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The controversy over employment policy: Low labor costs and openness, or demand policy? A sectoral analysis for Turkey

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Abstract

The purpose of this paper is to test the effects of labor cost, openness, and demand side variables on employment for the case of Turkey using the panel data of private manufacturing industry at three digit level for 25 sectors for the period of 1973-2001. We use a seemingly unrelated regression (SUR) model, which allows for cross-sectoral heterogeneity. The estimation results show that higher growth is more effective in stimulating employment compared to lower labor costs. The reliance of Turkey and many developing countries on labor market flexibility and openness as the unique tools of employment policy reflects a pro-capital incomes policy bias rather than a necessity. The results confirm the Keynesian emphasis on demand-side policies to fight against unemployment.

Keywords: labor demand, structural adjustment, labor market flexibility, trade liberalization
JEL-Code: J23, E24, F16

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1. INTRODUCTION

In the last two decades the economic policy debate on the issue of unemployment in many developing countries has been dominated by the neoclassical policy prescriptions suggested by the international institutions like the IMF, World Bank, and supported by the domestic governments. The two main policy tools of the orthodox structural adjustment programs regarding employment growth have been labor market flexibility and openness to the world economy. On the one hand, labor market flexibility is expected to remove the so-called distortions caused by labor market institutions, which are argued to prevent the adjustment of labor costs and employment. Here the theoretical assumption is that labor demand is primarily determined by the cost of labor, and labor market regulations create rigidities and artificially high labor costs. On the other hand, trade liberalization, based on a narrow reading of the Heckscher-Ohlin theorem, is expected to increase employment in developing countries with a comparative advantage in labor intensive sectors. Labor market flexibility is supposed to play an important role also in connection to the effects of openness. It is argued that the positive effects of trade liberalization on employment and real wages may be hindered by labor market distortions, such as trade unions or minimum wage legislation, which prevent the initial downward adjustment of real wages in the short run due to the slow pace of the reallocation of capital across sectors (Edwards, 1988; Cox-Edwards and Edwards, 1994).

In the last two decades many developing countries have experienced massive increases in exports and labor market flexibility along these policy lines. However, the optimism about the employment effects of openness and flexibilization are not supported by the stylized facts of most of these countries, where significant trade and

labor market reforms have gone along with decreasing or at best stagnating employment rates (Horton et al, 1994; Amsden and van der Hoeven, 1995; Amadeo and Horton, 1997; Crotty and Dymski, 2000; van der Hoeven & Saget, 2004; Pollin et al, 2004; Onaran, 2004). This evidence is consistent with the Keynesian emphasis on the demand side effects of the structural adjustment packages, in particular the contraction in domestic demand via wage cuts as well as tight fiscal policies. Even the World Bank, after having promoted trade liberalization for two decades, in its final World Development Report (World Bank, 2005) discusses that the aggregate effects of trade reform on employment and income distribution are not always clear, and there will always be winners and losers. Nevertheless, the evaluation of the World Bank does not include a discussion of the downward pressure generated by the global markets on worker's bargaining power, and consequently on wages and domestic demand, which in turn limits the job creation potential of the country. The negligence of this vital link leads to a limitation of the policy framework once again to the areas of the labor market, infrastructure, and competition.

The purpose of this paper is to bring effective demand back to the terrain of employment policy, by testing the validity of the mainstream emphasis on the cost of labor as a core determinant of labor demand as well as the positive expectations from openness, and comparing these with the effects of the demand side variables on employment. Our analysis is based on the case of Turkey. We estimate an employment equation with labor cost (decomposed to real wage and productivity), openness (measured by the export and import intensity), and demand side variables (growth and investment) as the explanatory variables. On the demand side, we use investment along with growth as an explanatory variable in order to reflect both the positive effects of growth expectations and the negative effects of technological

change. Similarly on the cost side, productivity improvements may influence employment not only positively through unit labor costs, but also negatively via labor saving methods for a given level of capital stock. We use panel data covering private manufacturing industry firms employing more than 10 employees, aggregated at three digit (ISIC-Rev. 2) level for 25 sectors for the period of 1973-2001[1]. The estimation is based on a seemingly unrelated regression (SUR) model, which allows for cross-sectoral heterogeneity. The sectoral differences are evaluated in reference to the capital and skill intensity of the sector. Finally, we compare the relative magnitude of the effect of wages and demand side variables on employment.

Turkey, having strictly followed the orthodox structural adjustment recipes of the IMF and World Bank for two decades since 1980, and often praised by these institutions as a successful example regarding its trade reform and labor market flexibility, is a typical case to test the effectiveness of mainstream employment policies. The continuation of the same policy line during the phase of membership negotiations with the EU makes this analysis further more important, since it displays the striking deviation between the aspirations and the policy tools of the enlargement process. Any genuine reflection on the employment performance of the country after the trade and labor market reforms of the 1980s would call for a serious reconsideration of the old policy tools. Many studies on Turkey conclude that the employment increase in the export oriented growth era of the post-1980s can be regarded as quite weak or at most moderate (Taymaz, 1999; Erlat, 2000; Dietzenbacher and Gunluk-Senesen, 2003; Tunali et al, 2004). This stagnant employment performance is particularly a challenge to be explained when the improvements in terms of export performance are considered. Following the structural adjustment program, the ratio of manufacturing exports to GNP increased from around 1% in 1979 to 12% by the second half of

1990s. However, in the meantime average growth in the era of export-orientation has been not only lower (4% per year during 1980-2004) compared to the period of import-substituting industrialization (4.8% per year during 1970-79), but also more volatile, with growth interrupted by two major economic crises in 1994 and 2001. The low wage strategy of more than two decades, with only temporary corrections in between, has failed to stimulate stable long-term growth and investment as well as employment (Yenturk, 1997; Voyvoda and Yeldan, 2001, 2005; Metin-Ozcan et al., 2001; Onaran and Yenturk, 2001; Boratav et al, 2000; Onaran and Stockhammer, 2005). Since the latest economic crisis of 2001, the country is stuck with urban unemployment rates ranging between 14.2% and 13.6% during 2002-2004, in spite of a strong and fast recovery in economic growth. This jobless growth pattern is preventing the country from utilizing its demographic window of opportunity, and is reinforcing the social problems due to the inability of the industrial sector to absorb the disguised unemployed in the agricultural sector.

The indicators of labor market flexibility also point out that this disappointing employment performance can not be explained by "rigidity". Turkey takes place among the highly flexible OECD countries according to a labor market flexibility index compiling data on minimum wages, hiring and firing practices, centralized collective bargaining, unemployment insurance, and top marginal tax rate (Lawson and Bierhanzl, 2004). The degree of flexibility becomes even more significant, when the informal sector and the informal practices in the formal sector are also taken into account (OECD, 1996; Taymaz and Ozler, 2003). Turkey also ranks as the second most flexible country in the OECD with respect to the low rate of indexation of real wages to productivity (OECD, 2000). Econometrical studies show that wages are significantly responsive to unemployment as well (Ilkkaracan and Yorokoglu, 2004;

Ilkkaracan and Selim, 2003; Onaran, 2002). In a way, the problem is not little but excessive emphasis on labor market flexibility, which leads firms to neglect the importance of human capital, entrepreneurship and innovativeness (Taymaz and Ozler, 2003).

The empirical results of this paper suggest that policies targeting higher growth are more effective in stimulating employment compared to those targeting lower labor costs. The reliance of Turkey and many developing countries on labor market flexibility and openness as the unique tools of employment policy reflects a pro-capital incomes policy bias rather than a necessity.

The rest of the paper is organized as follows: In section 2, we present our methodology and model specification. We introduce the stylized facts of our working sample in section 3. Section 4 discusses the empirical results, and section 5 concludes.

2. EMPIRICAL MODEL AND THE METHODOLOGY

The labor demand function, which we estimate on a sectoral level, incorporates the effect of three groups of variables: labor costs, demand for the sector's output and expectations for future sales, and finally the variables reflecting the degree of openness.

Regarding the labor cost effect, we start with the real unit labor cost as the explanatory variable, which is the ratio of real wage per worker (deflated by wholesale price index) to labor productivity, and then in an alternative specification, we decompose labor cost into real wage and productivity, which enter the empirical estimation as separate explanatory variables. Labor cost is the main determinant of labor demand in mainstream models, and a significant negative effect is expected. In addition to the

cost aspect, unit labor cost, or more precisely its variation is also regarded as an indicator of the wage flexibility. Real unit labor cost incorporates the degree of indexation of nominal wages to inflation as well as productivity. In that respect, a change in the unit labor costs reflects either a change in the effective bargaining power of the workers, or an unexpected price or productivity shock. Other things being equal, a falling unit labor cost goes along with a loss of bargaining power of the workers. Overall the changes in the unit labor costs mirrors the institutional structure of the labor market, regarding trade union power, workers' organizations, minimum wages, or the mechanisms of indexation of wages to prices and productivity changes. These institutions are usually regarded as "labor market rigidities" in the mainstream economics, and labor market deregulation targets at higher downward flexibility of unit labor costs, which in return is expected to lead to a higher labor demand. Additionally, unit labor cost is also regarded as the main indicator of international competitiveness within the context of structural adjustment programs, and a decline in labor costs are expected to improve the international trade performance, and thereby labor demand.

At the next stage, we use real wage and productivity as separate explanatory variables. A decline in real wage or an increase in productivity leads to a decline in unit labor costs, and thus can lead to an increase in employment, as long as labor demand is sensitive to labor costs, as the neo-classical economics assume. However, if labor demand is mostly responding to the demand for the output of the sector rather than labor costs, there will be no significant change in employment in response to changes in either wages or productivity. Moreover, the effect of labor productivity is two sided: On the one hand, higher productivity for a given wage level leads to lower labor costs, but on the other hand, it also leads to labor saving, and a downward shift of the

labor demand curve for a given level of output. In a Kaldorian framework, if an increase of labor productivity is not matched by an increase in effective demand, then it may have a negative impact on employment. Within the context of neo-classical structural adjustment programs, this aspect is usually dismissed as a short-run phenomenon, and the stimulating effect of productivity on the competitiveness of the sector is expected to promote both production and employment in the long run. In our empirical estimation, the sign of the coefficient of productivity will show which of the labor cost or labor saving effects dominate. Moreover, as we discuss below, we also control for investment. Thus a negative effect of productivity on employment for a constant level of investment, i.e. a given technology, indicates that productivity improvement is based on labor saving organizational innovation rather than technological change.

On the demand-side, the standard variable to be considered is the production of the sector, which is measured by the real value added of the sector[2]. Although the demand side effects are particularly emphasized in Keynesian economics, they are also consistent with a neoclassical labor demand function derived from the profit maximizing decision of a firm based on a production function (eg. Milner and Wright, 1998). In our estimation, we also pay attention to the way the sector responds to the increase in demand, i.e. do the firms simply increase their rate of capacity utilization, or do they invest in new capital stock? An increase in the ratio of investment to value added can be an indicator of the general optimism about the sustainability of growth in the industry, which then leads to an upward shift in the labor demand for a given level of production. However, the effect of investment on employment will also be related to the nature of new investment, i.e. whether it is investment in the extension of the existing capital stock with the same technology, which is expected to have a positive

effect on employment, or whether it incorporates the adoption of new labor saving technology, which would lead to a negative employment effect.

The last set of variables accounts for the effects of openness on employment for a given level of aggregate demand. We use export/output and import/output ratios of the sector to capture the degree of openness of the sector. Within the context of traditional trade theory, these variables reflect the relative comparative advantage of the economy (Hine and Wright, 1997; Milner and Wright, 1998). As a result of trade liberalization, production is expected to shift to exportables from products competing with imports. According to the traditional trade theory, in a developing country, which is relatively more labor abundant and therefore has its comparative advantage in labor intensive sectors, a shift towards exportables, i.e. an increase in the export intensity of the sector is expected to translate to an increase in the labor intensity of production, and therefore higher employment for a given level of output. Similarly, increased import intensity is expected to be associated with a decline in employment. However, there are a number of reasons, why these expectations of the traditional trade theory about employment may not be realized: First, the effect of foreign trade can also work through a disciplining effect on firms due to increased international competition (Hine and Wright, 1997; Milner and Wright, 1998; Feenstra and Hanson, 1997, Hanson and Harrison, 1999; Onaran and Stockhammer, 2006). This may lead to labor saving as well as the adoption of new imported production technologies, which are relatively more capital intensive, leading to a decline in labor intensity. Also, if the firms feel insecure about the sustainability of the increase in export demand, which is volatile due to changes in the exchange rate and world markets, they will be reluctant to increase employment. Finally, another unexpected effect in the case of imports is related to the degree of import dependency of the economy: If imported goods are

complementary to domestic inputs, which is usually the case for import dependent developing countries, they may also have a positive effect on employment (Onaran, 2004).

Before proceeding with the estimations, the time series properties of the variables are analyzed. Employment, unit labor cost, real value added, export and import intensities, and labor productivity are non-stationary, while investment/value added is stationary nearly for all the sectors. Thus, we use all the variables except the investment rate in difference form. Employment, unit labor cost, real value added and real wage are in logarithmic difference, while the variables measured in ratios, i.e. export intensity, import intensity, and labor productivity, are in simple difference.

In the case of unit labor cost, wages and productivity, we use the first lag of the variables in order to avoid endogeneity problems. This also makes sense intuitively, since the adjustment of employment to changes in unit labor cost requires a period of adjustment. In the case of investment or foreign trade both current values and the first lags are used, since again the lags in terms of adjustment can be significant. Value added is used only in its current value due to degrees of freedom problems, and the implicit assumption is that the process of adjustment to growth takes place within the same year. However, the results are fairly robust to the use of other combinations of lag structures.

We use a seemingly unrelated regression (SUR) model, which allows for cross-sectoral heterogeneity of the coefficients, i.e. it accounts for sector-specific impacts and behavioral differences. The common shocks that affect all sectors are captured by the correlation across the sector specific error terms. Summing up, the two specifications to be estimated are as follows:

$$\Delta L_{it} = b_{0i} + b_{1i}\Delta ulc_{it-1} + b_{2i}\Delta va_{it} + \sum_{j=0}^{j=1} b_{3i,j} iva_{it-j} + \sum_{j=0}^{j=1} b_{4i,j}\Delta xq_{it-j} + \sum_{j=0}^{j=1} b_{5i,j}\Delta mq_{it-j} + u_{it} \quad (1)$$

$$\Delta L_{it} = b_{0i} + b_{1i}\Delta w_{it-1} + b_{2i}\Delta ql_{it-1} + b_{3i}\Delta va_{it} + \sum_{j=0}^{j=1} b_{4i,j} iva_{it-j} + \sum_{j=0}^{j=1} b_{5i,j}\Delta xq_{it-j} + \sum_{j=0}^{j=1} b_{6i,j}\Delta mq_{it-j} + u_{it} \quad (2)$$

where i is the sector indicator (i = 1,.....,25), t = 1975,.....,2001, and ΔL, Δulc, Δw, Δva stand for the logarithmic changes in employment, unit labor cost, real wage (deflated by sectoral WPI), and real value added; iva for investment/value added; and Δql, Δxq, Δmq for the differences in and labor productivity, export-intensity, and import- intensity.

3. STYLISED FACTS

In this section, we discuss the general trends in employment, unit labor cost, production, and investment, in the private manufacturing industry in Turkey, including an overview of the sectoral differences. Three notes on the coverage of the data are in place here. First, we focus on manufacturing industry, since time series data for wages are available for a sufficiently long period. Second, we analyze only the private manufacturing sector, since the employment changes in the public sector (state economic enterprises in manufacturing) in the post-1980s were shaped by policy decisions regarding downsizing and privatization. Third, again due to data limitations, the analysis is limited to the formal sector.

Figure 1 shows the growth in employment and unit labor costs in private manufacturing industry for the period of 1974-2001. Particularly the developments in the export oriented growth era after 1980 is striking: although unit labor costs are mostly declining, growth in employment is not very strong. One important exception to the decline in unit labor costs is the 1989-92 period, when the trade unions pushed

for a recovery of the losses in wages at the earlier stage of the structural adjustment program, and these demands were accommodated by the employers thanks to declining imported input costs due to the appreciation of the local currency as a result of capital account liberalization in 1989 and thereby massive capital inflows. However this consensus was interrupted by the currency crisis of 1994, which led to sharp declines in wages well beyond the decreases in output and productivity. After this shock, there has been an extended recovery in wages starting from 1996 onwards, which also increased the labor costs, though not to pre-crisis levels. Finally 2000-01 crisis is again a period of decline in wages and labor costs. Some of the cases of wage increases are accompanied by labor shedding, but it is hard to talk about a clear inverse relation between the trends in employment and unit labor costs throughout the whole period. This fact hints at the inability of the downward flexibility of wages to stimulate employment in the post-1980 era, quite contrary to the optimism that increased international competitiveness based on lower unit labor costs will also benefit labor through higher employment rates.

<<<Please insert Figure 1 approximately here>>>

On the other hand, when the trends in employment and production (real value added) are examined, as shown in Figure 2, it is seen that there is closer positive relation between employment and growth. In particular periods of sharp contraction in value added are accompanied by comparably significant decreases in employment, as can be seen during the crises of 1994 and 2001.

<<<Please insert Figure 2 approximately here>>>

Similarly, the employment growth rates are closely related to the investment performance of the economy, as can be seen in Figure 3, which shows the trends in

employment and investment as a ratio to value added. Investment rate in the private manufacturing industry falls dramatically at the beginning of the export-oriented growth era compared to the high investment rates of the import substitutionist era, and mostly stagnates afterwards. In spite of periods of partial recovery, investment rates never returned to the peak-levels of the pre-1980 period. Short-term stimulus from international demand has mostly come along with an increased use of the existing capacity rather than new investment. In the post-1980s, Turkey never came close to the dynamic growth pattern of the 1970s, when productivity, investment, and employment had increased together. The low rates of manufacturing investment in Turkey, compared to the successful cases of newly industrializing countries, like Korea, goes also in parallel with the relatively lower rates of growth in employment (Onaran and Stockhammer, 2005).

<<<Please insert Figure 3 approximately here>>>

Finally Table 1 summarizes the trends in the 25 sectors of private manufacturing industry regarding average annual percentage change in employment, unit labor cost, real value added, and the average annual investment/value added for the whole period of 1974-2001 as well as the sub-period of the export-oriented growth era in the post-1980s. Table A.1 in the Appendix gives a list of the sectors. In 22 out of 25 sectors, unit labor costs have on average declined in the post-1980 era. Meanwhile, in only seven out of 25 sectors, employment growth rate is relatively higher in the post-1980s compared to the 1970s. Similarly, growth rate in production is higher in only six out of 25 sectors. Regarding the investment rate, there is only a minor improvement in only eight out of 25 sectors. The sectors with an improvement in the employment performance are almost always those with an increase in investment and/or growth

rate. This evidence poses doubts about the expectations of the structural adjustment policies implemented since 1980 in Turkey, which promises high employment rates as a result of lower unit labor costs, without considering the effects of these policies on investment and long term growth potential of the economy. Nevertheless, accounting for the diversity in employment performance at the sectoral level as well as decomposing the effects of both cost and demand side variables, requires a more comprehensive econometrical analysis.

<<<Please insert Table 1 approximately here>>>

4. ESTIMATION RESULTS

In this section we present the estimation results for employment, and a detailed discussion of sectoral differences. Wherever appropriate, the sectoral differences are evaluated with respect to the relative capital or skill intensity of the sector. The last two columns of Table A.1 in the Appendix classify the sectors as capital or labor intensive, and skilled or unskilled.

In the following, we first discuss the effect of each variable, and then we compare the relative magnitude of the wage and demand effects on employment. The results of Equation 1 and 2, which were introduced in Section 2, are presented in Table 2.1 and 2.2 respectively. The parameter homogeneity is rejected according to the Wald test statistics in Table A.2 in the Appendix, indicating that a pooled panel estimation based on the assumption of homogenous parameters across sectors is not the appropriate method. The error terms of the sector-specific equations are found to be correlated according to the Breusch-Pagan test statistics presented in Table A.3. Thus applying SUR instead of independent estimation for each sector (Ordinary Least Squares) increases the efficiency of our estimators.

<<<Please insert Table 2.1 & 2.2 approximately here>>>

The only variable, which is positively significant nearly in all the sectors in both specifications, is the growth rate (of real value added). This result verifies the robustness of the role of aggregate demand in promoting employment. We also find a negatively significant coefficient of unit labour cost in Specification 1 and real wage in Specification 2 on employment for most of the sectors. In the following we will discuss the details of Specification 2, and the relative importance of demand and wage effects based on this specification, but the results according to Specification 1 are mostly robust, and are available upon request.

According to the results of Specification 2, real wage growth rate with a lag of one year has a negatively significant effect on employment in 15 out of 25 sectors. However, there are 10 sectors, where the common wisdom about the inverse relation between wages and employment is not valid. In seven sectors (food, tobacco, furniture, other chemicals, glass, iron and steel, and non-ferrous metals), the effect is insignificant, and in three (beverage, wood, and electrical machinery) the effect is significant but positive. Most of the sectors with an insignificant wage effect are using relatively skilled labor, and four of them are capital intensive. It is plausible that capital intensive and skilled labor using industries are relatively insensitive to labour costs, since labor costs constitute a less important part of total costs in these industries. However there are also some unskilled-labor using sectors, where wage cuts are unable to stimulate employment. Finally the unexpected positive partial effect of wages on employment can be interpreted as an indicator of the demand effect out of wage income. If the wages in these sectors are moving together with wages in aggregate, and since these sectors are primarily producing consumer goods, the

expansion in aggregate demand can create further optimism about the future sales expectations (even for a given level of output growth), leading to increased employment. This result can be interpreted as an indicator of the aggregate demand effect of wages from a Keynesian perspective.

Regarding the institutional properties of the sectors, where wages have no negative significant effect on employment, it is worth noting that they are mostly the sectors, where collective bargaining is relatively centralized with a high coverage rate[3], which is expected to weaken the negative relation between real wages and labor demand through a coordination of wage bargaining and the consequences for employment.

The effects of productivity, which is the second component of unit labor costs, are also mixed. We find a positive significant coefficient of lagged productivity in 12 out of 25 sectors, where the cost reducing effects of productivity improvements in the previous year dominate the labor saving effects in this year. An important property of these sectors is that almost all of them use relatively unskilled labor. The sectors are nevertheless mixed in terms of their capital intensity. On the other hand, in eleven sectors productivity improvement has basically no significant effect on employment. This may be due to either the neutralization of the cost effect by labor saving effects or the irresponsiveness of labor demand to labor costs. Finally in only two sectors (textile and electrical machinery), the effect is significantly negative, where we can talk about the relevance of labor saving productivity improvement.

The next variable, which is related to technology as well as demand side effects, is investment. We report the joint significance of current and lagged investment based on Wald tests, which are presented in the first column of Table A.4 in the Appendix. In nine sectors investment has a statistically significant positive joint effect on

employment (wearing apparel, leather, furniture, chemicals, plastic products n.e.c, other non-metallic mineral products, iron and steel, non-ferrous metals, machinery except electrical). Six of these sectors are capital intensive. Besides they are mostly unskilled labor using sectors. On the other hand, in five out of 25 sectors (food, tobacco, wood, pottery and china, transport equipment), the impact of investment on employment is jointly negative. Among these sectors, transport equipment is the only capital intensive and skilled sector, and the other four sectors are labor intensive and unskilled sectors. The negative joint effect of investment on employment can be interpreted as an indicator of investment in labor-saving technologies. Finally, In 11 out of 25 sectors, investment doesn't have a significant joint effect, thus either both effects are insignificant, or the positive demand side effects are neutralized by the negative technology effects of investment through time. The effect of investment on employment is diverse across the sectors, and it is not possible to talk about a clear pattern with respect capital or skill intensity of the sector.

Comparing the effects of investment and productivity in the two sectors, where productivity had a negative effect**,** we find out that investment has no significant effect in these sectors. This shows that in both sectors, the labor saving efficiency effect is not working through investment in new technology, but rather the increases in productivity through labor shedding for a given level of capital stock.

Regarding the effect of openness, we again discuss the results based on the joint significance of the current and lagged effects of export and import intensities. The Wald test results for joint significance are in the second and third columns of Table A.4. An increase in the export intensity of the sector has a jointly positive significant effect on employment in only nine out of 25 sectors (food, tobacco, wearing apparel,

wood, paper, glass, iron and steel, fabricated metal products, and professional equipment). The effect is negative in five sectors (footwear, rubber products, pottery and china, other non-metallic mineral products, and electrical machinery), and insignificant in the rest of the 11 sectors. Moreover among the nine main exporting sectors of Turkey[4], the effect of export intensity is positive in only four sectors; it is negative in three of the significant exporting sectors like footwear, rubber products, and pottery and china, and insignificant in two sectors. Even for the traditional labor intensive exporting sectors of beverage and textiles, it is interesting to find that increased exports do not play the expected role of increasing employment. On the other hand, import penetration has the traditionally expected negative significant (joint) effect on employment in only six sectors (wearing apparel, leather, chemicals, non-ferrous metals, fabricated metal products, professional equipment). The effect is insignificant in the majority of the sectors (14 out of 25), and it is even positive in five sectors (footwear, other chemicals, plastic products n.e.c., other non-metallic mineral products, and electrical machinery). The positive impact of imports even in some major import-competing sectors results from the composition of imports in these sectors, which mostly consist of intermediate inputs and capital goods, which are complementary to domestic production, rather than substitutes. The import dependency effect in these sectors is dominating the expected negative impact of import penetration on employment.

Finally, we test the relative effectiveness of the wage and demand variables in determining the demand for labor. We use two different tests for this purpose: First we compare the sum of the coefficients of current and lagged investment rate, and growth (of real value added) with the absolute value of the coefficient of real wage growth. Second, we compare only the effects of growth and wage. The Wald test statistics

based on the coefficients of Specification 2 are in columns four and five in Table A.4. According to the first test, in 18 out of 25 sectors, we find that growth and investment are jointly more effective than real wage in increasing employment. In the rest of the five sectors, where real wage has a higher impact on employment compared to the demand-side variables (beverage, tobacco, paper, printing and publishing, other chemicals, rubber products, and transport equipments), the coefficient of investment is negative and/or insignificant, which would be a potential reason behind this result. In the case of two sectors (paper, and rubber products) the magnitude of demand vs. wage effects are very close. When we compare only at the effect of growth on the demand side with the wage effect, the results indicate that in 22 out of 25 sectors, growth is more effective than wage cuts in increasing employment, and in the remaining three sectors (beverage, wood, and iron and steel), wages have either a positive or insignificant effect. These findings are consistent with the high positive significance of growth in almost all the sectors. The results indicate that the reliance on lower wages to stimulate employment is a political choice, rather than an empirically validated decision. The dominance of supply side policies relying on labor market deregulation and wage cuts shows the clear anti-labor bias in the era of structural adjustment in Turkey. These results are fairly robust when the tests are repeated based on specification 1.

5- CONCLUSION

This paper has analyzed the effects of labor costs, openness, and demand on employment in the private manufacturing industry in Turkey, with a particular emphasis on sectoral differences. The variation of the results across sectors is significant, and indicates that pooled regression analysis may be misleading.

The only variable, which is positively significant nearly in all the sectors, is the growth rate of the value added of the sector. Real wages, on the other hand, have a negative significant effect in the majority of the sectors, but there is a significant number of sectors (10 out of 25), where the mainstream expectation about the negative cost effect is not verified.

Comparing the effects of wage and growth (in value added), it is found that in the vast majority of the sectors (22 out of 25) a policy promoting growth would be more effective than a policy relying on low wages to stimulate employment. The only sectors, where this relation is reversed, are the sectors with a positive or an insignificant wage effect. Thus in all the sectors, where employment has some significant negative response to wages, the demand effect dominates the wage effect.

In roughly half of the sectors, decreasing unit labor cost through increasing labor productivity has a positive effect on employment with a lag of one year. But in the other half of the sectors, productivity improvement has basically no significant effect on employment. Thus, the cost reducing effects of productivity improvements are offset by the labor saving effects. In only two sectors, there is evidence of labor saving productivity improvement, where the effect is significantly negative.

The effects of investment are also rather mixed in terms of the positive demand vs. negative labor-saving technology effects. Investment has a positive effect on employment in nine sectors, a negative effect in five sectors, and the opposing effects are offsetting each other in 11 sectors.

Finally, regarding the effects of openness, in only nine sectors an increase in the export intensity of the sector has a positive significant effect on employment. The effect is even negative in five sectors, and insignificant in 11 sectors. Even in some of

the traditional labor intensive exporting sectors of Turkey, the positive expectations of the mainstream economic policies about the effect of exports on employment are not realized. Import penetration also does not have the traditionally expected negative effect on employment in the majority of the sectors. While the effect is mostly insignificant, there are even sector with positive effects, where the complementary effect of imports for domestic production is dominating the expected negative impact of import competition.

Albeit sectoral differences, one very robust policy tool, valid for all sectors, is the role of aggregate demand in promoting employment. Neither reliance on cheap labor, nor traditional ways of productivity increases via downsizing, nor trade liberalization plays such a robust role. Quite on the contrary, the employment effects of these policies turn out to be insignificant in many cases, or even negative. These partial ineffectiveness or negative effects can be significantly amplified, when the interactions between low wages and aggregate demand deficiency, and the consequential negative feedback of low employment on wages are also taken into account. The negligence of these interactions has led to a vicious circle of low wage, low growth, and low employment in Turkey. The results confirm the Keynesian emphasis on demand-side policies to fight against unemployment. Policies targeting higher growth are more effective in stimulating employment than policies that lead to lower labor costs in the name of labor market flexibility, and this result is robust across sectors. Thus imposing labor market flexibility and openness, as the unique policy tool to combat unemployment is a pro-capital redistributive policy decision. Similarly, it is also a choice to opt for the alternative of an egalitarian growth policy with a high job creation potential, and the likelihood of success is higher, when the dynamic interaction between wages, demand, and employment are also considered.

The policies to achieve a high and sustainable growth and to avoid the vicious cycle of low wage, low growth, and low employment require a systematic industrial, trade, and technology policy.

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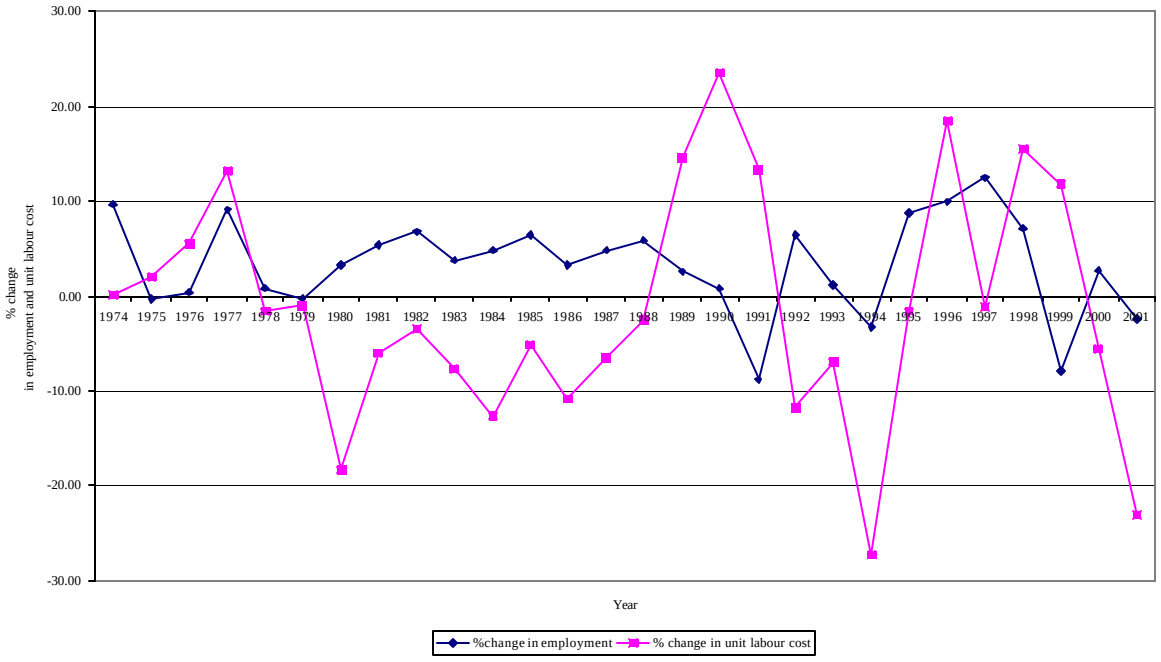
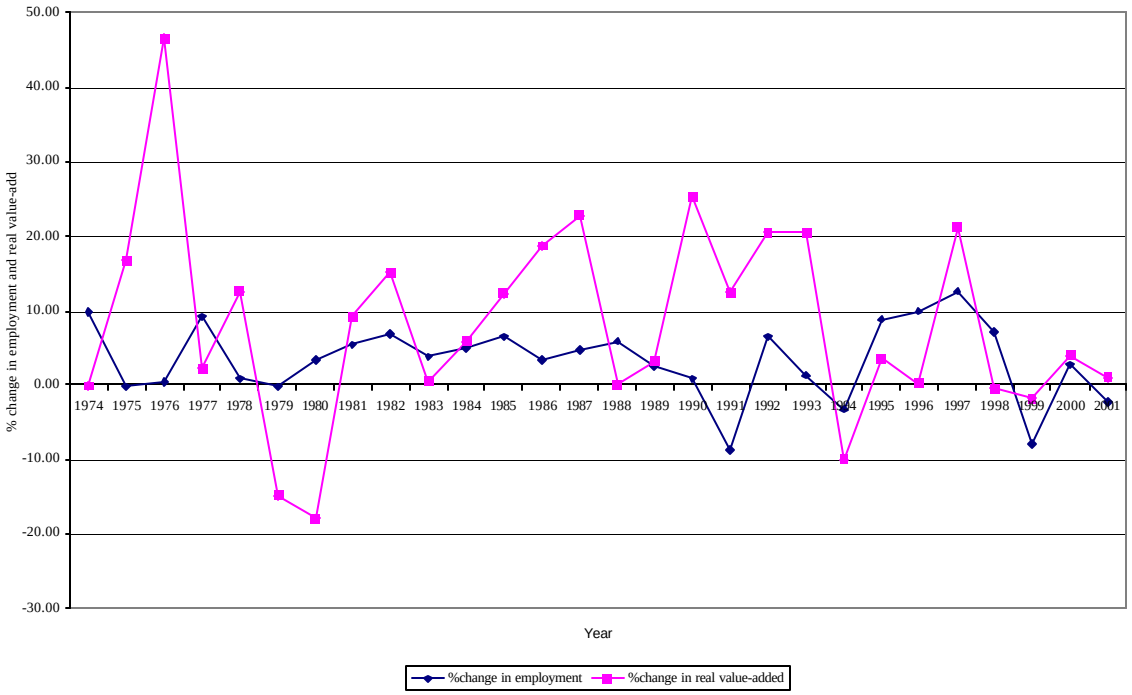
Figure 1. Annual % Change in Employment and Unit Labour Cost, Private Manufacturing Industry



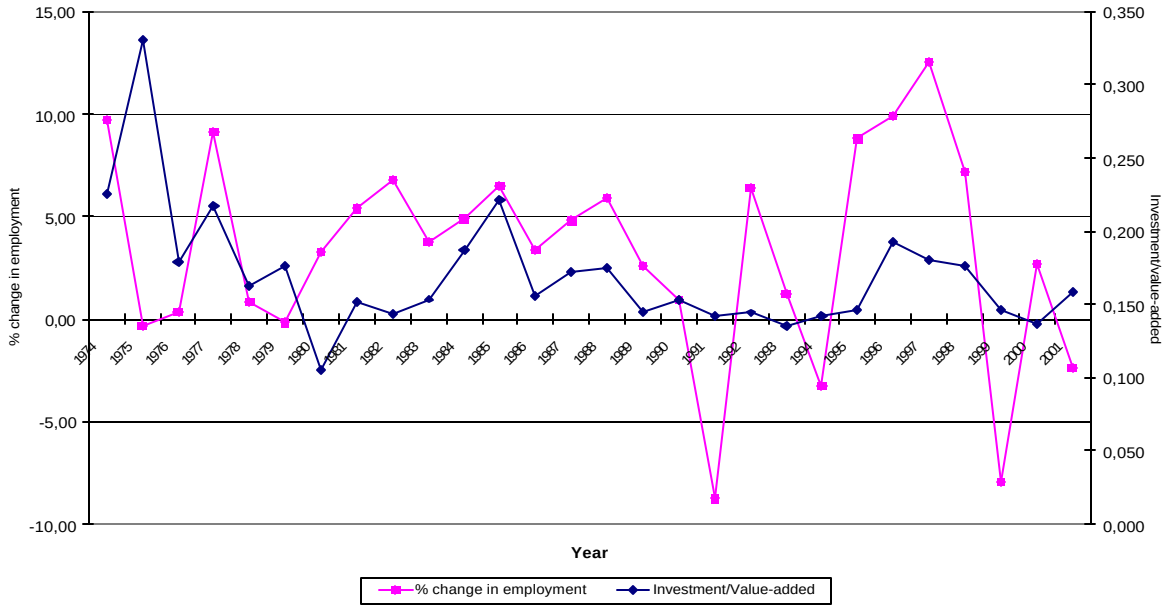
Source: S.I.S. Manufacturing Data Base, 1973-2001

Figure 2. Annual % Change in Employment and Real Value Added, Private Manufacturing Industry



Source: S.I.S. Manufacturing Data Base, 1973-2001

Figure 3. Investment/Value added and Annual % Change in Employment, Private Manufacturing Industry



Source: S.I.S. Manufacturing Data Base, 1973-2001

Table 1. Developments in employment, unit labor cost, investment and growth in the sectors of private manufacturing industry, 1980-2001 and 1974-2001

	Average Annual % Change in Employment		Average Annual % Change in Unit Labour Cost		Average Annual Investment/Value Added		Average Annual % Change in Real Value Added	
Sector	1980-2001	1974-2001	1980-2001	1974-2001	1980-2001	1974-2001	1980-2001	1974-2001
311-2	2,95	2,96	-2,22	0,51	0,11	0,12	6,68	14,78
313	0,33	1,31	-5,37	-1,73	0,19	0,18	7,77	9,38
314	6,43	2,05	0,99	1,72	0,07	0,06	36,67	28,3
321	3,81	3,59	-2,09	-0,89	0,21	0,22	6,61	7,67
322	11,8	10,96	1,96	2,98	0,11	0,11	15,19	20,73
323	3,57	4,12	-2,8	0,44	0,1	0,1	9,61	12,91
324	6,33	7,2	-1,39	-1,13	0,06	0,09	11,29	14,12
331	2,49	2	-3,18	-0,3	0,22	0,21	9,62	8,14
332	8,57	10,98	-1,74	0,31	0,1	0,12	16,81	18,44
341	5,15	4,71	-0,21	0,65	0,18	0,2	5,91	7,73
342	2,66	1,41	-0,72	-0,03	0,2	0,18	10,3	6,83
351	0,21	2,54	-1,7	1,11	0,21	0,23	4,86	9,91
352	3,2	2,44	-0,55	-1,2	0,08	0,09	7,64	7,08
355	0,75	0,75	1,26	0,73	0,14	0,13	3,33	5,03
356	4,69	4,74	-0,17	2	0,21	0,21	6,67	7,24
361	2,99	4,08	-0,04	0,08	0,17	0,18	7,75	10,22
362	1,86	2,26	-2,05	-1,1	0,22	0,2	9	9,03
369	2	3,11	-2,63	-1,19	0,17	0,22	8,6	9,14
371	2,44	3,15	-1,62	0,52	0,2	0,23	11,34	12,3
372	1,24	4,06	-1,14	0,71	0,21	0,22	8,52	17,52
381	2,85	2,89	-0,38	-0,95	0,14	0,14	8,84	9,7
382	2,09	2,27	-2,03	-0,46	0,13	0,2	10,53	10,19
383	3,02	4,38	-1,65	-0,82	0,12	0,13	11,36	12,9
384	4,03	4,5	-0,58	1,7	0,2	0,19	13,48	13,11
385	9,05	7,43	-0,68	-1,21	0,13	0,13	25,33	20,8

Source: Own calculations based on the S.I.S. Manufacturing Data Base, 1973-2001

Table 2: Estimation results for the log. change in employment (DL_{it})
Estimation period: 1975 2001. Total panel (balanced) observations=27*25=675. Estimation method: SUR
Table 2.1 Specification 1

		Sector																									
Variable		**311-2**	**313**	**314**	**321**	**322**	**323**	**324**	**331**	**332**	**341**	**342**	**351**	**352**	**355**	**356**	**361**	**362**	**369**	**371**	**372**	**381**	**382**	**383**	**384**	**385**
$D\mathbf{ulc}_{it-1}$	Coefficient	-0,072	0,066	-0,255	-0,030	-0,132	-0,090	-0,216	0,170	0,011	-0,101	-0,205	-0,098	-0,106	-0,093	-0,047	-0,160	-0,068	-0,101	-0,089	-0,012	-0,102	-0,146	0,056	-0,317	-0,043
	p-value	0,020	0,044	0,019	0,278	0,000	0,039	0,000	0,006	0,882	0,012	0,000	0,000	0,007	0,296	0,090	0,000	0,197	0,028	0,111	0,819	0,003	0,000	0,261	0,000	0,177
$D\mathbf{va}_{it}$	Coefficient	0,106	0,106	0,217	0,168	0,170	0,297	0,343	0,020	0,312	0,100	-0,064	0,031	-0,002	0,231	0,037	0,313	0,140	0,274	0,080	0,105	0,257	0,095	0,202	0,093	0,291
	p-value	0,000	0,015	0,000	0,000	0,000	0,000	0,000	0,672	0,000	0,006	0,060	0,147	0,942	0,000	0,261	0,000	0,004	0,000	0,034	0,000	0,000	0,000	0,000	0,043	0,000
$\mathbf{iva}_{it}$	Coefficient	-0,966	0,148	-0,963	0,149	0,316	1.000	0,275	-0,125	-0,181	-0,159	-0,336	0,322	-0,096	0,099	-0,103	-0,530	0,044	0,235	0,129	-0,076	-0,011	-0,086	0,276	-0,189	-0,018
	p-value	0,000	0,017	0,110	0,008	0,001	0,000	0,000	0,030	0,435	0,018	0,000	0,000	0,285	0,727	0,206	0,000	0,319	0,008	0,040	0,413	0,762	0,000	0,003	0,370	0,887
$\mathbf{iva}_{it-1}$	Coefficient	-0,136	-0,222	0,400	-0,079	0,176	-0,590	-0,213	-0,138	0,739	0,146	0,123	0,060	0,154	-0,289	0,212	-0,556	-0,002	-0,153	0,063	0,311	-0,083	0,186	0,013	-0,347	-0,232
	p-value	0,383	0,002	0,524	0,131	0,113	0,000	0,000	0,232	0,001	0,032	0,165	0,063	0,116	0,224	0,013	0,000	0,974	0,084	0,224	0,004	0,030	0,000	0,907	0,087	0,077
$D\mathbf{xq}_{it}$	Coefficient	0,180	-1,430	6,310	-0,160	0,000	-0,540	-0,050	0,490	-0,320	-0,350	-0,050	-0,310	0,480	-0,270	-0,050	-0,930	0,740	-0,670	-0,100	0,810	0,190	-0,110	-0,780	0,020	0,040
	p-value	0,288	0,130	0,006	0,267	0,998	0,019	0,389	0,000	0,008	0,304	0,894	0,047	0,095	0,381	0,884	0,001	0,000	0,002	0,635	0,096	0,082	0,118	0,000	0,932	0,058
$D\mathbf{xq}_{it-1}$	Coefficient	0,750	-0,290	0,210	0,470	0,190	-0,120	-0,080	0,010	0,480	1,570	-0,470	0,140	0,040	-0,300	1,730	-0,040	0,370	-0,300	0,860	0,310	0,430	0,110	0,090	0,160	0,070
	p-value	0,000	0,723	0,940	0,002	0,000	0,589	0,314	0,930	0,001	0,000	0,186	0,245	0,904	0,458	0,000	0,907	0,060	0,098	0,001	0,495	0,000	0,099	0,709	0,698	0,001
$D\mathbf{mq}_{it}$	Coefficient	0,540	-0,200	-1,730	-0,190	-3,670	-0,810	-0,180	0,200	0,020	-0,300	-0,460	-0,090	0,180	-0,030	0,050	-1,320	-0,600	-0,190	-0,110	-0,380	-0,120	0,000	0,060	-0,140	-0,001
	p-value	0,013	0,895	0,132	0,544	0,009	0,000	0,270	0,257	0,961	0,004	0,311	0,114	0,379	0,953	0,871	0,001	0,077	0,501	0,539	0,000	0,024	0,960	0,309	0,626	0,473
$D\mathbf{mq}_{it-1}$	Coefficient	0,090	5,730	1,300	0,360	-2,490	-0,150	0,520	0,320	-0,040	-0,020	3,500	-0,090	1,160	0,160	0,310	1,660	0,940	0,990	-0,090	0,200	-0,100	0,140	0,150	-0,340	-0,010
	p-value	0,668	0,000	0,245	0,177	0,102	0,091	0,003	0,085	0,905	0,861	0,000	0,042	0,000	0,738	0,376	0,001	0,003	0,001	0,583	0,177	0,099	0,000	0,048	0,091	0,000
Fixed effects$_i$	Coefficient	0,131	0,010	0,002	0,004	0,030	-0,013	0,012	0,061	-0,020	0,046	0,034	-0,068	-0,007	0,026	0,003	0,203	-0,023	-0,005	-0,039	-0,030	0,009	-0,018	-0,013	0,127	0,050

Unweighted Statistics

R-squared	0,418
Adjusted R-squared	0,128
S.E. of regression	0,112
Durbin-Watson stat	2,241

Table 2.2 Specification 2 (Estimation results for the log. change in employment (DLit))

Variable		Sector 311-2	313	314	321	322	323	324	331	332	341	342	351	352	355	356	361	362	369	371	372	381	382	383	384	385
$D w_{it-1}$	Coefficient	-0,049	0,095	-0,122	-0,058	-0,152	-0,083	-0,211	0,189	-0,058	-0,099	-0,179	-0,118	-0,043	-0,171	-0,095	-0,188	0,024	-0,120	-0,045	-0,102	-0,106	-0,083	0,091	-0,203	-0,120
	p-value	0,125	0,043	0,361	0,049	0,010	0,065	0,001	0,000	0,513	0,096	0,006	0,000	0,320	0,057	0,002	0,020	0,686	0,075	0,513	0,233	0,001	0,024	0,103	0,050	0,003
$D ql_{it-1}$	Coefficient	-0,092	-0,007	0,554	-0,288	0,454	0,522	0,806	0,602	1,217	0,238	0,249	0,025	-0,069	0,462	-0,075	-0,201	0,225	0,346	0,070	0,022	0,288	0,163	-0,585	0,371	-0,096
	p-value	0,608	0,971	0,019	0,077	0,003	0,015	0,003	0,000	0,063	0,036	0,015	0,538	0,454	0,072	0,645	0,363	0,149	0,079	0,324	0,776	0,148	0,066	0,000	0,000	0,216
$D va_{it}$	Coefficient	0,218	0,131	0,240	0,200	0,178	0,292	0,334	0,143	0,283	0,121	0,006	0,036	0,053	0,202	0,088	0,352	0,161	0,261	0,091	0,122	0,264	0,085	0,229	0,103	0,280
	p-value	0,000	0,015	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,003	0,892	0,102	0,119	0,001	0,014	0,000	0,001	0,000	0,092	0,000	0,000	0,007	0,000	0,035	0,000
iva_{it}	Coefficient	-1,043	0,104	-1,137	0,033	0,430	1,081	0,290	-0,088	-0,160	-0,187	-0,134	0,286	-0,254	0,243	-0,076	-0,614	0,101	0,226	0,167	-0,154	-0,003	-0,102	0,230	-0,190	0,026
	p-value	0,000	0,191	0,061	0,653	0,000	0,000	0,000	0,014	0,568	0,013	0,242	0,000	0,018	0,373	0,385	0,001	0,030	0,027	0,038	0,215	0,958	0,000	0,025	0,341	0,843
iva_{it-1}	Coefficient	-0,131	-0,216	0,263	0,016	0,093	-0,535	-0,205	-0,302	0,906	0,148	0,066	0,092	0,033	-0,267	0,264	-0,331	-0,033	-0,091	0,009	0,434	-0,064	0,175	-0,084	-0,397	-0,122
	p-value	0,429	0,010	0,669	0,801	0,381	0,002	0,000	0,000	0,003	0,076	0,534	0,010	0,774	0,224	0,003	0,082	0,569	0,375	0,891	0,000	0,300	0,000	0,429	0,068	0,366
$D xq_{it}$	Coefficient	0,090	-1,420	8,870	-0,180	0,010	-0,600	-0,080	0,510	-0,290	-0,430	-0,140	-0,150	0,120	-0,620	-0,450	-0,970	0,740	-0,590	-0,050	0,580	0,130	-0,150	-0,520	-0,050	0,030
	p-value	0,595	0,170	0,000	0,300	0,822	0,015	0,183	0,000	0,040	0,248	0,772	0,413	0,742	0,034	0,193	0,010	0,000	0,003	0,855	0,292	0,270	0,082	0,024	0,808	0,222
$D xq_{it-1}$	Coefficient	0,810	0,450	3,120	0,470	0,150	-0,030	-0,120	0,190	0,630	1,560	-0,300	-0,140	0,490	-0,220	0,850	-0,110	0,580	-0,230	0,950	0,720	0,400	0,100	-0,210	0,380	0,050
	p-value	0,000	0,668	0,285	0,012	0,001	0,915	0,122	0,017	0,000	0,000	0,478	0,441	0,131	0,513	0,047	0,796	0,016	0,244	0,001	0,159	0,001	0,221	0,397	0,380	0,007
$D mq_{it}$	Coefficient	0,470	-2,820	-1,560	0,230	-2,850	-0,690	-0,110	-0,170	-0,430	-0,240	-0,670	-0,010	0,370	-0,390	0,280	-1,210	-1,020	-0,220	0,070	-0,300	-0,160	-0,010	0,090	0,160	-0,002
	p-value	0,035	0,177	0,182	0,562	0,017	0,000	0,481	0,158	0,305	0,043	0,343	0,811	0,138	0,462	0,415	0,043	0,015	0,449	0,728	0,005	0,024	0,766	0,154	0,581	0,323
$D mq_{it-1}$	Coefficient	-0,060	4,820	0,990	0,350	-2,820	-0,030	0,610	0,090	0,220	0,020	2,340	-0,170	0,490	0,470	0,450	2,230	0,740	1,010	-0,140	-0,010	-0,110	0,140	0,200	-0,680	-0,010
	p-value	0,807	0,006	0,370	0,248	0,030	0,744	0,000	0,434	0,625	0,866	0,016	0,001	0,128	0,309	0,257	0,001	0,021	0,002	0,539	0,941	0,151	0,000	0,015	0,000	0,000
Fixed effects$_i$	Coefficient	0,143	0,011	0,002	0,007	0,025	-0,034	0,011	0,064	-0,050	0,050	0,015	-0,065	0,025	0,012	-0,011	0,184	-0,034	-0,018	-0,038	-0,038	0,006	-0,009	0,016	0,130	0,042

Unweighted Statistics

R-squared	0,436
Adjusted R-squared	0,106
S.E. of regression	0,114
Durbin-Watson stat	2,214

APPENDIX

Table A.1. Sector codes and properties

Sector Code	Explanation	Capital/Labour intensity*	Skill/Unskilled labour*
311-312	Food manufacturing and other food manufacturing	Labour intensive	Unskilled
313	Beverage industries	Labour intensive	Unskilled
314	Tobacco manufactures	Labour intensive	Unskilled
321	Manufacture of textiles	Labour intensive	Unskilled
322	Manufacture of wearing apparel, except footwear	Labour intensive	Unskilled
323	Manufacture of leather and products of leather, leather substitutes and fur	Labour intensive	Unskilled
324	Manufacture of footwear	Labour intensive	Unskilled
331	Manufacture of wood and wood and cork products, except furniture	Labour intensive	Unskilled
332	Manufacture of furniture and fixtures, except primarily of metal	Labour intensive	Unskilled
341	Manufacture of paper and paper products	Capital intensive	Unskilled
342	Printing, publishing and allied industries	Capital intensive	Skilled
351	Manufacture of industrial chemicals	Capital intensive	Skilled
352	Manufacture of other chemical products	Capital intensive	Skilled
353**	Petroleum refineries	Capital intensive	Skilled
354**	Manufacture of miscellaneous products of petroleum and coal	Capital intensive	Skilled
355	Manufacture of rubber products	Capital intensive	Unskilled
356	Manufacture of plastic products not elsewhere classified	Capital intensive	Unskilled
361	Manufacture of pottery, china and earthenware	Labour intensive	Unskilled
362	Manufacture of glass and glass products	Capital intensive	Unskilled
369	Manufacture of other non-metallic mineral products	Capital intensive	Unskilled
371	Iron and steel basic industries	Capital intensive	Unskilled
372	Non-ferrous metal basic industries	Capital intensive	Unskilled
381	Manufacture of fabricated metal products, except machinery and equipment	Capital intensive	Unskilled
382	Manufacture of machinery except electrical	Capital intensive	Skilled
383	Manufacture of electrical machinery apparatus, appliances and supplies	Labour intensive	Skilled
384	Manufacture of transport equipment	Capital intensive	Skilled
385	Manufacture of professional and scientific, measuring and controlling equipment not elsewhere classified	Labour intensive	Skilled

* The classification relies on authors' judgement, based on Onaran and Stockhammer (2006), who develop such a taxonomy, where the classification of capital and labor intensive sectors is based on a narrowing down of the 5-category taxonomy in Peneder (20001), and the skill classification is derived from the 3-category WIIW classification in Landesmann et al (2004) such that low and medium skill industries are classified as unskilled, and high skill industries are classified as skilled.
** Excluded due to data constraints.

Table A.2. Wald test for Parameter Homogeneity

Specification 1								
	Δulc_{t-1}	iva_t	iva_{t-1}	Δva_t	Δxq_t	Δxq_{t-1}	Δmq_t	Δmq_{t-1}
F stat	5,060	14,961	8,065	38,311	5,331	6,393	6,617	9,149
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Specification 2									
	Δw_{t-1}	iva_t	iva_{t-1}	Δva_t	Δxq_t	Δxq_{t-1}	Δmq_t	Δmq_{t-1}	Δql_{t-1}
F stat	4,692	11,585	6,776	34,434	4,6884	5,199	3,603	8,699	5,090
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table A.3. Breusch-Pagan test of independence

	Specification 1	Specification 2
chi2 Statistics	590,053	588,511
Probability	0,000	0,000

Table A.4. Wald Coefficient Test Results for Model 2

Restriction 1	$H_0 : \beta_{40}(iva_t) + \beta_{41}(iva_{t-1}) = 0$ $H_1 : \beta_{40}(iva_t) + \beta_{41}(iva_{t-1}) \neq 0$
Restriction 2	$H_0 : \beta_{50}(\Delta xq_t) + \beta_{51}(\Delta xq_{t-1}) = 0$ $H_1 : \beta_{50}(\Delta xq_t) + \beta_{51}(\Delta xq_{t-1}) \neq 0$
Restriction 3	$H_0 : \beta_{60}(\Delta mq_t) + \beta_{61}(\Delta mq_{t-1}) = 0$ $H_1 : \beta_{60}(\Delta mq_t) + \beta_{61}(\Delta mq_{t-1}) \neq 0$
Restriction 4	$H_0 : \lvert\beta_1(\Delta w_{it-1})\rvert \geq \beta_3(\Delta va_{it}) + \beta_{40}(iva_t) + \beta_{41}(iva_{t-1})$ $H_1 : \lvert\beta_1(\Delta w_{it-1})\rvert < \beta_3(\Delta va_{it}) + \beta_{40}(iva_t) + \beta_{41}(iva_{t-1})$
Restriction 5	$H_0 : \lvert\beta_1(\Delta w_{it-1})\rvert \geq \beta_3(\Delta va_{it})$ $H_1 : \lvert\beta_1(\Delta w_{it-1})\rvert < \beta_3(\Delta va_{it})$

	Restriction 1		Restriction 2		Restriction 3		Restriction 4		Restriction 5	
Sector Code	F Stat	Prob > F	F Stat	Prob > F	F Stat	Prob > F	F Stat	Prob > F	F Stat	Prob > F
311-2	32,498	0,000	9,543	0,002	1,669	0,197	15,453	0,000	19,364	0,000
313	0,991	0,320	0,315	0,575	0,426	0,514	0,264	0,607	0,233	0,629
314	5,013	0,026	7,029	0,008	0,200	0,655	1,279	0,259	5,711	0,017
321	0,572	0,450	0,977	0,323	1,423	0,234	19,167	0,000	13,616	0,000
322	12,017	0,001	7,024	0,008	13,008	0,000	27,371	0,000	30,591	0,000
323	9,031	0,003	2,263	0,133	22,897	0,000	21,744	0,000	58,912	0,000
324	2,100	0,148	3,230	0,073	3,822	0,051	51,532	0,000	61,247	0,000
331	24,889	0,000	26,126	0,000	0,250	0,618	24,540	0,000	0,824	0,364
332	4,870	0,028	2,491	0,115	0,144	0,704	8,959	0,003	14,962	0,000
341	0,158	0,691	2,947	0,087	1,446	0,230	1,969	0,161	9,131	0,003
342	0,171	0,679	0,473	0,492	2,562	0,110	0,325	0,569	5,626	0,018
351	142,147	0,000	1,696	0,194	9,626	0,002	199,794	0,000	39,780	0,000
352	2,067	0,151	1,539	0,215	6,241	0,013	0,699	0,403	3,508	0,062
355	0,005	0,941	3,006	0,084	0,010	0,921	0,821	0,365	12,843	0,000
356	4,248	0,040	0,490	0,484	3,410	0,065	14,532	0,000	14,204	0,000
361	20,711	0,000	4,030	0,045	0,990	0,320	2,904	0,089	33,933	0,000
362	0,781	0,377	16,709	0,000	0,252	0,616	3,831	0,051	4,972	0,026
369	4,463	0,035	10,044	0,002	4,407	0,036	25,032	0,000	32,147	0,000
371	2,528	0,113	4,478	0,035	0,039	0,843	6,119	0,014	1,626	0,203
372	4,900	0,027	2,507	0,114	3,119	0,078	13,174	0,000	6,418	0,012
381	0,546	0,460	8,214	0,004	6,202	0,013	9,083	0,003	37,875	0,000
382	6,166	0,013	0,148	0,701	13,082	0,000	16,003	0,000	12,357	0,000
383	0,894	0,345	3,272	0,071	8,686	0,003	2,575	0,109	3,721	0,054
384	2,973	0,085	0,375	0,540	2,014	0,157	0,712	0,399	6,382	0,012
385	0,334	0,563	4,496	0,035	17,022	0,000	2,684	0,102	66,816	0,000

ENDNOTES

[1] We exclude the sectors of petroleum refineries and manufacture of miscellaneous products of petroleum and coal, since the data was not available for these sectors for years, in which the sector consists of only one or two firms. We also exclude other manufacturing industry. The period of analysis is determined by data availability at the beginning of this study.

[2] In order to exclude the increases in output caused by variations in input values, we use real value added as the measure of production. While output comprises the value of inputs, value added only consists of net output (output minus non-wage input costs).

[3] According to Ilkkaracan and Yorukoglu (2004), collective bargaining in glass, iron and steel, non-ferrous metals, and electrical machinery are highly centralised with average collective bargaining ratios exceeding 50%, and food, beverage, and other chemicals are moderately centralised with ratios above 30%.

[4] Based on export and import ratios, Erlat (2000) classifies food, beverage, textiles, wearing apparel, footwear, furniture, and glass as the main traditional exporters of the Turkish economy ever since the 1970s. Additionally rubber products and pottery and china are also classified as main exporters since the 1980s. Regarding imports, paper products, printing and publishing, other chemical products, plastic products n.e.c., other non-metallic mineral products, iron and steel, non-ferrous metals, fabricated metal products, electrical machinery and transport equipments are the main import-competing sectors of the Turkish private manufacturing industry. Tobacco, leather, wood and chemicals are the ones, which also became import-competing sectors in the post-1980 era (Erlat, 2000).