978–79 created worldwide recessionary and cost-push inflationary effects at the same time. The observed evidence on incompatibility between the PC relationship and the co-existence of stagnation and inflation was actually predicted by *monetarist economists* such as Milton Friedman and Edmund Phelps who proposed a so-called *expectations-augmented PC* in the late 1960s:

$$\pi = \alpha \cdot U + \beta \cdot \pi^e \qquad\qquad\qquad\qquad\qquad (6b)$$

where π^e is inflation expectations while β represents the expectation adjustment parameter. In the short-run, there is still a negative relationship between inflation and unemployment for a given π^e. That is, inflation expectations act as a shift variable in the model. However, assuming that $\beta=1$ and $\pi^e = \pi$ in the long-run, the PC must be vertical according to the monetarist critique of the standard PC. In other words, there is no trade-off between π and U in the long run, and the vertical long-run PC represents a kind of "natural rate of unemployment".

According to the monetarist economists, the formation of inflation expectations is *backward-looking*, or *adaptive*, in the sense that not all information is available to economic agents during their formation of price expectations:

$$\pi_t^e = \lambda \cdot \pi_{t-1} + (1-\lambda) \cdot \pi_{t-1}^e \qquad\qquad\qquad (7)$$

where λ and $(1-\lambda)$ are the adjustment parameters, or weights. Here, equation (7) states that the expected rate of inflation at time t is only a weighted average of the actual inflation rate and the expected inflation rate in the

previous period. This equation, which shows how expectations are formed, is interpreted by many economists as an appropriate measure of *inflation inertia*.[5] Notice that the concept of backward-looking, or less informed, expectations is also used by Phillip Cagan (1956) as a major determinant of money demand in his famous analysis of hyperinflation.[6]

2.3 Monetarist-Structuralist Debate: Demand-Pull vs. Cost-Push Inflation

The discussions on causes of inflation in the 1960s and early 1970s were dominated by the debate between the monetarists and structuralists as to whether inflation is a demand-pull or cost-push issue.

Cost-push theories of inflation largely attribute inflation and disinflation to non-monetary, supply-side effects that change the unit-cost and profit-markup components of the prices of individual products (Humphrey, 1998). The *structuralist* approach to inflation is one of the major versions of the cost-inflation theories. The idea linking inflation to *country-specific structural factors*, such as the coexistence of a "progressive" (industrial) sector and a "traditional" (agricultural or the export) sector, dates back to the influential studies of Streeten (1962) and Baumol (1967).[7] The first-generation of structuralist inflation models developed in the 1960s explained Latin American inflation with the productivity differences between the industrial and agricultural sectors. In general, they argued that the traditional sector responds to monetary, or aggregate-demand, shocks with a lag. This lag is accompanied by a partial increase in industrial output and employment in the short run, which in turn increases wages and hence the demand for agricultural products. This increase implicates a change in *relative prices* in favor of foodstuffs. Higher agricultural prices lead to higher wage demands in this sector. Increasing wages increase the demand for industrial products, and the mechanism continues to work. In this model, aggregate supply chronically *lags behind* aggregate demand as a result of the temporary output rigidities in one of the sectors. Therefore, the structuralist model is accepted as a cost-push theory.

In the 1970s, the so-called *Scandinavian model* of inflation[8] was one of the popular versions of the structuralist approach. A special feature of the sophisticated Scandinavian theory is that wages in Scandinavian countries such as Norway and Sweden are set through nationally supervised collective bargaining from which nearly uniform wage increases for all union workers emerge:

> Wages rise in the more progressive and profitable industries, which can afford to pay more and prefer to do so rather than lower prices or announce higher profits, which

> would invite public criticism and eventually the entry of competitive firms; the wage increases are next extended to the less progressive and profitable industries; the latter must raise their prices since their low profits make it impossible to absorb the costs; important components of the cost of living, such as rents, thus move up; the wage earners who had made the first gains find that they need a catch-up to hold their previous advantage in terms of purchasing power; and the spiral continues. (Whitney, 1982: 80)

The so-called *post-Keynesian* theory of inflation developed particularly in the 1970s,[9] and the short-lived *disequilibrium economics* in the tradition of Don Patinkin and Axel Leijonhufvud provided other well-known types of cost-push theories of inflation with a special emphasize on the role of markup pricing, income claims, and relative price changes. It should be added that some variants of the neo-Marxian and Latin American neo-structuralist inflation theories are still based on the idea of the cost-push inflation, which stems from similar *distributional conflicts*.[10]

Keynesian, structuralist, post-Keynesian, and neo-Marxian versions of cost-push theories seem to have similar distributional mechanisms which imply changes in relative prices, and which produce continuous increases in the general price level, i.e., a sustainable inflationary process. Nevertheless, another group of the supply-side theories of inflation intends to explain only a one-time increase in the price level caused by an exogenous shock such as an oil-price shock and/or devaluation of the national currency. The "imported inflation thesis" which is based on *one-time* shocks, however, cannot explain inflation because it does not include a "mechanism", which can produce *sustained* price increases in an open economy. The temporary nature of most of the oil-price shocks allows only transitory changes in relative prices, output, and employment, while leading to a one-time pressure on general price level. Nevertheless, it should be noted that, in the literature, there are also some sophisticated modeling attempts proposing alternative mechanisms in which, for instance, the causation runs from exchange-rate depreciations or balance-of-payments crises to inflation through increases in inflationary expectations, government deficits and/or the money supply.[11]

The modern QTM in the tradition of Milton Friedman accepts that the inflation occurs when the rate of growth of the money supply exceeds the growth rate of the real aggregate output in the economy. According to the monetarists, the QTM implies that inflation is always, everywhere and solely a monetary and demand-side phenomenon. In their view, cost-push arguments for inflation are misleading because they primarily are based on some *micro*economic observations on the supply-side. Monetarists believe in general that the firm- or industry-specific cost increases cannot be

inflationary as long as they are not related to, or accommodated by, increases in the money supply. Thus, the causation runs from inflation to costs, and not vice versa.

2.4 Rational Expectations Revolution: Forward vs. Backward Looking Expectations

Macroeconomics in the 1970s is dominated by a revolutionary idea of the so-called *Rational Expectations* (RE) economists, such as Robert E. Lucas, Thomas J. Sargent, Neil Wallace, Robert J. Barro and Bennett T. McCallum. Starting with the monetarist assumptions of continuous market-clearing and imperfect information, the RE school, or the first generation of the *new classical macroeconomics*, argued that people do not consistently make the same forecasting errors as suggested in the adaptive expectations idea: Economic agents form their macroeconomic expectations "rationally" based on all past and current relevant information available, and not only on past information as in the case of backwards-looking, or adaptive, price expectations. According to the traditional monetarist approach from the 1960s, the errors in price expectations were related to each other. Here, however, they are totally random, or independent of each other.

The RE approach to the business cycle and prices generated a vertical PC both for the short- and the long-run. If the monetary authority announces a monetary stimulus in advance, people expect that prices rise. In this case, this fully anticipated monetary policy cannot have any real effects even in the short-run as argued by monetarists. Thus, the central bank can affect the real output and employment only if it can find a way to create a "price surprise". Otherwise, the "forward-looking" expectation adjustments of economic agents will ensure that their pre-announced policy fails. Similarly, if a policymaker announces a disinflation policy in advance, this policy cannot reduce prices if people do not believe that the government will really carry it out. That is, in the new classical framework, price expectations are closely related to the necessity of *policy credibility and reputation* for successfully disinflating the economy.

According to monetarist and new classical economists, the growth in the money supply stems typically from the ongoing public sector deficits that are primarily financed by the central bank. In the "unpleasant monetarist framework" presented by Sargent and Wallace (1981), *the government budget constraint* is essential to understanding the time path of inflation.[12] Alternative financing methods for current government deficits only

determine the timing of unavoidable inflation in the future, under the assumption that fiscal policy dominates monetary policy.[13]

2.5 New Keynesian vs. New Classical Economics

In the 1980s, the second generation of the new classical macroeconomists such as Edward C. Prescott, Finn E. Kydland and Charles I. Plosser argued that upswings and downswings in economic activity originate from *real (or aggregate supply) shocks* rather than monetary (or aggregate demand) shocks. Assuming that the aggregate demand curve is fixed, and by keeping the assumptions of continuous market-clearing, imperfect information, and rationality of expectations, the so-called *real business cycle* (RBC) theorists investigate the effects of supply shocks (e.g., process and production innovations, discovery of new sources of raw materials, changes in relative prices of foods and energy, bad weather, and nominal effective exchange rate changes) on the business cycle.

To a large extent, RBC theorists do not attempt explicitly to explain price level changes or inflation; rather, they focus particularly on real-output effects of adverse, or negative, supply shocks such as deviations of factor productivity from trend or relative price changes caused by oil price shocks. However, one can easily argue that the main contribution of RBC economists is that they call our attention to the possibility of the important role of supply shocks in explaining inflation. In terms of the variables in equation (5b), that is, persistent and negative supply-shocks ($g < 0$) may cause inflation, assuming that $v=m=0$. This statement is, actually, also in accordance with the monetarist inflation explanation because m exceeds g even in this case. Note that RBC theory implies that persistent technological improvements may contribute significantly to the disinflation process in an inflationary environment.

Assuming that all markets clear continuously due to speedy price and quantity adjustments, neoclassical, monetarist and new classical line of thinking about causes and cures of inflation mostly ignore the possibility of adjustment lags which may stem from *rigidities* in wages and prices in the *short*-run. Since the late 1970s, however, the *new Keynesian* economists, such as George Akerlof, Janet Yellen, Joseph E. Stiglitz, Robert J. Gordon, John B. Taylor, N. Gregory Mankiw, Guillermo Calvo, Olivier Blanchard and Julio Rotemberg, have investigated the possible microeconomic causes of these rigidities to eliminate the Keynesian "arbitrary" assumption of fixed wages and prices in the short run. The new Keynesian attack on the new classical macroeconomics is concentrated principally on the

assumption of "continuous market-clearing", accepting that inflation is still a monetary phenomenon in the long run. According to the new Keynesians, *wage and price stickiness* in the short run can be explained by factors like "small menu costs" or "staggered (or non-synchronized) wage and price changes". For many firms, particularly under low inflation conditions, it may be costly to change their prices continuously as a response to each demand shock (see, for example, Mankiw, 1985). Another argument is that staggering may slow the process of general price (or wage) level adjustment, even when individual prices (or wages) change frequently.[14]

Obviously, the idea of price rigidities is not applicable to "auction markets" where prices change continuously. Its validity is apparently limited to some posted-price "customer markets" where prices of final products are more responsive to changes in the costs of intermediate inputs than they are to changes in aggregate demand (Taylor, 1998). Moreover, the possibility of intermittent or non-synchronized price and wage adjustments, as a source of an inertia generating mechanism under imperfect competition conditions in hyper- or high-inflation economies, significantly diminishes because, under such conditions, small menu costs do not matter, and the length of contracts dramatically shrinks. Nevertheless, rigidity arguments related to factors such as the overlapping degree of wage contracts may contribute to understanding the short-run dynamics of inflation even in these type of economies, particularly taken together with the notions that expectations may be formed economy-wide, may be forward- or backwards-looking, and may be accompanied by a lack of policy credibility.

2.6 New Neoclassical Synthesis: Toward a Better Understanding of the Dynamics of Output and Price Fluctuations

Since the early 1990s, the sharp difference between the emphasis of new Keynesian and new classical economists on the major origins of business cycles and price movements has been increasingly softening, and a *new neoclassical synthesis* (NNS) is now on the agenda of macroeconomics.[15] According to Goodfriend and King (1997), the new generation of quantitative models of economic fluctuations has two central elements:
(1) systematic application of intertemporal optimization behavior of firms and households, and rational expectations, and
(2) incorporation of imperfect competition and costly short-run price adjustments into dynamic macroeconomics.

In the NNS, monetary, or demand, shocks are a key determinant of business cycles, as a result of the incorporated new Keynesian assumption of price stickiness in the short run. At the same time, however, the NNS assigns a potentially large function to supply shocks, such as changes in productivity, changes in tax policy or relative price shocks, in explaining real economic activity, as suggested in the new classical RBC theory.[16] The highly complex models of the NNS allow that Keynesian and RBC mechanisms operate through somewhat different channels. The so-called *new IS-LM-PC* version of the NNS makes the price level an endogenous variable. The NNS also views expectations as critical to the inflation process, but accepts expectations as amenable to management by a monetary policy rule.[17] King (2000: 87) summarizes:

> The distinguishing characteristic of the New IS-LM model is that its key behavioral relations can be derived from underlying choice problem of households and firms and that these relations consequently involve expectations about the future in a central manner. The IS curve relates expected output growth to the real interest rate, which is a central implication of the modern theory of consumption. The aggregate supply/Phillips curve component of the model relates inflation today to expected future inflation and output gap. This relationship can be derived from a monopoly pricing decision that is constrained by stochastic opportunities for price adjustment together with a consistent definition of the price level.

2.7 New Political Macroeconomics of Inflation

The theories reviewed so far focus mainly on macroeconomic determinants of inflation (e.g., monetary and real shocks, and inertia in inflation) and simply ignore the role of *non-economic factors* such as institutions, political process and culture in the creation or acceleration process of inflation. They also overlook the possibility that sustained government deficits, as a potential cause for inflation, may be partially or fully endogenized by considering the effects of the political process and possible lobbying activities on government budgets, and thus, on inflation.

The so-called *new political economy* is the study of how the political nature of decision-making affects policy choices and, ultimately, economic outcomes.[18] That is to say,

> (…) in the real world, economic policy is not chosen by the social planner who safely inhabits economics textbooks, sheltered from agents with conflicting interests while he calculates optimal policy. Economic policy is the result of a decision process that balances conflicting interests so that a collective choice may emerge. (…) In order to study political economy, that is, to study the effects of politics on economic outcomes,

we must therefore begin with some political and economic building blocks. (Drazen, 2000: 20)

Therefore, the new political economy literature provides fresh perspectives on the relations between timing of elections, policymaker performance, political instability, policy credibility and reputation, central bank independence and the inflation process itself.

2.8 Summing Up: On Classifying the Possible Determinants of Inflation

The economy-wide price-level is the relative price of goods and services in terms of money, as implied in the definition of inflation in the first sentence of this section. Therefore, inflation must be a phenomenon that results from the interaction of *monetary* (demand-side) and *real* (supply-side) factors.[19]

The primary source of shocks in the demand-side is seen commonly as sustained public sector deficits. Modeling the role of government deficits and their financing methods is one of the major challenges faced by economists. The modification of an inflation model to allow for feedbacks, or "eroding" effects, from the inflation to the real value of government revenues due to the existence of tax-collection lags (*Olivera-Tanzi effect*),[20] and/or to the real value of the government's liabilities (*inflation tax*), leads to an increase in the complexity of the structure of the proposed model.

The study of inflationary effects stemming from real shocks is closely related to the economics of technology, long-run growth theory, and theory of exchange-rate determination, since they arise in the form of, e.g., negative productivity shocks, stagflationary relative-price shocks related to imported raw materials, or depreciations in the domestic currency.

But, this is not the whole story. The time path of prices may also be influenced by the expectations, stickiness of prices/wages, and possible indexation experiences in the economy. Therefore, these *inertial* factors should be considered as a third block of explanatory factors of inflation.[21]

The last block of explanatory factors of inflation seems to be offered by the new political macroeconomics. To model the dynamics of inflation more realistically, the political process, or the role of institutions, must also be considered explicitly. Most of the theoretical discussions on causes of inflation above are based on the assumption that financial markets are highly developed and functioning very well in the presence of necessary laws and rules. However, this is not the case in many high-inflation developing countries. Thus, the political or institutional approach to economics suggests that one should take into account the institutional,

political and cultural changes in such economies, and modify the model to explain high-inflation accordingly.

In my view, as a conclusion, the complex and dynamic interactions of four groups of factors (i.e., demand shocks, supply shocks, inertial factors and the political process) come together to explain inflation in any economy.

3.   Empirical Studies on Turkish Inflation

After reviewing the theoretical discussions on causes of inflation in the previous section, I attempt now to survey the large empirical literature on determinants of inflation in Turkey. This survey is limited to those empirical studies that investigate *explicitly* the sources of Turkish inflation while the plentiful contributions on disinflation processes are consciously excluded.[22]

This section is divided into two subsections to discuss the evidence on the causes and dynamics of pre-1980 and post-1979 inflations separately. There are many reasons for this. First, Turkey experienced a radical structural change in the 1980s, as discussed more fully by Ertuğrul and Selçuk in Chapter 2 in this book. Second, the world economy was characterized by two major oil-price shocks in the 1970s, but stagflationary effects of oil-price shocks weakened in the last two decades. In addition, developments in econometrics and time series techniques accelerated since the early 1980s while the computing possibilities dramatically improved within the same period.

3.1 Empirical Evidence on Dynamics of Inflation Prior to 1980

Turkey experienced a short period of high inflation in the second half of the 1950s but the history of today's high and persistent inflation goes back to the first half of the 1970s at the earliest (see also Figure 1 above). The acceleration of inflation after 1953 is explained by the fact that the money supply started to grow faster than real output (Fry, 1980) while the decade of the 1970s is characterized by both the frequent devaluations of the Turkish lira, and the stagflationary effects of two major oil price shocks in 1973–74 and 1978–79.

To my knowledge, Akyüz (1973) is the first analytical attempt to study the causes and dynamics of inflation in Turkey. For the 1950–68 period, he investigates the relations between the money supply and prices in terms of

a combined "adaptive expectations - demand for money" model, and concludes that inflation is not self-generating, and it can be explained by the present and past changes in the money supply, real income, and the non-monetization ratio. His further analysis shows that the monetary growth in Turkey is largely attributable to the expansion in the monetary base, which in turn is closely related to the agricultural price policies followed by the government through the State Economic Enterprises in the mid 1950s. He stresses that the *political* reason for these economic policies was the populist tendency of the first elected government after the transition to a multi-party parliamentary system in 1950.

Ertuğrul's (1982) comprehensive study departs from the statistical analysis of causality between money and prices prior to 1980. The author develops then step-by-step a *self-generating* inflation model with six equations which is based on the statistical endogenity of money supply and on the assumption of adaptive inflation expectations in Turkey. Notice that he models government deficits as a function of relative agricultural support prices. Ertuğrul's macroeconometric simultaneous-system estimations based on deseasonalized quarterly data for 1970–78 show that increases in real income have a remarkable negative effect on the general price level. He concludes that inflationary expectations variable is the major determinant of inflation in Turkey.

Aksoy (1982), on the other hand, aims to test the monetarist and structuralist theories of inflation by using Turkish annual data for the period of 1950–79. He mainly concludes that the relationship between the money supply and prices is not proportional, but depends on both the inflationary expectations and the nature of foreign exchange availability. Furthermore, he finds little evidence on the cost-push effects of relative prices, i.e. the relative price shocks work through the money supply mechanism rather than creating cost-push pressures.

In the late 1970s, two major phenomena seem to contribute substantially to the increase in inflationary pressure in the financially-repressed Turkish economy: first, the fast domestic credit expansion, particularly to government and public sector enterprises, and second, the sharp recession caused by the foreign exchange shortage, which in turn stemmed from two oil-price shocks. After his analysis using quarterly data for 1962–77, Levy (1981: 370) adds:

> Since the prices of oil and other raw materials are still rising, Turkey's terms of trade can be expected to deteriorate further. In order to ease the adjustment of the economy to the higher world price of petroleum and raw materials, their domestic prices must be increased. Although *political and social pressures* do not make this an easy task, Turkey's inability to pay for its imports and *pressure* by the International Monetary

Fund have recently forces the Turkish government to announce an increase in the price of oil and oil products. [*Italics* are added.]

Finally, using annual data to estimate a simple model for the demand for money, Togan (1987) reports that the time path of money and interest rate determined the movements in the rate of inflation from 1960 to 1983.

3.2 Sources of Inflation in the 1980s and 1990s

There is a much larger literature focusing on specific aspects of post-1979 inflation in Turkey. The sharp acceleration of inflation in 1980 and the increased availability of statistical data for shorter frequencies after 1980 appear to have contributed to this enrichment in the empirical literature.

Table 1 presents a detailed comparison of selected empirical studies on the sources of sustained inflation from 1980 to today in Turkey. The empirical studies reviewed here differ unsurprisingly in their sample period, structure, methods, and hence, in their conclusions.

For many authors, Öniş and Özmucur (1990) is a common starting point to survey the studies on causes of Turkish inflation after 1979. Using monthly data from 1981–87, Öniş and Özmucur (1990) explore inflationary dynamics in Turkey. The authors reject a pure monetary explanation of inflation based on a vector-autoregression analysis (VAR) and a simultaneous equation model. They find that devaluations of the Turkish lira have a strong impact on domestic inflation while supply-side factors seem to have in general significant effects on inflation. Rittenberg (1993) argues contrarily that Granger causality tests show that causality runs from price level changes to exchange rate changes but that there is not feedback causality in the opposite direction.

Yeldan (1993) analyzes the political economy of inflation and disinflation in Turkey, by focusing particularly on distributional and structural aspects. His computable general equilibrium analysis with some Keynesian features shows that public sector expenditures act as an important and strong source of demand-pull inflation in Turkey. Furthermore, the distributional conflicts among socio-economic classes have a direct impact on the formation of price movements in the 1980s. He observes that the profit/rent inflation, which is based on increases of monopolistic producer mark-ups over prime costs, has a relatively strong inflationary impact on the cost-side, as compared to wage inflation. Finally, Yeldan refers to devaluationist exchange-rate policy as a major source of imported inflation due to the import-dependent character of the Turkish industry.

Metin (1995) concludes by using a broader data set with annual and quarterly frequencies that fiscal expansion dominated the determination of Turkish inflation from 1950 to 1988. Excess money demand influences inflation positively in the short run. That is, to reduce inflation successfully, governments have to eliminate public sector budget deficits. Furthermore, devaluations also have some inflationary effects. İnsel (1995), Erol and van Wijnbergen (1997), Lim and Papi (1997), Agénor and Hoffmaister (1997), Darrat (1997) and Akyürek (1999) also provide results supporting the inflationary effects of depreciations. For many authors, this conclusion implicates the necessity to design an exchange-rate-based stabilization program to reduce the inflation in Turkey.

In 1984, domestic citizens were allowed to open foreign exchange deposit (FED) accounts in Turkish banks. The subsequent increase in FED-accounts to money-supply ratio after 1984 may be interpreted as a gross indication of rising *currency substitution* in Turkey. The capital account liberalization in 1989 also seems to have contributed to this development. In the presence of strong currency substitution, it is theoretically expected that the exchange rate instability significantly increases and that the government's ability to collect seigniorage revenue is limited. Currency substitution, which may create inflationary effects by reducing the seigniorage revenue of the government, is closely related to the credibility of economic policies or inflation expectations. If, for example, economic agents perceive that the government will pursue a lax fiscal policy, then they flee from domestic currency to avoid future inflation tax. In this case, both the money demand and the exchange rate become unstable. The effects of currency substitution on exchange rate instability and seigniorage-maximizing rate of inflation in Turkey are empirically investigated by Selçuk (1994, 1997 and 2001), Scacciavillani (1995) and Akçay, Alper and Karasulu (1997). Scacciavillani (1995) mainly reports that the share of foreign currency holdings in liquid assets exhibits a strong and stable relationship with exchange rate fluctuations. Furthermore, he finds that the relationship between the inflation rate and currency substitution is statistically insignificant. Selçuk (2001), on the other hand, concludes that, as long as there is some degree of currency substitution in the economy, the Turkish government cannot collect more seigniorage revenue to finance budget deficits by simply setting the growth rate of monetary base at a higher level.

In Turkey, it is common for politicians and bureaucrats to blame crude-oil price increases for inflation. Özatay (1992), Kibritçioğlu and Kibritçioğlu (1999), and a few studies cited in Kibritçioğlu (2001) discuss

the potential once-and-for-all price effects of increases in crude-oil and oil-product prices. By using the 1990 input-output table for Turkey, Kibritçioğlu and Kibritçioğlu (1999) calculate that a hypothetical 20% increase in the dollar price of imported crude-oil leads to a cumulative increase in the general price level of only 1.1% within ten months. Furthermore, they estimate that a 20% increase in the nominal dollar price of the Turkish lira contributes to inflation in the amount of 2.8% within the same time frame. Finally, their VAR model estimations indicate the importance of both nominal exchange rate increases and past values of inflation itself as main determinants of inflation for the period 1986–98.

The negligible role of a crude-oil price increase as a determinant of Turkish inflation may be explained principally by both the absence of a dynamic mechanism which generates continuous increases in the price level, and the gradually decreasing oil-dependency of many industries after 1980 as in the rest of the world. But, the substantial swings in the crude-oil prices since the late 1980s are usually followed by fiscal-conditional increases in prices of oil-products in Turkey. Obviously, this phenomenon makes the analysis of net inflationary effects of crude-oil price increases more complicated.

Recently, Akçay, Alper and Özmucur (1997), Lim and Papi (1997), Agénor and Hoffmaister (1997), Alper and Uçer (1998), Akyürek (1999), Cizre-Sakallıoğlu and Yeldan (1999), and Baum *et al.* (1999) have emphasized in particular the increasing role of *inertia* in the process of inflation in Turkey. Erlat (2001), for instance, states that both Turkish consumer and wholesale price indexes each have a significant long-run memory component. The expectational component of inflation inertia may result from the lack of credibility of government policies. Nonetheless, the degree and potential determinants of inertia as a whole should be investigated in more detail for Turkey.

Table 1: Selected Empirical Studies on Causes of Inflation in Turkey

Author/s and Publication Year	Frequency and Period of Data	Empirical Method/s	Main Variables	Main Results
Togan (1987)	Annual data from 1960 to 1983	Ordinary Least Squares (OLS) Regressions, Cochrane-Orcutt (CORC) iterative procedure, first-moving moving average process and simulations	Implicit GNP deflator, real GNP, M2, and nominal average rate of interest on demand and time deposits	Using a simple model for the demand for money, Togan shows that the time path of money and interest rates does determine the movements in the rate of inflation in Turkey.
Öniş and Özmucur (1990)	Monthly data from 1981 to 1987	A four-variable vector autoregression (VAR) model and three-stage least squares	WPI, monetary base and nominal exchange rate	Non-monetary, supply-side factors have significant effects on inflation in Turkey. Devaluations are strongly inflationary. A pure monetary interpretation of the Turkish inflation is rejected.
Özatay (1992)	Monthly data from Jan. 1982 to Sept. 1990	Econometric modeling based on input-output relationships (estimation of sectoral price equations), Granger causality tests, and simulations	Selected manufacturing price indexes for public and private sectors, nominal exchange rate, nominal medium term lending rate, domestic and imported inputs, and sectoral outputs	Public sector prices are generally not super-exogenous because they stem from various big and infrequent shocks. Only prices of electrical energy, refinery products, and mining are strongly exogenous. Lending rates, agricultural prices, and import prices are also found as strongly exogenous. The responses of private manufacturing prices to such shocks are remarkably high and persistent. Hence, there is a considerable amount of inertia in the private sector prices. Wages seem to be negligible as a source of inflation.
Rittenberg (1993)	Monthly data from Oct. 1982 to Aug. 1989	Granger causality tests	Nominal exchange rates, WPI and money supply for Turkey and trading partners	Granger-causality runs from price level changes to exchange rate changes but there is not feedback causality. This conclusion is not altered by the inclusion or exclusion of the money supply variable. Thus, exchange rate adjustment does not seem to have created a vicious cycle of currency depreciation leading to inflation as is often feared.

Table 1: Selected Empirical Studies on Causes of Inflation in Turkey (*cont.*)

Author/s and Publication Year	Frequency and Period of Data	Empirical Method/s	Main Variables	Main Results
Yeldan (1993)	1980–90	Computable general equilibrium analysis	CPI, public and private manufacturing producer prices indexes, interest rates, wages, value added in manufacturing, fiscal expenditures, nominal exchange rates, etc.	Public sector expenditures act as an important and strong source of demand-pull inflation in Turkey. The distributional conflicts among socio-economic classes have a direct impact on the formation of price movements in the 1980s. The profit/rent inflation fed by increases in monopolistic producer mark-ups over prime costs has a relatively strong impact on cost-push inflation. Devaluationist exchange-rate policy creates a remarkable cost-push pressure in Turkey.
De Santis (1993)	Annual data from 1950 to 1991	Multivariate cointegration technique of Johansen and a monetary model in error correction form	CPI, per-capita M2, per-capita real GNP, and opportunity cost of holding a unit of money and its return	In the short run, the difference between the interest rate on money and the interest rate on loans has a fundamental role in controlling inflation in Turkey. The per-capita money supply affects the price level in the short run as well as in the long run.
Ateşoğlu and Dutkowsky (1995)	Annual data from 1960 to 1988	Ordinary Least Squares (OLS) Regressions	Implicit GDP deflator, real GDP, M1, M2, and the rate of interest on time deposit	Turkish economy behaves consistent with predictions of a simple real business cycle model. Output follows an autoregressive structure with trend. Monetary policy is neutral. Elasticity between money and prices is unitary.
Metin (1995)	Quarterly and annual data from 1949 to 1988	A multivariate cointegration model based on the joint disequilibrium analysis of both long and short run behavior	Implicit GNP price deflator, CPI, real GNP, M1, base money, nominal exchange rate, Central Bank's nominal discount rate, etc.	Excess demand in the government sector is the main determinant of inflation. The excess demand for money affects inflation positively but only in the short run. Imported inflation and the excess demand for assets in capital markets have some effect on consumer price inflation. There is no significant effect from the excess demand for goods. As a result, inflation could be reduced rapidly by eliminating the fiscal deficit.

Table 1: Selected Empirical Studies on Causes of Inflation in Turkey (*cont.*)

Author/s and Publication Year	Frequency and Period of Data	Empirical Method/s	Main Variables	Main Results
İnsel (1995)	Annual data from 1977 to 1993	Cointegration approach to analyze the one to one relationship between inflation and monetization	Inflation rate, PSBR, monetary base, M2, real GDP growth, GNP	The public finance view of inflation is not supported. Monetization of public sector deficits is an important, but not the only reason for high inflation. Inflation in Turkey is mainly determined by exchange rate policy, real interest rates and inflationary expectations.
Akçay, Alper and Özmucur (1997)	Annual data from 1948 to 1994 and quarterly data from 1987 to 1995	Unrestricted vector autoregression (VAR) and Vector Error Correction (VER)	Annual model: implicit GNP deflator, currency in circulation, consolidated budget deficit over GNP; quarterly model: WPI, Central Bank money, consolidated budget deficit over GDP	Calculations with annual data show that a significant impact of budget deficits on inflation cannot be refuted under the assumption of long-run monetary neutrality. However, quarterly data implies a weakened link from other variables to inflation. The inertia in the inflation was increasing due to the accumulation of inflationary expectations in the period 1987–95. The availability of bond financing after 1986 might be the reason for the weakening causality from budget deficits to inflation to a certain extent.
Murinde and Eren (1997)	Quarterly data from 1972 to 1990	Two-Stage Least Squares (2SLS)	CPI, nominal official exchange rate, UK's CPI, real government expenditure, reserve money, official interest rate, real loans, real gross domestic investment, real GDP, official reserves, and income-tax rate	The main transmission mechanism via which monetary and other policy instruments influence inflation in Turkey involves corporate sector activities. Both monetary and corporate sector factors are useful in underpinning Turkish inflation.

Table 1: Selected Empirical Studies on Causes of Inflation in Turkey (*cont.*)

Author/s and Publication Year	Frequency and Period of Data	Empirical Method/s	Main Variables	Main Results
Erol and van Wijnbergen (1997)	Quarterly data from 1980 to 1993	Simulation experiments with a macro-econometric model	38 variables including CPI, nominal exchange rates, etc.	A real exchange rate policy based on the relative purchasing power parity rule caused moderate inflationary effects. Real exchange rate appreciations are contractionary for the demand-determined output case. Exchange rate policy can provide an anchor for price stability only if it is credible.
Lim and Papi (1997)	Quarterly data from 1970 to 1995 (Subperiods: 1970–80 and 1981–95)	A multi-sector macro-econometric model with short- and long-run dynamics (OLS estimations and cointegration tests)	WPI, CPI, nominal and real GNP, M2Y, reserve money, nominal and real exchange rates, wages, public sector borrowing requirement, etc.	Monetary variables (initially money, and more recently the exchange rate) play a role in the inflationary process. Public sector deficits also contribute to inflationary pressures. Inertial factors are quantitatively important.
Agénor and Hoffmaister (1997)	Quarterly data from 1980 to 1994	A generalized VAR model to analyze short-run links between five variables for four countries	CPI, ratio of current industrial output to potential output, M2, nominal effective exchange rate, and nominal manufacturing wages	At short forecast horizons, historical shocks associated with inflation itself are the main factor explaining movements in inflation. Nominal exchange rate depreciation also plays a substantial role in the Turkish inflationary process. Wage shocks have relatively little inflationary impact. Monetary shocks have at best a tertiary importance in explaining movements in the rate of inflation. Finally, shocks resulting from changes in output gap are not important determinants of inflation.
Darrat (1997)	Annual data from 1960 to 1963	Multivariate cointegration analysis and error-correction model	CPI, M1, a proxy for import prices, real GDP and nominal exchange rate	Monetary growth is an important source of inflation in Turkey. The empirical results reveal also a significant effect of the depreciation of the Turkish Lira in provoking inflation in Turkey.

Table 1: Selected Empirical Studies on Causes of Inflation in Turkey (*cont.*)

Author/s and Publication Year	Frequency and Period of Data	Empirical Method/s	Main Variables	Main Results
Metin (1998)	Annual data from 1950 to 1987	Multivariate cointegration analysis	CPI, real GNP, base money, and general budget deficit	The scaled budget deficit significantly affects inflation in Turkey. Real income growth and monetization of public sector deficits also affect inflation positively.
Alper and Uçer (1998)	Monthly data from 1985 to 1997	Unrestricted VAR model	CPI, WPI, M1, M2, M2Y and nominal exchange rate basket	The empirical link between fiscal imbalances and inflation is weaker than one might think. Inflation has increased side-by-side with a visible erosion in TL-denominated monetary aggregates with seigniorage revenue somewhat declining. Inertia was what drives inflation in the short run.
Kibritçioğlu and Kibritçioğlu (1999)	Annual data for 1979, 1985 and 1990, and monthly data from 1986 to 1998	Iterations based on Turkish input-output tables from 1979, 1985 and 1990 & a five-variable VAR model	1990 input-output data, WPI, price of imported oil, nominal exchange rate, M2 and interest rate	By using the 1990 input-output table for Turkey, the authors calculate that a hypothetical 20% increase in the dollar price of imported crude-oil causes a cumulative increase in the general price level only in the amount of 1.1% within ten months. Most part of this effect occurs within the first two or three months after the oil-shock. The VAR model estimations indicate the importance both of nominal exchange rate increases and past values of inflation itself as main determinants of inflation for the period 1986–98.
Akyürek (1999)	Monthly data from 1981 to 1998	VAR, moving average representation (MAR) and cointegration tests	CPI, base money, nominal exchange rate and output	Monetary and nominal exchange-rate shocks have been significant sources of inflation in Turkey. The results also indicate that inflation feeds itself.

Table 1: Selected Empirical Studies on Causes of Inflation in Turkey (*cont.*)

Author/s and Publication Year	Frequency and Period of Data	Empirical Method/s	Main Variables	Main Results
Cizre-Sakallıoğlu and Yeldan (1999)	Quarterly data from 1987 to 1996	Hodrick-Prescott Filtering method to decompose the quarterly variations of consumer prices into a trend component and cyclical deviations around the trend & Political economy approach	CPI, WPI, private manufacturing producer prices and real exchange rates	In Turkey, much of the behavior of price dynamics is governed by inertial expectations rather than shifts in the monetary variables such as money supplies, and the fiscal deficit.
Baum *et al.* (1999)	Monthly data from 1971 to 1995	Semi-parametric and maximum likelihood estimation methods	CPI	Long memory in the CPI-based inflation rate is a general phenomenon also for Turkey. The persistence in inflation rates worldwide can arise from (1) the aggregation of constituent processes, each of which has short memory, (2) time-varying coefficient models or non-linear models, or (3) money growth.
Erlat (2001)	Monthly data from 1987 to 2000	Unit root tests and autoregressive fractionally integrated moving average (ARFIMA) models	CPI and WPI	The monthly inflation rate is essentially stationary but has generally a significant long memory component. 2000–02 disinflation and economic restructuring program of the government has to deal with a process which is mainly not non-stationary but has a strong long-memory component and will exhibit a great deal of resistance initially. However, if this policy is successful, would yield long-lived results.

Table 1: Selected Empirical Studies on Causes of Inflation in Turkey (*cont.*)

Author/s and Publication Year	Frequency and Period of Data	Empirical Method/s	Main Variables	Main Results
Dibooğlu and Kibritçioğlu (2001)	Quarterly data from 1980 to 2000	A dynamic open-economy aggregate supply - aggregate demand model with imperfect capital mobility and structural vector-autoregressions	CPI, GDP, crude-oil prices, M1 and nominal exchange rate	A major component of inflation in Turkey has been "aggregate demand-driven" or "core" inflation. Real oil price, supply and balance-of-payments shocks had no significant effect on inflation while the real aggregate-demand shocks, which stemmed from changes in the money stock and autonomous aggregate-demand, can be interpreted as a combined result of changes in high public sector budget deficits and devaluations of the TL. Finally, output is mainly explained by supply shocks within the model.

Abbreviations: CPI: consumer price index; GDP: gross domestic product; GNP: gross national product; M1: narrow money supply; M2: broad money supply; M2Y: M2 plus foreign demand deposits, PSBR: public sector borrowing requirement, and WPI: wholesale price index.

4. Concluding Remarks

Any attempt to survey the extremely broad literature on theories of inflation in merely a few pages is confronted with the risk of incompleteness and superficiality. However, this type of an effort may also be regarded as a necessary first step if one intends to organize, understand, model and explain the dynamics of inflation carefully. The theoretical survey in Section 2 yields, among other things, a four-blocked schematization of origins of inflation: Demand-side (or monetary) shocks, supply-side (or real) shocks, adjustment (or inertial) factors, and political processes (or the role of institutions). It appears that inflation is the net result of sophisticated dynamic interactions of these four groups of explanatory factors. That is to say, inflation is always and everywhere a macroeconomic *and* institutional phenomenon.

The survey of the empirical studies in Section 3 on the dynamics of high and persistent inflation in Turkey shows that the existing modeling experiences seem to have focused mainly on demand-side factors, such as

the money supply and government deficits. Some studies are limited solely to investigate the possible effects of *one-time* shocks, such as occasional increases in oil prices. However, the *persistent* nature of high inflation requires a more integrated framework to explore the *dynamics* of inflationary *mechanism* in Turkey. Therefore, the possible sources and the degree of inflation inertia need to be investigated further. The consideration of inertia in existing empirical studies is generally limited to the role of inflationary expectations. However, the study of the short-run adjustment dynamics of the general price level should also be examined further as attempted recently by Çağlayan and Filiztekin (2001).

The role of the political process in explaining Turkish inflation has been in general ignored in empirical modeling efforts. To my knowledge, there are some political economy approaches to explain Turkish inflation (e.g., Öniş, 1997 and Özatay, 1999), but empirical studies in the tradition of *new* political economy are far from adequate. Recently, Ergun (2000) and Tutar and Tansel (2001) focus particularly on institutional and electoral determinants of government budget deficits in the country. Apparently, it is crucial to consider institutional explanatory factors in understanding the dynamics of inflation in Turkey.

The ongoing high and persistent inflation in Turkey still offers to economists, political scientists, sociologists, and historians a good opportunity to investigate its causes and dynamics both empirically and in an interdisciplinary fashion.

Notes

[*]   The author thanks C. Emre Alper, Libby Rittenberg and Faruk Selçuk for their helpful comments on an earlier version of this chapter. The usual disclaimer applies.

[1]   For many economists today, an adequate approach to explain the process of high and long-lasting increases in the general price level of goods and services requires a concentration on sources of *core*, or *underlying*, inflation, and not on changes in *relative* prices caused by factors such as one-time increases in administered prices or unfavorable weather conditions.

[2]   For detailed surveys of inflation theories see, for example, Whitney (1982: 59-87), Frisch (1983), McCallum (1987), Beckerman (1992: 27-49) and Siklos (ed.) (1995: 3-34). Humphrey (1998) specifically surveys the historical origins of cost-push inflation theories.

[3]   For more information on the past and current Phillips-curve debates see Fischer (1983: 20-150), Humphrey (1986: 91-133) and King (2000).

[4]   The closed-economy IS-LM model and its open-economy version the F-M model are used particularly to analyze how changes in monetary and fiscal policy shift the

aggregate demand curve, and whether they affect the level of output and prices in the short- and long-run. The literature on the so-*called open economy macroeconomics*, or *international macroeconomics*, which is originating particularly from the F-M model, is listed on the web at: http://politics.ankara.edu.tr/~kibritci/oem.html.

5 If we assume for simplicity that $\lambda=1$, then the equation (7) can be written as $\pi^e=\pi_{t-1}$. Note that many economists consider this definition of backward-looking inflation expectations when they need a proxy of inflation inertia. From this point of view, inflation inertia can be interpreted as continuous upward shifts in both the aggregate demand and aggregate supply curves. That is to say, the actual inflation is caused by inflation expectations, and one expects inflation because it was experienced in the past.

6 Subsequently, the one-way statistical causality running from money to prices in Cagan's *hyper*inflation model is substituted by the assumption of two-way causality which allows to model a *self-generating* inflation process; see, e.g., Olivera (1967), Dutton (1971), Jacobs (1977) and Aghevli and Khan (1978). Notice that Siklos (ed.) (1995: 3-34) discusses in detail the issue of the endogenity of money supply in hyperinflation periods with special reference to the rational-expectations revolution. Finally, for two interesting studies in the tradition of Cagan's money-demand model, see Ball (1993) and Ruge-Murcia (1999) who analyze particularly the dynamics of *high* inflation in developing economies.

7 For more information on the theoretical background of the structuralist inflation theory, see Kirkpatrick and Nixon (1976), Frisch (1983: 153-186), and Beckerman (1992: 32-36).

8 See Edgren *et al.* (1973), Aukrust (1977), and Calmfors (1977).

9 The post-Keynesian arguments to explain inflation can be found mainly in studies of Michal Kalecki, Nicholas Kaldor, Paul Davidson, Hyman P. Minsky, and Sidney Weintraub.

10 See, for example, Bresser-Preira and Nakano (1987), and Saad-Filho and Mollo (1999).

11 See, for example, Montiel (1989), Calvo and Végh (1999), Fielding and Bleaney (2000), and the cited references therein.

12 For more information on the discussions about the idea of "unpleasant monetarist arithmetic" presented by Sargent and Wallace (1981), you may visit the following web page: http://politics.ankara.edu.tr/~kibritci/sargewall.html.

13 The so-called "fiscal theory of price level" developed by Eric Leeper, Christopher A. Sims, John H. Cochrane, and particularly by Michael Woodford in the 1990s mainly argues that money is completely *secondary* in determining the price level, which is instead driven by the sequence of primary government deficits and surpluses. For more information on this theory and discussions about its validity, see Woodford (2000) and the references cited therein.

14 For two detailed literature surveys on the sources of staggered prices, see Nadiri (1987) and Taylor (1998). Calvo (2000) is devoted particularly to discussion of the implication of price stickiness in emerging market economies.

15 For a discussion of the origins and emergence of the NNS, see Goodfriend and King (1997), Woodford (1999), and King (2000).

16 For a discussion of inflationary effects, which may result from temporary or persistent oil-prices shocks within the NNS framework, see Goodfriend and King (1997: 40-47).

17 Goodfriend and King (1997: 50) state: "Economists working within the synthesis of the 1960s were pessimistic about taming inflation, viewing inflation as having a momentum of its own and fluctuating with unmanageable shifts in the psychology of price setters".

[18] For more information on the emergence of the literature on new political macroeconomy, see Alesina *et al.* (1997) and Drazen (2000).

[19] Traditionally, macroeconom(etr)ic models posit that monetary shocks have an effect on the economy only through a *demand* channel of transmission. In recent years, however, some economists argued that monetary shocks may also create important *supply*-side, or *cost*-side, effects on output and prices. For various theoretical models of monetary transmission mechanisms which allow monetary policy shocks to have both supply-side and demand-side effects, see Barth and Ramey (2001) and references cited therein.

[20] See Olivera (1967) and Tanzi (1977, 1978).

[21] This classification of the determinants of inflation has a broad similarity with Robert J. Gordon's (1977, 1997) "triangle model of inflation" which is limited to the first three factors mentioned so far.

[22] Needless to say that the selection of studies here is unintentionally influenced by the availability of them. However, a large list of publications on inflation and disinflation in Turkey is available on the web at: http://politics.ankara.edu.tr/~kibritci/inflation/.

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