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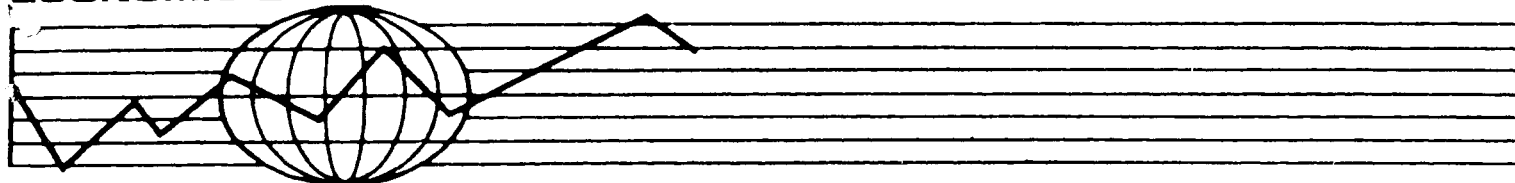
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ECONOMIC DEVELOPMENT CENTER



**STRUCTURAL ADJUSTMENT AND TRADE IN TURKEY:
A GENERAL EQUILIBRIUM ANALYSIS OF THE EXPORT-LED
VERSUS DOMESTIC DEMAND-LED STRATEGIES
OF DEVELOPMENT**

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ABSTRACT

This paper attempts to assess the feasibility of the current strategy of manufactured export-led growth for Turkey over the Fifth and Sixth Five-Year Plan periods (1985-1994). The explicit hypothesis of the paper is that a domestic market, wage-goods oriented development strategy with agriculture leading the process will be more conducive to Turkey's long-term economic growth, as compared to an export-oriented strategy.

The simulation experiments are conducted with the aid of a dynamic micro-planning model which belongs to a class of price-endogenous constructs known as Computable General Equilibrium (CGE) models. The model as applied to Turkey distinguishes seven economic sectors, four types of labor, three consumer groups, seven social classes, and a government. In addition, it accommodates both fixed and flexible wages along with a disequilibrium mechanism of labor allocation, endogenous rural-urban migration, international trade flows with government intervention, and separate rules of allocation for the private -versus- public fixed investment.

The overall conclusion that is supported by this study is that by combining a time-wise regressive, selective export-promotion program with a domestic demand oriented, wage-goods strategy, Turkey can achieve a superior growth performance over the current strategy of manufactured export-led industrialization.

The model results further emphasize the pressing need for the revitalization of the domestic demand, and the importance of the agricultural productivity growth in promoting Turkey's overall objectives of industrialization, income equity, and foreign trade over the Fifth and Sixth Plan periods.

STRUCTURAL ADJUSTMENT AND TRADE IN TURKEY: A GENERAL EQUILIBRIUM ANALYSIS OF THE EXPORT-LED VERSUS DOMESTIC DEMAND-LED STRATEGIES OF DEVELOPMENT

1) Introduction

After 20 years of planned inward-looking industrialization experience, with the introduction of a wide-ranging set of economic policies on January 24, 1980, Turkey started to pursue an outward-oriented growth path centered around the dynamism of manufactured exports. Both the IMF and the World Bank provided generous support to the Turkish adjustment efforts. Thus, over the 1980-1985 period, Turkey used SDR 1.5 billion from the IMF, in addition to the World Bank's U.S. \$1.6 billion of "structural adjustment" loans (SALs).

Stimulated mainly by a vigorous export promotion strategy which consisted of high export subsidies, competitive devaluation of the Lira and repressive attitudes towards the domestic demand, Turkey succeeded in increasing the total value of its merchandise exports fourfold within the 1980-1985 period, averaging an increase of 25% per annum. This high export growth, however, was not achieved without costs, nor was free of problems. Indeed, during the referred period, Turkish economy was observed to be beset with a variety of structural imbalances and inconsistencies, which, in turn, gave rise to serious doubts about the limits to further export expansion, and the possibilities of future growth in manufacturing industries in general to sustain that expansion.

First, despite all the conscious attempts and generous incentives towards the private sector to induce more "privatization" of the economy, private investments have observed to be stagnant and business conditions remained sluggish since the January 1980 Reform. This fact, coupled with the overall disability of the political system to create public sector

resources and investment in the public sector, resulted in a sharp drop in fixed capital investments and an increase in the rate of unemployment. Further, there was an observed imbalance between the structure of exports (in favor of manufactured products) and the allocation of private investment funds (away from manufacturing industries), a phenomenon which was directly in conflict with the foundations of the overall growth strategy that rests on increased manufactured exports. Thus, in the post-Reform period, the decline in private investment and the increase in unemployment seemed to be the two "concomitants" of the Turkish export promotion efforts.

A third imbalance was yet to be found in the sectoral priorities which were severely biased against agriculture. Throughout the period, agricultural output growth has been slow and erratic, and became one of the main causes of the prolonged domestic inflation through the increases in food prices.

Finally, the export promotion strategy was also observed to be coupled with a militant policy of repressing wage incomes, which led itself to an overall suppression of the domestic demand in the economy. Under conditions of slow growth, the repression of the domestic demand this way has been quite instrumental in generating a surplus which could be allocated to foreign markets via exports. However, contrasted with the historical importance of the domestic absorption capacity of the Turkish economy, export expansion by itself could not have produced sufficient invigoration for economic growth, and the manufacturing industries continued to operate at sub-capacity levels throughout the post-Reform period.

Thus, Turkey came to a cross-roads in 1985--the year at which the Fifth Five-Year Development Plan would be put into effect: in the coming decade, *should* Turkey continue with its dedication to manufactured export-led growth

devoting its resources for foreign markets; or should it re-evaluate its current repressive stance towards the domestic market, and make attempts to re-orient its industry towards establishing stronger linkages with the rest of the domestic economy?

The analytical quest for the answer to this question constitutes the main motivation of this study. More specifically, the paper calls for an assessment of the feasibility of manufactured export-led growth as the major dynamic of development for the Turkish economy in the coming decade, which effectively covers the Fifth and the Sixth Five-Year Plan periods; and attempts to design an economically viable alternative development strategy.

In this context, given the economic problems of the past decade, and given the realities of the domestic and the international environment, it has to be recognized that a reversal to the previous inward-looking strategy of import-substitutionist industrialization is no longer feasible, nor desirable. Yet, it should be realized that the export-led development model alone does not exhaust the wide spectrum of "open" development strategies. Indeed, in her own search for the alternative styles of development that are "beyond export-led growth", Adelman (1984, p: 938) emphasizes the distinction between "an open development strategy, in which trade is an element of growth, and an export-led strategy in which trade is the major source of growth".

Thus, this study starts with the major premise that the export-led model is not the only potentially promising alternative to the closed-economy strategies of development. To be more explicit, it is argued in the following pages of this paper that, within the confines of an open trade regime, a reallocation of investment funds towards the agricultural sectors which serve the *domestic* market rather than the *foreign* markets may lead to

superior outcomes over those of the export-led industrialization strategy. The arguments in favor of such a strategy would rest on the dynamic backward-forward linkages between the induced growth of the agriculture and the created mass market for the domestic industrial products that will be used as inputs in this process. Hence, effectively proposed is a "balanced" industrialization strategy, working through the agriculture-industry interlinkages by expanding the internal demand for the intermediate and final (consumption) goods that are produced by the domestic manufacturing sectors.

The intuition behind this hypothesis is the argument that by increasing the rate of investment and production in the wage-goods and in the key linkage-manufactures (intermediates, capital goods, etc.) simultaneously; and further, by generating an effective demand for the domestic absorption of these goods, the conditions of a more balanced growth path can be created that is in harmony with its production targets and the patterns of consumption.

The logic and rationale of the proposed emphasis on the "agriculture-linked-manufacturing growth" reflects, in part, an optimism that agricultural and industrial growth can be restructured to find its dynamic by serving the domestic market in an open trade regime, rather than being bounded by the often conjectural and uncertain conditions of foreign demand.

That growth of agriculture can be expected to stimulate industrial growth through a variety of mechanisms is well recognized and argued for in the development literature. These mechanisms include: 1) the release of an agricultural labor surplus to become a source of industrial employment (Lewis, 1954; Ranis & Fei, 1961; Jorgenson, 1961); 2) the provision of cheaper food production and raw materials, and hence lower wage costs and

intermediate good prices for the inputs used by the industry (Mellor, 1976); 3) the generation of resource pulls through intermediate and final demand linkages for the products produced by the industry (Adelman, 1984; Hirschman, 1981; Hayami & Ruttan, 1985); and 4) the provision of an investable surplus through the transfer of agricultural savings and rents (Adams, 1978; Mellor, 1984; Chichilnisky & Taylor, 1980).

The proposed strategy is well suited to a middle-income developing country like Turkey, with her established agricultural base and the mass domestic market. Studies by Celasun (1983) and by Nishimuzu & Robinson (1984), for instance, conclude that domestic demand expansion has been the most important source of growth for Turkey in the post-war era. The call for such a strategy is especially timely for Turkey, which, in the early 1970's, had successfully completed the initial stages of industrialization that consisted of the domestic production of consumer nondurables and light intermediates (World Bank, 1982; Pamuk, 1984). Hence, the challenge for Turkey in the next decade is the establishment of the capital goods and the basic intermediate industries, and domestic production of the associated technologies. The advocated strategy, with its emphasis on the dynamic backward and forward interlinkages across sectors seems to be the most appropriate strategy serving Turkey's long-term industrialization interests.

It is thus hypothesized in this paper that a domestic market oriented development model with agriculture leading the process will be more conducive to Turkey's long term economic growth as compared to an export-oriented development strategy.

To test this hypothesis analytically, the paper employs a dynamic micro-planning model which belongs to a class of price-endogenous constructs known as Computable General Equilibrium (CGE) models. The model is composed

of a simultaneous system of non-linear equations which endogenously solve for: relative prices, sectoral production, wages, profits, the exchange rate, imports, exports, sectoral consumption and investment, and the functional distribution of income.

The model as applied to Turkey distinguishes seven economic sectors, four types of labor, three consumer groups, seven social classes and a government. In addition, it accommodates both fixed and flexible wages along with a disequilibrium mechanism of labor allocation, endogenous rural-urban migration, international trade flows with government intervention, and separate rules of allocation for the private-versus-public fixed investment.

The rest of the paper is organized as follows: the next section presents an overview of the Turkish economy in the post-1980 period, and analyzes in depth the economic implications of the policy measures implemented with the 1980 Reform package. The third section describes the model and its distinguishing characteristics. The simulation results are presented in the fourth section. The paper concludes with a general discussion in section five, and with a mathematical summary of the model equation as an Appendix.

2) Elements of Transition: The 1980 Reform and the Manufactured Export-led Growth

The January 1980 Reform package aimed at not only short run stabilization, but also at changing the structure of the economy towards more outward orientation by providing an increased role to the private sector and the market forces. Further, a change in sectoral priorities have occurred, with greater emphasis being given to the export-oriented manufactures, such as processed food items, textiles and wearing apparel and light intermediates, and also to commercial services, especially overseas

contracting.

These principles were simultaneously translated into a set of far-reaching policies:¹ Turkish Lira was devalued by almost 50% against the US Dollar, with further daily adjustments made to ensure that the effects of price increases on the real exchange rate be offset. The existing multiple exchange rate system (of five different rates) was eliminated -- except for imports of fertilizer and other agricultural chemicals. Commensurate with the real devaluation policy, an extensive scheme of export encouragement measures were introduced. Exporters were given the right to import intermediate inputs and other capital goods duty-free under the foreign exchange allocation scheme. A subsidized credit system was established which provided exporters easy access to Central Bank credits at a rate lower than the one charged on similar projects whose output is not directed for exports. Further, in January 1981, new income tax reductions were granted for exporters; and in May 1981, tax rebate rates (which were designed to reimburse the exporters for the indirect taxes they paid for the production of the exportables) were increased substantially.

The import regime was liberalized and the waiting period for import licenses was reduced considerably. The quota list was eliminated and imports were grouped into two: Liberalized List I -- goods whose importation would be free; and Liberalized List II -- goods with partial import limitations. This was followed by the restructuring of the tariff system in December, 1983, and a further import liberalization in which, in value terms, about 80% of the items in Liberalized List II were freed from quantitative restrictions. This meant an important turning point in Turkey's efforts of trade liberalization, effectively increasing the share of free imports in total imports from 18% to 60% by the end of 1983.²

Measures were also taken to introduce more flexibility and rationality to the state enterprise system. In particular, the State Economic Enterprises' (SEEs') prices were liberalized and consumer subsidies were eliminated or greatly reduced. This policy has had considerable immediate effects, leading to price increases ranging from 45% for gasoline, to 300% for paper products and to 400% for fertilizer.

In July of 1980, interest rates were freed from government ceilings. This policy was met with sharp increase in interest rates on both deposits and loans. However, with the enforcement of a "gentlemen's agreement" by a cartel of commercial banks, it did not render much competition within the commercial banking system. Finally, a value added tax (VAT) scheme was enacted in November 1984, which replaced all production and other indirect taxes.

Overall however, despite the extensiveness of the 1980 Reform measures, their economic effects have been retarded mostly due to the unsettled political climate. Real GDP continued to decline in 1980 and reached an annual average of -1.1% for that year. It was only after the September 1980 military intervention that political certainty has been established and social conditions became "mature" enough to allow the full implementation of the reform package. Thus, 1981 constituted the turning point for the domestic economy. In that year, led by a 62% rise in the dollar value of merchandise exports, GNP grew by 4.1%, and industrial value added rose by 7.2%. With a 13% growth registered for the merchandise imports, current account deficit was narrowed to \$2,342 million after its record high of \$3,680 million in 1980. Further, the premium on the Dollar in the (unofficial) parallel foreign exchange market declined to 2.3% from its peak of 50% in 1979.³

However, due to the restrictive monetary policies and the reduction in domestic absorption, business conditions have in general been sluggish, and domestic private investment remained stagnant in 1981, after its decline of 20% in 1980. Thus, despite the wage reductions which allowed for an average nominal increase of only 12-15% (after taxes) in 1981⁴, unemployment increased from 14.8% in 1980, to 15.2% in 1981, and further to 15.6% in 1982.

Table 1 presents the main economic indicators of this period. It can be seen that, led by the export demand, growth in manufacturing has been quite high, but this performance was not shared by other sectors of the economy. Growth in agriculture has been sluggish and erratic, and the construction sector was virtually stagnant throughout the decade. As a consequence, real GDP growth has been modest, averaging 4.4% per annum. Accordingly, the growth in the domestic uses of the GDP, through fixed investment and consumption, were hesitant, averaging 3% per annum for the former, and 3.1% for the latter. This observation suggests that during the analyzed period the sources of growth came not from the domestic economy, but from outside via increased export demand.

Indeed, the export performance of the Turkish economy between 1980 and 1985 was quite remarkable. The value of exports expanded from \$2.9 billion in 1980, to \$7.9 billion in 1985, registering an average rate of growth of 22% per annum. Coupled with this overall expansion, both the sectoral composition and the country destination of exports have undergone major changes. The share of industrial exports were doubled from 36% of the total in 1980, to 80% in 1985. The average rate of growth of such exports was on the order of 50% per annum and continuous throughout the period. In the meantime, however, agricultural exports registered negative growth rates,

TABLE 1: Main Economic Indicators: Turkey, 1979-1985

	1979	1980	1981	1982	1983	1984	1985
Real Growth in:							
Agriculture	2.8	1.7	0.1	6.4	-0.1	3.5	2.4
Mining	-16.3	-4.1	-7.3	-5.5	7.5	7.9	11.9
Manufacture	-5.3	-6.4	9.5	5.4	8.7	10.2	5.5
Construction	4.2	0.8	0.4	0.5	0.6	1.9	2.9
Services	0.2	-0.2	3.7	3.5	3.9	5.3	4.0
GDP (FC)	-0.6	-1.0	3.6	4.5	3.9	5.8	4.2
Fixed Investment	-3.6	-10.0	1.7	3.4	3.0	2.0	5.1
Private Consumption	-3.1	-5.2	0.6	1.5	4.9	5.3	3.4
Volume in Mill US \$:							
Exports	2261	2910	4703	5746	5728	7133	7958
Imports	5069	7909	8933	8843	9235	10757	11344
Current Acc. Deficit	1639	3408	1919	935	1848	1407	813
Wholesale Prices ¹	63.8	107.2	36.8	25.2	30.6	52.0	44.0
Index of real wages: ²							
SII	100	74.7	69.1	69.3	70.0	66.6	65.9
MI	100	92.9	109.9	94.3	87.8	75.0	62.5
Unemployment Rate	13.6	14.8	15.2	15.6	16.1	16.1	16.7

1) Percentage change over previous year.

2) Based on Consumer Price Index. The SII data are the average daily wages as reported by the Social Insurance Institute. The MI (Manufacturing Industry) Survey wage is calculated by dividing total payments by the number of workers engaged.

Sources: SPO Annual Programs; World Bank --EM2DA Turkey Data Information System, 1986.

and their share was reduced to 16% of the total in 1985.⁵

In terms of country destination of exports, there was also a drastic change in favor of the Middle Eastern countries, especially to Iran and Iraq. Exports to the Middle Eastern market have increased by an average rate of 40% per annum, and their share in total exports have quadrupled from 10.3% in 1979, to reach 40.7% in 1985. It can in general be argued that special events, such as the war conjuncture in the region, have played a crucial role enabling Turkey to expand its exports towards that market. Indeed, thanks to its neutrality policy, Turkey managed to continue its economic relations with both Iran and Iraq, and the share of exports destined to those two countries have jumped from a mere 7.5% of the total in 1980, to 24.4% in 1982, and stabilized around 26% for the rest of the period. In fact, of the \$1.8 billion increase in the value of exports in 1981, as much as \$0.8 billion was accounted by the imports of these two countries, with an additional \$0.4 billion claimed by Libya and S. Arabia. Based on these observations some scholars argued that the limitedness of the Turkish exports markets and their conjectural nature in general, signal a deficiency in the overall export strategy, and might hinder possibilities of future export growth once the special conditions of the war conjuncture are over (Berksoy, 1985; Kepenek, 1984).⁶ Nevertheless, it is still a unanimously held view in Turkey that without the high devaluation policy and the export promotion scheme, such markets could not have been exploited, and that, the surge in exports can not be explained by the favorable international conjuncture alone.

Subsidies to exports were indeed substantial throughout the period, ranging between 23% (in 1983) and 15% (in 1984) of the value of exports within the manufacturing sector (Milanovic, 1986). The most important

component of the subsidy was the production tax rebates which covered about half of the subsidies granted in 1982 and 1983, and amounted to as much as 75% of the total subsidy rate in 1984 during when the rebate rates were finally being scaled down.⁷

Since the Reform, the relatively high levels of the tax rebates became a very controversial issue and came under severe criticisms. In addition to being a source of high losses to the central government budget⁸, the rebate scheme was held responsible for the emergence of the so-called "fictitious" exports, which, in effect, can be defined as that amount of foreign exchange transferred from the country of destination of exports to the Turkish Central Bank, while the actual transfer of goods have never taken place. The transfer of foreign currency, however, entitled the exporter to claim the tax rebates. Thus, one part of what purported to be "merchandise exports" was actually never realized. Milanovic (1986, p. 12) reports, for instance, that the value of "fictitious" exports was estimated at about \$1 billion in 1984, or 14% of total exports at that year!

In addition to the direct subsidy scheme, another set of policies that have been quite instrumental in bringing forth the overall expansion in exports was to be found in the sphere of the domestic economy. As was noted earlier, the rate of growth of domestic demand in the analyzed period stayed on the order of 3% per annum, while the average annual rate of growth of GDP has been about 4.5%. Especially effective in curtailing the growth in the domestic demand was the repressive real wage policies of the period, which successively suppressed the wage demands of the workers. So that the real wage index, with 1979 taken as the base-year, fell to 65.9 in 1985 for the insured workers, or to 62.5 if the overall manufacturing wages were to be considered.

In general, it can be argued that in an economy in which export expansion is considered to be of prime importance, the militant policy of suppressing real wages would serve a dual purpose: First, by reducing the effective domestic demand it would render the foreign markets to become relatively more profitable and attractive vis-a-vis the domestic markets. Second by holding labor costs down, it would allow the exportables to be more competitive in foreign markets and also would stimulate further investments.

Looking in retrospect, it can be said that the fall in real wages in Turkey has in fact been conducive in limiting the size of the domestic market, and thereby provided sufficient surplus, which, with the stimulation of the generous incentives, has found its vent in expanded exports.

The second aspect of the repressive wages policy, on the other hand, was not observed to be materialized within the time span considered here. Private investments, despite all the incentives aiming at the privatization of the economy, have been sluggish and stagnated at about 7.5% of the GNP. As the public investments were gradually receded to the order of 11.0% of the GNP in 1985, however, aggregate fixed capital investment began to lose its share in total GNP and have declined to 18.6 percent in 1985 (see Table 2).

This development has indeed given rise to a rather interesting phenomenon regarding the distribution of investments between the public and private sectors. We have noted above that with the introduction of the 1980 Reform, the reduction of the size of the public sector became one of the main targets of the policy makers. It was hoped that with proper incentives, private investment would fill in the programmed reductions of the public sector. The experience of the 1980-1985 period, however, suggests

Table 2: Relative Shares of the Public & Private Sectors in Total
Fixed Capital Investments
(Current Billion TL & Percent)

	<u>Share in Total Fixed Inv</u>			<u>Fixed Inv/GNP (%)</u>
	<u>Total Fixed Invest. (TL)</u>	<u>Public (%)</u>	<u>Private (%)</u>	
1973	59.3	42.3	57.7	19.1
1974	76.1	46.0	54.0	17.8
1975	107.9	49.9	50.1	20.1
1976	153.7	48.6	51.4	22.8
1977	210.8	51.1	48.9	24.1
1978	279.6	48.7	51.3	21.7
1979	449.3	52.4	47.6	20.4
1980	863.6	56.1	43.9	19.5
1981	1241.4	61.8	38.2	18.9
1982	1646.9	61.1	38.9	18.8
1983	2214.9	60.9	39.1	19.2
1984	3370.0	60.0	40.0	18.4
1985	5098.6	60.0	40.0	18.6

Sources: SPO Annual Programs; World Bank, 1986, Table 2.3

otherwise. As documented in Table 2, the share of the private sector in total fixed capital investments were observed to drop to the order of 39.4% after 1981, from their historical trend of 50% of the 1970's. Contrasted with the fact that the industrialization strategy of the 1970's was one of public-induced growth, the observed drop in the share of the private investments after 1980, in an era of dedication to the privatization of incentives, looks rather peculiar, and raises serious doubts about the power and intentions of the private capital-holders to mobilize their resources without complementary attempts from the public sector.

Equally important in this context is the private sector's priorities in allocating its investment funds among the productive sectors of the economy. To gain more insights on this matter, an appropriate approach would be to look at how the "investment incentive certificates" are distributed over the productive sectors within the analyzed period. The distribution of the investment incentive certificates represent, in general, the private entrepreneurs' intentions to invest and their preferences across various sectors. Table 3 indicates that since the Reform, the share of the investment certificates allocated to agriculture and manufacturing has declined substantially, and that of transportation, export, and to some extent, mining has increased. Further, within the manufacturing sector, incentives were reallocated towards the "light consumer items", as the share of the food and textiles increased their claim of the certificates within the manufacturing sector from 22.3% (of the manufacturing total) in 1980, to 54% in 1985.

Commensurate with the observed loss of interest towards the manufacturing industries (observe in particular, the dramatic decline in the total value of certificates claimed during 1982 and 1983), investment goods

imports have virtually stagnated since 1982. Investment goods imports were valued at \$2,324 million in 1982, and at \$2,317 million in 1983. They increased by 14% in 1984 to \$2,659 million, but were again reduced to \$2,500 million in 1985, well below its programmed target of \$2,900 million⁹. This phenomenon came rise despite the overall increases of imports (at an average rate of 7.4% per annum) and the generous tariff incentives granting duty-free importation of such goods for exports producers, and could mostly be explained by the observed tendency of "dis-investment" in the manufacturing industry.

TABLE 3: Sectoral Distribution of Investment Incentive Certificates, 1980-1985 (%)

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u> ¹
Agriculture	13.3	4.4	4.7	3.8	2.0	1.9
Mining	1.8	2.8	2.7	5.4	19.4	11.0
Manufacture (of which Food, Textiles)	78.1 (22.3)	48.1 (26.4)	41.0 (28.2)	47.7 (32.6)	50.5 (53.8)	40.8 (54.0)
Energy	0.2	0.1	0.2	0.5	2.3	0.2
Transportation	5.1	42.1	41.9	28.2	10.7	39.4
Tourism	1.4	0.3	1.7	4.4	7.7	3.4
Trade	0.1	0.1	1.3	1.7	0.8	1.3
Other Services	0.0	1.0	3.9	3.6	2.1	1.9
Export	---	1.1	2.6	4.9	4.5	---
TOTAL	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
Bill TL:	207.0	1046.0	513.3	571.2	1105.2	745.1

1) Provisional Figures for January-May.

Sources: SPO Annual Programs; TUSAID, 1985, p: 124.

From a dynamic growth-oriented perspective, however, this observation signals a very important deficiency in the industrialization strategy: that precisely at the same time the overall growth strategy rests on increased manufactured exports, physical investments shy away from manufacturing industries, putting their future growth potentials under serious dubiety.

In this context, the TUSAID 1985 Report argues that one of the main reasons for the stagnation in private investments have been the *restricted domestic demand* and the concomitant low use of the installed production capacity in the manufacturing sector. Indeed, by 1985, use of the installed production capacity in private manufacturing still could not have exceeded the 70% mark. In turn, according to the respondents to the SIS - Manufacturing Industry Surveys, the most important reason for underutilization of capacity has again been the *insufficiency of domestic demand*, with its importance gradually rising over time from an average index of 45% in 1983, to 52% in 1985.¹⁰

Summarizing then, the analysis of this section clearly indicates that there exists a pressing need for the revitalization of the domestic demand, and of the domestic absorption capacity in general, for the Turkish economy within the next decade. Growth in the post-Reform period, while being moderately rapid, was mainly based on the increased *foreign* demand for the manufactured output, and in this sense, we chose to label the economic strategy of the period as that of "manufactured export-led industrialization."

It was argued that the two main instruments of this strategy were: 1) generation of an exportable surplus by way of curtailing the domestic demand (absorption) via suppressed real wages; and 2) allocation of this surplus to foreign markets through an extensive scheme of export subsidies and a high

devaluation policy.

Viewed in this context, then, the limits to further export expansion and further economic growth in Turkey would be drawn: *firstly*, by the possibilities of future growth in the manufacturing industries, so that the exportable surplus could be sustained; and *secondly*, by the extent to which domestic demand could further be suppressed.

Looking in retrospect, one can argue that with an incentives strategy that biases investments away from the productive sectors and leads to stagnation in the capital investment goods industries, such limits would be reached very soon.

This argument finally brings forward the task of seeking out the viable alternatives to the current strategy of growth in Turkey, and it is precisely this task to which the rest of this paper is to be devoted.

3) The Model

A Computable General Equilibrium (CGE) model is a multisector, multi-agent construct which is composed of a set of non-linear simultaneous equations which simulate the optimizing behavior of various economic actors in response to various market signals.

All CGE models are Walrasian in spirit, in that they are constructed along the lines of production--income distribution--consumption--capital accumulation and certain rules for market clearing in factor and product markets.

The model utilized in this study belongs to the class of CGE models that incorporate the international economy as well as the domestic market into analysis. As a tribute to its dynamic characteristics it is named TURKPLAN. Its theoretical foundations stem from the now classic book by

Dervis, de Melo and Robinson (1982), and borrow elements from the earlier CGE applications to Turkey -- by Dervis & Robinson (1978), Lewis & Urata (1983) and by Grais, de Melo & Urata (1984).

The model is constructed and designed to be run in two stages. The first stage is a static general equilibrium construction which is composed of a system of non-linear simultaneous equations which converges to a within period solution by means of a numerical solution algorithm in both production and factor markets. The second stage, on the other is designed to up-date the exogenous variables of the first stage. It is a dynamic system and basically used for the purposes of "aging" the model.

In the *static* stage, given an arbitrary set of prices, the model solves for the output levels across sectors and finds the market clearing wage rates and profits. These, in turn, become sources of income generation for various household groups and determine the patterns of demand. Quantities imported and exported are solved as a function of domestic production costs, international prices and relevant elasticities. The investment behavior is also endogenized through the saving propensities and sectoral investment share parameters which, in turn, are determined as a function of the differential profit rates across sectors. After calculating excess demands in this manner, the model updates the initial guess of domestic prices through a Walrasian tatonnement algorithm and iterates the whole process until convergence is achieved.

In the *second* stage, a dynamic adjustment process is provided which allows for capital accumulation; for population growth; for changes in technical productivity; and for other changes in the "behavior" of economic actors. Other key variables such as world prices, domestic price index, exogenous cash flows and the exchange rate (if it were held fixed in the

first stage) are also updated in this stage. Also it is in this dynamic stage that the model recognizes rural-urban migration possibilities and utilizes a Harris & Todaro (1970) type of an adjustment process in which migratory behavior is seen as a function of the differences between the rural and the expected urban wage rates.

The overall model utilizes elements of the neo-classical general equilibrium theory with optimizing behavior on the part of consumers and producers in response to market signals under competitive conditions. The main stream neo-classical paradigm provides almost the only formal analytical apparatus available to assign numerical values to the decision of various economic agents. In many real world applications to the developing countries, however, modellers have adapted a variety of structuralist phenomena to better reflect the workings of such economies. The term "structuralist" is often associated with the Latin American school of thought with regards to the inflationary macro-imbalances of a developing economy, though in our context, it should more generally be associated with a recognition of imperfect markets and low elasticities in production and trade.

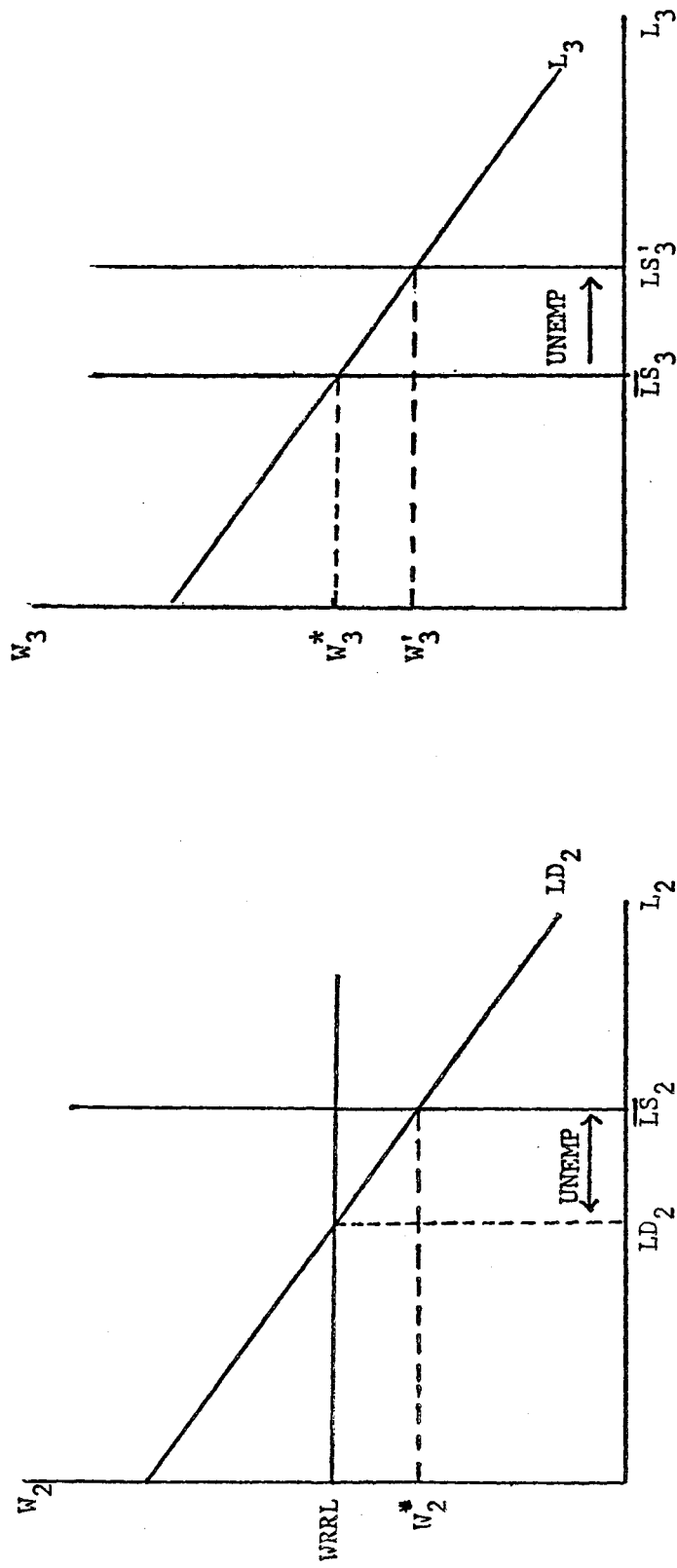
To be more explicit, on the production side, the neo-classical assumptions of perfect mobility of physical capital and the thereby equalization of profit rates across sectors are dropped. Sectoral physical capital stocks are held fixed in the static stage and the profit rates are allowed to vary. In the dynamic stage, however, a behavioral rule is provided, which updates the sectoral investment allocation coefficients in response to differences in the sectoral profit rates. This behavioral submodel, in a way "lurches" the system towards a dynamic intertemporal (neoclassical) equilibrium, in which, profit rates across sectors are

equalized.

Domestic output in each sector is given by a constant return Cobb-Douglas production function with capital and aggregate labor as primary inputs. Intermediate inputs are assumed to be demanded in fixed proportions to the level of output. Labor is further disaggregated into four categories: *Agricultural labor* is employed only in agriculture, and is treated as separate and immobile within any period. However, between periods, endogenous rural-urban migration takes place in response to the differences between the agricultural and the expected urban wage rates. Within the urban sectors a distinction has been made between the *organized/skilled labor* and the *unorganized/unskilled labor* markets. The real wage rate of the organized labor category is assumed fixed, being only parametrically varied. The unorganized labor wage rate, on the other hand, adjusts freely to clear the unorganized labor market, which in turn is linked with the market for the skilled labor through a spill-over mechanism in which the excess of the skilled labor is absorbed. Under such a specification, there is no open unemployment problem in the model. The problem of the labor surplus is thought to be reflected in the significantly low wages realized in the unskilled labor market and the consequent urban-worker poverty. Figure 1, below, further illustrates these mechanisms. Finally, the *service labor* is employed only in the "Commercial & Financial Services" sector and typifies the small scale service enterprise employees, family workers, self-employed, etc.

On the trade side, the neoclassical hypotheses of perfect substitutability of tradables and the law of one price are dropped. Instead, following the common tradition of the previous CGE models TURKPLAN adopts the Armingtonian composite commodity system, in which domestic goods

Figure 1 : Specification of the Urban Labor Markets



(A) Organized Labor Market

(B) Unorganized Labor Market

and imports are imperfect substitutes and are aggregated in a CES function with a given elasticity of substitution. On the export side, domestic output is exhausted between exports and domestic consumption according to a Constant Elasticity of Transformation (CET) specification. The CET frontier has been introduced to the literature by Powell and Gruen (1968), and is used here in order to capture the differences in the quality and/or the nature of the exported goods versus goods used for domestic consumption, that are aggregated within the same sector.

In the simulation experiments the exchange rate was held fixed, and an endogenous deficit on the balance of payments accounts was allowed to accumulate.

The macro closure adopted for the model is partially "savings-driven", and borrows elements from both the neoclassical and the Cambridgean specifications. More specifically, a distinction has been made between the private and the public consumption-saving decisions. Private households are assumed to save a fraction of their disposable income, given corresponding saving parameters. The government, on the other hand, is assumed to set an exogenous policy on the required level of public investment as a proportion of total GDP; and given this exogenous policy ratio, it withdraws the necessary fraction of its total income as public savings, with government consumption being determined residually.

Thus, modelled in this way, the savings-pool of the economy sets the limits of investment demand, and capital formation in general. The choice of this specification was based on the fact that it would give the maximum medium term sensitivity to balance of payments accounts and the foreign trade performance of the economy, the prime focus of this study. It also makes investment growth and capital accumulation maximally sensitive to the

levels of per capita income and changes in income distribution.

The base-year for the model is 1981. The choice is due to the assumption that the convulsions of the second oil-shock have been settled and the Turkish economy has finally moved out of the deep recession it drifted into during the latter half of the 1970's. Thus, 1981 can be taken to be the year in which the economy is in a position of relative equilibrium. It is also the year when the export-drive has begun and new policies started to take shape so as to open up the economy to foreign competition. Therefore the period 1981-onwards offers a unique era for Turkey, attracting the attention of many economists and policy-makers, as well as the author of this paper.

In working with the base-year data set, the process of model calibration was facilitated to a large extent through the use of the software program "General Algebraic Modeling System" (GAMS) of the World Bank. Starting from the SAM accounts, GAMS simplifies and automates the process of generating the values of the structural parameters needed by the model, so that the data that emerge from this process represent an equilibrium solution for the base year. The methodology of model calibration and the associated GAMS input program are described in further detail in Yeldan & Roe (1987).

The model was further "validated" through 1981-1985 by checking its tracking capability of the realized historical growth path as the decisive criterion.

4) Searching for the Alternatives

This section turns to an investigation of the medium-term prospects of the Turkish economy over the 1986-1994 period, which spans Turkey's Fifth and Sixth Five-Year Development Plans. The CGE model is utilized as

a planning device in order to analyze the expected behavior of the economy under the guidance of alternative development strategies.

In analyzing the results of the policy experiments, it is important to keep in mind that all model outcomes are conditional upon the successful implementation of specific policy packages and the projections of various exogenous variables. It should be made clear that the model does not attempt to "predict the future", nor does it have a claim to do so. Rather, it is designed to be used as a laboratory to test the *relative*, in contrast to *absolute*, effects of various development strategies, given the projected path of exogenous variables and the domestic and external economic conditions. The primary objective is to assess the relative characteristics of the projected growth paths generated by different policy regimes, and to be able to identify various objectives with the associated policy variables. In this context, it has to be remembered that choosing one policy option as being "better" than others is always conditional upon our assumptions about the "future", the mathematical specification of the model, as well as the power and willingness of the government to pursue the policy options underlined in each policy package.

For various exogenous variables for the subperiod 1986-1989, the data has been gathered directly from the Fifth Five-Year Plan's (FFYP's) own projections. For the rest of the experimental period, FFYP's trend values have been used.

As we have seen in the second section, during the 1980-1985 period, Turkish policy-makers have tried to lay the foundations of a development strategy which finds its dynamic in increased manufactured exports and in the overall reallocation of domestic resources away from agriculture and towards industry. Currently, the government, with its centralized

administration of the export-incentives, stands strongly for the continuation of the export drive, and regards this process as a means of "deepening" the industrial structure of the domestic economy. The Fifth Five-Year Development Plan, which in fact was drafted in 1983 and put into effect in 1985, is clearly the government's most important instrument in attaining its trade objectives for the next decade. Our first policy experiment, then, is inspired by the government's current policy stand, and it mainly simulates a growth path of the economy in which direct export subsidies to manufacturing and the reallocation of public investment away from agriculture to industry are the two main characteristics. This first experiment is named MXLI, which stands for "Manufacturing Export-Led Industrialization" and is described in detail further below.

As an alternative to MXLI, the simulation of a domestic demand and wage goods oriented development strategy constitutes the second policy experiment that is to be tested in TURKPLAN for the coming two Five-Year Plan periods. As a tribute to its emphasis on the "linkages" of the economy, it is named "Agriculture-Linked Manufacturing Industrialization" strategy, and hereafter referred to with its acronym, ALMI, to conserve on space. I now turn to a detailed description of the two experiments.

The MXLI strategy is simulated by subsidizing manufacturing exports by 12% (the average subsidy rate for manufacturing in 1985) through the remaining four years of the Fifth Plan (1986-1989), and by 6% during the Sixth Plan period, with no subsidy being granted to agricultural exports. All subsidy rates are provided on an ad valorem basis and directly paid out of the government's budget. Also, to eliminate the tariff induced bias against exports, the tariff rates are decreased gradually from their 1985 levels, and are abolished completely in 1990.

To further reflect the positive bias towards export-oriented manufacturers, the public investment shares of these sectors are increased at the expense of agriculture. More specifically, agriculture's share of the public investment fund is set at 8%, whereas the manufacturing sectors are allocated a sum of 43%.

Finally, in order to account for the repressive policies towards labor, frequently associated with the orthodox export-oriented policy packages, the rate of growth of the organized labor wages is assumed to be only half of the rate observed under the alternative ALMI strategy.

As an alternative to MXLI, the ALMI strategy is implemented by shifting the investment structure towards Agriculture and those sectors which have strong backward and forward linkages with Agriculture, namely Intermediates and Machinery. Thus, Agriculture's share of the government investment fund is gradually increased to 25% of the total, by the end of the Fifth Plan period. Private investment behavior, on the other hand, is allowed to be determined endogenously, responding to sectoral deviations from the economy-wide average rate of return to capital, as is also the case under the MXLI experiment. Retention of this neoclassical property allows the model to move towards an intertemporal, steady-state equilibrium in which all profit rates are equilized across sectors. As the ALMI experiment results indicate however, notwithstanding the increased public investment, the rate of return to agricultural capital remains high so that agriculture continues to claim a significant portion of the private savings as fixed capital investment. It is assumed that the increase in agricultural investment will allow the factor productivity of agriculture to grow at a rate twice faster than the one assumed to be achieved under the MXLI strategy (2.5% versus 1.2% during 1986-89, and 2% versus 1% during 1990-94). Given the prolonged neglect of

the Turkish agriculture which especially has reached to severe proportions during the 1980's, and given its vast potential of unexploited resources, the assumed ALMI rates of agricultural technical productivity growth should be considered modest. In fact, the above assumed ALMI technological progress rates are 20% below the rates hypothesized by Adelman (1984, p. 941) in her simulations of the "Agricultural Demand-led Industrialization" strategy for Korea, where she has taken the average productivity growth rate of all developing countries during the 1970's as her estimate of the technical progress rate achievable under ADLI during the next decade.

With respect to foreign trade, direct export subsidies are equalized and tied to a time-table which gradually reduces and abolishes all export subsidies by 1989, the last year of the FFYP. Further, all tariff rates are reduced to 10% and equalized across all sectors, so as to remove the anti-agriculture bias associated with having a differential system of incentives that grant higher levels of protection to industry.

The simplification and rationalization of the Turkish system of trade incentives is in fact one of the main recommendations of the World Bank's 1982 Balassa mission, which has concluded that the system of protection in Turkey has traditionally discriminated against agriculture, with protection rates lower than industry on the average of 28%. Similar conclusions have been reached by the Yagci (1984) and Milanovic (1986) studies as well, where the authors repeatedly stressed the need for the gradual narrowing and eventual elimination of the wide variations in protection rates. In particular, Milanovic (p.75) argued that the Turkish export encouragement scheme for the 1980-1984 period was not uniform towards all sectors, nor towards all producers; and that, "it consistently favored producers of capital goods over consumer and intermediate goods industries and, in

addition, gave special incentives to large exporters."

Thus, the ALMI strategy introduces a system of "neutral" protection across sectors in which the implicit anti-agriculture bias is eliminated. In contrast to a scheme of high export incentives, ALMI calls for a redirection of trade incentives where domestic demand plays a leading role under the auspices of an undistorted, open trade regime. Also, as another reflection of adherence to the principle of openness in trade and, further, to assure comparability among the two runs, the nominal exchange rate is adjusted each year so as to offset any differential between the domestic and the world inflation rates.

In short, then, the experiment results of the ALMI in comparison to the MXLI strategy indicate the rate of return to the national economy of a "balanced" development strategy that does not discriminate between agriculture and the industry with respect to its foreign trade regime.

Turning back to the macro side, the model's closure rule requires that the government investment/GDP ratio be specified exogenously. To assume comparability among model-runs, this ratio has been fixed at the path projected by the Fifth Plan (except for the third experiment, yet to be described below). The Plan projects for a slow paced rise in the ratio of public investment to the Gross Domestic Product, which is predicted to stabilize around 11.6% by year 1990. Assuming that this particular ratio reveals Turkish authorities' desired rate of public investment in the medium-run, government's investment fund is kept at 11.6% of the nominal GDP for the entire Sixth Plan period, as well.

Finally, as was also mentioned under the discussion of the MXLI experiment, the ALMI rate of growth of the organized labor real wage rate is assumed to be 50% higher than the one envisaged for the MXLI. This

assumption, in part, reflects the expected salient character of ALMI towards labor as well as its democratic orientation. However, these assumed political attributes should not be taken as the identifying institutional characteristics of the above distinguished experimental economic regimes. Certainly, one can count numerous other factors besides government's sectoral priorities in investment and trade which may affect the evolution of the Turkish socio-political structure in the next decade, a full investigation of which is surely beyond the scope of this paper.

What needs to be stressed here is the wage-goods orientation of the ALMI strategy, which calls for building a strong domestic mass-consumption market that puts primary emphasis on the satisfaction of the domestic wants. And, it is this particular nature of ALMI that is likely to raise the factor remunerations of workers, in order to generate the foundations of the strong domestic "mass-consumption market." The MXLI, on the other hand, seeks its source of demand in foreign markets, and tends to observe the wage bill only as a "cost item", hence the need for suppressing the real wages.

We now turn to the analysis of the experiment results. As can be seen from Table 4, on the basis of domestic macro performance, ALMI's results fare substantially better than those of the MXLI's. Both the real GDP and real consumption have consistently higher growth rates under the ALMI experiment.

Mainly as a result of the faster economic growth, real private savings and capital accumulation is higher with the ALMI strategy, as well. With increased per capita incomes, private households are able to increase their real private savings at an average annual rate of 5.6%, as compared to MXLI's 4.0%. Thereby the capital accumulation is also more rapid under ALMI, where aggregate real investment grows at 9.1% per annum on the

average.

With faster capital accumulation, capital is more abundant under ALMI. This, in part, explains the lower average profit rate figure of the ALMI experiment (21.7% versus 24.1%). Another explanatory factor is embedded in our very assumption that, with ALMI, the organized labor real wage rate grows 50% faster as compared to the MXLI's. Further, observe that the higher growth of the organized labor real wage rate does not strain the ALMI economy; on the contrary, more labor is able to find employment at the higher organized labor wage rate. This suggests that in the ALMI economy labor productivity rises faster, and, in effect, this "permits" the manufacturing real wages to grow at a rate higher than the one observed in the MXLI economy.

Table 4: Experiment Results

<i>Results in Final Year (1994)</i>	<i>MXLI</i>	<i>ALMI</i>	<i>ALMI-SEL</i>
Real GDP ¹	11412.5	12787.8	12530.2
Real Private Consumption ²	8041.4	8771.7	8574.4
Real Private Savings ²	1038.5	1194.1	1148.2
Aggregate Real Investment ³	3010.1	3505.2	3243.6
Average Profit Rate (%)	24.1	21.7	21.6
Organized Labor Employment ⁴	3390.7	3688.4	3435.4
Agricultural terms of trade ⁵	128.9	95.5	94.9
Merchandise Exports ⁶	19.8	17.4	18.5
Merchandise Imports ⁶	25.5	26.1	24.3
BOP Deficit	-0.4	3.0	-0.1

Growth Rates to Final Year (Annual %)

Agriculture	3.7	6.2	6.2
Food Processing	3.9	5.6	5.6
Textiles, Clothing	10.1	6.6	6.7
Intermediates	7.2	7.5	7.6
Machinery	8.2	8.9	8.5

Table 4 - Continued

	MLXI	ALMI	ALMI-SEL
Social Overhead	6.5	7.7	7.1
Services	5.5	5.5	5.3
Real GDP	4.9	6.2	6.0
Real Private Consumption	4.5	5.5	5.3
Aggregate Real Investment	7.3	9.1	8.2
Merchandise Exports (Nominal)	11.5	10.0	10.7
Merchandise Imports (Nominal)	9.5	9.7	8.9

Growth Rates of Real Wages (Annual %)

Rural Labor	3.4	2.9	2.8
Organized Labor	2.0	3.0	3.5
Unskilled Labor	-0.3	1.1	0.5
Service Labor	2.7	4.0	3.8

Index of Real Absorption in 1994 (1985=100)

Agriculture	142.5	171.3	169.9
Food Processing	143.8	163.3	160.0
Textiles, Clothing	209.6	180.7	176.0
Intermediates	177.9	185.2	181.8
Machinery	183.0	195.9	183.4
Social Overhead	176.8	195.3	186.1
Services	164.7	165.8	162.1

Index of Physical Capital Stocks in 1994 (1985=100)

Agriculture	162.8	210.6	211.0
Food Processing	264.4	206.2	200.3
Textiles, Clothing	335.8	233.8	215.3
Intermediates	149.6	163.2	168.8
Machinery	269.4	312.1	325.3
Social Overhead	146.5	141.8	142.9
Services	120.4	118.6	116.6

-
- 1) Valued at market prices, 1981 Base
 - 2) Deflated by CPI, 1981 Base
 - 3) Deflated by the Capital Price Index, 1981 Base
 - 4) 1000 x Man years
 - 5) Ratio of the agricultural to the non-agricultural sectors' producer prices (1985=100)
 - 6) Current billion US\$.

A closer look at the growth rates of the real manufacturing wages further illustrates this point. In addition to the slower rate of growth of the organized real wage rate, both the unskilled and the service labor categories experience lagging wage incomes under MXLI experiment. In fact, with MXLI, the unskilled labor real wage rate averages *minus* 0.3% per annum. This comes on top of the observed severe decline in the manufacturing wages during the 1980-1985 period. Clearly, the MXLI strategy continues to impose a very harsh pressure on urban real wages, and raises doubts so as to whether it would be possible to restrict the rate of growth of those wages to a very slow -- or even to a declining -- growth path throughout the whole 15-year period. From a cultural and social standpoint, it may be very hard to keep the workers' wage demands in check for such a long period of time. Especially, given its political and organizational experience during the free collective bargaining era of the past two decades, it may prove to be very difficult to achieve further cutbacks in the share of labor in total manufacturing value added.

On the rural side, however, the MXLI results indicate that the rate of growth of the agricultural real wage is more rapid than its counterpart under ALMI. This result, of course, comes as no surprise especially when it is considered in relation to the movements of the agricultural terms of trade across the two experiments. Under the MXLI experiment, the agricultural terms of trade index reaches to 128.9 (with 1985=100), whereas with ALMI it registers a slight fall (to 95.5).

This reveals that, under ALMI, taking both price and income effects into account, the rate of increase in agricultural productivity is faster than the rate of increase in agricultural prices. In the absence of any negating market restrictions, the relative abundance of the agricultural

good exerts downward pressure in its price and relatively reduces the rate of growth of farmers' incomes. This result is consistent with the findings of the Adelman & Robinson (1978) and de Melo (1978) studies as well. Yet, strictly speaking, occurrence of this phenomenon may run counter to the objectives of the ALMI strategy which puts primary emphasis on the dynamic rural-industrial demand linkages. This point, in fact, is strongly stressed in Adelman (1984, p.945), who argues that "the appropriate dynamic incentives (which this policy aims at fostering) will not materialize if shifts in domestic terms of trade against agriculture are allowed to negate the income benefits of productivity improvement", and that "a continued stream of technological improvements can only be expected from farmers if they experience continuing improvements in their incomes". What is needed -- along with the productivity-improving effects of the ALMI strategy -- then, is a "terms of trade policy" which will guarantee that the fruits of the increased agricultural productivity will be equally shared by both farmers and the urban consumers.

The elements of this policy are plentiful and do not necessarily call for the government's regulation of agricultural prices through price floors, and what not. Though, they certainly include the elimination of the biased trade policies which distort incentives against agriculture and impose implicit taxes on agricultural exports. The assymetric treatment of agriculture, which is often implicit in many developing nations' trade regimes, causes agriculture to seem relatively less profitable, with the end result that economic resources are diverted away from that sector to heavy industries, where domestic resource costs are high, and dynamic linkages with the rest of the economy are limited. International trade policy, therefore, should constitute an important part of any policy package whose

prime objective is to improve rural incomes. Adelman, in fact, recognizes this point, and states that it is possible to implement the "terms of trade policy"... indirectly through international trade rather than through price control and subsidies (by) following an open-economy policy of letting the world market prices set the internal terms of trade". The ALMI strategy, by imposing a uniform tariff rate of merchandise imports, does not discriminate against any sector and allows both agriculture and industry to exploit their full economic potential.

As a matter of fact, the simulation results indicate that, after ten years of the ALMI experience, the *relative* lag in the rural incomes, as compared to the MXLI alternative, is indeed modest. Also, compared with the MXLI results, one can see that the difference in the rural incomes between the two experiments is much smaller than the observed difference in the urban incomes. One factor that explains this outcome is the migration possibilities recognized in the model. Rural migration, as attracted by the differential in the agricultural and the average urban wage rates, releases most of the pressures on agricultural labor that are imposed by the falling output prices.

Thus, the experiment results suggest that, given the migratory possibilities, negative terms of trade effects of the ALMI strategy are not likely to be severe, and can in principle be counterweighed by appropriate social policies that are designed to improve the material welfare of farmers, such as more investment in human capital, improved education, better health facilities, and the like.

A case can also be made for dispersing the industrial activities more evenly (in the geographical sense) by making the industrial capital more mobile across regions. This policy option, in fact is strongly advocated by

Schuh (1976), who states that, policies which aim at more decentralization of the industrial activities would result in "...more efficient factor markets serving agriculture, (which) in turn, would serve for a reduction in the disparity in per capita incomes between the agricultural and non-agricultural sectors" (p. 57). Such a policy would also induce "...a more optimal rate of investment in human capital (by increasing) the rate of return on investment in agricultural research and extension (and by allowing)... the rural communities to capture the returns to such investment" (pp. 56-57).

Further, in this context, Schuh argues that a distinction has to be made between *sectoral* and *regional* migration; and that "while the sectoral migration should be *encouraged* and facilitated to accommodate the changing conditions of supply and demand" (p. 62), it has to be recognized that regional outmigration can impose sizable negative externalities on the supplying region by draining its most critical resources through a selective process which "...can cause the migration to be either non-equilibrating, or to require an inordinate amount of time for equilibrium to be reached" (p. 60). Thus, in effect, policies designed to induce capital to the low-wage, low-income areas would "...provide a means of retaining the human capital and skills in the immediate area, (thereby) internalizing the externalities. The outflow of conventional capital would also be retarded or stopped, and the local tax base would remain strong" (p. 55).

Now, turning our attention to the international trade, we observe that the overall performance of ALMI is not as strong and convincing as in the previous macro indicators. The average rate of growth of the nominal value of merchandise exports cannot exceed the 10% mark, and poorly contrasts with MXLI's average rate of 11.5%. When the overall situation of the balance of

payments is considered, it can be seen that MXLI succeeds in closing the Sixth Plan period with a surplus of US\$ 0.35 billion where ALMI scores a deficit of US\$ 3.01 billion. The BOP deficit, if valued in domestic currency, comprises about 9.5% of the total savings generated in the ALMI economy, and raises serious doubts about the feasibility of the favorable results achieved in other macro categories. As the model results indicate, the ALMI strategy seems to allow the Turkish economy to reach her historical growth rate of 6-7%, with increased capital accumulation and higher private incomes. However, in terms of self-reliance and economic dependence, its prospects are very gloomy, as the economy still remains dependent on foreign borrowing and on the exogenous flows of workers' remittances.

The overall conclusion that emerges from the model results is thus clear: if Turkey attempts to solve her Balance of Payments problems solely through a foreign trade policy of heavy export subsidies, coupled with a persistent emphasis on manufacturing orientation that does not take into account the dynamic agriculture-industry interlinkages, nor the needs of the domestic markets, the end result will be a slow-growing economy, with suppressed wage-incomes and a hesitant domestic demand recovery. On the other hand, a primarily domestic demand oriented, wage-goods strategy that focuses exclusively on developing the domestic production network of sectoral interlinkages, seems to achieve the objectives of more rapid growth, higher per capita incomes, and rationalization of the economic structure; yet fails to create a self-reliant economy, that will not be constrained by the availability of foreign funds.

The best strategy, therefore, is a mixed one, that entails the positive elements of both of the previous two alternatives but attempts to minimize on their adverse consequences. More specifically, what is required is an

economically viable alternative that: 1) is capable of generating sufficiently high economic growth and of raising the rate of investment; 2) gives sufficient emphasis to the needs of the domestic demands as well as the domestic savings; 3) recognizes the need for achieving a more rational production structure where intermediate and final demand linkages across sectors are taken into account and none of the sectors is discriminated; and finally, 4) is capable of generating sufficient export revenues so that it will not likely be hampered by the binding foreign exchange constraints.

In order to test the feasibility of such an alternative, a third experiment has been conducted which in effect attempts to blend the ALMI strategy with a selective export promotion policy. This experiment is to be referred as the "Selective ALMI Strategy", or "ALMI-SEL" in short; and in addition to the policies of the simple ALMI strategy described above, it imposes the following:

1) For the Intermediates and the Machinery sectors, instead of gradually eliminating the direct export subsidies by 1990, hold them at their 1986 levels throughout the FFYP period (1986-1989), and then start decreasing them gradually and abolish altogether by 1994.

2) Continue to follow a constant PLD real exchange rate policy throughout the FFYP; however, for the Sixth Plan period, let the parity slide down by devaluing the PLD real exchange rate by an average of 5% per annum.

3) To compensate for the expected loss in foreign savings due to the attempts towards eliminating the Balance of Payments deficit, increase the government investment fund, bringing its nominal value to 14% of the GDP throughout the whole experiment period.

4) In order to finance government's investment requirements and to

allow non-inflationary implementation of these policies, increase household income tax rates -- by 1% for the rural and worker households, and by 1.5% for the capitalist households.

5) Increase the rate of growth of the organized labor's real wage rate to an average of 3.5% over the whole experiment period (1.5% higher than the rate assumed for MXLI) to allow for the increased productivity of that labor category.

Thus, ALMI-SEL recognizes the Intermediates and the Machinery sectors as the "infant-export industries" and provides additional (yet quite modest) export incentives through the Fifth Plan period by holding their direct export subsidy rates at their 1986 level (10%), during when for the other other sectors, the subsidies are in the process of elimination. As for the Sixth Plan period, the granted export subsidies are tied to a time-table which gradually diminishes their rates to nill by the end of the experiment period. What is implemented with this policy is, therefore, a typical "infant industries" program which grants certain additional incentives to selected sectors for a pre-determined period of time, at the end of which the selective treatment will be eliminated. The suggestion to follow an infant manufactured-exports program is, in fact, not new and has been advocated in the CGE modelling study by Dervis & Robinson (1978), and also by Boratav (1984a). It is hoped, with the implementation of such a program, that the traditional light-manufacturing and primary exports orientation of the Turkish economy will be redirected towards more complex industries which, in the mean time, will be able to utilize their potential economies of scale and "deepen" the industrialization process.

The World Bank's 1982 Balassa mission to Turkey lends support to this argument as well, in stating that Turkey's comparative advantage is to be

found neither in the simplest most labor-intensive goods, nor in the most capital-intensive products. Rather, "it lies in the large range of goods between the two extremes, and increasingly skill-intensive products"; and that, "in the longer term, Turkey's comparative advantage will increasingly lie in electrical and non-electrical machinery, machine tools, and electronics" (World Bank, 1982, p. 22).

The third column in Table 4 presents the main economic indicators of the ALMI-SEL experiment. As can be observed, average rates of growth of real GDP, real private consumption and real aggregate investment are slightly below the rates achieved under ALMI, but still substantially higher than those of the MXLI. The slowdown of the engine of economic growth relative to ALMI is mainly due to the loss of extra foreign resources injected to the domestic economy by way of deficits in the balance of payments. Even so, capital accumulation remains remarkably high thanks to the increased rate of growth of real government investment.

With respect to foreign trade, we see that ALMI-SEL's results remain favorable. Nominal exports rise by an annual average rate of 10.7%, and, though below the rate achieved by the MXLI, they suffice to close the balance of payments deficit by reaching a modest surplus of US\$ 0.1 billion in 1996.

Thus, a comparison of the three model runs suggests that, on the basis of the broad macroeconomic indicators examined thus far, ALMI-SEL presents itself as an economically viable and feasible alternative, achieving considerable success both on the domestic and foreign macro indicators.

A further macro-level comparison of the three experiments can be made using the results from the factor markets. Such a comparison indicates that the real wage growth rates of the ALMI-SEL economy follow a similar path as

the one under the ALMI economy. It has to be remembered in this context that under the ALMI-SEL experiment, the organized labor real wage rate is assumed to grow at an average rate of 3.5% per annum, which is significantly higher than the assumptions that were made in the ALMI (3%) and the MXLI (2%) experiments.

As a matter of fact, under ALMI-SEL, the rate of growth of the average nominal manufacturing wage rate reaches 21.8% per annum -- the highest of the three experiments. This affirms that the internal logic of the ALMI-SEL rate of growth and export performance does not rely on suppressed wage demands that restrain the domestic demand on the otherwise exportable output, as was in the case of the MXLI strategy.

This phenomenon should, first and foremost, be attributed to the efficiency gains of a more rational economic structure that allows for rapid increases in real wage rates by increasing the rate of productivity growth of all sectors. Higher productivity growth implies higher wage-incomes and profits which, in turn, lead to a higher level of consumption demand and increased savings. Thus, growth breeds further growth, and the economy is, on a sustainable basis, able to reproduce itself for expanded production and in the mean time is able to meet the wage demands of the workers. For the MXLI economy, however, the foreign demand on manufactured exports alone cannot generate the same dynamism and settles the growth path of the economy to a slower paced one.

As a final inference from Table 4, we also observe that the rate of growth of the industrial capital stock is more rapid under ALMI-SEL, indicating that the linkage effects are working. Indeed, in the MXLI experiment, Food Processing and Textiles are the only manufacturing sectors that achieve higher physical capital stock indexes. On the other hand, in

the heavy manufacturing industries of Intermediates and Machinery, capital accumulation is more rapid under ALMI and ALMI-SEL.

Generally speaking, the heavy export emphasis of the MXLI strategy seems to be capitalized by the "export-oriented", light-manufacturers such as food, textiles, clothing and leather, which, on the basis of their traditional comparative advantage, expand rapidly, and, along with Agriculture, exhaust the investable resources of the private savings pool. ALMI-SEL on the other hand, achieves what MXLI fails to do with respect to heavy manufacturing, by generating strong domestic demand pulls for those sectors, as well as by an energetic public investment program which emphasizes accumulation of capital in key linkage-industries. On this account, ALMI-SEL accomplishes the best results, as with an index of 168.8 in Intermediates, and an index of 325.8 in Machinery, accumulation of real physical capital is the most rapid with this experiment.

The foregoing discussion of the model runs suggests that, coupling a proper export-incentives program with a public investment strategy that seeks a balance between the wage-goods and the capital goods industries in an overall consistent framework, where the dynamic interlinkages of the economy are taken into account, Turkey can attain her export targets without causing undue strain on her domestic markets. The elements of this strategy also includes an income distribution and a social welfare policy geared towards the improvement of the rural people's material well-being in order to combat the pressures of the likely negative terms of trade on their incomes.

We have further seen that government's sectoral investment decisions play a key role throughout the whole process in generating the crucial intermediate input demand pulls for the capital-investment producing

sectors. The next section brings together the distinguishing elements of the alternative strategy of growth and further attempts to deduce some policy conclusions for other middle-income developing countries, as well.

5) Discussion

a) Elements of the New Strategy of Growth

The foregoing analysis clearly indicated the importance of the vitalization of the domestic demand and also the key role that could be played by the domestic agriculture in promoting the industrialization objectives of Turkey in the coming decade. The forward runs of the model suggested that by combining a selective export promotion program with a domestic demand oriented, wage-goods strategy which focuses primarily on the development of the domestic production network of sectoral interlinkages, Turkey can achieve a superior growth performance over the current strategy of manufactured export-led industrialization.

In general, the superiority of a rural-development led, wage-goods oriented industrialization strategy seems to rest on the following three distinguishing advantages: 1) expansionary increases in the national income through technological change in agriculture, along with its consequent multiplier effects on manufacturing growth through the dynamic intersectoral resource-pulls; 2) a change in the level and structure of domestic production which can be manipulated to satisfy a higher level of domestic absorption via increases in wage-goods; and 3) induced shifts in the relative demand for factors of production in favor of labor through increases in labor productivity.

Arguments based on agricultural pessimism in the Third World often ignore those dynamic mechanisms that agricultural growth may invoke throughout the rest of the economy. Yet, as the model runs clearly suggest,

agriculture is a potentially dynamic sector, and can be used as a leverage to achieve a wide array of development objectives. We have seen in section four, for instance, that rapid agricultural growth generates more efficient growth patterns in the production processes of the consumer oriented sectors, as it releases the contractionary pressures of their high cost inputs. This phenomenon can be very conducive for designing macro policies to combat domestic inflation. Further, it was observed that, with proper incentives and a proper investment policy, agriculture can display sufficient flexibility to absorb the burden of price adjustment, releasing productive resources to be employed within the industry.

In sum, the model runs emphasize the pressing need for a careful reevaluation of the current policies towards agriculture, and suggest that a conscious redirection of the government's incentives and investment priorities which is so designed to induce structural changes in the functional role of that sector -- from that of *surplus extraction* to one of *surplus creation* -- will be more effective in promoting Turkey's overall objectives of growth, income equity and trade over the Fifth and Sixth Plan periods.

The *income distribution consequences* of the new strategy will be complex. Generally speaking, based on the model solutions with respect to the functional distribution of income, the new strategy of growth is likely to increase the relative incomes of the poor and of the urban laboring classes markedly. This, after all, will be the logical outcome of a wage-goods oriented strategy of development which is based on the expansion of the domestic market. With respect to the rural labor, on the other hand, the progressive distributionary effects of the alternative strategy will depend on how fast the productivity increases in agriculture can be

translated into higher material incomes through movements in the domestic terms of trade. However, the matter is not only pricing issue. Government's social policies towards human capital build-up in rural areas, by way of massive public investments in health, education, transportation and electrification, will also be equally important in improving the material welfares of the rural poor. This second point is, of course, a part of the social welfare objective, but it is equally part of the industrial growth strategy, in that it would mean additional effective demand for the products produced by the domestic industry.

The *technology adaptation* aspects of the proposed strategy are likely to have favorable effects for the rural poor as well. As Hayami & Ruttan (1985) painstakingly point out, agricultural "bio-technology", in contrast to "mechanical technology", is *scale-neutral* and *divisible*, thus making it possible for the small/medium size farmers to have easy access to such technology. Further, there is strong evidence in the economic literature that small/medium size farmers use mostly labor intensive methods of production; are very responsive to production incentives; and tend to invest heavily in human capital formation.¹¹ In the Turkish rural socio-economic structure, in which small-peasantry is observed to be the dominant mode of production¹², these hypotheses will be more likely to translate into higher adaptability and increased labor employment in agriculture.

Overall then, the following distinguishing elements of the new strategy could be identified:

(i) First, priority should be given to increasing agricultural production and securing the domestic network of sectoral linkages through a careful public investment program;

(ii) Based on the expected fact that the new investments will necessitate increases in capital imports, a realistic and comprehensive set of commercial policies would have to be enacted. A realistic foreign exchange policy of currency depreciation along with a selective, time-wise regressive export promotion scheme can be regarded as being the two most important components of the new trade regime. The proposed export promotion scheme is selective and is tied to a time schedule, and is thought to be directed towards the basic intermediates and machine-tools industries, through which Turkey would be able to develop and exploit her comparative advantage, and in the meantime, would be least likely to face protectionist measures in the foreign markets. In this context, a further case can also be made in favor of an across-the-board scheme of tariff protection, along with a discriminatory policy of domestic taxation to tap the demand for luxury imports, and to provide additional resources for the government budget in order to allow for the anti-inflationary implementation of its investment policies;

(iii) In order to counter the likely negative effects of the falling domestic terms of prices against agriculture, a social welfare program of rural development through expanded investments in human capital should be enacted;

(iv) Based on the fact that agricultural development -- by its nature of small-scale production units and the overall irregularity of the production process -- requires a considerably decentralized administrative structure (Mellor, 1976), more participatory forms of government and decision-making should be encouraged.

In a nutshell, then, the proposed strategy entails elements of an industrialization program, an employment program, an income distribution

program, and a social community-development program. Further, due to its underlying economic and social structures, the new strategy of growth is expected to inherently allow (or rather to warrant) more participatory forms of government, a fact which would be very conducive in speeding up the democratization process of the civil political life in Turkey.

b) *Policy Implications of the New Strategy for the Developing Countries*

In this section I will try to place the elements of the new strategy into the theoretical perspective of the international development literature in an attempt to infer some global policy implications regarding the industrialization efforts of the other middle-income developing countries during the 1990's.

Overall, a wage-goods oriented, agriculture-linked manufacturing growth strategy appears to be most promising for those developing countries which have a potentially large domestic market and a proven responsive agriculture, along with an established physical infrastructure and industrial base. As Adelman (1984, p. 948) attests, practically this would mean most of the middle-income and the large low-income countries, which have not already reached the NICs' status of proven export potential, or those which are not anticipating a sufficient rapid growth in the world demand for their non-traditional exports.

In fact, the observed stagnation of the volume of world trade in the first half of the 1980's, along with the rising tide of the protectionist sentiment in the developed market economies, have already led a number of scholars to call for a reassessment of the feasibility of export-led growth as the major development dynamic for most LDCs in the coming decade (e.g., Kaplinsky, 1985; Cline, 1982; Sampson, 1980; Streeten, 1982).

Based on his observations on the changing nature of the global economy,

for instance, Kaplinsky (1985) argues that the international context of the coming decade is not likely to allow export-led strategies of development to serve as a viable alternative for the less developed countries. First, he argues that, mostly fueled by the enigma of the prolonged recession the incidence of protectionism in the advanced countries is more likely to grow than to decline, and given the limited/weak bargaining power of the LDC governments, their exports are relatively worse affected (p. 78; see also: Verreydt & Waelbroeck, 1980; and/or Sampson, 1980). He further notes that the degree of protection seems to increase proportionally with the extent of value added involved, and "appear to be highest in the labor intensive sectors where LDCs are being advised to specialize on the basis of comparative advantage".¹³ This fact seems to hinge upon the observation that "the *specific* impact of these LDC exports on individual firms, plants, workers and regions producing in developed countries is visible compared to the *generalized* benefits arising from lower-priced consumer goods or expanded LDC purchasing power" (p. 78, italics original).

A third observation propagated by Kaplinsky is due to the radical electronics-based technical change in the manufacture processes. It is argued that with the expanded development and diffusion of the micro-electronics based technologies, the viability and the low wage-cost advantage of the LDC producers will likely to be undermined, since such technologies will allow the automated machines to substitute for the unskilled labor in the production process.¹⁴ This last observation is also important, in that, it indicates a culminating process that may evolve into a structural change of the post-War pattern of trade in which intra-industry trade has grown more rapidly than inter-industry trade.¹⁵ Generally speaking, this phenomenon will likely undermine the logic of building "world

factories" and shipping parts around the world, and will place the relative burden of protection against LDC exporters who are not yet part of the "internationalized production network".¹⁶

Finally, it has been argued by Cline (1982) that there are inherent limits to generalizing the export successes of the NICs to other LDCs, the so-called "fallacy of composition". In his careful simulation exercise, he calculates that if all LDCs had the same export-intensity as the East Asian Gang of Four (South Korea, Taiwan, Singapore and Hong Kong), adjusting for differences in size and level of industrialization, this would imply a seven-fold increase in the manufactured exports of the Third World countries. "This expansion would imply a rise in the LDC share of the market for manufactured imports from 16.7 to 60 percent for the industrial countries, and from 27.0 to 74.4 percent in the United States. (Further) (...) if the product composition is held the same as in the base period (1976), several food sectors show imports from LDC's in excess of the entire domestic market" (p. 85). Based on these observations, Cline argues that protectionist response is likely to follow the attempts to generalize the East Asian export-led model of growth.¹⁷

It has to be noted in this context that, although this paper shares most of the elements of the growing disenchantment in the economic literature towards the viability of an export-led growth strategy for most LDC's in the next decade, its main propositions do not necessarily hinge upon any kind of an empirically questionable argument based on export pessimism. Rather, as stated in the introductory pages, the underlying motivation of this study has been based on the observation that, as there are inefficient strategies of import-substitutionist growth, there can also be inefficient styles of the export-oriented development strategy. Surely, the empirical debate on

whether the Turkish economy, or the developing countries in general, will be able to sustain rapid rates of export growth in the immediate future is very important in every aspect of the new development strategy, but the point is that its economic rationale is not conditional upon a negative attitude towards the future export potentials of the LDC's.

This brings us to yet another parable of this study, and it is the basic argument that there is no such eternal strategy that can be valid for all countries at all times. In the Turkish context, for instance, it was observed that the early import-substitutionist strategy was quite conducive in giving an original stimulus to the Turkish industry during the 1960's. However, this initial momentum was quickly exploited by late 1970's, and that strategy has failed in its planned targets. The 1980s' strategy of manufactured export-led growth, on the other hand, has been instrumental in increasing merchandise exports, and also changing their composition in favor of the manufacturing industries. Yet it could not provide sufficient invigoration to the domestic economy, and raised serious concerns over the next decade if/when the export potentials of the export promotion scheme has reached its limits. As we have seen in section four, over the medium-run, the model runs clearly suggest the superiority of a domestic demand-based industrialization strategy which is primarily oriented towards the production of wage-goods and towards the simultaneous expansion of the intermediate industries and the overall absorption capacity of the domestic economy.

The relevance and applicability of this conclusion to the other middle-income developing countries depend, of course, on the specific structural conditions of those indigenous economies, and also on the changing economic and political conditions of the global international environment.¹⁸ In the

mean time, however, it is important to emphasize that, potentially viable alternatives to export-led growth do exist, and many developing countries are likely to benefit from a careful reevaluation of their arsenal of alternative policy options in the 1990's.

FOOTNOTES

- 1) See Milanovic (1986) and Yagci (1984) for a comprehensive evaluation of the protection and the export-incentive schemes in Turkish manufacturing since 1980.
- 2) Yagci, 1984, pp. 125-126.
- 3) World Bank, 1982, p. 49
- 4) Ibid, p. 50.
- 5) Calculated from the SPO Annual Programs, and from the Turkey data files of the World Bank (1986, Table 3.2). In order to ensure comparability with the SPO's sectoral aggregation scheme, exports of lightly manufactured agricultural products, such as processed tobacco, canned fruits, etc. are included among the manufacturing industries.
- 6) For example Berksoy (1985, p. 145) indicates that the temporary stagnation of exports in 1983 can mainly be explained by the sudden drop (by 4%) of the export demand of the Middle Eastern countries in that year.
- 7) Milanovic, 1986, p. 9-20.
- 8) For example, in 1984 the TL value (using the average quarterly exchange rate) of the tax rebates granted to manufacture stood at 11.5% of the total consolidated budget revenues of the government.
- 9) TUSIAD, (Turkish Industrialists and Businessmen's Association) Annual Report, 1985, p. 16.
- 10) TUSIAD, 1985, p. 40-43.
- 11) See e.g., the World Bank (1982) *World Development Report*. New York: Oxford University Press.
- 12) See, e.g. Keyder (1983); Boratav (1983, Ch. 2) or Tutengil (1983). For a recent review of the Turkish agriculture and its rural class structure from a political point of view, see Seddon & Marguiles (1984).
- 13) Boratav (1984a) and (1984b) shares this argument for the Turkish exportables, as well.
- 14) Kaplinsky (1985, pp. 79-84). For a more general investigation of the constraints faced by small-scale producers in the developing countries, see Schmitz (1982).
- 15) For a good discussion of intra-industry trade in the context of developments in the world trade regime, see Ruggie (1983).

- 16) Kaplinsky, *ibid*, p. 78 and 82. See also Frobel et. al. (1980) who provide an extensive research on the patterns of international division of labor, based on the mobility of international capital and the increased use of low-cost labor in the designated sites of the Third World -- the so-called "world factories of production".
- 17) In this context, see also the critical discussion by G. Ranis (1985) "Can the East-Asian Model of Development be Generalized: Comment" *World Development* 13(4), April pp. 478-484; and "Reply" by Cline (1985), same issue, pp. 547-548.
- 18) For example, for some political scientists, the current global recession can be attributed to the disequilibrating pressures of the erosion of the non-rival hegemony of the United States in the world economy and international politics, and to the painful transitional phase towards a world system of many hegemonic states, none of which have the ultimate supreme power. For the political implications of this view, see, e.g. R. O. Keohane (1984) *After Hegemony: Cooperation and Discord in the World Political Economy*, New Jersey: Princeton University Press.

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APPENDIX: Equations of the Model

This appendix lists the equations of the CGE model. Endogenous variables are denoted by capital letters without any bar (-) on them. All capital letters with a bar, lower case letters and the Greek characters are exogenous variables or parameters. Letters with a circumflex (^) are policy variables to be set exogenously by the government. Time subscript t is omitted for all variables unless there are time lags are involved. The subscripts i and j are used for sectors. Unless otherwise noted, they range from 1 to 7 (total number of sectors). The subscript s refers to different skill types of labor and range from 1 to 4.

1. Prices

$$PM_i = \overline{PWM}_i \cdot (1 + \hat{tm}_i) \cdot \hat{ER}$$

$$PE_i = \overline{PWE}_i (1 + \hat{te}_i) \cdot \hat{ER}$$

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

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

$$PVA_i = PX_i (1 - \hat{tn}_i) - \sum_j PC_j a_{ji}$$

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

$$\sum_i PC_i \cdot \Omega_i = \bar{P}$$

2. Factor Markets and Product Supplies

$$XS_i = \overline{AD}_i \prod_s L_{is}^{\alpha_{is}} \overline{K}_i^{\alpha_{ik}} \quad \text{with } \sum_s \alpha_{is} + \alpha_{ik} = 1$$

$$INT_i = \sum_j a_{ij} XS_j$$

$$PVA_i (\partial XS_i / \partial L_{is}) = \lambda_{is} W_s$$

$$W_2 = \overline{WRRL} \cdot \overline{P}$$

$$UNEMP = \overline{LS}_2 - \sum_i L_{i2}$$

$$\sum_i L_{i3} = LS_3 + UNEMP$$

$$\sum_i L_{is} = \overline{LS}_s \quad \text{for } s=1 \text{ and } s=4$$

$$\overline{LS}_1(t+1) = (1+\Gamma_1) \cdot \overline{LS}_1(t) - MIG(t)$$

$$\overline{LS}_s(t+1) = (1+\Gamma_s) \cdot \overline{LS}_s(t) + (\overline{SM}_s) \cdot MIG(t) \quad \text{for } s \geq 2$$

$$MIG(t) = \mu [(\overline{EW}_u - W_1)/W_1] \cdot \overline{LS}_1(t)$$

$$\overline{EW}_u = [\sum_i \sum_{s=2} W_{is} \cdot L_{is}(t)] \cdot (1/L_u(t))$$

$$RP_i = PVA_i \cdot XS_i - \sum_s L_{is} \cdot \lambda_{is} \cdot W_s$$

$$\pi_i = RP_i / PK_i \cdot \overline{K}_i$$

3. Income Generation, Savings and Investment

$$YH_R = PVA_1 \cdot XS_1 + \overline{SREM} \cdot \overline{WR} \cdot \hat{ER} + \overline{SPBOR} \cdot \overline{PBOR} \cdot \hat{ER}$$

$$YH_W = \sum_{i=2}^7 \sum_{s=2}^4 L_{is} \cdot \lambda_{is} \cdot W_s + (1 - \overline{SREM}) \cdot \overline{WR} \cdot \hat{ER}$$

$$YH_K = \sum_{i=2}^7 RP_i + (1 - \overline{SPBOR}) \cdot \overline{PBOR} \cdot \hat{ER}$$

$$YG = \text{TARIFF} - \text{EXSUB} + \text{INDTAX} + \text{TOTHHTAX} + \overline{GBOR} \cdot \hat{ER}$$

where:

$$\text{TARIFF} = \sum_i \hat{tm}_i \cdot \overline{PWM}_i \cdot M_i \cdot \hat{ER}$$

$$\text{EXSUB} = \sum_i \hat{te}_i \cdot \overline{PWE}_i \cdot E_i \cdot \hat{ER}$$

$$\text{INDTAX} = \sum_i \hat{tn}_i \cdot \overline{PX}_i \cdot XS_i$$

$$\text{TOTHHTAX} = \hat{t}_r \cdot YH_R + \hat{t}_w \cdot YH_W + \hat{t}_k \cdot YH_K$$

$$\text{HHS}AV = \sum_h \bar{S}_h \cdot YH_h \cdot (1 - \hat{t}_h) \quad h = R, W, K$$

$$\text{GIF} = \hat{S}_g \cdot \text{GDPMP}$$

$$\text{DST}_i = \psi_i \cdot XS_i$$

$$\text{DKP}_i = \overline{HP}_i \cdot (\text{HHS}AV + \text{FSAV} \cdot \text{ER} - \sum_j (\text{DST}_j \cdot \text{PC}_j)) / \text{PK}_i$$

$$\text{DKG}_i = (\overline{HG}_i \cdot \text{GIF}) / \text{PK}_i$$

$$\text{ID}_i = \sum_j b_{ij} \cdot (\text{DKP}_j + \text{DKG}_j)$$

$$\bar{K}_i(t+1) = \bar{K}_i(t) \cdot [1 - dp_i] + \text{DKP}_i(t) + \text{DKG}_i(t)$$

$$\overline{HP}_i(t+1) = \overline{HP}_i(t) + \phi \cdot SR_i(t) [\pi_i(t) - \tilde{\pi}(t)] / \tilde{\pi}(t)$$

$$\tilde{\pi} = \sum_i \pi_i \cdot SR_i$$

4. Product Markets and Foreign Trade

$$CD_i = [\bar{Q}_i \sum_h (1 - \bar{S}_h) YH_h (1 - \hat{t}_h)] / PC_i$$

$$GDTOT = YG - GIF$$

$$GD_i = [\overline{QG}_i \cdot GDTOT] / PC_i$$

$$CC_i = \bar{B}_i [\delta_i M_i^{-\rho_i} + (1 - \delta_i) DC_i^{-\rho_i}]^{-1/\rho_i}$$

$$M_i/DC_i = [(\overline{PD}_i/\overline{PM}_i) \cdot (\delta_i/(1 - \delta_i))]^{\sigma_i} \quad \sigma_i = 1/(1 + \rho_i)$$

$$XS_i = \overline{AT}_i (\gamma_i \cdot E_i^{\theta_i} + (1 - \gamma_i) \cdot DC_i^{\theta_i})^{1/\theta_i}$$

$$E_i/DC_i = [(\overline{PE}_i/\overline{PD}_i) \cdot (1 - \gamma_i)/\gamma_i]^{\eta_i} \quad \eta_i = 1/(\theta_i - 1)$$

$$\sum_i \overline{PWM}_i \cdot M_i - \sum_i \overline{PWE}_i \cdot E_i - \overline{WR} - \overline{PBOR} - \overline{GBOR} = FSAV$$

$$CC_i = INT_i + CD_i + GD_i + ID_i + DST_i$$

$$GDPMP = \sum_i PVA_i \cdot XS_i + IND TAX + TARIFF$$

Endogenous Variables

PM_i	Domestic price of the imported good
PE_i	Domestic Price of the exported good
PD_i	Domestic good price
PC_i	Composite good price
PX_i	Output price
PVA_i	Value added price (at factor cost)
PK_i	Price of capital
XS_i	Total supply
INT_i	Intermediate input demand
W^s	Average nominal wage rate
L^s_{is}	Labor demand for labor type-s, by sector-i
$UNEMP$	Unemployed organized labor
RP_i	Aggregate nominal profits
YH^h	Household income (h=R,W,K): R=Rural, W=Worker, K=Capitalist
YG^h	Government budget income
$HHS\Delta V$	Household savings
GIF	Government investment fund (public savings)
DST_i	Inventory stock investment
DKP_i	Real private investment by sector of destination
DKG_i	Real public investment by sector of destination
ID_i	Real aggregate fixed investment by sector of origin
CD_i	Real private consumption demand
$GDTOT$	Aggregate nominal public consumption
GD_i	Real public consumption demand by sectors
CC_i	Armingtonian composite good
M_i	Real imports
E_i	Real exports
$FSAV$	Balance of payments deficit
$GDPMP$	Gross domestic product at market prices

Dynamic Stage Variables

\overline{LS}	Labor supplies
MIG^s	Rural urban migration
EW^u	Expected (average) urban wage rate
L^u	Total urban labor supply
π_i	Sectoral profit rate
$\tilde{\pi}$	Economy-wide average profit rate
HP_i	Private investment sectoral allocation coefficients
\overline{K}_i	Aggregate physical capital
SR_i	Sectoral share in aggregate profits

Government Policy Variables (All exogenous)

ER	Nominal exchange rate
tm_i	Tariff rate
te_i	Export subsidy rate
tn_i	Indirect tax rate (net of production subsidies)
t_i^h	Household income tax rate (h=R,W,K,)
S_i^g	Public savings-GDP ratio
HG_i	Public investment sectoral allocation coefficients
QG_i	Sectoral allocation of public consumption

Exogenous Variables and Parameters

a_{ij}	Input-output coefficients
b_{ij}	Capital composition coefficients
Ω_i^{ij}	Price index weights
\bar{P}	Value of price index (numeraire)
\bar{AD}_i	Production function shift parameter
α_i^s	Production function share parameter
λ_{is}	Coefficient of proportionality of the sectoral wage rate to the average wage rate for labor type-s
\overline{WRRL}	Organized labor real wage rate
Γ_s	Labor supply growth rate
\overline{SM}_s	Share of agricultural labor that joined the urban labor type-s
μ	Migration mobility parameter
\overline{SREM}	Share of remittances accruing to rural household
\overline{SPBOR}	Share of private foreign borrowing accruing to rural household
\overline{WR}	Workers' remittances (in foreign currency)
\overline{PBOR}	Total foreign private borrowing
\overline{GBOR}	Government's foreign borrowing
\overline{PWM}_i	World price of imports
\overline{PWE}_i	World price of exports
\overline{S}_h	Household saving propensities
ψ_i^h	Ratio of inventory stocks to gross output
dp_i	Depreciation rate of the physical capital stock
ϕ	Financial market responsiveness parameter

\bar{Q}_i	Sectoral allocation of private consumption
\bar{B}_i	Shift parameter in composite commodity function
δ_i	Share parameter in composite commodity function
σ_i	Elasticity of substitution in composite commodity function
\bar{AT}_i	Shift parameter in CET function
η_i	Elasticity of transformation in the CET function
γ_i	Transformation function share parameter