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Adjustment, Stabilisation and the Analysis of the Employment Structure in Turkey: An Input-Output Approach

by

Öner Günçavdi, Suat Küçükçifçi and Andrew McKay

Centre for Research in Economic Development and International Trade, University of Nottingham

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Abstract
The aim of the paper is to examine the effects on employment of the large-scale structural adjustment programme undertaken by Turkey from the early 1980s onwards. In this respect, we particularly analyse how appropriate the choices of factor intensity after structural adjustment programme have been in the domestic production in comparison with the availability of domestic factor endowment. Our findings show that foreign trade in intermediate goods creates extra use of domestic labour, which can be considered as the labour cost of importing intermediate goods. This is the case in the majority of industries in the pre- and post-liberalisation period in Turkey. However, the capacity of using extra labour as a result of importing intermediate goods appeared to have decreased in the post-liberalisation period.

Outline
1. Introduction
2. Stabilisation, Structural Adjustment and Employment: Issues and Evidence
3. Methodology
4. Structural Adjustment and Employment Structure in Turkey
5. Conclusion

I. INTRODUCTION

In the inhospitable international setting of the pre-1980 period, Turkish economy pursed an inward-oriented industrialisation strategy, which was supported by high a degree of protectionism. This period was however followed by balance of payment crisis in 1979, which arose basically from the low level of exports and heavy dependence on imported capital goods and raw materials. In order to deal with the crisis, Turkey launched a far-reaching stabilisation and structural adjustment programme in the early 1980s. Due to the dependence of domestic production on imported inputs and the shortage of foreign exchange, Turkey attributed particular importance to trade reform (Baysan and Bilitzer, 1990). An integral part of a large-scale reform programme, the aim of trade reform was to mobilise productive domestic resources towards the fields that Turkey could have comparative advantage in international markets, and could earn foreign exchange. One important result was that the Turkish economy has become more open during the last two decades. For example, in the 1970s, the volume of foreign trade was equivalent to 11 percent of GNP. The same figure increased first to 18 percent in 1980 and then to 43 percent in 1995 (capital and intermediate goods continuing to be the most important items of imports). Turkey still continues to liberalise its foreign trade. A Customs Union was established with the EU in January 1995 as an important step in promoting closer economic integration. It is clear that foreign trade plays an increasingly crucial role in the Turkish economy.

In order to evaluate the success of the reform programme, measuring the factor intensity in production is particularly important in Turkish case. Although Turkey has widely considered as one of the success stories after launching trade reform, there have been few studies examining whether changes in production technology and the structure of foreign trade after the structural adjustment programme took place in according to the expectations of neoclassical theory of comparative advantage. An important question in this respect that has attracted a lot of discussion in Turkey has been how this transformation of the economy has influenced the employment structure.

This paper aims to measure the factor proportion in the Turkish economy, and to see the extent of trade-induced domestic factor savings or costs resulting from the importation of intermediate inputs in production. There have been a number of research to measure

factor intensity and to evaluate the impacts of changes in economic policies on factor proportions in developing countries (e.g Allauddin and Tisdell, 1988; Sarma and Ram, 1989; Hashim, 1996; and Günlük-Şenesen, 1998). An important feature that distinguishes our analysis here from others is the choice of methodology to measure factor intensity. Our methodology follows Riedel (1975), and takes into account domestic factor savings or costs arising from allowing for the use of imported inputs in production in measuring factor intensity.

The reminder of the paper is organised as follows. In section II we discuss the effects of structural adjustment programmes on employment in developing countries. Section III briefly describes the methodology that we use in measuring labour intensity in domestic production. The Turkish experience with the structural adjustment programme undertaken in the early 1980s and its impacts on employment are empirically examined in section IV. Finally section V sets out our conclusions.

II. STABILISATION, STRUCTURAL ADJUSTMENT AND EMPLOYMENT: ISSUES AND EVIDENCE

The issue of the impact of stabilisation and structural adjustment on employment has been considered in some detail in a review by Toye (1995) and in a multi-country World Bank study by Horton, Kanbur and Mazumdar (1991, 1994). Both studies show how the outcome will vary from case to case. From a conceptual point of view, orthodox stabilisation frequently relies on exchange rate devaluation combined with monetary or fiscal contraction. The aim of this combination of measures is to increase the production of tradable goods in the economy while reducing their consumption, so bringing about external balance and macroeconomic stability without major adverse effects on the non-tradable sector. This package includes both measures, which are likely to have an adverse employment impacts (such as fiscal contraction) and others, which are likely to have favourable, impacts (the incentive to increased production of tradable goods). What the net effect on employment is will then vary from case to case depending on the magnitudes of the different effects. This in turn will depend on various factors including the starting point, the precise policy measures put in place, the characteristics of the tradable and non-tradable sectors, how the labour market operates and the responsiveness of the production sectors to changing incentives (Addison and Demery, 1993; Toye, 1995).

Other policy measures included in structural adjustment are also likely to have significant employment effects including privatisation of previously state owned industries, labour market reform, measures which increase the attractiveness of foreign direct investment and trade liberalisation. The last has attracted a lot of attention in recent years, and is of course particularly relevant to the Turkish case. Concerns are often expressed about the adverse employment and other effects of import-competing industries being exposed to greater international competition. And trade itself may lead to skill-biased technical progress (Wood, 1994), which can be expected to have adverse effects on the employment of unskilled workers. But at the same time trade liberalisation can be expected to have favourable impacts on export or potential export industries, as well as on other industries using imported inputs that benefit from trade liberalisation.

From a conceptual perspective then the overall effect of economic reform on employment is ambiguous. This is borne out by the empirical evidence, which finds adverse employment effects in some instances and favourable effects in others. Toye (1995) for instance contrasts the stabilisation experience of Chile from 1973-79 combined with labour market deregulation (which had adverse effects of employment), with the more gradual reform in Indonesia from 1983-1990 which was associated with favourable employment consequences.

For the present case then, neither theoretical arguments nor the experience of other countries give any clear guidance as to whether the impact of stabilisation and structural adjustment in Turkey will have had favourable or adverse effects on employment. This question needs to be considered empirically.

III. METHODOLOGY

According to Riedel's (1975) methodology, total demand for labour in an open economy consists of two components:

(i) The demand for labour arising only from domestic production; and

(ii) The implicit labour demand in earning the foreign exchange with which to purchase the imported inputs required per unit of domestic production.

In this methodology, exports are considered as the only source of earning foreign exchange.

The analysis here is built upon a Leontief input-output model, which is based on the assumptions of fixed input coefficients with constant returns to scale, fixed factor shares in production and perfectly elastic supplies of factors of production. In this model, the labour demand for domestic production is measured as follows.

$$\mathbf{L}^d = \mathbf{E}\left(\mathbf{I} - \mathbf{A}^d\right)^{-1} \tag{1}$$

where $\mathbf{L}^{\mathbf{d}}$ is total (direct and indirect) domestic labour demand matrix, $\mathbf{E}$ the diagonal matrix of direct labour requirements, which is given as the ratio of total labour used in a particular sector to total output in that sector, $\mathbf{I}$ the unit matrix, and $\mathbf{A}^d$ domestic input-output coefficient matrix, all with $(n \times n)$ dimension. The labour demand of a unit of domestic production in industry j is calculated from (1) as follows.

$$\mathbf{L}_j^d = \sum_i \mathbf{L}_{ij}^d \tag{2}$$

where $\mathbf{L}_j^d$ is a row vector of total (direct and indirect) domestic demand for labour arising from a unit increase in final demand for output in industry j. Although final demand includes exports in measuring total domestic demand in equation (2), this measure assumes that all intermediate goods are domestically produced. However, in an open economy, foreign trade in intermediate goods must also be considered in measuring the factor requirement of domestic production. This modification of calculation is crucial because importation of intermediate goods can either save or use extra domestic labour in production. In particular, importing labour intensive goods would allow the economy to save domestic labour inputs. The economy must, on the other hand, earn foreign exchange to purchase imported inputs from abroad, and produce more for exports. This production however will require extra use of labour.

Now we calculate total (direct and indirect) imported input requirements for per unit of the domestic commodity j as follows.

$$\mathbf{M}_j^d = \sum_i \mathbf{R}_{ij} \tag{3}$$

where

$$\mathbf{R} = \mathbf{A}^m \left(\mathbf{I} - \mathbf{A}^d\right)^{-1}$$

$\mathbf{M}_j^d$ is the row vector of total imported input requirement in domestic production. $\mathbf{R}$ is the inverse of imported input coefficient matrix whose elements are noted by $\mathbf{R}_{ij}$. $\mathbf{R}_{ij}$ indicates the total imported inputs required by sector *i* in respond to a unit increase in the final demand in sector *j*. $\mathbf{A}^m$ is the direct imported input coefficient matrix, whose elements show the direct imported inputs provided by industry *i* to produce a unit output of industry *j*. An interesting question that stands out in examining the effects of foreign trade on labour demand, is how much each unit of exports generates factor requirement in domestic production. In order to calculate this effect, we must first measure total (direct and indirect) labour demand in producing a unit of an exported good as follows.

$$L^{Fx} = \mathbf{x}_i \mathbf{L}_\mathbf{j}^\mathbf{d} \tag{4}$$

where $\mathbf{x}_j$ is a column vector implying the proportionate share of the j^{th} commodity in total exports. Equation (4) yields a constant value. This unit export then requires the use of imported inputs in production by the following amount.

$$M^{Fx} = \mathbf{x}_i \mathbf{M}_\mathbf{j}^\mathbf{d} \tag{5}$$

In equilibrium, the total foreign exchange requirement to finance imports in equation (5) is provided by export earnings. In order to produce one unit of exported goods, we directly need L^{Fx} units of labour at the last stage of the production chain from equation (4). However, this extra unit of production for exports stimulates an extra use of imported inputs, so that additional foreign exchange is required to finance these imported inputs. Such a foreign exchange requirement of a unit export, measured by equation (5) in equilibrium, leads to an additional rise in the production of exportable goods by M^{Fx}, which in turn requires $L^{Fx} M^{Fx}$ units of extra uses of labour at the second stage of the production chain. And again this extra production of exports requires imported inputs at the second stage of the production chain. And so on. The sum of all

labour requirements in the original production of one unit of exports in the beginning of the production chain can hence be written as follows.

$$L^{Fx} + L^{Fx}M^{Fx} + L^{Fx}\left(M^{Fx}\right)^2 + L^{Fx}\left(M^{Fx}\right)^3 + ... + L^{Fx}\left(M^{Fx}\right)^n = \frac{L^{Fx}}{1 - M^{Fx}} \tag{6}$$

where $0 \le M^{Fx} \le 1$. Using equation (6), total (direct and indirect) additional factor requirements in earning foreign exchange to purchase total imported inputs of the domestic production, $\mathbf{M}_j^d$ can be written as

$$\mathbf{L}_j^m = \left[\frac{L^{Fx}}{1 - M^{Fx}}\right]\mathbf{M}_j^d \tag{7}$$

Equation (7) shows the total (direct and indirect) demands for both factors in earning foreign exchange, which is necessary to finance total (direct and indirect) demand for imported inputs required by domestic production. Total factor requirements of domestic production are then

$$\mathbf{L}_j^T = \mathbf{L}_j^d + \mathbf{L}_j^m \tag{8}$$

The first term on the right hand-side of equation (8) is the labour demand in the domestic production of final and intermediate goods, and is measured by equation (2). The second one is the additional labour demand necessary to generate foreign exchange (through exporting) to purchase imported inputs required per unit domestic production, and measured by equation (7). Equation (8) implies that the labour demand of an economy is determined not only by the production technology, but also by the structure of foreign trade. In this framework, production technology determines both $\mathbf{L}_j^d$ and $\mathbf{M}_j^d$ whereas the structure of foreign trade is influential on the determination of domestic factor savings or costs measured by the terms in the bracket in equation (7). For example, in an open economy where capital intensive intermediate goods are imported and foreign exchange required to finance these imports is earned by exporting labour intensive commodities, it is likely to expect that foreign trade will induce both savings in domestic capital and the more use of domestic labour.

In order to see the effects of foreign trade on employment, we need to measure the labour demand in the case of no foreign trade. In other words, we calculate labour demand by assuming that all intermediate inputs are produced domestically. This is possible to measure by using the following method.

$$\mathbf{L}_j = \sum_i \mathbf{L}_{ij} \tag{9}$$

where

$$\mathbf{L} = \mathbf{E}(\mathbf{I} - \mathbf{A})^{-1}$$

The measure in equation (8) differs from that in equation (9) that the former allows for the measure of the factor intensity of the exported goods, which are used to purchase intermediate goods not produced domestically. Using these two different measures in equation (8) and (9) we can obtain some economic intuition on the effects on labour demand of allowing for foreign trade. For example, the case where $L_j < L_j^T$ implies that the importation of intermediate inputs in domestic production and the exchange of exported goods to earn the foreign exchange required to purchase these imported inputs increases domestic labour demand in production, *vice versa*.

Price Adjustment Procedure

In order to examine the effects of this change in foreign trade on employment structure of the economy, we need to measure the labour demand created by allowing for imports in intermediate goods both before and after the adjustment, then to compare these figures. However, this type of intertemporal comparison requires us to handle changes in price levels. Using two input-output matrices for different years in current prices, we attempt to adjust coefficient matrices for *s* based on the base year *t* (*s*>*t*) (e.g. see Günlük-Şenesen and Küçükçifçi, 1994).

The deflating procedure involves expressing $\mathbf{A}_s$, the matrix of technical coefficients, in the prices of the year *t*. We define $\mathbf{A}_s^t$ as $\mathbf{A}_s$ deflated with year *s* prices, so that

$$\mathbf{A}_s^t = \mathbf{P}_s^{-1}\mathbf{A}_s\mathbf{P}_s \tag{10}$$

where $\mathbf{P}_s$ is the diagonal matrix of industrial price indices capturing changes in price levels from year *t* to *s*. From (10), the typical element of $\mathbf{A}_s^t$ is

$$a_{s,ij}^t = \frac{x_{s,ij}}{x_{s,j}} \frac{P_{s,j}}{P_{s,i}} \tag{11}$$

where $P_{s,i}$ and $P_{s,j}$ are changes in industrial price indices of sector *i* and sector *j* from year *t* to year *s* respectively, and the $(P_{s,j}/P_{s,i})$ term on the right-hand side captures changes in relative prices from year *t* to year *s*. In what follows the methodology presented in this section is applied to the Turkish economy in order to examine the employment generation effect of stabilisation and structural adjustment policies in the 1980s.

IV. STRUCTURAL ADJUSTMENT AND EMPLOYMENT STRUCTURE IN TURKEY

Macroeconomic Background

Until the end of the 1970s, the Turkish economy enjoyed a very high growth rate mainly by following a state-led import substitution strategy (see Table 1). In the midst of a severe recession in the world economy, the average growth rate reached about 7 per cent in the period of 1973-76 by implementing unsustainable expansionary economic policies. An inflationary process (as a consequence of these policies), failures to mobilise domestic resources (mostly due to the repressed financial system), the periodic overvaluation of the Turkish Lira and anti-export biases in the trade regime led the economy to encounter severe balance of payment difficulties by 1977 (Celasun and Rodrik, 1989). Despite this inhospitable setting of the pre-1980 period, the economy had grown by approximately 6.3 per cent a year between 1963 and 1973, and 3.7 per cent in the period of 1974-1979 (SPO, 1997: 20). The sustainability of these economic policies undertaken was, however, constrained largely by the availability of foreign exchange. The dependence of the domestic production on imported intermediate and capital goods[1] had been requiring increasingly more foreign exchange by the end of the 1970s, which was partly provided through exporting traditional agricultural commodities

1 The large majority of Turkish imports consists of intermediate inputs and raw material, and capital goods. The share of imported inputs and capital goods was accounted for almost 90 per cent of total imports in 1950, 95 per cent in 1970 and 90 percent in the period of 1983-1996 in Turkey (see SPO, 1997: 53).

and partly from capital inflows either in the form of remittances from workers living mainly in Germany, or in terms of borrowing with short-term maturity. When the country's balance of payment position worsened, the widely-used means of external adjustment of the period were the use of international reserves (if available), restricting imports through a highly protective trade regime and, when imbalances reached unsustainable levels, sizeable devaluations of the currency.

In the absence of adequate foreign exchange, and with a lack of institutional background allowing domestic resources to be mobilised towards more productive fields, Turkey launched an economic reform programme in 1980, aiming to solve the internal and external disequilibrium problems of the late 1970s. The objective of the reform programme was first to stabilise the economy, and then to adjust the structure of the economy from an inward-oriented strategy towards an export-oriented one (Arıcanlı and Rodrik, 1990; Nas and Odekon, 1992). Recognising the dependence of domestic production on imported inputs and foreign exchange, Turkey liberalised its trade regime. First, the exchange rate regime was changed drastically from a fixed exchange rate system to a more flexible and realistic one with increased reliance on market forces. Various export incentives were launched to increase export earnings, and quantitative controls on imports, such as quotas and a licensing system, were eliminated (Baysan and Blitzer, 1991; Olgun and Togan, 1990). An improvement in the balance of payments was also of great importance to the government to gain creditworthiness that was needed to attract international funds from IMF and the World Bank, and to compensate for the depressed domestic demand by exports. Therefore a gradual import liberalisation was chosen because of worries that a rapid one would cause a deterioration in the balance of payments. With continuous mini devaluation of the Turkish Lira, the government aimed to keep exports competitive in international markets, and so to secure foreign exchange earnings.

Table 1 – Main Macroeconomic Indicators

	1973-76	1977-80	1981-83	1984-88	1989-93	1994-96
			(Period Average in %)			
Real GDP growth rate	7.2	1.3	4.0	5.9	5.2	3.1
Savings/GDP	20.8	17.3	17.3	21.7	21.9	21.4
Investment/GDP	21.4	22.5	18.5	22.3	23.7	23.9
Exports/GDP	3.7	3.3	7.8	11.5	9.1	13.3
Imports/GDP	9.2	8.6	13.7	16.4	14.7	21.1
Total PSBR/GDP[1]	---	6.9	4.1	4.7	9.1	7.6
Main Prices						
Inflation (average in %)	19.2	61.9	56.6	48.5	65.1	93.4
Real exchange rate[2] (% average)	-3.9	7.4	12.0	-0.69	-6.45	5.72
Real interest rate (average in %)	-10.7	-43.4	-13.2	2.96	4.66	24.4

[1] *PSBR* stands for public sector borrowing requirement.
[2] Calculated as $e(P^*/P)$, where e is the nominal exchange rate, P^* and P are the consumer price indices of the *USA* and Turkey respectively. Negative numbers indicate the overvaluation of currency, *visa versa*.

As seen in Table 1, the overall growth performance of the economy was quite remarkable over the reform period between 1983 and 1994. Following a 1.3 per cent growth rate in the period of 1977-1980, the economy grew at an annual rate of nearly 5 per cent on average afterwards. The share of exports in GDP rose to approximately 8 per cent in 1981-83 from 3.3 per cent in the period 1977-80, while the share of imports also rose to nearly 14 per cent in the former period from 9 per cent in the 1977-80 period. The resource gap between saving and investment, as a share in GDP, declined from 5.2 per cent in the 1977-80 period, first to 1.2 percent in 1981-83, and then to 0.6 per cent in 1984-1988. Besides, the employment generation capacity of the economy declined in the post-liberalisation period. Total employment grew at annual rate 0.95 percent on average in the period of 1981-82, while it was 2 percent in the period of 1977-79 (see Bulutay, 1995). Although the economy seems to have higher growth rates after these initial years of the liberalisation period, it has never reached to its pre-liberalisation level.

Data

The aim of this section is to examine the effects of a large-scale structural adjustment programme on employment structure in Turkey. In order to do so, we employ two input-output tables showing the different structures of production and foreign trade in Turkey before and after the structural adjustment. The tables of input-output for 1973 and 1990 are used for our purpose. Although another table for 1979 is also available, results based

on this table lack credibility because it was a year of foreign exchange shortages, which caused constraints on the supply side (e.g. see Bilginsoy, 1993).

The input-output tables for Turkey include 64 sectors, but we had to decrease the number of sectors to 24 because price indices were only available at this more aggregated level.[2] The price indices for the manufacturing industry are wholesale price indices compiled from the State Institute of Statistics (*SIS*) for 1990. The price indices for services are implicit deflator computed from *SIS* data for GNP. All index values are, however, adjusted to the base year 1973 for our purpose. Sectoral employment data in Turkey are collected from different sources, and typically cover *formal* employment figures which are recorded by the *Social Insurance Agency* and the *Civil Servants' Pension Fund* (see also Celasun, 1989 for detail). However the use of informal labour is widespread case in the Turkish economy (see Yeldan 2000, Özar, 1995, Köse and Yeldan 1996 for further discussion). For example, Günlük-Şenesen (1998) estimates that the use of informal labour in 1990 is 98 percent of total employment in agriculture, 44 percent in manufacturing and 48 percent in services. The estimated figures on the use of labour (including formal and informal) in all 24 industries are borrowed from Günlük-Şenesen (1998), and show consistency with the estimates of similar figures in Köse and Yeldan(1996). In addition to the labour intensity of domestic production, calculating capital intensity requires data on capital inputs used in production. However such data is not readily available for the Turkish economy.[3]

Results

Given the existing structures of production and foreign trade in each year, total sectoral labour demands per billion Turkish Liras (TL) output in the 1973 prices are reported in Table 1. In the first column of each table, we show the factor demand of the economy assuming that all intermediate inputs are produced domestically, which is calculated by equation (9). For example, Alauddin and Tisdell (1988) and Sarma and Ram (1989) used

2 The aggregation of the industries in the original tables is as follows. Agriculture (1-4), Mining (5-10), Food-Beverage (11-19), Textiles (20-24), Wood-Furniture (25-26), Paper-Printing (27-28), Chemicals (29-31), Oil-Refining (32-33), Rubber-Plastics (34-35), Glass-Cement (36-38), Iron-Steel (39-40), Metal Product (41), Machinery (42-43), Electrical-Machinery (44), Transportation-Vehicles (45-48), Other Manufacturing (49), Utilities (50-51), Transportation Service (56-60), Banking (61), Personal Services (62), Public Services (63), Housing (64). Figures in brackets indicate the number of sectors in original tables.

3 Köse and Yeldan (1996) report estimated sectoral capital stock data only for 1990.

this measure in calculating the factor proportions of industries in Bangladesh and India respectively. The second column indicates factor requirements of producing final and domestic intermediate goods in each sector, as measured by equation (2). This is the measure of factor intensity, which has previously been used by other studies for Turkey (Günlük-Şenesen, 1998). The total additional factor requirements in earning foreign exchange to purchase the total imported inputs of domestic production in each table are given by equation (7), and reported in the third column. The total (direct and indirect) factor requirement, including the additional demand for labour necessary to produce the goods that are exchanged for the imported intermediate goods, are given in the fourth column of the table. And finally, the difference between factor requirements under two alternative production structures (one without any imported inputs, the other allowing for imported intermediate goods, measured by equation (8)), appears in the fifth column. Positive figures in this column can be considered as domestic factor savings, while negative ones are factor costs of one extra unit of exports produced for the purpose of earning foreign exchange required to purchase imported intermediate inputs that are necessary for the given structure of production.

As seen in Table 2, foreign trade – the exchange of exports for imported intermediate inputs in domestic production – creates extra demand for labour. This is the case in all industries with the structures of domestic production and foreign trade in 1973. We reach the same conclusion for the majority of industries in 1990 (Table 2b with the exceptions of three industries, namely *agriculture*, *food* and *textiles*.[4] More precisely, the production of a unit of an export good for earning foreign exchange required to purchase imported inputs in the domestic production in these three industries appear to save from the use of labour in the domestic economy. This result suggests that these three industries have possibly been exchanging their relatively capital-intensive outputs for the labour-intensive imported inputs.

Table 2a
Total Labour Requirement per Billion TL Output in the Turkish Economy

	1973	L_j	L_j^d	L_j^m	L_j^T	$\left(L_j - L_j^T\right)$	L_j / L_j^T
1	*Agriculture*	109,005	108,112	1,696	109,809	-0,804	0,993
2	*Mining*	39,729	37,737	2,926	40,664	-0,935	0,977

4 This figure is zero for the public service sector in both years. This is because this industry produces non-tradeable goods for the domestic economy.

3	*Food*	68,843	67,589	1,875	69,464	-0,621	0,991
4	*Textile*	54,353	51,648	3,926	55,573	-1,220	0,978
5	*Wood*	54,749	52,965	2,484	55,449	-0,700	0,987
6	*Paper*	33,735	30,501	5,459	35,960	-2,225	0,938
7	*Chemicals*	22,570	17,861	9,570	27,431	-4,861	0,823
8	*Petroleum*	15,980	7,394	11,130	18,523	-2,543	0,863
9	*Rubber and Plastic*	36,693	25,909	13,148	39,057	-2,364	0,939
10	*Glass and Cement*	31,162	28,875	3,835	32,710	-1,548	0,953
11	*Basic Metal*	25,471	20,552	9,008	29,559	-4,088	0,862
12	*Metal Products*	29,649	24,527	9,659	34,186	-4,537	0,867
13	*Machinery*	22,462	17,956	9,249	27,205	-4,743	0,826
14	*Electrical Machinery*	25,687	19,856	11,160	31,016	-5,329	0,828
15	*Transport Vehicle*	23,931	19,105	9,561	28,666	-4,736	0,835
16	*Other Manufacturing*	28,045	23,094	7,973	31,067	-3,022	0,903
17	*Electric, Gas, Water*	12,743	11,122	2,379	13,501	-0,758	0,944
18	*Construction*	39,470	36,947	4,554	41,501	-2,031	0,951
19	*Trade*	27,607	27,167	0,543	27,710	-0,102	0,996
20	*Transport-com*	21,900	19,551	3,425	22,976	-1,077	0,953
21	*Banking*	13,324	13,078	0,437	13,515	-0,191	0,986
22	*Personal Services*	52,185	51,471	1,237	52,708	-0,523	0,990
23	*Public Services.*	20,802	20,802	0,000	20,802	0,000	1,000
24	*Housing*	12,091	11,928	0,268	12,196	-0,106	0,991

Table 2b
Total Labour Requirement per Billion TL Output in the Turkish Economy

	1990 (in 1973 prices)	L_j	L_j^d	L_j^m	L_j^T	$\left(L_j - L_j^T\right)$	L_j / L_j^T
1	*Agriculture*	43,165	42,315	0,797	43,112	0,053	1,001
2	*Mining*	18,884	18,045	1,090	19,135	-0,251	0,987
3	*Food*	25,987	23,423	1,959	25,382	0,606	1,024
4	*Textile*	27,623	25,035	2,382	27,417	0,206	1,008
5	*Wood*	21,036	19,633	1,490	21,123	-0,088	0,996
6	*Paper*	21,114	17,195	4,330	21,524	-0,411	0,981
7	*Chemicals*	12,980	9,241	5,522	14,763	-1,784	0,879
8	*Petroleum*	17,116	3,138	15,852	18,990	-1,874	0,901
9	*Rubber and Plastic*	13,286	8,189	5,260	13,450	-0,164	0,988
10	*Glass and Cement*	21,613	19,152	2,984	22,136	-0,523	0,976
11	*Basic Metal*	12,468	8,229	6,572	14,802	-2,333	0,842
12	*Metal Products*	14,272	11,193	4,682	15,874	-1,603	0,899
13	*Machinery*	13,991	11,247	4,169	15,416	-1,425	0,908
14	*Electrical Machinery*	11,286	8,042	5,506	13,549	-2,263	0,833
15	*Transport Vehicle*	15,172	12,727	3,549	16,277	-1,105	0,932
16	*Other Manufacturing*	15,364	5,838	15,929	21,768	-6,403	0,706
17	*Electric, Gas, Water*	7,943	7,273	0,916	8,190	-0,247	0,970
18	*Construction*	16,878	14,963	2,753	17,715	-0,837	0,953
19	*Trade*	19,124	18,490	0,686	19,175	-0,051	0,997
20	*Transport-com*	10,917	9,094	2,245	11,339	-0,422	0,963
21	*Banking*	24,441	24,028	0,536	24,565	-0,124	0,995
22	*Personal Services*	39,324	37,689	2,561	40,250	-0,926	0,977
23	*Public Services.*	13,304	13,304	0,000	13,304	0,000	1,000
24	*Housing*	1,274	1,180	0,133	1,313	-0,039	0,970

Source: The calculation of authors based upon SIS (1973) and (1990*), The Input-Output Structure of theTurkish Economy*, Ankara: State Institute of Statistics.

In order to see the changes in the extent of creating labour demand, we obtain the ratio of two measures of labour demand, rather than their difference as seen in fifth column, and shown in the column six. Any figures below unity indicate the presence of extra demand for labour arising from earning foreign exchange (through exporting) which is required to purchase imported inputs. Figures above unity, on the other hand, imply saving in labour as a result of allowing foreign trade. Figure 1 is based on the results of the column six. The industry numbers are displayed on the horizontal axis whereas the ratios in the sixth column are on the vertical axis. The horizontal line passing through one is the point where foreign trade does not creates any extra net labour demand. In other words, the labour intensities of domestic production measured with and without imported inputs (by equation (9) and (8)) are equal $\left(i.e. \mathbf{L}_j^m = 0\right)$. What it tells us is how much additional labour demand is created by foreign trade, which becomes less as the unit line is approached. More precisely, the production for earning foreign exchange in this industry requires less labour in exchange of imported intermediate goods.

The labour intensities of foreign trade in both years are shown in Figure 1. The horizontal-small lines indicate the values in 1973, while those in 1990 are shown by triangles. The distance between these two calculated values tells whether the *net employment generating effects* of foreign trade have increased or decreased between these two years. As seen in the figure, the ratio in the column six becomes smaller for most of the industries in Table 2 from 1973 to 1990, indicating that foreign trade stimulates less use of labour in domestic production after the post-liberalisation era. In industries like *basic metal*, *other manufacturing*, *personal services* and *housing*, on the other hand, extra demand for labour for the exchange of exports for imported intermediate goods appear to increase in the same era.

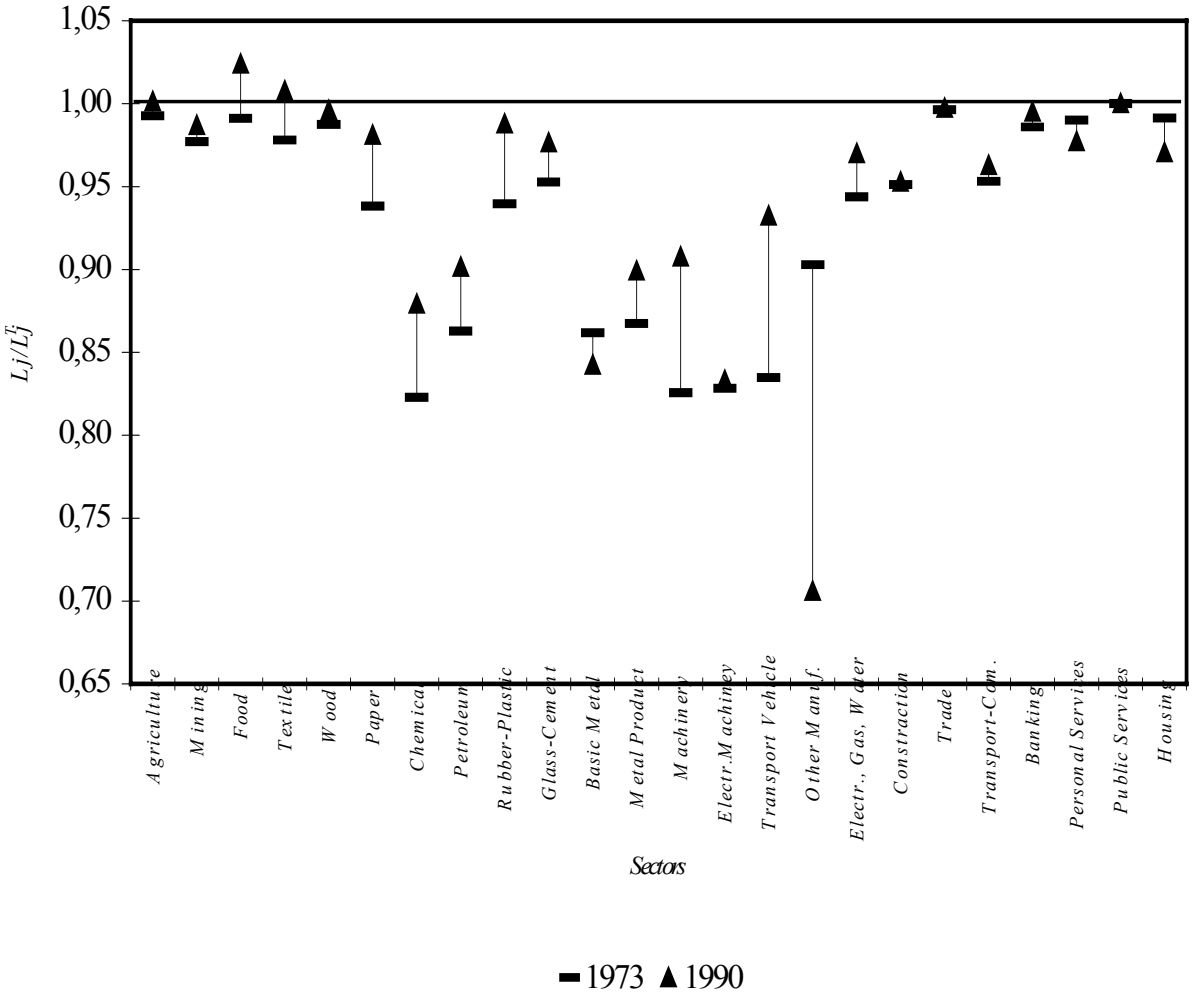

Figure 1 *Employment Generation Effects of Structural Adjustment Programme from 1973 to 1990*

Our empirical analysis shows that openness to foreign trade in intermediate goods results in the extra use of labour in the majority of industries in Turkey. This employment generation effects of foreign trade imply that the domestic production exchanges relatively labour-intensive exported goods with relatively less labour-intensive imported intermediates. However, this ability of creating extra use of labour, as a result of allowing for the importation of intermediates, appears to have declined in the post-liberalisation era.

V. CONCLUSION

This paper examined the effects of the Turkish structural adjustment programme undertaken in the 1980s on the employment structure. There exist similar research using input-output models (Allauddin and Tisdell, 1988, Sarma and Ram, 1989, Hashim, 1996 and Günlük-Şenesen, 1998). However, they have widely ignored the presence of imported intermediate inputs in domestic production so their results lack credibility. Therefore their calculation may have under- or over- estimated the labour intensity of industries. In this study, we draw attention to these biases in the measures of labour intensity, and showed a more appropriate measure that takes into account the presence of imported intermediate inputs in domestic production.

This new measure was applied for Turkey. Using two input-output tables for the pre- and post-stabilisation eras, we calculated labour demand of the Turkish industries and analysed the changes in labour demand. Our findings showed that foreign trade in intermediate goods creates extra use of domestic labour, which can be considered as the labour cost of importing intermediate goods. This is the case in the majority of industries in the pre- and post-liberalisation period in Turkey. However, the capacity of using extra labour as a result of importing intermediate goods appeared to have decreased in the post-liberalisation period.

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