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Trade Liberalization and Employment Generation: The Experience of Turkey in the 1980s

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Abstract: The Turkish economy achieved considerably high growth rates in the 1960s and 1970s under the import substitution industrialization strategy. However, as observed in many other countries that had adopted similar strategies, the process of rapid economic growth proved to be unsustainable in the late 1970s under the severe pressure of balance of payments problems. On January 24, 1980, the Turkish government announced a stabilization and structural adjustment program which was fully implemented under the military regime after September 1980. The program was based on an "export-led growth" strategy and liberalized foreign trade, product, and, later, capital markets. This paper assesses the employment impact of trade liberalization and the export-led growth policy by analyzing employment changes in the manufacturing industry.

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1. Introduction

The Turkish economy achieved considerably high growth rates in the 1960s and 1970s under the import substitution industrialization (ISI) strategy. However, as observed in many other countries that had adopted similar strategies in the same era, the process of rapid economic growth proved to be unsustainable in the late 1970s under the severe pressure of balance of payments problems. On January 24, 1980, the Turkish government announced a stabilization program which was fully implemented under the military regime after September 1980. As Senses observes (1990: 3) "[t]he program which was initially introduced as a short term stabilization programme to tackle short term instability through standard IMF policy prescriptions was soon transformed under the guidance of the World Bank to incorporate also measures for structural change."

The program was based on an "outward-oriented trade" strategy and foreign trade, product, and, later, capital markets were liberalized to a large extent. The policies followed as a part of the stabilization and structural adjustment program (SSAP) and accompanying institutional and legal changes have had far-reaching implications for the process of economic development in Turkey. The SSAP marked a major break from the import substitution industrialization regime, and has firmly established a new regime based on outward-oriented/export-led "growth" strategy. The economy experienced an export boom, immediately responding to generous export incentives and continuous real depreciations in the early 1980s. While the share of exports in GNP increased substantially (from a mere 4.2% in 1980 to 9.2% in 1983), the inflation rate was also reduced from 89.6% in 1980 to 26.0% in 1983. The GNP decline in 1980 (-2.8%) was reversed and respectable growth rates were successfully attained (4.8% in 1981, 3.1% in 1982 and 4.2% in 1983). The GNP growth rate increased almost continuously until 1987 when it reached its 20 years' peak of 9.8%.

The response of the Turkish economy to trade liberalization was hailed by many researchers as a support for the case for liberalization. For example, Dornbusch (1992: 69) suggests that "Korea and Turkey are cases of highly successful liberalization." The World Bank also considers the Turkish program as "major, strong and sustained" (Dornbusch, 1992: 69).

Although there are many studies that assess critically the macroeconomic effects of the SSAP (for a small set of recent studies, see Baysan and Blitzer, 1990; Senses, 1990; Uygur, 1991b and 1993; Celasun, 1994; Boratav, Türel and Yeldan, 1995; and Köse and Yeldan, 1998), the employment effects of the SSAP seem to have attracted little attention.

There are only a few comprehensive studies that analyze employment shifts in the 1980s (for example, see Celasun, 1989; Senses, 1994 and 1996; Yentürk, 1997). However, these studies mainly deal with employment performance in the broad sectors of the economy. Yentürk's analysis is the only study that investigates employment performance for detailed sub-sectors of the manufacturing industry. She analyzed employment generation in the private manufacturing industry at the 3-digit level.

The aim of this study is to analyze employment generation in manufacturing industries at the 4-digit level to shed light on the employment performance of the trade liberalization experience in Turkey. The analysis is focused on the manufacturing industry for three reasons. First, the manufacturing industry was the engine of export growth in the 1980s. The share of manufactured exports in total exports jumped from 36.8% in 1980 to 64.3% in 1983 and to 88.0% in 1995. Thus, the (positive) employment effects of export-led growth should clearly be seen in this sector. Second, the manufacturing industry plays an important role in economic development. The importance of the manufacturing industry for exports is obvious. Moreover, the level of (labor) productivity is much higher in manufacturing than in agriculture and services. It also serves as a "hub" for the generation and diffusion of new technologies to the rest of the economy. Finally, reliable data for the manufacturing industry are available to analyze various aspects of the process of employment generation at the disaggregated level.

The paper is organized as follows. A brief overview of economic policies and macroeconomic performance indicators is provided in the second section. Section 3 presents a descriptive analysis of growing and declining manufacturing industries. Labor demand equations are estimated for 4-digit manufacturing industries in Section 4. Main findings and policy implications are summarized in Section 5.

2. Economic policies and macroeconomic performance since 1980

2.1 Economic policies since 1980

The Turkish Republic, established in 1923, had initially intended to follow relatively liberal economic policies. However, it had to have recourse to "étatism" to encourage private business through public entrepreneurship, especially after the onset of the Great Depression in 1929. The economy grew rapidly, albeit at a declining rate, in the 1930s, and experienced

sharp reductions in growth rates in all sectors during the Second World War. During the multi-party system in the 1950s, the new government formed by a new party followed liberal policies and succeeded in raising the growth rate thanks to the favorable external conditions. This period ended in 1960 with a military intervention partly as a response to deteriorating economic conditions. A new constitution was adopted in 1961 and development planning was institutionalized in 1963 by the establishment of a new, then highly prestigious institution, the State Planning Organization. The SPO envisaged economic development through import substituting industrialization, and high growth rates were achieved during the developmental period until 1980.

The ISI strategy ended in 1980 with a very severe balance of payments crisis (Turkey fell into international insolvency in 1978), high inflation and a significant decline in manufacturing output and, consequently, in GNP, in two consecutive years. The government announced a standard stabilization program on January 24, 1980, which was then transformed into a full-fledged structural adjustment program with extensive institutional changes to reorient the economy towards an export-led growth path under the auspices of the IMF and the World Bank.

The SSAP aimed at reducing price distortions in foreign trade, product and factor markets, liberalizing trade and capital accounts, and minimizing the role of the state-owned enterprises (SOEs) especially in the manufacturing industry. The successive governments relied on an "outward-oriented" trade strategy which is defined by Krueger as a strategy "in which the development strategy itself is based on the growth of domestic economic activity in response to producer incentives that closely mirror international prices. As such, it is expected that rapid growth of industry will occur (as agricultural productivity rises) as producers find their best alternatives in the global economy." (Krueger, 1998: 1521)

The liberalization of the economy followed closely the path suggested by guiding institutions. As Krueger advised, "optimal dismantling of controls might start with foreign trade, agricultural prices, the labor market and the domestic capital market, leaving capital account transactions to the end" (cited in Uygur, 1993: 2). Thus, three periods can be identified on the basis of changes in economic policies and political climate (for specific policies see Senses, 1990: 14-27; Uygur, 1993: 14-21).

The first period, 1980-83, starts with the announcement of the stabilization program in January 1980, and a subsequent major devaluation and relaxation of price controls for SOEs. The period is characterized by the implementation of the SSAP by the military government

from September 1980 to November 1983. An export boom was generated by the help of continuous depreciations and generous export incentives, reaching up to 36% of export revenue in 1983 (Uygur, 1991a). There was not much change in tariff protection and quantitative restrictions that were used to keep imports under control. The emphasis in this period was to stabilize the economy, to solve the balance of payments problems through export growth and to change the structure of relative prices in favor of export-oriented sectors (through real depreciations and export subsidies), labor intensive sectors (by reducing real wages and allowing interest rates to rise), and manufacturing and energy sectors (by increasing agricultural support prices less than the inflation rate).

Mr. Özal's Motherland Party secured a majority in the parliament after the 1983 general elections, and ruled the country without any strong opposition until the general elections in November 1987, and a relatively weaker position until its defeat in 1989 local elections. The second period from 1983 to 1988 observes a major liberalization reform in the import regime. The system of quantitative restrictions was changed from "positive lists" that specify commodities that could be imported under certain conditions, to "negative lists" that specify commodities that require prior import permission in January 1984 (Baysan and Blitzer, 1990). Imports were classified into three lists: the Prohibited List (commodities in the list could not be imported), the Approval List (also referred to the License List, contained commodities that require prior official permission), and the Fund List (covered mainly luxury goods which could be freely imported after the payment of a special levy). In contrast to the previous system, the new system, based on "negative lists", allowed all other goods not included in these lists to be freely imported. Baysan and Blitzer (1990: 17) state that "[t]he new system liberalized about 60 per cent of 1983 imports. ... Almost all consumer goods were liberalized, although this accounted for only about 5 per cent of total imports in 1983. Intermediate goods were liberalized far more than capital goods. In total, liberalized goods accounted for 43 per cent of 1984 imports."

However, the government had to raise tariff rates for a large number of goods to mitigate the immediate effects of liberalization in the early 1980s. This led to an increase in tariff revenue and the ratio of tariffs to imports after 1984. The government then gradually reduced the number of goods in negative lists, and tariff rates, to continue to liberalize the economy. Meanwhile, new measures to encourage direct foreign investment were introduced in 1986. However, Boratav, Türel and Yeldan (1995: 4) state that "expansionary fiscal and

monetary policies starting in 1985 with a public investment boom led to the virtual neglect of stability objectives".

The third period (1988-93) is characterized by liberalization of interest rates in 1987-88, capital accounts in August 1989, a wage explosion and higher agricultural prices after 1988, and, as a result, further deterioration of public sector accounts. In this period, "short-term capital movements in response to relations between exchange and interest rates create erratic changes in balance of payments" (Boratav, Türel and Yeldan, 1995: 4). The period ended in a currency crisis in 1994 that led to a steep real depreciation and decline in output and imports, and an increase in exports. Since we have data on the manufacturing industry only until 1994, in this paper we will not analyze developments after the 1994 crisis.

Before the analysis of macroeconomic performance indicators, a brief discussion on policy makers' expectations on the effects of liberalization on employment is in order. It was believed that the ISI strategy distorted relative prices against export-oriented industries that were assumed to be labor intensive because, as a developing country, Turkey had a comparative advantage in the sectors that use the abundant resource, i.e., labor. Therefore, the elimination of anti-export biases, an initial reduction in real wages (necessary to sustain real devaluations, to enhance international competitiveness, and to make a room for export expansion), and an increase in interest rates would lead to reallocation of resources towards labor intensive (and export-oriented) sectors, and the substitution of labor for capital in all sectors. Thus, the demand for labor, and employment were expected to increase as a result of liberalization. The increase in labor demand could also lead to wage increases, at least in export-oriented sectors. Moreover, the liberalization of financial markets would lead to higher real interest rates and the elimination of credit rationing. Higher interest rates would encourage savings, and, consequently, investment that would generate new employment opportunities. Finally, "it is expected that [under the outward-oriented trade strategy] rapid growth of industry will occur (as agricultural productivity rises) as producers find their best alternatives in the global economy." (Krueger, 1998: 1521) The rapidly growing economy would, of course, create new jobs.

Real exchange rate depreciations, which are considered to be the essential element to encourage exports, and interest rate increases could create contractionary effects, and hence, a reduction in employment in the short run (for contractionary devaluations, see Lizondo and Montiel, 1989). As Morley (1992) shows in a comparative study, devaluations are less likely to lead to recession if they are accompanied by an increase in foreign lending. Turkey had

benefited greatly from a massive debt-rescheduling and inflow of foreign aid during the crucial years of liberalization. "The debt relief granted through the OECD Aid Consortium totalled a considerable USD 4.2 billion during the difficult stage of 1980-1985. The IMF provided SDR 1.2 billion in June 1980 in three year standby agreement and a further SDR 225 million in April 1984. The World Bank contributed USD 1.6 billion through five structural adjustment loans to support the liberalization and rationalization programs." (Uygur, 1993: 13). Thanks to the inflow of foreign aid, the initial contractionary effect of the SSAP was avoided (see Senses (1998) for the role of foreign aid and international lending agencies in enforcing the SSAP).

2.2 SSAP and macroeconomic performance

In this section, a number of macroeconomic indicators will be analyzed to understand structural changes in the Turkish economy since 1980. The data, when available, are presented for the 1970s as well for comparison. The analysis starts with long term patterns of growth rates. We will then investigate changes in relative prices to check if they are in accordance with policy objectives. Since trade liberalization is an essential policy change in the 1980s, we will also look at the behavior of exports and imports. Finally, we will analyze changes in employment and gross fixed capital formation (GFCF) at the sectoral level, because of the importance of investment for employment generation. The data sources and variable definitions are explained in Table A1 in the Appendix.

Figure 1 presents the data on 5-year moving average growth rates for the major sectors of the economy for the period 1926-1996 (the 5-year average growth rate for 1996 is the simple average of annual growth rates in 1994-98, where the expected growth rate is used for 1998). There are three periods of large declines in growth rates: the Second World War, the late 1950s, and the late 1970s. Average growth rates are quite high especially for industry during the ISI period of the 1960s and 1970s. The economy recovered in the first half of 1980s, but it seems that growth rates tend to decline since the mid 1980s. Moreover, there are large fluctuations in growth rates since the late 1980s.

The share of industry increased to some extent in the first half of the 1980s and stabilized at around 26-27% thereafter. As a result of very low growth rates in agricultural production, the share of agriculture continued to decline in the 1980s.

The stabilization program seems to have been successful in reducing the inflation rate from about 90% in 1980 to 26% in 1983 (as measured by the percentage rate of change in the

implicit GDP deflator), but since the gradual return to democracy after the 1983 elections, it tends to increase in a step-wise fashion (from about 40% in the mid 1980s to about 80% in the early 1990s). Although it is remarkable that the economy did not fall into a hyper-inflation trap, the gradual but continuous rise of the rate of inflation is alarming.

Figures 2-5 present data on changes in major prices targeted under the SSAP. The real interest rate (the interest rate for 1-year time deposits minus the rate of inflation) was negative throughout the 1970s, and it even reached –56.6% in 1980 as a result of the steep increase in the inflation rate. The real interest rate became positive due to a simultaneous increase in the nominal interest rate (from 33% in 1980 to 50% in 1982), and a sharp decline in the inflation rate (from 89.6% to 28.3% in the same period). The real interest rate has remained positive since the early 1980s with the exceptions of 1989 and 1994.

The real exchange rate (the nominal TL/USD exchange rate*US GNP deflator/Turkish GNP deflator)[1] shows a huge real devaluation in the first half of 1980 (almost 75% real devaluation from 1979 to 1984). The TL appreciated in the late 1980s, in sharp contrast to the previous period, and depreciated to a small extent in the early 1990s. During the currency crisis in 1994, it depreciated considerably (about 30% in real terms), but the next year it came back almost to its pre-crisis level. Ocampo and Taylor's (1998: 1532) observations seem to be valid for Turkey, too:

> ...in many cases in the past decades, both the trade and capital accounts of the balance of payments have been deregulated simultaneously. The exchange rate is allowed (at least dirtily) to float, responding to developments in financial markets instead of imbalances in the current account. In countries where this package has been applied (more in Latin America and Asia than sub-Saharan Africa), almost uniformly a combination of a high local interest rate and a strong exchange rate has emerged, diluting whatever benefits concomitant trade liberalisation was supposed to bring and often leading to a balance of payments crisis in the medium run.

Changes in sectoral real prices (sectoral price indices divided by the GNP deflator index) are depicted in Figure 3. As expected, the main losers in the first half of the 1980s are agriculture, public services, and construction (the latter not shown in the figure). The highest price increases are observed in the mining (not shown in the figure), and energy sectors.

[1] The real exchange rate in official statistics is calculated as a weighted average of a basket of currencies (usually USD and DM). In this study, we use only USD to calculate the real exchange rate to have data on a longer time period. Since changes in the nominal exchange rate and the rate of inflation in Turkey dominate changes in the real exchange rate, the trend is almost the same for all measures.

Housing, transportation and the trade sectors had above average price increases. The finance sector continued to enjoy higher prices throughout the period under consideration, with the exception of 1994 when the currency crisis erupted. The mining and energy sectors have maintained their relative prices since the mid-1980s. Prices for public services increased sharply in the late 1980s and early 1990s as a result of increases in public employees' salaries, but have declined since 1993.

Figure 4 shows real consumption wages (wages deflated by the consumer price index) for the major sectors of the economy. There were significant losses in all sectors in the first half of the 1980s. Workers in finance and social services sectors were able to secure wage hikes in the middle of the 1980s which were followed by wage increases in other sectors in the late 1980s. In spite of these increases, the real wage rate in the manufacturing sector reached its 1978 level only in the early 1990s, and the real minimum wage remained lower than its 1978 level throughout the period.

What is more significant for profitability is, of course, the level of real product wages (wages deflated by sectoral prices). Figure 5 presents the data on real product wages. Labor's losses are strongly pronounced in real product wages. Real product wages in all but two sectors (finance and social services) have remained below their 1978 levels in most of the period.

The decline in real product wages could indicate that profitability had increased in those sectors under consideration. Köse and Yeldan (1998) and Boratav *et al.* (1998) show that mark-ups and profit margins in the private manufacturing sector increased in the late 1980s.

The analysis of the structure of relative prices shows that the SSAP had reached its target of changing relative prices in favor of capital (higher interest rates and lower wages) and export-oriented sectors (mainly through real exchange rate depreciation) in the first half of 1980s. Exports responded quickly to real depreciation (and export incentives), and increased from 2.9 billion USD in 1980 (4.2% of GNP) to 5.7 billion USD in 1983 (9.2% of GNP). Imports also increased sharply, albeit at a lower rate, partly to supply intermediate goods for exporters. The importance of real devaluation for export performance is apparent in Figure 6. The share of exports in GNP closely follows the pattern of the real exchange rate, as also found in econometric studies on the determinants of export behavior in Turkey (see, for example, Barlow and Senses, 1995).

Figure 7 presents the data on export promotion and import protection. "Actual tariffs" is the ratio between tariff revenue and the value of imports. Since the government supported exports through various methods (most important ones being direct payments through tax rebates and cash premia, subsidized export credits, duty allowances on imported inputs, and corporate tax allowances), the exact value of export subsidies is difficult to measure. Figure 7 presents estimates by various researchers. Although there are significant differences between these estimates, one can conclude that export subsidies were quite generous (reaching 30% of the value of exports in the early 1980s). Tariff protection remained almost constant in the early 1980s, and has continuously increased until the early 1990s, and had rapidly declined since 1992 on the eve of the customs union with the EU.

There is a remarkable shift in the sectoral composition of exports. The importance of manufactured products for the export boom is evident. The share of manufactured products in exports increased from 36.8% in 1980 to about 80% in the mid 1980s and continued to increase gradually thereafter. On the other hand, the changes in the composition of imports in the same period follow closely fluctuations in oil pricesThe share of mining was high in the first half of 1980s, and declined in the late 1980s and early 1990s. The level of specialization in exports has been lower in the 1980s thanks to the growth of manufactured exports that helped to diversify exports. The specialization level (as measured by the sum of squared shares of products defined at the ISIC 4-digit level) has remained about .1 since 1985 for exports and there is small but steady decline in the level of specialization of imports since the mid 1980s[2].

The volume of exports to the Middle East countries had an enormous growth in the early years of the 1980s, partly as a result of the Iraq-Iran war (for a detailed analysis of export expansion to the Middle East, see Akder, 1987). However, the OECD countries have remained the main growing export market since the mid 1980s. Imports from both the OECD and OPEC countries have continued to grow continuously with the exception of two years, 1989 and 1994.

The terms of trade (the index of export prices/the index of import prices) show different patterns for OECD and OPEC countries. The terms of trade deteriorated almost steadily against the OECD countries since 1984 whereas the terms of trade (excluding oil)

[2] The specialization ratio is calculated as follows : Specialization index=$\Sigma_i s_i^2$ where s_i is the i^{th} ISIC 4-digit sector in total exports.

against the OPEC improved to some extent in the late 1980s and early 1990s, but has declined since 1993.

Employment in manufacturing rapidly increased in the 1970s, and it has continued to increase at a lower rate since 1980 (see Figure 8). The average annual growth rate of manufacturing employment was 4.8% in the period 1969-80, and it dropped to 2.2% in the period 1980-93. The average annual growth rate of total employment was much lower, 1.8% in the first period, and 1.4% in the latter period. Thus, the share of manufacturing employment increased throughout the period, at a higher rate in the 1970s and at a much lower rate in the 1980s. Moreover, the growth rates exhibit huge fluctuations since the late 1980s, reflecting fluctuations in output growth rates, and macroeconomic instability.

Labor force participation rates that influence the unemployment rate in the economy are presented for Turkey, North America and the EU for comparison (see Table 1). The participation rate and employment/population ratio have declined sharply in Turkey in the last couple of decades. Although a large part of the decline in the participation rate in Turkey is attributable to migration from rural to urban areas and higher school enrolment rates, it seems that the "discouraged worker effect" could also be an important factor in an economy with low wages and irregular work arrangements.

Gross fixed capital formation (GFCF) is an essential factor for employment generation and long term growth. Therefore, we present the data on GFCF in Figures 9 and 10. GFCF as a percentage of GNP had increased until 1977 (27.2%), and then it declined partly due to the limited availability of foreign exchange in the late 1970s (21.8% in 1980). It remained around 20% in the first half of the 1980s, and has had a tendency to increase since 1985 (from 20.1% in 1985 to 26.3% in 1993). The share of public investment has been reduced dramatically since 1986 as a part of policies aimed at cutting public spending and reducing the role of the state in the economy. The composition of public GFCF shows dramatic changes. The share of public GFCF in manufacturing has a very fast and systematic decline (from 2.29% of GNP in 1980 to 0.23% in 1993). Public investment increased in transportation (including highways and telecommunications infrastructure) and energy sectors in the mid-1980s. In spite of government's own precaution against energy shortages in the near future, public investment in the energy sector experienced a drastic cut in the 1990s (see Figure 9).

The composition of private GFCF reveals the factors behind the expansion of private investment since 1985. There is an extraordinary investment boom in the housing sector that explains almost all increase in the private GFCF. Private GFCF in manufacturing remained

less than 4% of GNP in the 1980s, and slowly increased by about 1 percentage point in the 1990s as capital goods become relatively cheaper as a result of real currency appreciation in the 1990s. Private investment in the transportation sector also took off in the 1990s partly because of the same reason, and partly because of the deregulation of the telecommunications sector. GFCF by sectors (Figure 11) shows that there is not any increase in GFCF in any sector, with the only exception of the service sector. There is a profound decline in GFCF in the intermediate goods industry where the public sector traditionally had a dominant position. GFCF in the energy sector increased to some extent by public sector investment. The only major increase in GFCF is observed in the service sector where, as explained before, private GFCF in housing accounts for the largest share.

The lack of any increase in manufacturing GFCF for about a decade is quite surprising given the fact that the manufacturing industry has played an essential role in export expansion in the same period. Our findings support Rodrik's assessment of the export booms in South Korea and Taiwan, and Turkey and Chile. Rodrik (1995: 2) says that "modest export booms in Turkey and Chile in the 1980s have required cumulative exchange rate depreciations contemporaneously of the order of 100 percent, a change in relative prices vastly in excess of anything observed in East Asia." Moreover, the export booms in South Korea and Taiwan starting in the 1960s were accompanied by investment booms that are equally impressive. However, the increase in exports in Turkey and Chile has not been clearly linked with superior investment performance. The lack of investment is one of the factors behind weak employment performance in the manufacturing industry. Of course, it also raises certain concerns about the sustainability of growth in the near future.

Table 2 presents the data on production, employment, capital stock, capital intensity and labor productivity for broad sectors. As discussed before, average annual growth rates of all these variables in the post-1980 period were usually lower than those achieved in the 1970-78 period, especially in the manufacturing industry. The service sector has performed better since 1983, but the average growth rate for the economy as a whole has been lower compared to the previous decade.

Employment performance seems to be worse even in services. The average annual growth rate in manufacturing employment is almost less than half of the rate achieved in the 1970s. The largest relative decline in manufacturing employment is observed in the intermediate goods industry.

From 1980 to 1993, services (from 32.1% to 39.5%) and consumption goods (from 5.6% to 6.2%) increased their shares in total employment. Energy (from 0.3% to 0.5%) and intermediate goods (from 4.6% to 4.7%) sectors had modest increases, and agriculture (from 51.3% to 44.9%), mining (from 1.2% to 0.7%), and capital goods (from 3.5% to 3.4%) experienced declines in their employment shares. Employment share figures show that the main shift in employment occurred from agriculture to services which is determined by long term socio-economic processes. Within the non-agricultural sectors, it seems that there is not any strong shift towards labor intensive sectors and/or sectors with higher labor productivity. more productive sectors. Services is apparently more capital intensive than consumption and capital goods industries, but labor productivity is much higher in the latter sectors.

To summarize, our findings show that the employment performance of the Turkish economy in the 1980s has been rather poor, at least unsatisfactory given the high rate of population growth. The post-1980 adjustments have heavily relied on real wage cuts to stabilize the economy and to boost competitiveness of exporters because lower wages were thought to be essential to lower inflation rates (by reducing production costs and restraining domestic absorption), and to secure real depreciations. Real wage cuts played an important role in recovering the economy after all three crises in 1980, 1989 and 1994 (for a detailed analysis, see Ekinci, 1998). However, as Taylor (1990: 335) shows "... wage-cutting in no panacea. If capacity limits don't bind, policies aimed at shifting the income distribution in favor of profits may well reduce output and employment. When the economy tends towards demand levels exceeding capacity, real-wage reductions induced by inflation will help restore equilibrium, but these will be less necessary when real balance effects are strong." In other words, lower wages could be a factor that explains rather weak employment performance in the 1980s (for a similar explanation, see Yentürk, 1997: 4; Senses, 1996).

Another important factor, as explained before, is the lack of sufficient GFCF especially in manufacturing. As Celasun (1994: 458) explains, "[t]here are three points that will be emphasized [about the post-1980 adjustment process]. First, trade reforms and their effects did not take place in isolation but in the larger context of macro policy and relative price changes, including exchange rate depreciation combined with wage repression. Second, Turkey's macroeconomic adjustment interacted strongly with a regressive income distribution, which contains politically unsustainable aspects for the 1990s. Third, Turkey's relatively unsuccessful fiscal retrenchment –in the context of financial liberalization- produced high inflation and high interest rates in the late 1980s, hindering capital reallocation

toward manufacturing." The low level of GFCF in manufacturing calls for serious concerns for the prospects of growth in the future because "... manufacturing has always been the main focus of protection and economists in the Verdoorn-Kaldor tradition argue that productivity growth in that sector drives changes in the rest of the economy. Insofar as this argument is correct, the deindustrialisation observed in much of the developing world due to liberalisation, exchange rate appreciation, and high interest rates and other symptoms of austere policy could have far-reaching adverse consequences." (Ocampo and Taylor, 1998: 1532)

3. Employment generation in manufacturing industries: A descriptive analysis

The previous section has shown that employment performance of the manufacturing industry after 1980 has been rather weak. The average annual growth rate of manufacturing employment in the 1970-78 period was 5.24%, but it declined to 2.34% in 1980-83, 2.79% in 1983-88, and 1.17% in 1988-93. There are however significant differences among sub-sectors of the manufacturing industry. In this section, we will have a close look at the manufacturing industries at the most detailed level (ISIC 4-digit level[3]) to determine industry characteristics that explain differences in employment performance.

The data source is the Censuses of Manufacturing Industry (1980, 1985 and 1992) and the Annual Surveys of the Manufacturing Industry (all other years) conducted by the State Institute of Statistics (SIS). The survey covers all public establishments, all private establishments employing 10 or more people, and a sample of micro establishments where the sample is drawn from the most recent census. The SIS has conducted different surveys for three categories of establishments (*micro*, private establishments employing less than 10 people; *very small*, private establishments employing between 10 to 24 people; and *all others*). In this study, the dataset covering only the third group (private establishment employing 25 or more people and all public establishments) is used to analyze a larger set of variables. Employment performance is measured by the (logarithmic) growth rate of employment[4] for three periods mentioned in the previous section, namely 1980-83, 1983-88 and 1988-93. Eight industries had to be omitted from the analysis because these industries consist of less than two firms in certain years.[5]

[3] ISIC refers to Revision 2.
[4] Logarithmic growth rate is calculated as $100*ln(N_t/N_o)$.
[5] Those industries omitted from the analysis and the numbers of establishments and employees in those industries in 1994 are as follows .

Table 3 presents data on net employment creation for three periods at the ISIC 4-digit level. Industries are ranked in descending order by average annual employment growth rates for the 1980-93 period.[6] As may be expected, there are many "small" industries among the fastest growing industries. The fastest employment growth is observed in the jewellery industry where only 152 people were employed in 1980. When we look at only those industries that employed more than 1000 people in 1980, the fastest growers (in terms of employment) are wearing apparel, fur and leather products, knitting, and textile industries. Employment generation in wearing apparel and knitting industries is phenomenal especially when one considers that their performance has continued to be strong in recent years. These two industries alone created about 39,000 jobs in the period 1988-93 (53% of their 1988 employment) whereas the net loss in all other industries amounted to 78,000 jobs (8% of 1988 employment). In addition to these industries, radio, TV and communication equipment, motorcycles and bicycles, furniture, confectionery, motor vehicles and electrical appliances industries have also remarkable employment performance. Note that almost all these industries enjoyed positive net employment creation in all three periods.

Highest and most systematic job losses are observed in ship building, wine, basic chemicals, tobacco, engines and turbines, railroad equipment, and non-ferrous metal industries. It is interesting that the single largest employment loss in the 1988-93 period is observed in the spinning and weaving industry (29,742 jobs were lost, or 18% of 1988 employment). This result shows that it would be erroneous to consider all textile-related industries as a single, homogenous group.[7] The same is also true for food industries. Although some food industries were able to generate new jobs in all periods (for example, dairy products, fruits and vegetable and meat), some others had major losses (in addition to those

ISIC code	Number of estab.	Number of emp.
3114	13	1963
3232	1	a
3845	2	a
3849	6	102
3853	3	69
3902	0	0
3903	3	93
3904	0	0

a Not available because of confidentiality requirements.

[6] Unless otherwise noted, average annual growth rates are calculated by exponential growth rate formula, i.e ., average annual growth rate = $(N_t/N_0)^{1/t}$-1.

[7] These changes support the observation made by Navaretti, Faini and Silberston (1995 : 19) who suggest that "advanced country textile producers have managed to keep a competitive edge against LDCs more easily than in clothing" thanks to technological upgrading and automation. The redeployment of labor intensive garment production in nearby cheap labor countries was instrumental in preserving capital intensive textile production in developed countries.

mentioned before, other food products, oils and fats, bakery products, and grain mill products). The iron and steel and non-ferrous metal industries also experienced heavy losses in the 1988-93 period. The iron and steel industry was the second largest employer in 1980 (next to the spinning and weaving industry), and it succeeded in reorienting itself towards foreign markets in the early 1980s. The share of exports in iron and steel production increased from 1.3% in 1980 to 28% in 1985. It had also generated about 10,000 new jobs until 1988. However, the industry failed to continue to grow, and laid off 8,500 employees in the period 1988-93.

It seems that a cursory look at employment generation does not uncover any pattern in industry characteristics. Thus we rank and classify industries into four groups depending on their employment growth rates. For the periods 1980-83 and 1983-88, the average growth rate for the first three groups is positive (hence, these groups are called “high growth”, “medium growth”, “low growth” and “decline” groups). For the period 1988-93, only the first group has positive growth (then, we have “growth”, “low decline”, “medium decline” and “high decline” groups). Tables 4-6 shows for each group the average values of a number of variables that reflect certain industry characteristics (for variable definitions and data sources, see Table A2 in Appendix). Correlation coefficients with the growth rate variables are also presented (the last columns) along with the significance levels.

The data on growth rates show that growth is persistent to some extent over time. The coefficient of correlation between the growth rates in 1980-83 and 1983-88 (GREMP 80-83 and GREMP 83-88) is positive and significant, but the correlation between growth rates in 1980-83 and 1988-93 is not significant, although it is still positive.

The growth rate of value added (GRVA) is strongly correlated with employment growth for all periods. As expected, output growth is one of the main determinants of employment generation. Growth rate of exports seems not to have a significant impact on employment growth in the first two periods but this could be misleading if one does not take into account the export intensity, because the effect of export growth on employment is conditioned by the share of exports in output. As seen in Tables 4-6, the share of exports in output was rather low in the early 1980s. Thus it is difficult to get a significant impact of export growth on employment for the early 1980s.

Many researchers emphasized that low capacity utilization rates (CURs) in 1980 facilitated the rapid growth of exports in the early 1980s. Figure 12 shows CURs in private and public manufacturing industries. The average CUR was indeed very low in 1980 (about

55%) and increased continuously until 1987, following closely the pattern of export growth. Thus, there is a strong correlation between initial CUR and subsequent export growth at the aggregate level. However, there seems to be no correlation for the cross-section of manufacturing industries. Employment generating industries do not have lower initial CURs in any period.

Employment growth is strongly correlated with the growth rate of the number establishments in all three periods. This result shows that new firm formation plays a very important role in employment generation.[8] It is interesting that there is an adjustment asymmetry between growing and contracting industries. In growing industries, the growth rate of employment in almost all groups exceeds the growth rate of the number of establishments, and this leads to an increase in the average plant size in growing industries. However, in contracting industries, the decline in the number of establishments is less than the decline in the number of employees so that the average plant size declines in these industries.

There is a strong negative correlation between initial average plant size and that industry's employment growth. In other words, those industries that grow faster are dominated by small establishments. This, however does not necessarily mean that employment growth is higher in competitive industries. The correlation between employment growth and industrial concentration (as measured by the 4-firm concentration ratio) is not statistically significant in any period. Although industrial concentration is not important, geographical concentration of production seems to be very important. The geographical concentration index[9] is positively (though not significant only for the 1988-93 period) correlated with employment growth. Note that the Turkish manufacturing industry is heavily concentrated in the Marmara region where the regional market is very developed and facilities for exporting goods are relatively better.

The market share of private establishments is positively correlated with employment growth. This finding is not surprising because, as explained in the preceding section, the governments since 1980 have aimed at reducing the share of SOEs in the manufacturing

[8] Strictly speaking, the "number of establishments" variable includes growing small private establishments that are covered in the survey when the number of their employees exceeds 25 people. Since neither the survey nor the census data have any information on the date of establishment, it is not possible to determine the number of *new* firms/establishments. In spite of this problem, we believe that the change in the number of establishments reflect net entry to a large extent because the survival rate for small establishments is very low in Turkish manufacturing industries. For survival rates, see Taymaz, 1997: 114.

[9] Geographical concentration index is the usual Herfindahl index where provinces' share is used to measure the level of concentration, i.e., $REGC=\Sigma s_i^2$ where s_i is the market share of the i^{th} province.

industry, and have substantially slashed back their investment budgets. It is, however, at first sight surprising to find that foreign direct investment (FDI) does not have any impact on employment generation given the fact that FDI has been actively encouraged, especially since 1986. A relatively low level of FDI may explain the lack of correlation between these two variables.

Three variables are used to test the effects of foreign trade on employment generation: net export ratio (for international competitiveness), export intensity (for export orientation), and import penetration (for openness of domestic markets and import competition).[10] The net export ratio is positively correlated with the employment growth for the periods 1983-88 and 1988-93, although in the former period, not statistically significant at the 5% level. As in the case of the export growth variable, the effect of the net export ratio is revealed when the export intensity gets higher. The export intensity variable, on the other hand, is strongly correlated with employment growth in all periods. In other words, higher employment growth is achieved in export-oriented sectors. The import penetration variable is not correlated with employment growth, but the change in import penetration is negatively correlated with employment growth, significantly so in the first two periods. These findings suggest that employment growth rate is higher in export oriented sectors that also defend quite successfully their position in domestic markets against imports. (These industries "defend" their shares in the domestic market, because the values in Tables 4-6 show that the import penetration rates have increased for all groups in all periods, but the increase in the import penetration rate is much lower in growing industries. For example, in the period 1980-83, the increase in the import penetration rate for "high growth" industries was on average 0.64 percentage points, whereas it was equal to 5.60 percentage points for "declining" industries.)

The correlation coefficient of the average export subsidy variable has a switching sign. The export subsidy rate is not correlated with employment growth in the 1980-83 period, positively correlated in the period 1983-88, and negatively correlated in the period 1988-93. The import protection variable is not correlated with employment generation in any period. These seemingly surprising results can be explained when the characteristics of subsidized and protected industries are taken into account. As shown in Table 7, in the early 1980s, low wage industries had higher export subsidy rates, and there is not any correlation with export orientation and export incentives. However, in the 1983-88 period, export oriented industries

[10] These variables are defined, respectively, as follows : NETX=(X-M)/(X+M), XINT=X /Q, and MPENT=M/(X+M-Q) where, X denotes the value of exports, M the value of imports, Q the value of domestic production, all in current prices .

received higher subsidies, and the growth rate of exports became positively correlated with the level of export incentives. In the third period, export subsidies were higher in capital and energy intensive industries that pay higher wages. Export incentives are negatively correlated with the growth rate of exports in the period 1988-93. Hence, export incentives in the 1990s have not been sufficient to generate higher employment in capital intensive industries.

The growth rate of output price is positively correlated with employment growth but the correlation coefficient is significant only for the first period. The growth rate of input price is positively correlated in the first period, which may reflect the effect of higher demand for inputs. The growth rate of export price is positively correlated with employment growth, especially in the last two periods. The growth rate of import price is negatively correlated with employment growth in the last two periods although the coefficient of correlation is not statistically significant at the 10% level.

Factor intensities seem to play an important role in explaining employment growth. Capital intensities[11] of growing and contracting industries seem be equal until 1988. In the period 1988-93, capital intensive industries experienced lower employment growth. The energy intensity variable is strongly negatively correlated with employment growth in all periods. The lack of correlation between capital intensity and employment growth in the first two periods, and the negative correlation in the third period is surprising because, as shown before, real wages declined exactly in the first two periods. One would expect higher employment generation in less capital intensive sectors as a response to real wage cuts. However, less capital intensive sectors had a higher average employment growth when there were real wage increases in the late 1980s. This apparent paradox can be explained by export orientation and export growth. As shown in Table 7, the export growth rate is positively correlated with capital intensity in the period 1980-83. In other words, capital intensive industries played a more important role in the export boom of early 1980s. Note that export growth is also positively correlated with average labor cost in the same period. The link between export growth and capital intensity disappears in the second period and reappears with an opposite sign in the third period. The same pattern is observed for average labor costs. In other words, less capital intensive industries achieved higher output and employment growth rates, and also higher rates of GFCF (note the coefficient of correlation between change in capital intensity and export growth in Table 7) in the last period.

[11] Capital and energy intensities are defined, respectively, as capital stock per employee, and electricity consumption per employee.

Energy intensity, measured as electricity consumption per employee is much lower in growing industries in all periods. It seems that energy costs (or constraints) are quite important in employment generation in the 1980s. Labor costs are also lower in growing industries in all three periods. In other words, low wage industries have grown faster in the last 15 years. The growth rate of labor costs, however, is positively correlated with employment growth (or, to be more precise, the decline in labor costs is lower in growing industries) in the first two periods. It seems that export growth is not associated with wage growth in any period. These results show that the manufacturing industry has been restructured towards low wage sectors especially since the late 1980s, and the pattern of specialization in foreign trade has reinforced this trend.

Labor productivity (value added per employee), and gross profit margin (value added *minus* labor costs/sales) are not correlated with employment growth. Technological characteristics of industries have mixed results for employment performance. Although R&D activities are not developed in Turkish manufacturing industries, we nevertheless use the R&D data for the 1990-93 period[12] to test if there is any relationship between R&D intensity and employment performance. There is a negative correlation between R&D intensity (in 1990-93) and employment generation in the period 1980-83. The correlation becomes positive for the period 1988-93. However, in both cases, two outlier industries with the highest R&D intensities (wooden and cane containers, and electrical appliances industries) determine the coefficient of correlation. The technology transfer variable is not significantly correlated with employment growth in any period.

Finally, two variables, the share of production workers and the share of women employees, are used to test the effects of the composition of labor force. The share of production workers has positive correlation coefficients for all periods but only the one for the second period is significant. The share of women employees has also positive coefficients for all periods although in the first period, the correlation is not significant. This shows that there is a shift towards those sectors that employ more female workers. This trend is, of course, a part of the process towards low wage sectors because female workers are usually paid less than their male counterparts.

4. Determinants of labor demand in manufacturing industries

[12] No data are available before 1990. We use the average R&D intensity for the 1990-93 period to reduce the effects of annual fluctuations.

In this section, the determinants of labor demand in Turkish manufacturing industries are analyzed. It is assumed that the demand for labor is derived from profit maximizing behavior. The firm is assumed to maximize the present value of its earnings stream given by

$$PV = \sum_{t=0}^{\infty} \left(\frac{1}{1+r_t}\right)^t (p_t Q_t - w_t L_t - pk_t K_t - pm_t R_t - pe_t E_t - AC(\Delta L_t, \Delta K_t))$$

where r is the discount rate, *p* the product price, Q the output level, *w* the wage rate, L the number of employees, *pk* the user cost of capital, K the capital stock, *pm* the price of raw materials, R the amount of raw material consumed, *pe* the price of energy, E the amount of energy used, and AC the adjustment cost function. L and K are assumed to be quasi-fixed inputs. Subscript t indexes time and Δ is the difference operator. Under certain assumptions, one can derive labor demand function (in the neighbourhood of equilibrium) which is usually approximated by the partial adjustment equation

$$\Delta L_t = \lambda(L_t^* - L_{t-1})$$

where L* is the expected "optimum" (or, equilibrium) level of employment which depends on expected future prices, and λ is the adjustment parameter. The value of the adjustment parameter depends on the discount rate, adjustment costs, and the production technology. If it is assumed that expected future prices are forecast using past prices, the expected optimum level of employment, L*, can be substituted out from the labor demand equation. Then, the equation will include a distributed lag in all relevant past prices.

The exact form of the labor demand function depends on assumptions about i) the technology (the form of the production function), ii) the adjustment costs, iii) the structure of product and factor markets, and the behavior of the firm, and iv) expectations (for details, see Nickell (1986), Hamermesh (1993) and Bresson, Kramarz and Sevestre (1993)). If i) the technology is homothetic, ii) there are no adjustment costs, iii) all markets are perfectly competitive, and iv) expectations are rational, then the labor demand function is reduced to the static labor demand function where current employment level is equal the desired employment level which is determined only by current prices. However, the violation of any one of these assumptions will lead to a dynamic labor demand equation with the adjustment terms and a distributed lag in prices. The lag length depends on the precise specification of

the profit maximization problem as well as the aggregation schedule. Since the dynamic labor function can be analytically derived under very restrictive assumptions, following Symons (1985), we will adopt an empiricist approach, and estimate the following dynamic labor demand function by pooling data on ISIC 4-digit manufacturing industries for the period 1980-94:

$$L_{i,t} = \alpha_L L_{i,t-1} + \alpha_k K_{i,t-1} + \alpha_w w_{i,t} + \alpha_{pk} pk_{i,t} + \alpha_{pm} pm_{i,t} + \alpha_{pe} pe_{i,t} + \Lambda X_{i,t} + \Gamma Z_t + \alpha_i + \alpha_i^T t + \varepsilon_{i,t}$$

where L is the number of employees, K the capital stock, *w* the real product wage, *pk* the real cost of capital, *pm* the real cost of raw materials, *pe* the real cost of energy. X and Z are vectors of sector-specific and aggregate variables, respectively. Λ and Γ are corresponding vectors of parameters. ε is the error term. The subscripts i and t denote the industry (at the ISIC 4-digit level), and time (t = 1981, … , 1994), respectively. Note that we allow for sector-specific intercept terms (α_i) and trends (α_i^T). Labor and capital variables and all prices are in log form. All price variables are deflated by the product price.[13]

The labor variable is measured by the (log) number of employees (LEMP).[14] The lag value of employment is added into the model to check the speed of employment adjustment. A statistically significant positive coefficient for the lagged employment variable will indicate sluggish adjustment. Although we use aggregate data, we prefer to use only one lag for the employment variable because the data is annual. Moreover, since we do not have the data for a long time period, we prefer not to lose more observations by increasing the lag length.

The lagged value of the capital variable is used to test if the adjustment in employment depends on the adjustment of the capital stock. If the capital stock is not at the equilibrium level, and if the cost of adjustment in employment depends on the rate of change in the capital stock, then the lagged value of the capital stock variable will have a coefficient statistically significantly different from zero. A positive (negative) coefficient shows labor and capital inputs are dynamic p-complements (p-substitutes) (for definitions, see Hamermesh, 1993: 263). Since there are no reliable capital stock data at the 4-digit level, we use the (log) amount of electricity consumed (LELEC) as a proxy for the capital stock.

[13] The base year for all price indices is 1987. The product price data are available at the 3-digit level for the 1981-87 period, and at the 4-digit level since 1987.

[14] Because of the lack of data on small establishments, the data used in this section covers private establishments employing 25 or more people, and all public establishments.

The real product wage is measured by the (log) wage payments per employee deflated by the product price (LW). The cost of capital is proxied by the (log) import price of capital goods deflated by the product price (LPK).[15] The costs of raw materials (LPR) and energy (LPE) are also deflated by the product price.

The *X* vector includes three variables: sectoral output level (LQ), mark-up (MARKUP) and the interaction between mark-up and the labor cost variables (MARKUP*LW). The LQ variable is added into the model to estimate conditional labor demand functions. In this case, a proportionate increase in all input prices should leave employment unchanged. In other words, when the LQ variable is included, the labor demand function should be homogenous of degree zero in input prices. Therefore, in this case, the sum of the coefficients of price variables is constrained to be equal to zero ($\alpha_w + \alpha_{pk} + \alpha_{pm} + \alpha_{pe} = 0$). The MARKUP variable, which is defined as sales revenue/total costs (raw materials, energy and labor costs) ratio, is used to capture the effects of concentration on labor demand. If a few firms control the market, they can raise the product price (leading to a higher mark-up) by restricting output, and, hence, employment. Therefore, we expect a negative coefficient for the MARKUP variable. Slaughter (1997) suggests that not only the level of demand, but also the wage elasticity of labor demand depends on market structure. He suggests that labor demand is less elastic in concentrated markets. The MARKUP*LW interaction term is included to test Slaughter's hypothesis.

The Z vector contains five variables: the proportion of actual tariffs to total imports (TARIFF), the (log) real exchange rate, the coefficient of variation of the growth rates of prices at the ISIC 4-digit level in manufacturing industries (CVPR), the real interest rate (RIR), and the inflation rate (INF). The TARIFF variable is used to test the effects of protection on domestic employment. Since the data are not available at the sectoral level, we use the aggregate data to capture the effects of changes in tariff protection over time (see Currie and Harrison (1997) and Revenga (1997) for the use of various trade policy measures). The LRX variable is one of the main variables that determine the ratio between foreign and domestic prices. If foreign and domestic products are not perfect substitutes and/or if domestic firms enjoy a certain degree of market power, we expect positive coefficients for both variables. The CVPR variable is used to capture the effects of external shocks on labor demand. If there are sector-specific exogenous shocks in the economy, the growth rates of

[15] The capital goods include all products in ISIC 382, 383, 384 and 383 industries. The Fisher price indices at the ISIC 4-digit level are calculated by the UFT. The aggregate capital goods price index is calculated as the geometric average of 4-digit price indices where import value shares are used as weights.

sectoral prices will exhibit diversity. If there are economy-wide shocks, all prices will move in the same direction and, hence, the coefficient of variation of the growth rates of prices will be lower. It is shown in the labor economics literature that firms tend to hoard labor when there is a shock specific to that sector. In the case of an economy-wide shock, it is easier to shed labor, because the workers laid off by the firm cannot easily find employment in other firms, and are likely to be employed again by the same firm when the economy recovers. In such a case, the firm will not loose its firm-specific investment in human capital. Thus, we expect a positive coefficient for the CVPR variable.

The RIR variable (real interest rate) is defined as the interest rate for one-year time deposits *minus* the inflation rate). A high real interest rate will lower employment because of various factors (Symons, 1985). First, the real interest rate determines the discount factor. A high real interest rate will lower investment. Second, the real interest rate represents the price of certain assets (like inventories) not measured in fixed capital. Third, a high real interest rate may lead to less intensive use of the existing capital stock. The effects of inflation (the INF variable, measured as percentage change in the GNP deflator) on employment is ambiguous. On the one hand, it has a negative impact on employment because a high rate of inflation may increase uncertainty about the future. Moreover, as Wadhwani (1987) shows, if firms care about bankruptcy, they tend to employ fewer people in an inflationary environment. On the other hand, high inflation may indicate a positive demand shock that leads to output expansion in the future. In such a case, the effect on employment is likely to be positive.

The speed of employment adjustment (hence, the coefficient of the lagged employment variable) depends on the discount factor, the cost of adjustment and the production technology. Thus, it is possible to add a number of interaction terms that influence the speed of adjustment (for example, see Burgess (1988) and Burgess and Nickell (1990)). We experimented with a number of variables (interactions between the lagged employment and the real interest rate, inflation rate, etc.), but none of these interaction terms had significant coefficients. Therefore, we do not report any results for these variables.[16]

Estimation results are summarized in Table 8. In Model 1, the explanatory variables include only input and factor prices. Aggregate (price) variables and market structure variables are added in Models 2 and 3. Model 4 is the dynamic labor demand model. The output variable is included in Model 5 to find constant-output coefficients. In this model, the

sum of coefficients of input and factor prices are constrained to be equal to zero. All models include fixed effects and sector-specific time effects. All estimates are adjusted for sector-wise heteroscedasticity.

Estimation results show that wage elasticity of employment is negative: -0.096 in the static model, -0.063 in the dynamic model (but significant only at the 10% level), and -0.166 in the dynamic constant output model.[17]

The tariff rate and real exchange rate are significant in almost all models. It is interesting to see that both variables have larger coefficients in the constant-output model (compare Models 4 and 5). These results partly explain the sluggish employment performance since the late 1980s, because as shown in the preceding section, actual tariff rate has declined in the early 1990s and the real exchange rate, after the sharp depreciation in the first half of 1980s, has a tendency to appreciate since the mid-1980s. It is interesting to observe the fact that manufacturing employment increased about 12% from 1980 to 1984, and the real depreciation of the Turkish lira (the index value jumped from 114 to 202 in the same period) alone explains almost half of the increase in employment! The (logarithmic) rate of change in the real exchange rate is equal to 0.572 (*ln*(202/114)), and it leads to an 6.6% increase in employment (0.572*0.116, the real exchange rate elasticity of employment in Model 4).

The real interest rate has its expected negative impact on employment. The coefficient of the real interest rate variable is negative and significant in all models. The real interest rate elasticity of employment is about -0.1. The inflation rate has an insignificant coefficient. The CVPR variable has also a positive coefficient in all models, but it is significant in only Models 2 and 3.

The MARKUP variable has a negative coefficient that is significant in Models 3 and 5. It seems that employment is lower in oligopolistic sectors even when the sectoral output is controlled for. This result shows that those firms that enjoy market power have higher labor productivity than others. The interaction term (MARKUP*LW) has a positive coefficient but it is not significant in Model 4 (the dynamic model) that can be interpreted as a weak support for Slaughter's hypothesis.

The coefficient of the lagged employment variable is positive and significant, showing sluggish employment adjustment in Turkish manufacturing industries. The median length of

[16] We have also experimented with a number of demand side variables (like the deviations of world trade from trend) but they were all insignificant.

[17] Unless otherwise stated, "elasticity" refers to short-run elasticity. Long run elasticities can easily be calculated by multiplying short run elasticities by the inverse of $1-\alpha_L$ where α_L is the coefficient of the $LEMP_{t-1}$ variable.

the adjustment lag is about 5 (model 5) to 7 (model 4) months. The coefficient of the lagged electricity consumption (used as a proxy for capital stock) is also positive and significant in Model 4 that shows that a greater disequilibrium in the demand for capital slows adjustment of the demand for labor, i.e., labor and capital are dynamic p-complements (see Hamermesh, 1993: 233). Finally, the sectoral output has also a positive and significant coefficient. The value of the coefficient of the output variable shows that output elasticity of employment is about 0.27.

In all models, we estimate sector-specific coefficients for the time variable that accounts for exogenous shifts in labor demand generated by technological change. Among 77 sectors included in our analysis, only one sector, the wearing apparel industry (ISIC 3222) has a positive and statistically significant coefficient for the time variable. The coefficient is negative and significant in 64 sectors. This finding shows that the demand for labor declines over time because of technical change. Taymaz (1997) has estimated rates of technical change for all ISIC 4-digit manufacturing industries by using panel data at the establishment level for the 1987-92 period. We find that the estimated rates of technical change and annual exogenous shifts in the demand for labor (the coefficients of the time variable in Model 5) are strongly negatively correlated. Even when the outlier industry (ISIC 3825, office, computing and accounting machinery) is omitted, the correlation coefficient is statistically significant at the 5% level.

To summarize, our estimates of labor demand functions for Turkish manufacturing industries show that trade policy variables and macroeconomic variables are quite important for employment generation. A one percentage point decline in the actual tariff rate leads to the loss of about 8,000 jobs, whereas 1% appreciation of the real exchange rate destroys about 1,200 jobs in the large manufacturing industry.[18] Note that this is the direct impact of the appreciation of the real exchange rate. The nominal exchange rate has an indirect impact through the price of capital goods, because the appreciation of the nominal exchange rate will lower the cost of capital goods, which will have a positive impact on employment. The real interest rate is very important for manufacturing employment. One percentage point increase in the real interest rate leads to the loss of 1,300 jobs in the short run, and 2,200 jobs in the long run. These findings show that high real interest rates and the appreciation of the real exchange rate, which have played the key role to attract capital inflows after the liberalization

[18] There were about one million employees in the early 1990s in the large manufacturing industry, i.e., in those establishments employing 25 or more people. Here, we use elasticities estimated in Model 4.

of capital accounts in the late 1980s, have a very important effect on employment performance of the manufacturing industries.

Before concluding this section, a number of caveats of our analysis should be mentioned. First, there are some missing variables and measurement errors. Most notably, because of the lack of data, the quota coverage and export subsidy variables were not included in our analysis. Moreover, the aggregate actual tariff rate variable is used for all sectors. The price of capital goods is also measured with some error because it includes only imported capital goods. Second, the analysis is based on employment data at the ISIC 4-digit level which is plagued with the so-called aggregation problem. A further analysis at the establishment level can provide stronger evidence for the determinants of labor demand. Finally and most importantly, our analysis covers only the "formal" sector. Because of the lack of data, those private establishments that employ less than 25 people are not covered in our analysis. Some of the strong effects uncovered in the analysis could be weaker at the economy-level because of the reallocation of labor from the "formal" sector to the "informal" sector.

5. Conclusions

Major findings of our analysis can be summarized as follows.

- The employment performance of the Turkish economy in the 1980s has been rather poor, at least unsatisfactory given the high rate of population growth. The post-1980 adjustments have heavily relied on real wage cuts to stabilize the economy and to boost competitiveness of exporters because lower wages were thought to be essential to lower inflation rates (by reducing production costs and restraining domestic absorption), and to secure real depreciations. This policy is neither sustainable nor desirable in the long run.
- Our estimates of labor demand functions for Turkish manufacturing industries show that trade policy variables and macroeconomic variables are quite important for employment generation. These findings show that high real interest rates and the appreciation of the real exchange rate, which have played the key role to attract capital inflows after the liberalization of capital accounts in the late 1980s, and real wage hikes in the early 1990s have a very important effect on employment performance of the manufacturing industries.

References

Akder, H. (1987), "Turkey's Export Expansion in the Middle East, 1980-1985", *Middle East Journal* (41): 553-567.

Barlow, R. and Senses, F. (1995), "The Turkish Export Boom: Just Reward or Just Lucky?", *Journal of Development Economics* (48): 111-133.

Baysan, T. and Blitzer, C. (1990), "Turkey's Liberalization in the 1980s and Prospects for its Sustainability", in T. Aricanli and D. Rodrik (eds.), The Political Economy of Turkey, London: Macmillan, pp. 9-36.

Boratav, K., Türel, O. and Yeldan, E. (1995), "The Turkish Economy in 1981-92: A Balance Sheet, Problems and Prospects", *METU Studies in Development* (22): 1-36.

Boratav, K., Kepenek, Y., Taymaz, E., Bali, T., Ertugrul, N.I., and Candan, M.A. (1998) *Türk KIT Sisteminin Iktisadi Degerlendirmesi*, Ankara: KIGEM.

Bresson, G., Kramarz, F. and Sevestre, P. (1993), "Dynamic Labour Demand Models", in L.Matyas and P.Sevestre (eds.), *The Econometrics of Panel Data*, Dordrecht/Boston/London: Kluwer, pp.360-387.

Burgess, S.M. (1988), "Employment Adjustment in UK Manufacturing", *Economic Journal* (98): 81-103.

Burgess, S.M. and Nickell, S.J. (1990), "Labour Turnover in UK Manufacturing", *Economica* (57): 295-317.

Celasun, M. (1989), "Income Distribution and Employment Aspects of Turkey's Post-1980 Adjustment", *METU Studies in Development* (16): 1-31.

Celasun, M. (1994), "Trade and Industrialization in Turkey: Initial Conditions, Policy and Performance in 1980s", in G.K. Hellenier (ed.), *Trade Policy and Industrialization in Turbulent Times*, London: Routledge, pp. 453-484.

Currie, J. and Harrison, A. (1997), "Sharing the Costs: The Impact of Trade Reform on Capital and Labor in Morocco", *Journal of Labor Economics* (15): S44-S71.

Dornbusch, R. (1992), "The Case for Trade Liberalization in Developing Countries", *Journal of Economic Perspectives* (6): 69-85.

Ekinci, N.K. (1998), "Türkiye'de 1980 Sonrasi Kriz Dinamikleri ve Intibak Mekanizmalari"" *Toplum ve Bilim*, no.77, 7-28.

Hamermesh, D.S. (1993), *Labor Demand*, Princeton, NJ: Princeton University Press.

Harrison, Ann and Ana Revenga (1995), *The Effects of Trade Policy Reform: What do We Really Know?*, NBER Working Paper No. 5225, Cambridge, MA.

Harrison, Ann and Edward Leamer (1995), "Labor Markets in Developing Countries: An Agenda for Research", *Journal of Labor Economics* (15): S1-S19.

Harrison, Glenn W., Thomas F. Rutherford, and David G. Tarr (1996), *Economic Implications for Turkey of a Customs Union with the European Union*, World Bank Policy Research Working Paper No. 1599, Washington, D.C.

Köse, A.H. and Yeldan, E. (1998), "Disa Açilma Sürecinde Türkiye Ekonomisinin Dinamikleri: 1980-1997", *Toplum ve Bilim*, no.77, 45-68.

Krueger, Anne O. (1998), "Why Trade Liberalisation is Good for Growth?", *Economic Journal* (108): 1513-1522.

Lizondo, J. S. and Montiel, P.J. (1989), "Contractionary Devaluation in Developing Countries", *IMF Staff Papers* (36), n.1, 182-227.

Maraslioglu, H. and Tiktik, A. (1991), *Türkiye Ekonomisinde Sektörel Gelismeler: Üretim, Sermaye Birikimi ve Istihdam*, 1968-1988, Ankara: SPO [The database is updated to 1993].

Ministry of Labour and Social Security (1998), *Labour Statistics, 1997*, Ankara: Ministry of Labour and Social Security.

Morley, S. A. (1992), "On the Effect of Devaluations During Stabilization Programs in LDCs", *Review of Economics and Statistics* (74): 21-27.
Navaretti, G.B., Faini, R and Silberston, A. (1995), "Overview", in G.B. Navaretti, R. Faini and A. Silberston (eds.), *Beyond the Multifibre Arrangement: Third World Competition and Restructuring Europe's Textile Industry*, Paris: OECD, pp. 13-24.
Nickell, S.J. (1993), "Dynamic Models of Labour Demand", in O.Ashenfelter and R.Layard (eds.), *Handbook of Labor Economics*, vol I, Amsterdam: Elsevier, pp. 473-522.
Ocampo, J.A. and Taylor, L. (1998), "Trade Liberalisation in Developing Economies: Modest Benefits but Problems with Productivity Growth, Macro Prices, and Income Distribution", *Economic Journal* (108): 1523-1546.
Revenga, A. (1997), "Employment and Wage Effects of Trade Liberalization: The Case of Mexican Manufacturing", *Journal of Labor Economics* (15): S20-S43.
Rodrik, D. (1995), *Trade Strategy, Investment and Exports: Another Look at East Asia*, NBER Working Paper No. 5339, Cambridge, MA.
Slaughter, M.J. (1997), *International Trade and Labor-Demand Elasticities*, NBER Working Paper no. 6262, Cambridge, MA.
State Planning Organization (1997), *Economic and Social Indicators (1950-1998)*, Ankara: SPO (This document is available in its full content at the SPO's web site, http://www.dpt.gov.tr).
Symons, J.S.V. (1985), "Relative Prices and the Demand for Labour in British Manufacturing", *Economica* (52): 37-49.
Senses, F. (1990), *Stabilization and Structural Adjustment Program in Turkey*, Tokyo: Institute of Developing Economies.
Senses, F. (1994), "Labour Market Response to Structural Adjustment and Institutional Pressures: The Turkish Case", *METU Studies in Development* (21): 405-448.
Senses, F. (1996), *Structural Adjustment Policies and Employment in Turkey*, ERC Working Paper 96/01, METU.
Senses, F. (1998), "Kriz, Dis Yardim ve Neoliberal Politikalar", *Toplum ve Bilim*, no.77, 29-44.
Taylor, L. (1990), "Real and Money Wages, Output and Inflation in the Semi-industrialized World", *Economica* (57): 329-353.
Taymaz, E. (1997), *Small and Medium-sized Industry in Turkey*, Ankara: SIS.
Togan, S. (1993), *1980'li Yillarda Türk Dis Ticaret Rejimi ve Dis Ticaretin Liberizasyonu*, Ankara: Türk Eximbank.
UFT (1998),*Foreign Trade Statistics, 1997 Annual*, Ankara: UFT.
Uygur, E. (1991a), *Policy, Trade and Growth in Turkey: 1970-1990*, Paper presented at the UNCTAD Expert Group Meeting on Trade Policies in Developing Countries During the 1990s, May, Antalya.
Uygur, E. (1991b), *Policy, Productivity, Growth and Employment in Turkey, 1960-1989, and Prospects for the 1990s*, Geneva/ ILO, MIES Special Topic Study.
Uygur, E. (1993), *Financial Liberalization and Economic Performance in Turkey*, Ankara: The Central Bank of the Republic of Turkey.
Wadhwani, S.B. (1987), "The Effects of Inflation and Real Wages on Employment", *Economica* (54): 21-40.
Yavan, Z. (1997), *Türkiye'de Issizlik: Yapisal ve Yapisal Olmayan Özellikleri*, Istanbul: TUSIAD.
Yentürk, N. (1997), *Türk Imâlat Sanayiinde Ücretler, Istihdam ve Birikim*, Istanbul: Friedrich Ebert Vakfi.