

Conflicting Interests and Structural Inflation: Turkey, 1980-1990

A. ERİNÇ YELDAN

The paper analyses the structural causes of the recent Turkish inflationary episode. It is argued that monetary policies based on credit tightening alone are not likely to yield the desired target of price stabilisation. Instead, it is hypothesised that the underlying sources of price inflation are affected by income inequality and conflicting claims on national output; and that excessive credit expansion serves mainly to accommodate the inertial inflation thereby originated in the real sector.

Given this hypothesis, the paper employs a computable general equilibrium model to investigate four distinct sources of structural inflation for the Turkish economy: (i) the profit/rent inflation based on monopolistic mark-ups over prime costs; (ii) imported inflation due to the import-dependent structure of the domestic industry; (iii) cost-push and demand inflation due to urban wage claims; and (iv) inflation that results from the fiscal pressures of the government's budget deficits.

The general equilibrium model is in the Keynesian tradition in determining the production level by aggregate demand constraints. Furthermore, it accommodates oligopolistic mark-up rules and working capital expenses for price determination, and nominal wage fixity to determine the level of employment.

The general equilibrium analysis of the macro economy suggests that, over the analysed period, conflicting claims of various social classes on national output and conflicting rates of intersectoral accumulation warranted by competing producer groups have become important sources of disequilibria in the domestic economy; and that the distributional conflict among socio-economic classes had a direct impact on the formation of price movements.

I. INTRODUCTION

Since the crises of 1977-1980, Turkish economy has been trapped into an inflationary process, which, in spite of a series of anti-inflationary measures undertaken, has proven to sustain its inertia towards re-acceleration. This observation on the prolonged nature of the inflationary pressures raises the concern that the *raison d'être* of the price dynamics in Turkey is to be found in the structural mechanics of the domestic economy, rather than being based on short-run monetarist channels of restoration of real balances in lieu of excess credit expansion.

A. Erinç Yeldan is Associate Professor of Economics, Bilkent University, Ankara, Turkey.

Author's Note: I wish to acknowledge the grant made by the Capital Marketing Board of Turkey to conduct this research. I am indebted to Erol Çakmak, Osman Zaim, and Ahmet Ertugrul for their valuable comments and suggestions; and to Mediha Agar and Sevdil Yildirim for computational assistance. They bear no responsibility, however, for any errors or views expressed in this paper.

The theoretical literature on the structuralist versus monetarist debate on the causes of price inflation rests on the fundamental question of whether excessive increases in domestic credit lead to inflation or only serve to accommodate inflation, which itself was originated and sustained elsewhere. Recent evidence accumulated from country studies, however, reveals that *inertial inflation* is a critical element of prolonged inflation in the developing economies [e.g., Paus (1991); Rattsø (1990); Blejer and Cheasty (1988)]; and that classic macro stabilisation policies based on the Keynesian Phillips curve trade-off, centred around the inflation-versus-unemployment menu of choices, do not provide a viable guideline for conducting an anti-inflationary reform programme [Kirkpatrick and Nixon (1976)].

In the Turkish context, as well, there is an emerging consensus that monetary policies based on credit restraint alone will not be sufficient to contain inflationary pressures, and that the stabilisation programme should be based on the analysis of the root causes and on propagating mechanisms of price dynamics in the domestic economy [e.g., Cecen, Doğruel and Doğruel (1990); Onis and Ozmucur (1990); Boratav (1990); Aksoy (1982)].

This study is based on the premise that conflicting interests in portioning of the national product and structural constraints in economic growth can be cited among the most important factors in explaining the dynamics of Turkish inflation. To this end, a computable general equilibrium (CGE) model of the domestic macro economy is constructed and utilised for an empirical analysis of the structural causes of inflation and their relative contribution to price movements. It is thought that, based on their capability to depict the production, demand, and capital accumulation processes of the domestic economy in a general equilibrium framework, the CGE-type model would be able to convey valuable information on the structural mechanics of price inflation which culminate in the *real* sphere of the economy. Given this configuration, the working hypothesis of the paper is that price inflation in the domestic economy is invigorated through income inequality and a struggle for claims on the national output, and thus its root causes could be traced down to the operation of the real economy. This hypothesis by no means rejects the argument that factors such as excessive monetary expansion and/or disequilibria in fiscal balances are to be cited among the causes of price inflation. Rather, the argument of the present study is that such mechanisms are to be taken among the *contributing* factors to the culminating inertial inflation; and that monetarist policies can be effective in counteracting such sources of inflation in the *short run*, as the evidence from Turkey during 1981-1984 attests (see Table 1). The structural sources of inertial inflation, however, remain to propagate into price acceleration. The OECD (1991-92) Report on Turkey, for instance, traces the causes of the recent acceleration of Turkish price inflation to the sudden increase of wage costs during the last two collective bargaining terms. Evidently, the inertial conflict due

Table 1

Prices and the Composition of Costs in the Turkish Economy, 1980–1990

	Price Inflation ^a		Nominal Exchange Rate Index ^b	Interest Rate ^c (%)	Nominal Wages Index ^d	Manufacturing Industries		Domestic Terms of Trade Index
	Annual Rate	Index				Producer Prices Index		
			Pub.	Priv.				
1980		100.0	100.0	13.5	100.0	100.0	100.0	100.0
1981	37.6	137.6	137.7	40.5	147.1	131.1	131.1	100.0
1982	32.7	182.6	200.9	40.5	187.5	165.2	166.2	80.0
1983	28.8	235.2	279.7	40.5	220.1	213.7	219.9	77.0
1984	45.6	342.4	456.0	46.8	270.5	311.5	323.3	78.0
1985	45.0	496.5	647.9	45.0	354.0	451.8	453.1	74.0
1986	34.8	669.4	836.2	46.0	423.1	576.8	613.8	72.0
1987	50.4	1006.6	1068.2	38.0	686.5	702.4	860.3	–
1988	65.0	1660.8	1620.4	74.0	1033.0	1219.1	1546.5	–
1989	75.0	2906.5	2625.0	54.0	2287.4	2033.3	2530.8	–
1990	63.6	4737.6	3280.6	49.0	–	3241.7	3637.7	–

Sources: *SIS Monthly Statistics Bulletins; Central Bank Annual Reports; [Boratav and Türel (1988)].*

^aConsumer prices.

^bCalculations based on the annual average.

^cAnnual average of 6-month time deposits.

^dBased on the manufacturing industry wage series.

to the prolonged decline in real wages in manufacturing has finally reached the limits of "political rationality" [Onis (1991); Yeldan (1992)]. As Friedman (1968) has pointed out, however, such excess demand pressure should be read as the cause of "accelerating" rather than sustained "inertial" inflation.

One of the most comprehensive treatments of the Turkish "sustained" inflation is by van Wijnbergen (1988) and van Wijnbergen, Anand and Rocha (1988). These studies focus on the three sources of public sector expenditure financing: external borrowing, monetisation, and the issue of domestic interest-bearing debt. The aggregate revenue from these sources is combined into the *financeable deficit*; any inflation rate that is *compatible* with this combination is regarded as "sustainable", and the deficit is known to be "financeable". In these authors' view, "inflation acts as a tax because it forces the private sector to reduce expenditure just to maintain the real value of money balances it desires to hold for a given rate of return structure" [van Wijnbergen *et al.* (1988), p. 2]. In the following pages, I shall try to capture such inflationary implications of fiscal deficits in a series of comparative static experiments centred around the theme of financing accelerated public deficits via inflationary taxation (see Table 4).

Given this setting and our hypotheses, the paper is organised in five sections: The second section discusses the elements of price inflation in the Turkish economy in the 1980s; the third section outlines the distinguishing characteristics of the CGE model; and the general equilibrium analysis of structural inflation is carried out in the fourth section. The fifth section is reserved for summary comments and discussion.

II. STRUCTURAL INFLATION IN THE POST-1980 TURKISH ECONOMY

In 1980, with the aid of a series of economic and institutional reforms, Turkey enacted an anti-inflationary structural adjustment programme to stabilise and restore the internal and foreign balances of the domestic economy. The stated expectation of this programme was the integration of the domestic economy with the world economy at large through a re-orientation of incentives towards exports. All this was to be achieved under the logic of private capital accumulation under the auspices of the 'unfettered' workings of the free markets. In this expectation, the theoretical underpinning of the implemented programme was the orthodox idea that in an economy in which world (efficiency) prices were not to be distorted through trade restrictions—and further, in which capital accumulation was to be based on a profit motive yet to be privately internalised—one would achieve the optimum allocation of productive resources.

In the fight against price inflation, this theoretical perspective has rested its policies upon the monetarist prescription of domestic credit restraint in order to

control the excess commodity demand. Thus, it was envisaged with the reform programme that the main source of price inflation was the demand-pulls originating from excessive monetary expansion. Accordingly, in the post-1980 period, the Turkish authorities embarked on an adjustment programme, which, through its various phases, has primarily aimed at controlling the growth of the money supply and sought to restrict the absorption capacity of the economy via severe repression of the wage incomes.

Table 1 presents the realised inflation rates and the values of various monetary tools in the post-1980 Turkish economy. The underlying philosophy of the table is based on three alternative macro definitions of the value of domestic currency: (i) the interest rate; (ii) the foreign exchange rate; and (iii) the (inverse of) price level. The first four columns of Table 1 depict the behaviour of these definitions of the Turkish Lira in the 1980s. The remaining columns of the table present the main cost items that contribute to the composition of prices.

The most striking observation obtainable from Table 1 is that during the decade of 1980–1990, the domestic price level rose by almost 50 times. Looking at the definition of the domestic currency relative to the *foreign* currencies, we see that, until 1987, the Lira was on a depreciating trend in real terms. This trend was the outcome of the reorientation of incentives towards exports, and was consistent with the overall philosophy of the structural adjustment and the anti-inflation programmes. Beginning with 1988, however, we see that the Lira was overvalued above and beyond the domestic and foreign inflation differential. Similar trends are also observable given the *internal* definition of the Lira: until 1986 the domestic money market operated under *positive* real rates of interest; however, with the exception of 1988, the real interest rate has turned negative since then. In this regard, the monetary policies and incentives of the post-1987 period do not show conformity with the stated objectives of the reform programme.

The data on the cost items, on the other hand, reveal that throughout the period the increase in the nominal wages falls short of the increases in the price level. Despite the steep gains of 1989, when considered over the entire period 1980–1989, the erosion of real wages exceeds 20 percent. Furthermore, casual observation of the data on industrial producer prices signals interesting results with respect to the composition of cost inflation in Turkey. Accordingly, based on the distinction of private versus public producer prices, we see that until 1985 the two series move almost together. However, beginning with 1986, the spread between the two widens in favour of the private sector. Thus, over 1980–1989, the rate of increase of the private producer prices exceeds the increase in the nominal wage rate by 15 percent. Further, in 1989, the index of private producer prices is higher than the index of nominal wages by 10 percent; while that of the public sector lags behind by 14 percent. These diverse movements are further portrayed in Figure 1. Here, the

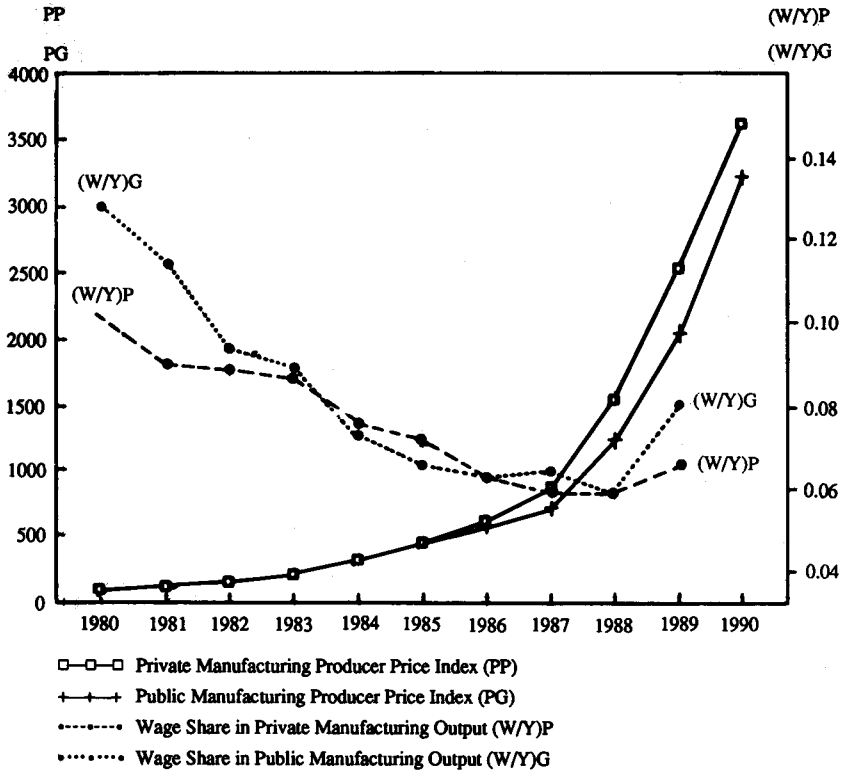


Fig. 1. Producer Price Indexes and Wage Share in the Value-added in Turkish Manufacturing.

manufacturing industry producer prices of the private versus public sectors are contrasted with the respective wage shares in the value-added. As can be observed, the share of wages in aggregate output in both public and private manufacturing follows the same secular downward trend through 1988. With the sharp increase of wages in 1989, however, the wage share obtains an upturn, a phenomenon which is especially pronounced in the public sector. In the private sector, on the other hand, the increase of the wage share is relatively modest, bringing the ratio of labour costs in private manufacturing output to only its 1986 level, the year at which producer prices accelerate over those of the public sector. The fact that, in the private sector, per unit revenues for final output could have been increased at a faster rate than the increase in labour costs as compared to the public sector suggests the possibility of continued resource extraction for private capital based on "mark-up pricing rules". Further, considering the fact that the manufacturing industry is a strategic supplier of intermediate inputs, the rising trend in the industrial prices directly affects the input costs of the user sectors. These observations suggest

that the underlying factors which propagated cost inflation in Turkey in the 1980s should be sought in the patterns of private sector input (producer) prices—rather than the wage costs or the public sector pricing behaviour.

The last column of the table gives information on the movement of the domestic terms of trade of agriculture and industry for the relevant period. According to these series, changes in the domestic prices favour industry relative to agriculture, suggesting that the contribution of agricultural input costs to the price inflation has been relatively insignificant.

Summarising our observations thus far, we can cite four possible structural sources of price inflation for Turkey in the post-1980 period: (i) the foreign-based inflation due to the import-dependent character of industry [Yağci (1983)] and the cost pressures culminating from the devaluationist exchange rate policy [Onis and Ozmucur (1990)]; (ii) the supra-economic profit/rent inflation, which is fed upon producer mark-ups over prime costs, originating from the segmented and monopolistic market structure of industry and commerce [Aksoy (1982); Boratav (1990)]; (iii) the demand and cost inflation spiralling from the increase in wage costs; and (iv) the inflation originating from the fiscal pressures of the government's method of deficit financing [Akyuz (1990); Anand and Wijnbergen (1988)]. In the remaining part of this paper, we shall try to analyse the relative importance of these four structural mechanisms of price inflation together with their mode of interaction with the macro balances of the domestic economy. For this purpose, we formally recognise conflicting social classes which struggle for a higher share in aggregate output: rural and urban labour; rural, industrial, and merchant capitalist; and the public sector (government). The private classes derive their income from their respective "functional" positions as factors of production. The government claims tax revenues, and the public services the value-added. Thus, the study aims at an analysis of the *functional* distribution of income rather than its size distribution. The following section introduces the elements of the theoretical model utilised to this end.

III. THE CGE MODEL OF THE MACRO ECONOMY

The computable general equilibrium (CGE) model is based on a static Walrasian macro-model built around 4 production sectors (agriculture, industry, commerce, and public services); 3 households (rural, urban labour, urban capitalist); and a government. The model is based on a co-integration of the structuralist [Taylor (1981, 1990)] and of the Walrasian [Dervis, Robinson and de Melo (1983)] adjustment mechanisms.

Based on this synthesis, the distinguishing feature of the macro closure utilised in the model is a series of macro adjustments on income distribution, foreign exchange, and fiscal expenditures so as to create the necessary pool of

aggregate savings to finance a predetermined level of exogenous investment expenditures. Within this adjustment process, in order to sustain the required level of savings, three mechanisms are at work: (i) there occurs an income transfer from the low saving propensity/low income households to high-saving/high income capitalists; (ii) a significant portion of private savings is claimed by the government as coercive, forced savings in order to finance its fiscal deficit; and finally (iii) any insufficiency of the aggregate domestic funds is closed either by alignments in the foreign rate of exchange or additional borrowing. Such a specification enables the model to portray the conflicting claims and inflationary consequences of fiscal deficits.

Thus, as a last resort, the underlying mode of adjustment in the commodity markets becomes one of Keynesian rule of demand-determined production. In industry and commerce, where a significant degree of concentration and monopolisation are prevalent, prices are set by the producers by fixed mark-ups over variable costs. Consequently, in these sectors, the level of supply is determined by the aggregate final demand, given the mark-up-based market price. For agriculture and public services, given the lack of empirical evidence on market structure about these sectors, marginal cost pricing rules are assumed along with a neoclassical production function to determine the output supply.

Both the price level and the level of employment are treated as fully endogenous. Wages are assumed to be fixed *nominally*, given the non-economic mechanisms of class conflict. Further, given the *a priori* rules for mark-up determination, the level of producer prices becomes an endogenous variable responding to pressures of the aggregate final demand. Consequently, the model is able to capture endogeneity of price inflation based on structural rigidities and conflicting claims of various social classes on national output. The possibilities of mark-up pricing result in both a distorted price structure and an income composition favouring profit/rent recipients as discussed extensively in Boratav (1990) and Boratav and Türel (1988). Since nominal wages are fixed, the level of urban employment becomes endogenous, causing perturbations on levels of output supply. Labour hiring decisions of the firms depend on real wage costs along profit maximisation rules.

Accordingly, an important mode of adjustment in the commodity and factor markets can be traced out through a stimulus in the aggregate final demand. As pressures build up in the commodity markets, mark-ups are bidden up, raising producer prices. An increase in the price level reduces *real* wages, as wages are fixed nominally. Consequently, labour employment and, hence, output supply both increase. This process portrays the classic Keynesian motto: "output is supplied (labour is employed) because it is demanded"; in contrast to the (neo)-classical motto—or the celebrated Say's Law: "supply creates its own demand".

On the foreign trade side, the model adopts the traditional treatment of

foreign economic relations as utilised in many CGE applications: the Armingtonian commodity system for determining import demands; the constant elasticity of transformation specification in the allocation of export and domestic sales; external closure rules through the changes in nominal exchange rate or through endogenous flows of external finance, etc.

The model is calibrated to 1987, a year in which the domestic economy can be considered to be relatively in macro equilibrium. The overall documentation of the model and the key parameter values are provided in the Appendix Tables. We now turn our attention to the CGE analysis of the macro economy under alternative policy scenarios with respect to structural causes of price inflation.

IV. THE GENERAL EQUILIBRIUM INVESTIGATION OF THE STRUCTURAL SOURCES OF INFLATION

In this section we shall try to examine analytically, with the aid of the CGE model, the relative importance of the above mentioned four structural causes of price inflation, together with their mode of interaction with domestic macro economy in Turkey in the post-1980 Reform period. For this purpose, we shall utilise the CGE model as a "laboratory" to investigate the price dynamics and the macroeconomic balances under 6 prototype simulation experiments.

The CGE experiments were based on 1987, the year at which price inflation is observed to accelerate, and were thought to be conducted in two steps: In the first, three factors which contribute to price inflation from the cost side—the profit/rent rate, the wage rate, and the exchange rate—are investigated together; and in the second stage, the demand inflation originating from the pressures of the saving-investment squeeze due to the fiscal operations of the government is treated separately. In this stage of the CGE experiments, the public sector financial balances are closed with 3 distinct rules of closure: foreign borrowing, adjustment via exchange rate, and fiscal restraint. Summarising the first-stage experiments:

Experiment E-Profit: In this experiment, the mark-up rate in industry is increased parametrically by 5 percent. The wages are kept at their nominal levels, and the foreign balance is sustained by endogenous adjustment of the exchange rate.

Experiment E-Import: This experiment simulates the rise in imported intermediate costs. In the model run, the mark-ups and nominal wages are kept at their 1987 base-run values, but the world price of the industrial import is increased by 5 percent.

Experiment E-Wage: Here, the industrial wage cost is increased parametrically by 5 percent, and the consequent cost-push, demand-pull mechanisms of price inflation are investigated.

The relative results of these three simulation experiments are displayed in Tables 2 and 3. According to the model runs, a 5 percent increase in the mark-up rate results in an average increase of 1 percent in the overall price level. Comparable perturbations on the imported intermediate costs and the wage cost, on the other hand, reflect a price inflation rate of 0.6 percent. The common result of all three experiments is a stagnationist environment. However, the most severe fall in the production level is observed under the profit/rent inflation of increased industrial mark-up; and the least output loss is recorded with the wage inflation. The loss in the gross national product reaches to 0.8 percent with the profit/rent inflation, whereas it comes to only 0.3 percent with the wage cost experiment. The main reason of the relatively less severe record of output losses under the wage inflation should be sought in the dual character of the wage item, constituting both a cost factor and also a source of income for the net output. According to this Keynesian macro mechanism, as also stated in Cecen, Doğruel and Doğruel (1990), an increase in the industrial wages concurrently stimulates consumption demand on the

Table 2

Macro Equilibrium of the Economy

	Base-run ^a	E-Profit ^b	E-Import ^b	E-Wage ^b
GDP	58299.1	-0.8	-0.8	-0.3
<i>Consumption</i>				
Private	39084.7	-1.1	-1.0	-0.3
Public	5322.6	0.0	0.0	0.0
<i>Fixed Investment</i>				
Private	7033.0	+0.3	-0.4	-0.4
Public	7790.0	-0.9	-0.8	-0.3
<i>Exports^c</i>				
Agriculture	0.678	+18.5	-1.0	-0.1
Industry	6.994	-0.9	-2.4	-0.8
<i>Imports^c</i>				
Agriculture	0.736	-5.6	-1.6	+0.3
Industry	13.537	+0.1	-4.9	-0.2
Exchange Rate ^d	854.6	+0.9	-0.8	-0.0
Price Level ^e	100.0	100.5	100.6	100.6

^a1987 Billion TL.

^bPercentage changes over the Base-run.

^cBillion US\$.

^dTL per US\$.

^eIndex, 1987 Base-run = 100.

Table 3

Production, Employment, and Income Generation

	Base-run ^a	E-Profit ^b	E-Import ^b	E-Wage ^b
<i>Real Output</i>				
Agriculture	13824.8	-2.4	-1.5	+0.1
Industry	57908.6	-0.7	-2.8	-0.8
Commercial Services	18391.1	-3.5	+4.3	-1.3
Public Services	13822.0	-1.1	-0.6	-1.8
<i>Employment^c</i>				
Rural	8735.0	-4.1	-2.6	+0.1
Urban	7215.0	-0.8	-0.6	-4.2
<i>Distribution of Total</i>				
<i>Value-added</i>				
	100.0	100.0	100.0	100.0
Rural Capital	7.6	7.2	7.4	7.6
Industrial Capital	27.4	29.2	26.9	27.5
Commercial Capital	16.6	16.1	17.4	16.6
Rural Labour	10.4	10.1	10.2	10.5
Urban Labour	22.3	22.3	22.7	22.6
Government	15.7	15.1	15.4	15.2
<i>Real Wages^d</i>				
Rural	0.632	-0.5	-0.6	-0.6
Urban	1.640	-0.5	-0.6	-0.6
Average Profit Rate (%)	16.6	16.4	16.1	16.4
<i>Mark-up (%)</i>				
Industry	34.8	36.5	34.7	34.7
Commercial Services	103.1	103.1	103.0	103.0
<i>Average Variable Costs</i>				
Agriculture	0.709	-1.1	-0.7	+0.1
Industry	0.742	+0.8	+0.5	+0.8
Commercial Services	0.492	+0.4	+0.6	+1.6
Public Services	0.379	-1.6	-0.8	+0.8
Agricultural TOT ^e	100.0	96.4	98.5	99.3
<i>Real Household Income</i>				
Rural	10788.3	-3.9	-2.6	+0.1
Urban Labour	14518.3	-0.7	-1.8	+0.7
Urban Capitalist	31059.0	-0.1	-0.6	-0.9

^a1987 Billion TL.^bPercentage changes over the Base-run.^c1000* person-years.^d1987 Million TL.^eIndex, 1987 Base-run = 100.

final output, alleviating the recessionary pressure of increased production costs. In fact, one of the most striking results of the wage inflation experiment is that, while *real* wages fall as a consequence of the increase in the overall price index, the average rate of profit remains to be protected at its base-run level. Given their power to implement mark-ups over prime costs, the industrial and commercial bourgeoisie are able to protect their shares in net national product, while the pressures of the increased wage cost on the rate of profit are contended through decreased employment and by transmitting the increased variable costs into unfavourable domestic terms of trade against agriculture.

Another cost inflation process that is simulated in the model is that of a parametric increase in the world price of imported intermediates. As to be expected, the results of this experiment entail a decline in the gross domestic product (by 1.5 percent); a decline in the level of employment and real wages; and a falling rate of profit. This experiment, in a way, simulates the pre-1980 crisis conditions of the Turkish economy with accelerating inflation and stagnation in the economic activity. The adjustment that the modelled economy adheres to in response to these crisis conditions is the depreciation of the domestic currency and a contraction of the absorption capacity.

In the second stage of analysis, the CGE model is used to simulate the price inflation process which is invigorated as an end-product of the government's mode of fiscal deficit financing. The imbalance in the government's fiscal operations is "resolved" through increases in commodity prices, which contract real absorption in the private sectors, and through "forced" acquisition of funds from the private saving pool by inflating the overall price level. This resolution is very much in the spirit of what van Wijnbergen *et al.* (1988) refer to as the "financeable" deficit. Our aim here is to give a quantitative analysis of the inflationary adjustment necessary to make the prevailing deficit compatible with the revenue sources. The inflationary pressures thus built are simulated under three distinct methods of closure of the government's fiscal accounts:

Experiment E-Inv-Gbor: In this experiment, aggregate public investment is increased by 5 percent above its 1987 value in real terms. No adjustment on fiscal revenues is designed, and the increased financial claims of the public sector are assumed to be covered by infinitely elastic supplies of foreign borrowing. The exchange rate is kept at its 1987 level, nominally.

Experiment E-Inv-Er: Here, the above experiment is replicated in its investment targets, but the macro balance is obtained by flexible exchange rate adjustments.

Experiment E-Inv-Fis: The above experiment is implemented, and the financial claims of additional public investments are met by fiscal restraint.

The subsidies to agriculture are eliminated, and the transfer payments to private households are reduced by 25 percent. No alignment in the exchange rate or borrowing possibilities are allowed and, consequently, the burden of adjustment of this experiment falls heavily on private incomes.

The experiment results are displayed in Tables 4 and 5. In the first column of Table 4, the results of the E-Inv-Gbor experiment are presented, and they serve as a benchmark for comparison against the other two. A general overview of Table 4 reveals that, as compared to direct financing of government's outlays, adjustment via exchange rate is growth-oriented, yet inflationary; and that, adjustment by fiscal restraint is severely deflationary. With the E-Inv-Er economy, the overall price level is influenced through two sources: first, increased public expenditures squeeze financial markets and crowd out private funds in real terms; second, increased domestic costs of imported intermediates lead to classic cost-push inflation. As the model operates under fixed nominal wages, the increased price level simultaneously reduces real wages (at the rate of 3 percent) and consequently both employment and production expand. The only factor that inhibits further expansion in output is the falling effective final demand, as a result of reduced urban labour incomes.

We observe that agriculture favours the exchange rate adjustment over the fiscal restraint experiment. Under E-Inv-Fis, rural household incomes fall by 3 percent, and the output by 2 percent. This outcome is realised in spite of the rapid increase in the domestic terms of trade, favouring agriculture by 20 percent. The income distribution consequences of the experiments are also mixed. We observe that, based on their economic power of setting mark-ups, the industrialists are able to sustain their average profit incomes under E-Inv-Er; but under the deflationist environment of E-Inv-Fis, the fall in the aggregate final demand causes a significant reduction in the mark-ups. Consequently, the power base of industrialists erodes and their share in total value-added falls. Such adjustment is in line with Boratav's (1991) observations, suggesting that oligopolistic mark-ups may serve as an important intermediary between labour costs and final output prices. Based on these arguments, the economy seems to adjust through the Marx-Sraffian wage-profit trade-off—in the terminology of Gibson *et al.* (1986)—with flexible mark-ups under periods of "severe" output deflation. We further observe that the government achieves a significant increase in its share of total value-added, a result which contrasts with the declared stand of the post-1980 governments towards *de-statisation*.

Both experiments reveal the importance of final demand linkages in the domestic economy. Under E-Inv-Fis, for instance, reduced government expenditures and austerity in private transfers cause a reduction in the aggregate final demand. This outcome, even though it is conducive to easing inflationary pressures,

Table 4

Production, Employment, and Income Generation

	E-INV-GBOR ^a	E-INV-ER ^b	E-INV-FIS ^b
<i>Real Output</i>			
Agriculture	13871.6	+2.8	-2.1
Industry	59067.9	+1.7	+2.4
Commercial Services	17468.7	-2.7	-2.6
Public Services	13977.2	+0.4	+1.3
<i>Employment^c</i>			
Rural	8786.0	+4.8	-3.6
Urban	7239.0	+0.8	+4.9
<i>Distribution of Total</i>			
<i>Value-added</i>	100.0	100.0	100.0
Rural Capital	7.6	8.1	7.3
Industrial Capital	27.4	30.1	18.3
Commercial Capital	15.6	11.4	11.5
Rural Labour	10.5	11.1	10.1
Urban Labour	22.3	22.4	22.6
Government	16.6	16.9	30.2
<i>Real Wages^d</i>			
Rural	0.630	-0.4	+1.2
Urban	1.637	-0.4	+1.2
Average Profit Rate (%)	16.7	17.3	22.4
<i>Mark-up (%)</i>			
Industry	34.2	33.9	21.8
Commercial Services	102.5	102.2	102.1
<i>Average Variable Costs</i>			
Agriculture	0.711	+1.7	+0.4
Industry	0.739	+0.5	-7.1
Commercial Services	0.492	+0.2	+1.2
Public Services	0.386	+0.8	+2.6
Agricultural TOT ^e	101.1	102.1	119.5
<i>Real Household Income</i>			
Rural	10850.1	+6.2	-5.3
Urban Labour	14489.4	-1.6	+1.1
Urban Capitalist	31042.0	+1.5	+1.8

^a1987 Billion TL.^bPercentage changes over E-INV-GBOR.^c1000* person-years.^d1987 Million TL.^eIndex, 1987 Base-run = 100.

Table 5

Saving-Investment Balance

	E-INV-GBOR ^a	E-INV-ER ^b	E-INV-FIS ^b
<i>Savings</i>			
Private	9156.8	-0.5	+0.8
Public	4825.9	+2.0	-1.5
<i>Investment</i>			
Private	7033.0	0.0	0.0
Public	7790.0	0.0	0.0
<i>Central Government Budget</i>			
Revenues	17079.9	+2.1	-1.6
Expenditures	20244.0	+1.2	-1.0
<i>Government's Borrowing Requirement (GBOR)</i>			
Domestic	2123.8	-2.3	+2.6
External ^c	1.217	-19.2	0.0
Exchange Rate	854.6	+17.9	0.0
<i>Memo: GBOR/GDP</i>	0.054	0.052	0.055

^a1987 Billion TL.^bPercentage changes over E-INV-GBOR.^c1987 Billion US\$.

has nevertheless deflationary consequences in the product and factor markets. Such a deflationary environment provides an imminent threat to urban incomes, especially to those of urban capitalist groups whose product is heavily dependent on the domestic demand. This outcome signals important reasons why macro adjustments based on fiscal restraint and austerity measures are so unpopular in many "urban-biased" developing economies.

The exchange rate adjustment seems to offer yet another plausible alternative for achieving macro balances in the domestic economy. Under the given assumptions, the model solutions suggest a domestic currency depreciation rate of 17 percent over its base-run value. In this economy, agricultural incomes are strictly better off as they capitalise on the increasing terms of trade and the falling real wages. Urban workers and commercial capitalists, on the other hand, turn out to be the losing actors of this experiment, a result which follows directly from the inflationary consequences of the adjustment process.

V. CONCLUDING COMMENTS

The Turkish mode of adjustment in the 1980s has relied heavily on worsening distribution of income and on taxation of agriculture. The surge in manufacturing exports and economic growth could have been financed by transferring real income away from urban workers and the rural economy towards urban industrial and commercial private capital ventures.

The CGE analysis of the macro economy implemented in this paper reveals that:

- (1) The conflicting claims of various classes on national output, and the conflicting rates of intersectoral accumulation warranted by competing producer groups, are important sources of macro disequilibria in the domestic economy. Consequently, the distributional conflicts among socio-economic classes have a direct impact on the formation of price movements. Further, the profit/rent inflation is observed to have a relatively stronger impact on cost inflation, as compared to the popular belief alleging wage inflation as the culprit.
- (2) The Keynesian mechanisms of the aggregate effective demand and the absorption capacity play a critical role in the determination of output supply, employment, and the wage-profit ratio; the burden of adjustment to the inflationary processes, in general, falls the foreign exchange and the labour markets.
- (3) In this vein, the classic Keynesian prescription, of short-run Phillips curve-based "inflation-versus-unemployment" duality, does not offer a viable policy guideline in the CGE simulation experiments. Factors such as monopolistic mark-up pricing, conflict over the distribution of income, and the composition of aggregate demand seem to play a more complex role in the determination of the domestic macro balances.
- (4) In spite of being an important source of inflationary pressures, public expenditures serve the important function of generating strong demand pulls for the economy. In developing countries like Turkey, where private entrepreneurship and private capital are scarce factors, the disposition of this function gains greater importance. Policies based on the reduction of public expenditures signal dangers of profound deflation, which can lead to sharpening the conflicts among social classes, and which can culminate into a vicious circle of price inflation.

DOCUMENTATION OF THE CGE MODEL

This appendix gives a more formal presentation of the CGE model used in the paper. The documentation adheres to the following legend: upper-case letters without a bar are endogenous variables; those with a bar denote variables that are treated as exogenous. Lower-case and Greek letters refer to policy variables or structural parameters. Subscripts i and j refer to sectors, k refers to labour types and h to household categories. Non-linear relations are not explicitly spelled out, as their forms are part of the traditional CGE folklore. The $C(\cdot)$ and $d(\cdot)$ refer to the composite and CET functions; and $f(\cdot)$ refers to CES production functions.

Prices

$$PM_i = PWM_i \cdot (1 + tm_i) \cdot ER$$

$$PE_i = PWE_i \cdot (1 + te_i) \cdot ER$$

$$PC_i = PD_i \cdot (DC_i / CC_i) + PM_i \cdot (M_i / CC_i)$$

$$PX_i = PD_i \cdot (DC_i / XS_i) + PE_i \cdot (E_i / CC_i)$$

$$PVA_i = PX_i \cdot (1 - tn_i) - \sum_j a_{ji} \cdot PC_j$$

$$PK_i = \sum_j PC_j \cdot b_{ji}$$

$$PLEV = \sum_i \omega_i PC_i$$

Endogenous Variables

- PM_i : domestic price of imports
- PE_i : domestic price of exports
- PC_i : composite good price
- PX_i : producer price
- PVA_i : value-added (net) price
- PK_i : price of physical capital
- PD_i : domestic price of the domestic good
- $PLEV$: price level
- ER : exchange rate (TL/US\$)

Exogenous Variables and Parameters

- tm_i : tariff rate on import
 te_i : subsidy rate on export
 tn_i : indirect tax rate
 a_{ij} : input-output (Leontieff) coefficients
 b_{ij} : capital composition coefficients
 ω_i : price level index weights
 PWM_i : world price of imports
 PWE_i : world price of exports

Output Supply and Factor Markets

- $PX_i = (1 + \tau_i) \cdot AVC_i$ $i = \text{industry, commerce}$
 $XS_i = f_i(K_i, L_{ik})$ $i = \text{agriculture, public services}$
 $PVA_i \cdot (\partial XS_i / \partial L_{ik}^D) = W_{ik}$
 $U_k = L_k^s - \sum_i L_{ik}^D$
 $RP_i = PVA_i \cdot XS_i - \sum_k W_{ik} \cdot L_{ik}^D$
 $AVC_i = \sum_k W_{ik} \cdot L_{ik}^D + \sum_j a_{ji} \cdot PC_j \cdot XS_i$

Endogenous Variables

- τ_i : mark-up rate $(i = \text{industry, commerce})$
 XS_i : output supply
 L_{ik}^D : labour demand (employment) of type k , by sector i .
 U_k : unemployed labour
 RP_i : aggregate profits
 AVC_i : average variable cost

Exogenous Variables and Parameters

- K_i : physical capital stock
 W_{ik} : nominal wage rate
 L_k : labour supply

Income Generation and Flow of Funds

$$Y_R^H = PVA_A \cdot XS_A + \mu_R \cdot RM \cdot ER + TR_A$$

$$Y_W^H = \sum_i W_{ik} \cdot L_{ik}^D + (1 - \mu_R) \cdot RM \cdot ER + TR_W$$

$$Y_K^H = \sum_{i>A} RP_i + PBOR \cdot ER + TR_K$$

$$GREV = TARIFE + DOLVER + HHVER$$

$$TARIFE = \sum_i tm_i \cdot PWM_i \cdot M_i \cdot ER$$

$$DOLVER = \sum_i tn_i \cdot PX_i \cdot XS_i$$

$$HHVER = \sum_h ht x_h \cdot Y_h^H$$

$$GREXP = GIF + GDTOT + EXSUB + \sum_h TR_h$$

$$EXSUB = \sum_i te_i \cdot PWE_i \cdot E_i \cdot ER$$

$$HNSAV = \sum_h \sigma_h \cdot Y_h^H \cdot (1 - ht x_h)$$

$$GSAV = \gamma \cdot GREV$$

$$GIF = \psi \cdot GDP$$

$$GRDEF = GREXP - GREV - GBOR \cdot ER$$

$$PRINV = HNSAV - GRDEF$$

Endogenous Variables

- $Y_{R,W,K}^H$: total income of rural, worker, and capitalist households, respectively
- $GREV$: total fiscal revenues of the government
- $TARIFE$: tariff revenues from imports
- $DOLVER$: indirect tax revenues
- $HHVER$: household income tax revenues
- $EXSUB$: export subsidy payments
- $GREXP$: total government expenditures
- $HNSAV$: aggregate private (household) savings
- $GSAV$: aggregate public (government) savings

<i>GIF</i>	: public investment
<i>GRDEF</i>	: government's public deficit
<i>PRINV</i>	: aggregate private investment
<i>GDP</i>	: gross domestic product

Exogenous Variables and Parameters

μ_R	: share of remittances accruing to rural households
htx_h	: household income tax rate
σ_h	: marginal propensity to save of households
γ	: public savings ratio
ψ	: public investment ratio
<i>RM</i>	: total remittances from abroad
<i>TR_h</i>	: current transfers to households
<i>GDTOT</i>	: aggregate public consumption
<i>GBOR</i>	: net public borrowing
<i>PBOR</i>	: net private borrowing

Final Demand and Market Clearing

$$XD_i = d_i(DC_i, E_i)$$

$$CC_i = c_i(DC_i, M_i) = CD_i + GD_i + V_i + ID_i$$

$$DC_i = DCR_i \cdot CC_i$$

$$DCR_i = \partial c_i(DC_i, M_i) / \partial DC_i \quad \text{given } PM_i / PD_i$$

$$M_i = \partial c_i(DC_i, M_i) / \partial M_i \quad \text{given } PM_i / PD_i$$

$$E_i = \partial d_i(DC_i, E_i) / \partial E_i \quad \text{given } PE_i / PD_i$$

$$V_i = \sum_j a_{ij} \cdot XS_j$$

$$CD_i = (cd_i / PC_i) \sum_h Y_h^H \cdot (1 - htx_h) \cdot (1 - \sigma_h)$$

$$GD_i = (gd_i / PC_i) GDTOT$$

$$DKP_i = (kp_i / PK_i) PRINV$$

$$DKG_i = (kg_i / PK_i) GIF$$

$$ID_i = \sum_j b_{ij} (DKP_j + DKG_j)$$

$$XS_i = XD_i$$

$$\sum_i PWM_i \cdot M_i = \sum_i PWE_i \cdot E_i + RM + PBOR + GBOR$$

Endogenous Variables

DC_i : Armingtonian domestic commodity

E_i : exports

M_i : imports

DCR_i : share of domestic commodity in the Armingtonian composite

CC_i : Armingtonian composite commodity

CD_i : private consumption demand

GD_i : public consumption demand

V_i : intermediate input demand

DKP_i : private investment by destination

DKG_i : public investment by destination

ID_i : aggregate investment demand by sector of origin

XD_i : aggregate domestic demand

Exogenous Variables and Parameters

cd_i : sectoral share of private consumption demand

gd_i : sectoral share of public consumption demand

kp_i : sectoral share of private demand by destination

kg_i : sectoral share of public investment by destination

Appendix Table

Values of Key Parameters and Policy Instruments in the Base Year

Government Budget	
Ratio of Government's Fiscal Deficit to GDP	0.051
Enterprise Budget	
<i>Ratio of Working Capital Balances to Total Variable Costs (kwr)</i>	
Industry	0.239
Price Formation	
<i>Average Variable Costs (AVC)</i>	
Agriculture	0.709
Industry	0.742
Commerce	0.492
Public Services	0.379
<i>Mark-up Rate (τ)</i>	
Industry	0.348
Commerce	1.031
<i>Tariff Rate (tm)</i>	
Agriculture	0.091
Industry	0.173
<i>Indirect Tax Rate (tn)</i>	
Agriculture	0.003
Industry	0.029
Commerce	0.061
Public Services	0.032
Production and Factor Markets	
<i>Elasticity of Substitution between Capital and Labour</i>	
Agriculture	0.500
Industry	0.400
Commerce	0.400
Public Services	0.200
<i>Share of Capital in Value-added</i>	
Agriculture	0.421
Industry	0.762
Commerce	0.703
Public Services	0.697
<i>Supply of Labour (LSUP) (1000 Person-years)</i>	
Rural	9335.000
Urban	9469.000

Continued -

Appendix Table – (Continued)

Income Generation and Saving Flow*Income Tax (htx)*

Rural	0.032
Urban Worker	0.194
Urban Capitalist	0.135
Production Tax Rate	0.022

Household Saving Propensities (σ_H)

Rural	0.110
Urban Worker	0.129
Urban Capitalist	0.241
Government Saving Ratio (σ_G)	0.282

Final Demand Generation*Private Consumption Sectoral Shares (cd)*

	Rural	Urban Worker	Urban Capitalist
Agriculture	0.214	0.085	0.065
Industry	0.551	0.657	0.622
Commerce	0.126	0.133	0.161
Public Services	0.109	0.125	0.152

Public Consumption Sectoral Shares (gd)

Agriculture	0.006
Industry	0.269
Commerce	0.053
Public Services	0.672

Public Investment Sectoral Destination Shares (kg)

Agriculture	0.079
Industry	0.328
Commerce	0.125
Public Services	0.468

Domestic Good-export Transformation Elasticity

Agriculture	1.200
Industry	0.600
Commerce	0.550

Domestic Good-import Substitution Elasticity

Agriculture	1.200
Industry	0.600

Elasticity of Export Demand (δ)

Agriculture	3.000
Industry	1.250
Commerce	1.250

Ratio of Domestic Good in the Armingtonian Composite Aggregate

Agriculture	0.947
Industry	0.789
Commerce	1.000
Public Services	1.000

REFERENCES

- Aksoy, A. (1982) *Structural Aspects of Turkish Inflation, 1950–1970*. Washington, D.C.: (World Bank Publication, No. 540.)
- Akyuz, Y. (1990) Financial System and Policies in Turkey in the 1980s. In T. Aricanli and D. Rodrik (eds) *The Political Economy of Turkey*. New York: Macmillan.
- Blejer, M., and A. Cheasty (1988) High Inflation, 'Heterodox' Stabilisation, and Inflation Policy. *World Development* 16:8 867–881.
- Boratav, K. (1990) Inter-Class and Intra-Class Relations of Distribution Under 'Structural Adjustment': Turkey During the 1980s (Ch. 9). In T. Aricanli and D. Rodrik (eds) *The Political Economy of Turkey: Debt, Adjustment and Sustainability*. London: Macmillan Press.
- Boratav, K. (1991) *1980' li Yillarda Turkiye'de Sosyal siniflar ve Bolusum*. Istanbul: Gercek Yay.
- Boratav, K., and O. Türel (1988) Notes on the Current Development Problems and Growth Prospects of Turkey. *New Perspectives on Turkey* 2:1 27–51.
- Central Bank of Turkey (Various Issues) *Annual Reports*. Ankara.
- Cecen, A., S. Dogruel and F. Dogruel (1990) *Turkiye'de Ekonomik Buyume, Yapisal Donusum ve Kriz*. Istanbul: Egemen.
- Dervis, K., S. Robinson and J. de Melo (1983) *General Equilibrium Models for Development Policy*. London: Cambridge University Press.
- Friedman, M. (1968) The Role of Monetary Policy. *American Economic Review* 58:1 1–17.
- Gibson, B. N. Lusting, and L. Taylor (1986) Terms of Trade and Class Conflict in a General Equilibrium Model. *Journal of Development Studies* October.
- Kirkpatrick, C., and F. Nixson (1976) The Origins of Inflation in Less Developed Countries: A Selected Review. In M. Parker and G. Zis (eds) *Inflation in Open Economies*. Manchester: Manchester University Press.
- OECD (1992) *Economic Surveys—Turkey 1991-92*. Paris: OECD Publications.
- Onis, Z. (1991) Political Economy of Turkey in the 1980s: Anatomy of Unorthodox Liberalism (Ch. 2). In Heper (ed) *Strong State and Economic Interest Groups: The Post-1980 Turkish Experience*. Berlin and Newyork: de Gruyter. 27–39.
- Onis, Z., and S. Ozmucur (1990) Exchange Rates, Inflation and Money Supply in Turkey: Testing the Vicious Circle Hypothesis. *Journal of Development Economics* 32: 133–154.
- Paus, A. Eva (1991) Adjustment and Development in Latin America: The Failure of Peruvian Heterodoxy, 1985–90. *World Development* 19:5 411–434.
- Rattsø, J. (1990) Conflicting Claims and Dynamic Inflationary Mechanisms in India. In L. Taylor (ed) *Socially Relevant Policy Analysis*. Içinde. Massachusettes: The MIT Press.

- State Institute of Statistics (SIS) (Various Issues) *Monthly Statistical Bulletins*. Ankara.
- Taylor, L. (1981) *Structuralist Macroeconomics*. Newyork: Basic Books.
- Taylor, L. (1990) (der) *Socially Relevant Policy Analysis*. Massachusettes: The MIT Press.
- Wijnbergen, S. (1988) *External Debt, Inflation and the Public Sector: Towards Fiscal Policy for Sustainable Growth*. (The World Bank Working Paper No. EMN1, June.)
- Wijnbergen, S., R. Anand and R. Rocha (1988) Inflation, External Debt and Financial Sector Reforms; A Quantitative Approach to Fiscal Policy with an Application to Turkey. Washington, D.C.: (World Bank Working Paper.)
- Yağci, F. (1983) *Protection and Incentives in Turkish Manufacturing*. Washington, D.C.: (World Bank Staff Working Paper.)
- Yeldan E. (1992) The Economic Structure of Power in Turkey, 1980–1990: Prices, Growth and Accumulation. Bilkent University Department of Economics. (Discussion Paper No. 92–5, April.)