

**ON THE PATTERNS OF TRADE LIBERALIZATION,
OLIGOPOLISTIC CONCENTRATION AND PROFITABILITY:**

Reflections from Post-1980 Turkish Manufacturing*

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ABSTRACT

In this paper we investigate the structural consequences of the post-1980 outward-orientation on the market concentration and accumulation patterns in the Turkish manufacturing industries. Using various panel data procedures over 29-subsectors of Turkish manufacturing for the period 1980-1996, we focus on three sets of issues: (i) the effect of openness on the extent of market concentration as measured in CR4 ratios; (ii) the behavior of gross profit margins (mark-ups) in relation to openness, concentration ratios, and real wage costs; and (iii) the behavior of sectoral real investments (by destination) in relation to the profit margins, real wage costs, and the openness indicator.

Our results suggest very little structural change in the sectoral composition and nature of market concentration and behavior of profit margins under the post-1980 structural adjustment reforms and outward-orientation. We find that contrary to expectations, “openness” had very little impact, if any, on profit margins (mark-ups), and, within manufacturing, the trade-adjusting sectors reveal a positive relationship between the profit margins and openness. Profit margins are found to be positively and significantly related to concentration power and real wage cost increases. Real investments in the sector display positive relationship with profit margins and real wages, yet bear a statistically insignificant relationship vis-à-vis openness.

I. Introduction

In this paper, we investigate the structural consequences of the post-1980 outward-orientation on the market concentration and accumulation patterns in the Turkish manufacturing industries. The period under analysis is known to span the overall transformation of the Turkish economy from domestic demand-oriented import-substitutionist industrialization to one with export-orientation and integration with the global commodity and financial markets. During this period the manufacturing industry has evolved as the main sector in both leading the export-orientation of the economy, and also as a focal sector wherein the distribution patterns between wage-labor and capital have been re-shaped.

Existing independent studies¹ and rudimentary data from official agencies suggest both formal and anecdotal evidence that one of the major structural deficiencies of the sector reveals itself in the rather loose association between the

¹ See, e.g., Boratav, Yeldan and Köse (2000), Onaran (2000), Yeldan and Köse (1999), Filiztekin (1999), Ercan (1999), Pamukçu and de Boer (1999), Köse and Yeldan (1998a and 1998b), Yentürk (1997 and 1999), Uygur (1996), Kepenek (1996), İenses (1996), Bulutay (1995), and Maraşlıoğlu and Tıktyk (1991).

gains in export penetration and labor productivity on the one hand, and the dismal patterns of employment, accumulation, and of remunerations of wage labor, on the other. This deformation is, in fact, observed to be a perennial feature of the post-1980 structural adjustment era. In their analysis on the decomposition of labor productivity in manufacturing, for instance, Voyvoda and Yeldan (1999) report that, since the inception of the structural adjustment reforms and outward-orientation, the underlying sources of productivity gains were not significantly altered in the sector. They found that none of the leading export sectors of the 1980s could have generated sufficiently strong productivity contributions, nor admitted strong inter-industry linkages to serve as the leading sectors propelling the rest of the economy.

Given this background, there exists further considerable evidence on the extent of monopolization and high concentration in the Turkish manufacturing industries. The State Institute of Statistics data suggest, for instance, that the process of export orientation and overall trade liberalization since 1980 has not affected the structural characteristics of the manufacturing industry. Many of the monopolistically competitive sectors either kept their existing high rates of concentration, or even suffered from increased monopolization as measured by their CR4 ratios or Hirfindahl indexes. Even among many competitive sectors of 1980, one observes increases in the CR4 ratios by 1996.²

These observations suggest that, contrary to expectations, the opening process was unable to introduce warranted increases in competition in the industrial commodity markets. In this paper, we attempt to formalize on these observations and deduce econometric hypotheses on the patterns of trade liberalization, concentration and profitability. To this end, we estimate our empirical questions using various panel data procedures. Our data cover 29-subsectors of Turkish manufacturing for the period, 1980-1996. We focus on three sets of issues: (i) effect of openness on the extent of market concentration as measured in CR4 rates; (ii) the behavior of gross profit margins (mark-ups) in relation to openness, concentration rates, and real wage costs; and (iii) the behavior of sectoral real investments (by destination) in relation to the mark-ups, real wage costs, and the openness indicator.

Tackling on a similar set of issues as ours, Yalçын (2000) performed a two-stage least square estimation of price-cost margins (mark-ups) using panel data of ISIC four-digit level of Turkish manufacturing industries over 1983-1994. Yalçын's analysis is directly focused on the "import-discipline hypothesis" –whether the import penetration due to foreign trade liberalization of the 1980s was sufficient to remove the excess profits of the oligopolistic domestic firms, enhancing a relatively competitive market behavior. Utilizing panel data analyses for the public versus private sectors separately, Yalçын (2000) has found that even though there had been an overall decrease in the profit-margins in the entire private sector, profit-margins in the highly concentrated sub-sectors of private manufacturing did in fact increase along with import penetration. In contrast, using private manufacturing data over the 1977-1985 period, Forouton (1991) reported that import penetration in the concentrated

² See, for instance, Güne° (1996), Kaytaz, Altын and Güne° (1993) Katыrcыođlu (1990) and °ahinkaya (1993) for the evaluation of market concentration and patterns of oligopolistic mark-up pricing in the industrial commodity markets. Güne°, K°se and Yeldan (1997), in turn, document comprehensive panel data on the degree of concentration in Turkish manufacturing using the standard Input-Output classification for the period 1985-1993.

sectors has led to a reduction in the gross profit margins. Similarly, Engin, Katırcıođlu, and Akçay (1995) noted that, despite the nominal expectations of competitive pressures on the mark-ups via the discipline of import penetration, they found a positive –yet statistically insignificant– relationship between import penetration and profit margins in the private sector.

As such, the existing literature on the Turkish manufacturing industry fails to provide an unambiguous indication of increased competitiveness and falling profit margins despite expectations of pressures of global commodity markets. Thus, an exclusive purpose of this paper is to provide a formal assessment of these issues. The plan of the remaining pages of the paper is as follows: In the next section we present an overview of the post-1980 cycles of growth of the Turkish manufacturing sector from the viewpoints of accumulation, productivity and distribution. In section III, we introduce main hypotheses of our econometric methodology and data sources. We investigate and discuss our econometric findings in section IV. Finally section V summarizes and concludes.

II. Phases of Macroeconomic Adjustment in Turkish Manufacturing

Table 1 summarizes the main indicators of the manufacturing industry under the post-1980 adjustments. To document the extend of the oligopolistic structure of the sector, we tabulate the rate of market concentration in the manufacturing industry sub-sectors as calculated by the shares of the *four* largest enterprises in the total sales (revenues) of the sector (hence the acronym, CR4). Accordingly, we classify those sectors with CR4 ratios above 30% to be *imperfectly competitive*, and those having CR4 ratios below this threshold as *competitive*.³ Data on other sectoral variables come from the State Institute of Statistics (SIS) Manufacturing Industry Annual Surveys. To arrive at “wage rates” and the “average labor product”, we have used data on “total wages paid” and “value added” divided, respectively, by “average number of workers engaged”. We have used the sectoral wholesale producer prices in deflating nominal magnitudes.

<Insert table 1 here>

The periodization of the table follows the adjustment path of the overall economy. Over the last two decades, Turkish economy is observed to go through three distinct cycles of growth-crisis-and adjustment: The first covers broadly the period 1980-1989, with its main attribute being the increased export-orientation of the economy. Following the foreign exchange crisis of 1977-80 growth was re-invigorated following the introduction of a structural adjustment programme in January, 1980 under the auspices of the international centers such as the World Bank and the IMF. The period 1981-87 was marked with commodity trade liberalization and export promotion along with a price reform aimed at reducing the state’s role in economic affairs. The existing system of fixed exchange rate administration was replaced by a flexible regime of crawling-peg, and together with the introduction of a

³ This is the threshold used by Boratav, Yeldan and Köse (2000) and Yeldan and Köse (1999), where, on a further level of finesse, the sectors which had CR4 ratios between 30% and 49% are classified as “monopolistically competitive”, and those sectors with CR4 ratios exceeding 50% are regarded to be “oligopolistic”.

complex system of direct export subsidization, acted as the main instruments for the promotion of exports and pursuit of macroeconomic stability.⁴

During the period 1983-87, export revenues increased at an annual rate of 10.8%, and gross domestic product rose at an annual rate of 6.5%. The period was also characterized by severe erosion of wage incomes via hostile measures against organized labor. The suppression of wages was instrumental both in lowering production costs and in squeezing the domestic absorption capacity. The share of wage-labor in manufacturing value added receded from its average of 35.6% in 1977-80, to 20.6% in 1988. In this process, the average mark up rate (profit margins) in private manufacturing has increased from 31% to 38%.

During the 1980s, the composition of total fixed investments displayed quite adverse trends at the sectoral level from the point of view of strategic targets. In fact, as gross fixed investments of the private sector increased by 14.1% during 1983-87, only a small portion of this amount was directed to manufacturing. The rate of growth of private manufacturing investments has been on the order of half of this figure, at a rate of only 7.7% per annum, and could not reach its pre-1980 levels in real terms until the end of 1989. Much of the expansion in private manufacturing investments originated from the pull from housing investments which expanded by an annual average of 24.5% during 1983-87. This resulted in a significant anomaly as far as the official stance towards industrialization was concerned: in a period where outward orientation was supposedly directed to increased manufacturing exports through significant price and subsidy incentives, distribution of investments revealed a declining trend for the sector. The implications of this non-conformity between the stated foreign trade objectives towards *manufacturing exports* and the realized patterns of accumulation *away from manufacturing* constituted one of the main structural deficiencies of the export oriented growth strategy of the 1980's, and according to our view, had played a crucial role in the failure of maintaining the export promotion programme as a sustainable strategy of development.

As this unbalanced structure failed to generate the necessary accumulation patterns, the artificial growth path generated by way of wage suppression and price subsidies was observed to reach its economic and political limits by 1988. Starting 1988, we observe real wage earnings to enter a period of recovery following the gains of union movement, and also of the new wave of populist pressures. As can be witnessed from data tabulated in Table 1, all sub-sectors of manufacturing experienced significant rises in wage remunerations. On the average, *real* wages in manufacturing increased at an annual rate of 10.2% consecutively, from 1989 to 1993. In retrospect, it can be argued that the post-1988 populism could evidently be financed by expanding the tax base over the so-called "unrecorded private commercial transactions", and by moving towards a "fair" tax system. Yet, the strategic preference of the government was the maintenance of its current stance towards erosion of taxable capital incomes and absorption of all costs of adjustment in favor of profit incomes against the culminating wage pressures (Boratav, Yeldan and

⁴ See Boratav and Türel (1993), Aenses (1994), Celasun and Rodrik (1989), Uygur (1993), and Celasun (1994) for a thorough overview of the post-1980 Turkish structural adjustment reforms. For a quantitative assessment of the export subsidization programme, see Milanovic (1986) and Togan (1996).

Köse, 2000; Cizre-Sakallıođlu and Yeldan, 2000; and Türel, 1999). As one of the major indicators of the (functional) distribution of income, we observe that the profit margins in fact followed a rising trend, and reached to 47% in 1994, from its average of 33.5% in 1989. See Figure 1 for the portrayal of mark-ups and real wage costs over the 1980-1996 time horizon.

<Insert Figure 1 here>

Given these broad shifts in the macroeconomic environment, the 1989 policy maneuver of capital account liberalization served as one of the major policy initiatives to a new round of growth. This policy maneuver paved the way for injection of liquidity to the domestic economy in terms of short term foreign capital (flows of “hot money”). Such inflows enabled, on the one hand, financing of the accelerated public sector expenditures, and also provided relief of the increased pressures of aggregate demand on the domestic markets by way of cheapening costs of imports.⁵ Consequently, the bonanza of cheap imported intermediates fueled the second wave of the growth cycle between 1989-93.

Erratic movements in the current account, a rising trade deficit (from 3.5% of GNP in 1985-88 to 6% in 1990-93) and a drastic deterioration of fiscal balances disclose the unsustainable character of the post-1989 populism financed by foreign capital inflows. This prolonged instability reached its climax during the fourth quarter of 1993, when the currency appreciation and the consequent current account deficits rose to unprecedented levels. With the sudden drainage of short-term funds in the beginning of January 1994, imports dwindled by 15%, GDP fell by 5.5%, and the inflation rate soared to 106%. Together with this contraction, the post-1994 crisis management gave rise to significant shifts in income distribution, and real wages in manufacturing declined by 36.3%. Likewise, dollar-denominated wage costs decreased substantially and enabled export earnings to rise. In this manner, Turkey has, once again, switched back to its classic mode of surplus extraction whereby export performance of industrial sectors depended on savings on wage costs. In fact, the disequilibrium could have only been accommodated by the massive (downward) flexibility displayed by real remunerations of wage-labor. Thus, the post-1995 period witnessed the reinvigoration of foreign capital-led growth –the third cycle. Finally, the global deceleration following the contagion of the Asian financial crisis hit the Turkish economy starting August of 1998 under the already adverse conditions of severe macroeconomic disequilibria with accelerating fiscal and current account deficits, high inflation and unemployment, and increased social unrest.

Clearly, the inherent characteristics of the growth-crisis-adjustment cycles identified thus far have had quite different macroeconomic dynamics in operation. The export-orientation phase (1980-1988) was driven by commodity trade liberalization and real depreciation under conditions of wage suppression. The post-1989 financial liberalization completed the integration of the domestic economy with the global commodity and financial markets, and initiated a process of short-term foreign capital-led growth with abrupt mini cycles of boom and crisis throughout the 1990s. While the former cycle relied on domestic surplus creation via squeezing

⁵ See Özatay (1999); Balkan and Yeldan (1998); Selçuk (1997); Boratav, Türel and Yeldan (1996); Ekinci (1998); and Yentürk (1999) for an extensive discussion of the post-financial liberalization macroeconomic adjustments in Turkey.

wage incomes, the latter mostly relied on foreign finance under conditions of high wages.

We follow the microeconomic swings across the individual sub-sectors within manufacturing from Table 1. Given our criterion of distinguishing individual sectors as competitive *versus* imperfectly competitive based on their CR4 ratios, we observe that 18 of the 29 sectors fall under the “imperfectly competitive & oligopolistic” group in 1980. Eight of them have CR4 ratios higher than 50%. By 1996 there is very little change in these sub-groups. As of 1996 the share of value added of the imperfectly competitive sectors in manufacturing total reaches to 51%. Furthermore, these sectors employ 31% of total manufacturing employment in our data base. In contrast, the output share of the imperfectly competitive sectors was 55%, and their employment share was 42% in 1980.

Leaving sector 353 (Petroleum Refineries) aside due to its exclusive public ownership, as of the 1994-96 average, the highest degree of concentration is observed in:

Rubber and Plastics (355)	74.8%
Tobacco Manufactures (314)	64.5%
Miscellaneous Petroleum and Coal (354)	63.4%
Printing and Publishing (342)	60.0%

It is interesting to note that the size of the public sector is not necessarily the main actor in these sectors, with public share being 0.01 in 355; 0.04 in 354; and 0.07 in 342. Sectors 321 (textiles) and 322 (wearing apparel) display the most competitive environment with respect to their CR4 ratios.

Overall, one witnesses a mixed pattern of concentration over 1980-96. In general, there is very little structural shift across the two sub-groups. We record 341 (paper and paper products) to be the only sector to change its imperfectly competitive status from CR4 of 47.1% in 1980, to 22.6% in 1996. Per contra, it is interesting to note that one also witnesses a competitive sector such as manufacture of wood products (331) to increase its concentration level beyond the imperfectly competitive threshold of 30% by 1996.

At the expense of over-generalization, we can nevertheless confer a tendency for higher mark-up rates within the imperfectly competitive block. Petroleum Refineries (353), Soil Products (361), and Non-Metals (369) have the highest mark-up rates over 1994-96 with 1.07, 1.04, and 0.72, respectively. On the other hand, sectors 312, 323, and 324 yield the lowest mark-ups. We further observe that growth in real wages has been consistently negative over the 1981-88 and 1994-97 episodes, while real wage costs have been on an upward trend under the financial de-regulation of 1989-93. As of 1994-97, the highest share of labor costs in value added is recorded in Manufacture of Footwear (324) with 0.27. This is followed by Glass Products (362) with 0.25, and Paper and Paper Products (341) with 0.24. The dis-association between the real wage movements and labor productivity is clearly visible over the classic export-led manufacturing era, 1981-88. Even though real wages seem to have caught up with real average labor products over 1989-93, this pattern is observed to fall short of its momentum, and by 1994-97, real wages start to follow a contractionary trend.

In the next section, we turn to an analytical investigation of these dynamics from the view points of growth, accumulation, and distribution. We first provide a formal presentation of our methodology and data sources.

III. Econometric Investigation

We now turn to the econometric investigation of the dynamics of Turkish manufacturing industry over the post-1980 era. To this end, we focus on the 29 sub-sectors of manufacturing based on 3-digit ISI-Classification. (The ISIC codes and their sectoral identification are laid in Appendix Table 1).

We utilize two specifications: we first study the distributional issues and analyze the behavior of gross profit margins (mark-up rates) in relation to trade liberalization, sectoral concentration, and swings in real wage costs. Secondly, we analyze the patterns of accumulation, and study the behavior of sectoral investment (by destination) against the behavior of mark-up rates, real wage costs, and openness.

We continue to rely on our initial classification based on their CR4 ratios. Accordingly, we classify those sectors which have a CR4 in excess of 0.30 as “imperfectly competitive/oligopolistic”; and those with CR4 less than 0.30 as “perfectly competitive”. On a different spectrum, sectors are to be regarded as “open” provided that their trade volume (measured as imports plus exports) as a ratio of sectoral value added exceed 0.50. Per contra, sectors with trade volume-to-value added ratios less than 0.50 are regarded as “inward-looking”. We carry this classification based on the characteristics of the 29 sectors in 1980. We thus obtain the following tabulation (see Appendix Table 1 for identification of the ISIC codes):

	Open sectors	Inward-Looking Sectors
Competitive Sectors	312, 322, 381, 383	311, 321, 323, 331, 352, 356, 369
Imperfectly Competitive Sectors	351, 353, 382, 384, 385, 390	313, 314, 324, 332, 341, 342, 354, 355, 361, 362, 371, 372

III-1. Data Sources

Our data come from the State Institute of statistics (SIS) *Manufacturing Industry Annual Surveys* and *Indicators of Concentration*. The survey covers all public sector establishments and those private enterprises employing more than 10 workers.

Various concentration measures were available in addition to the CR4 ratio, such as CR10 and Hirfindahl indexes in our data. We chose to adhere to the CR4 as

the relevant measure of concentration due to its simplicity and also popularity.⁶ *Wage costs* include all payments in the form of wages and salaries and per diems, gross income tax, social security, and pension fund premiums. It also includes social security, pension, contributions, and the like payable by the employer, and overtime payments, bonuses, indemnities and payments in kind. Annual wages and salaries paid are compiled for production workers and other staff. *Profit margins* (mark-up rates) are defined as the ratio of total profits to total costs of wages and intermediate inputs. In the absence of reliable capital stock estimates, this variable provides a good proxy on the profitability of capital. Finally, sectoral investments are given by the annual gross fixed additions to capital stock.⁷

III-2. Method of Econometric Estimation

Our essential estimating equations are the following:

$$MR_{it}=f(\alpha_i, O_{it}, CR4_{it}, RW_{it}) \quad (1)$$

$$RI_{it}= f(\alpha_i, MR_{it}, O_{it}, RW_{it}) \quad (2)$$

The first implicit function represents the trade orientation and distributional aspects of the manufacturing industry where MR_{it} denotes mark-up rates; $CR4_{it}$ denotes concentration ratios; O_{it} stands for “openness” of each sector, (ratio of imports plus exports to sectoral value added), and RW_{it} denotes real wage costs. The second relationship tries to explain the process of capital accumulation using three possible determinants namely mark-ups, real wage costs, and the openness, where RI_{it} is the real investment of each manufacturing industry sector. The index $\{i=1,2,\dots,N\}$ refers to the individual unit, and $\{t=1,2,\dots,T\}$ refers to a given time period. The coefficients α_i (sector specific composite term) have two components: α_{i1} , a sector specific intercept, and α_{i2t} , a sector-specific deterministic growth trend.

Each equation is estimated using a panel data estimator, so that variation over both the cross section and time series dimensions are jointly considered. The advantages of using panel data estimation are various. Firstly, panel data enable major steps to overcome the problems associated with the lack of sufficient historical data for efficient estimation using single sector time series analysis. Secondly, it mostly compensates for the dissatisfaction with using a cross section estimation. Since temporal variation is ignored in cross section estimation, changes occurred in policy

⁶ Given that the idea of “seller concentration” refers to the size distribution of firms that sell a particular product, the concept is usually regarded as a significant dimension of market structure since it is thought to play an important part in determining market power. Some researchers who have been studying market power have sought to measure it by using indexes based on microeconomic theory dating back to Lerner (1934) who suggested that the difference between price and marginal cost divided by price could serve as a direct measure of departures from the competitive ideal. Despite its intuitive appeal, the *Lerner index* is criticized on the grounds that it is essentially an *ex post* measure of allocative efficiency. Curry and George (1983) provide a thorough evaluation of these issues.

⁷ For a more detailed information on these and related concepts see *SIS Manufacturing Annual Industry Surveys* and the SIS web site at <http://www.die.gov.tr>.

in the specific sectors of the manufacturing industries over the years can not be observed. In contrast, panel data estimation uses all the information available in time series and the cross section-based procedures.

Panel data estimation considers the sector specific differences. Observed static differences between sectors of the manufacturing industries can be taken into consideration in variation in the intercept terms, α_i 's. The intercept is allowed to vary only across individual sectors, not over the time period under consideration. Note that as the intercept-shifting dummy variables have been included, time-invariant regressors cannot simultaneously be introduced as this would induce multicollinearity. There would be two types of specifications. The first one allows only one intercept coefficient and one slope coefficient on each regressor using a simple pooled regression. The second one permits the intercept to vary across sectors and the estimation technique assumes constant slope coefficients across sectors. This is less restrictive than the former.

The general form of our specifications are assumed to be linear:

For trade orientation and distribution:

$$MR_{it} = \alpha_i + \beta_1 O_{it} + \beta_2 CR4_{it} + \beta_3 RW_{it} \quad (1')$$

For accumulation:

$$RI_{it} = \alpha_i + \beta_1 MR_{it} + \beta_2 O_{it} + \beta_3 RW_{it} \quad (2')$$

Two special cases of these general forms arise, depending upon whether the sector specific effects (α_i 's) have a fixed component, which is called the “fixed effect model” (FEM) or a random component, which is called the “random effects model” (REM). The choice of the model can be based on *a priori* assumptions. *A priori*, in the sense that we are dealing with individual sectors, and random selections from a population would support the adoption of the fixed effects model where inferences are restricted to the effects within the sample. However, not satisfied with looking at only a prior assumptions, we test the appropriateness of the FEM against the REM using the F-test and the Hausman chi-squared test (Hausman (1979), Hausman and Taylor (1981)). The Hausman statistic tests for the correlation between the sector-specific effects and explanatory variables. If they are correlated, the fixed effect estimator (the within, or the least squares dummy variable estimator) is consistent, while the random effects estimator (the feasible GLS estimator) is biased. The within estimator makes use of the variation of variables within each individual. The feasible GLS estimator is a weighted average of the within and between estimators which utilises variation between individuals (see Hsiao (1990) and Judge et al., (1985)). Rejection of the null of no correlation would lead to the adoption of the fixed effect estimator using the specification defined as (1' and 2') above.⁸

⁸ We estimated three specifications, one with

$MR_{it} = \alpha + \beta_1 O_{it} + \beta_2 CR4_{it} + \beta_3 RW_{it} + \beta_4 D_1 + \beta_5 D_2 + \beta_6 D_1 O_{it} + \beta_7 D_2 O_{it}$ where D_1 is a dummy for open sectors taking a value 1 and inward looking sectors taking a value 0. D_2 is a dummy for competitive sectors taking a value 1 and imperfectly competitive ones taking a value 0. $D_1 O_{it}$ and $D_2 O_{it}$ are respective interaction dummies with the openness. α , β_1 , β_2 , and β_3 , are common intercept and slope coefficients, respectively. This specification is estimated using pooled least squares for all sectors. Second one is an unrestricted form of the former specification written as

IV. Analysis of Econometric Results

We employ panel data estimation on specification (1') in six sets of equations. First, we estimate equation (1') for the whole sample, in other words for $i = \{1,2,\dots,29\}$ and $t = \{1980,1981,\dots,1996\}$. Then, we take each of the identified cells as one individual group exclusively and re-do the estimation. Finally, we distinguish those sectors which were “inward-oriented” in 1980, but became “open” by 1996. That is, sectors $i \in \{2 \text{ and } 4\}$ in 1980 and $i \in \{1 \text{ and } 3\}$ in 1996. This leaves us with the following sectors: $\{311, 314, 321, 323, 324, 331, 332, 341, 352, 355, 356, 362, 371, 372\}$. We classify this group with the identifier “trade adjusters”.

Distributional Indicators: Behavior of Gross Profit Margins

We start our econometric investigation with the analysis of the behavior of gross profit margins (mark-ups). Our bird’s-eye-view observations on the mark-ups, as portrayed in Figure 1 above, reflect a general rise of the average profit margins despite the increased openness and the secular rise of wage costs after 1989.

To test these hypotheses, we regress mark-up rates on openness, concentration (CR4 ratios), and real wage costs using the panel data. The results are tabulated in Tables 2a and 2b.

<Insert tables 2a and 2b here>

Our econometric results reveal the following relationship for the mark-up equation when all sectors are considered:

$$MR_{it} = \alpha_i - 0.004 O_{it} + 0.181 CR4_{it} + 0.111 RW_{it}$$

(-5.107) (6.361) (13.108)

where α_i is the of sector specific term. Thus, for whole sample, overall coefficient of openness is estimated to be a mere -0.004 . The magnitude, which is found to be statistically significant, is nevertheless very small, suggesting that the 16 years of adjustment to foreign integration has not brought a meaningful change in the market structure of the Turkish manufacturing industry. As such, the speed of adjustment of gross profit margins is revealed to be very slow in spite of the import discipline or

$MR_{it} = \alpha_{it} + \beta_1 O_{it} + \beta_2 CR4_{it} + \beta_3 RW_{it} + \beta_4 D_1 O_{it} + \beta_5 D_2 O_{it}$ and estimated as fixed effect model where α_{it} 's are estimated as intercept terms of each respective sectors.

Using F test we tested the null hypothesis of pooled OLS against the alternative of FEM. F test favor FEM ($F=26.8$ $F_{26, 455}=1.70$ at $\alpha=0.01$). The same equation is estimated using REM and specified as $MR_{it} = \alpha + \alpha_{it} + \beta_1 O_{it} + \beta_2 CR4_{it} + \beta_3 RW_{it} + \beta_4 D_1 O_{it} + \beta_5 D_2 O_{it}$ where α is a common intercept and α_{it} 's are considered as intercepts in the REM namely residuals. The null is here REM, and alternative is FEM. Using F-test we reject the null ($F=2.03$ and $F_{28,455}=1.46$ at $\alpha=0.05$). This type of testing also performed for considering equation (2') and results consistently favor FEM. Hausman χ^2 test also concludes that contemporaneous correlation between the residuals and the explanatory variables does exist for both equation (1') and (2') where each test statistic is found to be greater than $\chi^2_{(1)} = 3.84$ at a 5% significance level. Estimation results are not provided here but can be requested from the authors.

export penetration, and the technological and institutional barriers to entry seem to persist over the post-1980 reform era.

Concentration rates, on the other hand, have a statistically significant and a higher (positive) coefficient with 0.181. Thus, a one percent increase in the level of concentration as measured through the CR4 ratio is likely to affect the average profit margin of the sector by +0.18 percent. The a priori theoretical expectation that higher concentration levels would be indicative of higher profit margins is confirmed in the aggregate. What is more interesting, however, is that mark-ups do have a *positive* relationship with respect to real wage costs, with 0.111. These observations suggest that the sector has been characterized by Sraffian dynamics in the aggregate, with persistence of mark-ups against wage increases. (See also Boratav, Yeldan and Köse, 2000, and Yentürk and Onaran, 1999 for a further assessment of the behavior of mark-ups against the post 1989 wage cycle in Turkish private manufacturing).

Across the sub-groups, we observe that, in general, “open” sectors (as of 1980) have a negative relationship with “openness”. “Inward-looking” (as of 1980) sectors, on the other hand, display a positive relationship against the same variable. Most importantly, “trade adjusters” carry a coefficient of +0.026 vis-à-vis openness. Thus, for those sectors which were inward-looking by 1980, the process of opening could not have been associated with a competitive discipline squeezing the cost-margins (mark-ups). On the contrary, there seems evidence that the inward-looking sectors (as of 1980) have adjusted the new trade environment by way of increasing their profit margins (with an estimated coefficient of +0.026 vis-à-vis openness). Trade adjusters, as a group, displayed positive coefficients in relation with the concentration indicator (CR4) and the real wage costs. Except for the “inward-looking & imperfectly competitive” group, mark-ups have positive relationship with real wage costs under all groups. Thus, generally speaking, it seems that the manufacturing sectors could have responded to the shocks of trade policy and the real wage costs by increasing their profit margins over the post-1980 reform era.

At a finer level of detail of 3-digit ISI-classification, individual branches display much variation. Overall, among the statistically significant results, mark-ups respond negatively to openness in seven sub-sectors, and positively in seven sub-sectors. The sector that has the highest negative coefficient is beverage industry (313). Petroleum industries (353) and Non-Metals (369) also have significantly high negative coefficients. Sector 353, however, is a pure public monopoly, and its pricing behavior is likely to be attributable to mostly political factors.

On the other end of the spectrum, important intermediate good producers, such as Chemicals (352), Plastics (354), and Electrical Machinery (383) openness has relatively high *positive* responses on profit margins with +0.256, +0.097, and +0.0031, respectively. Within the “trade adjusters” only Food Manufacturing (321) and Iron and Steel (371) display statistically significant, negative, coefficients vis-à-vis openness.

When we analyze the sectoral effects of concentration and real wage movements against the mark-ups, we witness higher responsiveness coefficients. The most important sectors displaying high coefficients between concentration and profit margins are:

Non-metallic minerals (369)	2.798
Food Processing (311)	2.548
Metal products (381)	1.835
Plastics (356)	1.708
Chemicals (351)	1.520

Except for Chemicals, all these sectors disclose positive coefficients of real wage costs on mark-ups, as well. In fact, counting only the statistically significant results, of the eleven sectors which had positive relationship between mark-ups and the concentration levels, seven carry positive responsiveness vis-a-vis real wage costs. These findings provide supporting evidence confirming the hypothesis that increased real wage costs could have been translated into higher mark-ups via power of market concentration. The sectors that revealed the highest positive relationship between mark-ups and real wage costs are the following:

Petroleum Refineries (353)	0.838
Other Chemicals (352)	0.691
Rubber Products (355)	0.489
Non-Metals (369)	0.387
Plastic Products (356)	0.227

Summarizing, our econometric results reflect a pattern of sluggishness of the existing levels of concentration and mark-up induced non-competitive pricing in Turkish manufacturing against a 16-year long period of trade liberalization adjustments. With a relatively small rate of change of mark-up rates (averaging – 0.004 for the whole period), the sector seems to display a resistance to increased competition despite the import discipline the post-1980 adjustments have brought. It is also notable that the sectors that are characterized by high concentration coefficients do not necessarily reflect high shares of public ownership, and that reductions in the share of the public companies in the sector do not lead directly to an increase in the degree of competitiveness. In this respect, comparing the data for 1980 and 1996, one can see that there are sectors in which concentration rates (CR4) have declined parallel to a decrease in the share of the public sector (*iron and steel 371; beverages 313; paper and paper products 341*), whereas there have also been sectors (*chemicals 351, tobacco 314*) in which monopolization increased as a result of the same process. These observations reveal that, contrary to expectations of the orthodox theory, the process of trade liberalization has, in general, been insufficient to introduce the expected increase in competition in the industrial commodity markets. This verdict brings us to issues of distribution and pricing.

Investment Behavior and Patterns of Accumulation

Now we turn our attention to the analysis of the behavior of sectoral investment in response to openness, mark-up rates (profitability) and real wage costs by regressing sectoral real investments against CR4, MR and RW (equation 2'). Results are tabulated in Tables 3a and 3b.

<Insert Table 3a and 3b here>

The overall effect of profit margins on manufacturing real investment is quite strong with an elasticity of 0.548. This suggests the presence of strong accelerationist investment patterns in the sector. Openness, though positive, carries a smaller elasticity with 0.035. (Yet, it is not found to be statistically significant).

The estimated equation has been found to be:

$$RI_{it} = \alpha_i + 0.548 MR_{it} + 0.035 O_{it} + 0.841 RW_{it}$$

(5.956) (1.439) (15.063)

The most interesting result is the estimated positive impact of real wages on real investment with a coefficient of +0.841. In other words, real wages seem to act as an accelerationist variable, stimulating real fixed investments in the manufacturing sector, while the effect of openness –as measured in ratios of trade volume to value added– has been found to be in-significant. The un-orthodox behavior of real wages in stimulating both gross profit margins and real investments in a positive manner suggests the continued importance of domestic demand factors in the Turkish industrial commodity markets. These results concur with the findings of Yentürk and Onaran (1999) in their classification of the post-1980 Turkish manufacturing as following a *wage-led* growth pattern.

Sectoral responses of investment to mark-ups have generally very high coefficients. Sectors such as Transport Equipment (384), Textiles (321), Professional Equipment Goods (385) and Printing (341) have elasticities exceeding 2.0. It is interesting to observe that across the above-identified sectors, only Textiles (321), carry a statistically significant relationship of the effect of trade openness. Furthermore, we witness two sectors, Printing (341) and Non-Ferrous Metals (372), with negative elasticities of investment with respect to real wages, with –0.615 and –0.267, respectively. The highest effect of real wages on investment is found in Beverages (313) with +2.244. This is followed by Tobacco Manufacturing (314) with +2.222; Wood Products (331) with 1.666; and Other Chemicals (352) with 1.311.

V. Concluding Comments

In this paper, we investigated the structural consequences of the post-1980 outward-orientation on the market concentration, pricing behavior and accumulation patterns in the Turkish manufacturing industries. Utilizing existing evidence on the extent of monopolization and high concentration in the Turkish manufacturing industries, we attempted to formalize on these observations to deduce econometric hypotheses on the patterns of trade liberalization, accumulation, and profitability. To this end, we investigated our empirical questions using various panel data procedures over 29-subsectors of Turkish manufacturing for the period 1980-1996.

Existing data reveal very little structural change in the sectoral composition and nature of market concentration and behavior of profit margins under the post-1980 Turkish structural adjustment reforms and outward-orientation. It is also notable that the sectors which are characterized by high concentration coefficients do not necessarily reflect high shares of public ownership, and that reductions in the share of

the public companies do not lead directly to an increase in the degree of competitiveness. As such, the speed of adjustment of concentration is revealed to be very slow in spite of the import discipline or export penetration and the technological and institutional barriers to entry seem to persist over the post-1980 reform era.

We found that “openness” had very little impact, if any, on the levels of profit margins (mark-ups) and also on the behavior of sectoral investments. Our econometric results reflect a pattern of sluggishness of the existing levels of mark-ups in Turkish manufacturing against a 16-year long period of trade liberalization adjustments. With a relatively small effect of “openness” on gross profit margins (averaging -0.004 for the whole period), the sector seems to display a resistance to increased competition despite the import discipline the post-1980 adjustments have brought. In fact, those “trade adjusting” sectors which were classified as “inward-looking” in 1980, and became “open” by 1996 display a positive response ($+0.026$) of profit margins vis-à-vis openness. Thus, our results suggest that, contrary to the prognostications of the orthodox theory, the post-1980 export orientation of Turkish manufacturing could not lend itself into gains in competitiveness, and could not be sustained as a viable strategy of “export-led industrialization” via increased investments.

Profit margins (mark-ups) are further found to be positively and significantly affected from concentration power and real wage cost increases. Thus, there seems to be evidence that the manufacturing sectors have responded to shocks of trade policy and real wage costs by increasing their indigenous profit margins. Real investments, in turn, have been found to have a statistically *insignificant* relationship with “openness”; yet, significant and positive responses to profit margins and real wages. This finding suggests the continued importance of the domestic demand factors in the Turkish industrial commodity markets, and an overall wage-led growth pattern with both profit margins and real wages acting as accelerationist variables to stimulate fixed investments.

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Table 1. Phases of Macroeconomic Adjustment in Turkish Manufacturing, 1980-1997

Sectors	1980							Export-Led Growth 1981-88						
	Concentration Ratios (CR4)	Foreign Trade Ratio to Value Added	Share of Public Sector in Value Added	Share of Labor Costs in Value Added	Growth in Real Wages (%)	Growth in Real Average Product of Labor (%)	Gross Profit Margins (Mark-up)	Concentration Ratios (CR4)	Foreign Trade Ratio to Value Added	Share of Public Sector in Value Added	Share of Labor Costs in Value Added	Growth in Real Wages (%)	Growth in Real Average Product of Labor (%)	Gross Profit Margins (Mark-up)
<i>Competitive sectors (as of 1980)</i>														
311	10.2	0.38	0.33	0.33	5.50	41.57	0.21	11.6	0.92	0.29	0.23	-3.721	6.74	0.21
312	22.1	0.57	0.50	0.43	1.91	40.92	0.17	23.3	0.47	0.43	0.23	-4.469	10.85	0.17
321	12.7	0.29	0.14	0.34	17.99	13.11	0.31	9.2	0.81	0.12	0.26	-0.804	7.62	0.32
322	21.3	2.18	0.02	0.36	-10.84	44.45	0.21	19.2	4.63	0.01	0.20	-0.616	11.10	0.27
323	21.6	0.03	0.00	0.46	3.28	60.87	0.14	18.3	0.70	0.00	0.22	-3.921	8.63	0.22
331	19.9	0.08	0.37	0.37	3.63	-7.40	0.29	17.1	0.97	0.39	0.24	-4.366	6.66	0.24
352	21.2	0.29	0.05	0.28	0.49	43.18	0.27	22.6	0.52	0.04	0.18	0.75	11.48	0.38
356	25.4	0.02	0.01	0.27	8.71	-4.39	0.28	21.0	0.25	0.00	0.21	-1.55	6.92	0.24
369	17.0	0.19	0.20	0.28	-2.61	47.85	0.44	18.5	0.43	0.22	0.19	-0.47	5.67	0.49
381	16.3	0.72	0.07	0.30	13.85	8.34	0.40	14.9	2.66	0.08	0.23	-0.80	7.91	0.37
383	15.0	0.60	0.29	0.32	-8.37	13.63	0.36	24.9	1.23	0.07	0.19	-1.91	8.88	0.42
<i>Average</i>	-	0.39	0.15	0.33	2.77	26.54	0.28	-	1.04	0.13	0.22	-1.88	8.83	0.33
<i>Imperfectly Competitive & Oligopolistic Sectors (as of 1980)</i>														
313	55.8	0.02	0.65	0.18	1.77	37.51	1.17	45.4	0.04	0.61	0.10	-5.27	9.02	1.35
314	46.4	0.00	0.92	0.50	19.24	58.96	0.28	64.9	0.08	0.91	0.11	-7.42	22.61	1.26
324	63.1	0.01	0.53	0.47	26.92	19.53	0.19	49.3	0.32	0.40	0.43	-5.65	45.41	0.18
332	37.5	0.13	0.00	0.31	24.65	109.13	0.31	47.4	0.64	0.19	0.20	3.49	16.00	0.43
341	47.4	0.34	0.47	0.52	-15.06	-0.57	0.19	37.0	0.64	0.47	0.23	-7.52	9.83	0.28
342	36.5	0.05	0.19	0.52	-0.68	89.56	0.19	38.4	0.14	0.09	0.25	-1.13	13.94	0.41
351	49.2	1.78	0.54	0.21	-2.24	-10.13	0.47	41.0	2.84	0.40	0.12	-3.87	12.62	0.35
353	100.0	0.71	1.00	0.04	-12.79	180.20	0.37	99.2	0.29	0.86	0.01	-6.30	16.16	0.66
354	54.7	0.03	0.08	0.11	2.91	-4.65	0.53	68.9	0.18	0.11	0.06	-3.17	3.03	0.31
355	71.5	0.14	0.00	0.26	-0.84	8.92	0.40	70.7	0.42	0.00	0.19	-2.15	7.06	0.38
361	79.6	0.03	0.17	0.36	1.94	-7.68	0.72	62.0	0.14	0.14	0.16	-3.10	12.23	0.83
362	72.1	0.26	0.00	0.31	40.16	34.15	0.68	61.0	0.56	0.00	0.21	2.65	13.84	0.61
371	54.8	0.47	0.67	0.46	6.48	18.68	0.22	43.5	1.50	0.52	0.22	-4.90	12.49	0.23
372	47.2	0.35	0.51	0.37	2.18	-17.95	0.30	49.0	1.19	0.35	0.23	-4.52	8.97	0.24
382	33.4	1.37	0.22	0.42	9.69	25.45	0.25	38.0	3.03	0.19	0.27	-2.65	9.44	0.29
384	35.8	0.70	0.32	0.51	-16.89	22.31	0.21	35.7	1.17	0.12	0.26	-4.35	10.25	0.32
385	32.2	11.05	0.00	0.28	80.61	29.13	0.42	34.7	18.45	0.16	0.30	8.87	12.50	0.37
390	42.3	0.54	0.00	0.31	-7.41	-0.76	0.45	37.9	1.22	0.00	0.26	-1.53	2.57	0.40
<i>Average</i>	-	0.67	0.62	0.28	3.39	83.25	0.34	-	1.04	0.53	0.14	-3.15	12.71	0.46

Sectors	Unregulated Financial Liberalization 1989-93							Financial Crisis and Re-invigoration of Foreign Capital-Led Growth 1994-97						
	Concentration Ratios (CR4)	Foreign Trade Ratio to Value Added	Share of Public Sector in Value Added	Share of Labor Costs in Value Added	Growth in Real Wages (%)	Growth in Real Average Product of Labor (%)	Gross Profit Margins (Mark-up)	Concentration Ratios (CR4)	Foreign Trade Ratio to Value Added	Share of Public Sector in Value Added	Share of Labor Costs in Value Added	Growth in Real Wages (%)	Growth in Real Average Product of Labor (%)	Gross Profit Margins (Mark-up)
<i>Competitive sectors (as of 1980)</i>														
311	13.0	0.62	0.31	0.23	16.02	15.78	0.29	14.4	1.20	0.13	0.19	-9.57	-6.22	0.31
312	18.7	0.51	0.32	0.37	20.31	5.35	0.16	18.2	1.18	0.13	0.23	-9.55	6.70	0.20
321	8.5	0.94	0.07	0.28	7.37	7.10	0.35	7.5	1.76	0.03	0.22	-9.52	-2.42	0.36
322	5.6	2.40	0.02	0.20	3.83	7.07	0.30	6.0	1.86	0.02	0.20	-1.58	-1.60	0.31
323	27.0	2.24	0.00	0.22	2.38	7.30	0.28	24.1	2.72	0.05	0.20	-2.50	4.36	0.26
331	20.5	0.38	0.28	0.32	16.20	10.95	0.24	30.6	0.80	0.11	0.22	-14.41	-3.49	0.28
352	22.7	0.52	0.03	0.18	12.68	15.74	0.55	20.4	0.90	0.02	0.15	-6.53	-1.87	0.66
356	20.4	0.30	0.02	0.21	8.10	10.86	0.33	20.0	0.93	0.04	0.16	-3.46	-0.43	0.38
369	19.5	0.30	0.15	0.20	11.49	13.93	0.65	19.5	0.39	0.04	0.15	-9.92	-3.33	0.72
381	18.8	0.80	0.05	0.24	8.37	8.54	0.44	16.7	1.22	0.05	0.19	-6.28	-0.27	0.43
383	29.7	1.25	0.01	0.23	13.29	12.64	0.46	24.4	1.95	0.02	0.20	-8.93	-6.08	0.52
<i>Average</i>	-	0.90	0.10	0.23	11.62	11.69	0.39	-	1.46	0.04	0.19	-7.92	-2.00	0.38
<i>Imperfectly Competitive & Oligopolistic Sectors (as of 1980)</i>														
313	33.0	0.04	0.51	0.12	18.43	10.50	1.08	34.6	0.11	0.35	0.10	-10.27	-6.43	0.76
314	59.6	0.22	0.84	0.20	25.05	2.31	0.75	64.5	0.90	0.45	0.23	-9.32	-14.05	0.44
324	37.1	0.52	0.29	0.39	6.14	11.44	0.25	36.5	1.72	0.18	0.27	-9.41	1.19	0.35
332	44.9	0.38	0.00	0.22	9.92	6.48	0.43	40.6	0.72	0.00	0.17	-11.16	-0.88	0.52
341	25.6	0.81	0.32	0.35	17.69	5.90	0.31	22.6	1.46	0.19	0.24	-9.04	-3.09	0.40
342	50.1	0.12	0.09	0.17	6.67	22.19	0.52	60.0	0.19	0.07	0.14	-3.08	-2.19	0.44
351	49.9	2.31	0.38	0.25	15.67	-5.96	0.39	57.4	3.02	0.48	0.16	-6.66	7.14	0.55
353	98.1	0.17	1.00	0.02	24.42	9.21	1.12	98.3	0.24	1.00	0.01	-9.65	6.32	1.09
354	74.6	0.21	0.08	0.16	14.17	4.64	0.20	63.4	0.16	0.04	0.13	-15.73	2.75	0.43
355	71.5	0.55	0.01	0.25	15.83	9.99	0.58	74.8	0.85	0.01	0.20	-7.40	2.18	0.63
361	58.8	0.13	0.07	0.19	15.73	13.18	1.06	59.4	0.29	0.05	0.17	-9.02	-7.27	1.04
362	51.9	0.49	0.02	0.29	15.81	11.56	0.60	56.9	0.71	0.00	0.25	-4.66	-4.49	0.69
371	35.7	1.55	0.39	0.38	18.26	5.59	0.19	31.5	1.75	0.38	0.19	-10.74	9.79	0.32
372	46.8	1.08	0.30	0.35	17.66	3.08	0.28	45.4	2.46	0.38	0.23	-10.31	1.42	0.30
382	44.8	2.49	0.09	0.26	11.37	11.39	0.39	42.2	4.10	0.07	0.20	-6.97	0.92	0.45
384	47.8	0.89	0.07	0.26	14.56	16.16	0.34	41.0	1.91	0.05	0.20	-8.29	-0.69	0.38
385	45.1	6.25	0.11	0.24	8.60	18.60	0.51	56.8	5.58	0.05	0.16	-10.11	1.11	0.59
390	29.3	1.83	0.06	0.27	5.74	9.16	0.48	29.2	3.71	0.06	0.18	-6.55	6.87	0.57
<i>Average</i>	-	0.89	0.43	0.20	15.40	8.53	0.49	-	1.59	0.42	0.14	-8.28	3.24	0.53

Figure 1. Profit Margins (Mark-up Rates) and Real Wage Costs in Turkish Private Manufacturing

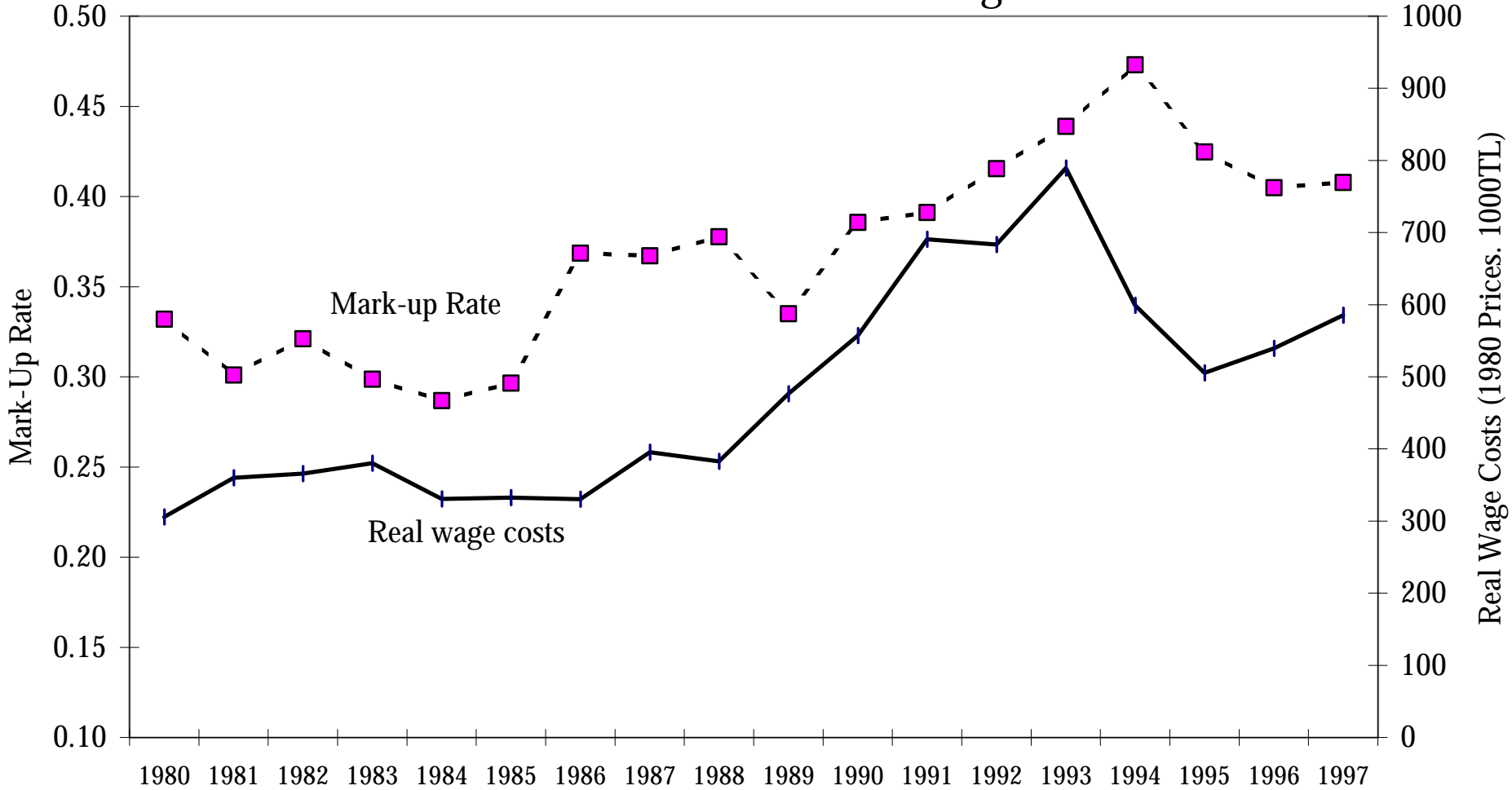


Table2a. Relationship between mark-up rates, openness, concentration ratio, and real wage costs

	Openness	Concentration Level (CR4)	Real Wage Costs	Adjusted R ²
<i>Overall Effect</i>	-0.004*	0.181*	0.111*	0.803
<i>Open & competitive</i>	-0.002	-0.055	0.130*	0.877
<i>Open & imperfectly competitive</i>	-0.003**	0.301**	0.155*	0.654
<i>Inward looking & competitive</i>	0.017**	0.302**	0.183*	0.828
<i>Inward looking & imperfectly competitive</i>	0.039*	-0.058	-0.104*	0.568
<i>Trade Adjusting</i>	0.026*	0.091	0.076**	0.781

Table2b. Relationship between mark-up rates, openness, concentration ratio, and real wage costs (FEM with cross-section specific effects)

Cross-Section Effects	Openness	Concentration Level (CR4)	Real Wage Costs
311	-0.037*	2.548*	0.099**
312	-0.014	-0.934*	-0.134*
313	-2.457**	-0.383	-1.167*
314	-0.050	3.327	-1.331
321	0.014**	-0.829*	0.064*
322	0.002	-0.074*	0.219*
323	0.018**	0.305**	-0.021
324	0.035	-0.437**	-0.130
331	-0.016	0.927*	-0.276*
332	0.063	1.079	0.015
341	-0.026	-1.033*	-0.217**
342	-0.999	0.230	-0.486**
351	-0.040*	1.520*	-0.196*
352	0.256*	0.649	0.691*
353	-1.399**	7.777	0.838**
354	-0.906	-0.136	-0.353
355	-0.041	0.689**	0.489*
356	0.097*	1.708*	0.227*
361	-1.511	-3.002	-0.268
362	-0.291	-0.444	0.068
369	-0.572**	2.798**	0.387**
371	-0.133*	-1.524*	-0.346*
372	0.032	0.702	0.014
381	0.004	1.835*	-0.028
382	0.004	0.733**	0.157**
383	0.031**	0.130	0.167*
384	0.042*	0.333*	0.056**
385	-0.005**	0.339**	0.067
390	0.070*	0.725	0.194

Note: (*) indicates that the coefficient is statistically significant; (**) indicates statistical significance at 5%.

Distribution

Table3a. Relationship between real investment, mark-up rates, openness and real wage costs

	Mark-up Rates	Openness	Real Wage Costs	Adjusted R²
<i>Overall Effect</i>	0.549*	0.035	0.841*	0.979
<i>Open & competitive</i>	1.975*	0.016	0.934*	0.963
<i>Open & imperfectly competitive</i>	0.207	0.004	0.700*	0.983
<i>Inward looking & competitive</i>	0.456*	0.297*	0.917*	0.992
<i>Inward looking & imperfectly competitive</i>	0.428*	0.249*	0.661*	0.907
<i>Trade Adjusting</i>	0.433**	0.271*	0.806*	0.991

Table3b. Relationship between real investment, mark-up rates, openness and real wage costs

(FEM with cross-section specific effects)

Cross-Section Effects	Mark-up Rates	Openness	Real Wage Costs
311	0.096	0.451*	0.948*
312	0.991	0.379**	0.476
313	1.081**	3.106**	2.244*
314	0.602**	0.949*	2.222**
321	2.180*	0.445*	0.054
322	10.847	0.134	3.153
323	-0.894	0.336*	-0.245
324	1.778**	0.194**	0.618**
331	1.446**	0.154	1.666*
332	0.556	0.163	0.509
341	2.188**	0.147	-0.189
342	0.218	-2.164**	-0.615**
351	-0.129	-0.095	0.089
352	-0.157	0.578*	1.311*
353	0.565	-0.294	-0.674
354	0.090	-0.097	0.806*
355	0.460	0.636	0.625
356	0.492	0.863*	1.204*
361	1.016*	1.848**	0.607**
362	1.137	1.325	0.715
369	1.230	-0.160	-0.227
371	1.464	0.325	0.540
372	0.253	-0.081*	-0.267*
381	1.662	-0.540	1.205**
382	-0.096	0.152*	0.687*
383	-0.489	0.547**	0.921*
384	3.159*	0.042	0.872*
385	2.459	0.029	2.580
390	0.699	0.161	0.971

Note: (*) indicates that the coefficient is statistically significant; (**) indicates statistical significance at 5%.

**Appendix Table 1: International Standard Industrial Classification of All
Economic Activities**
Manufacturing Industry Classification

311	Food manufacturing
312	Manufacture of food products not elsewhere classified
313	Beverage industries
314	Tobacco manufactures
321	Manufacture of textiles
322	Manufacture of wearing apparel, except footwear
323	Manufacture of leather and products of leather, leather substitutes and fur, except footwear and wearing apparel
324	Manufacture of footwear, except vulcanize or moulded rubber of plastic footwear
331	Manufacture of wood and wood cork products, except furniture
332	Manufacture of furniture and fixtures, except primarily of metal
341	Manufacture of paper and paper products
342	Printing, publishing and allied industries
351	Manufacture of basic industrial chemicals
352	Manufacture of other chemical products
353	Petroleum refineries
354	Manufacture of miscellaneous products of petroleum and coal
355	Manufacture of rubber products
356	Manufacture of plastic products not elsewhere classified
361	Manufacture of pottery, china and earthenware
362	Manufacture of manufacture of glass and glass products
369	Manufacture of other non-metallic mineral products
371	Iron and steel basic industries
372	Non-ferrous metal basic industries
381	Manufacture of fabricated metal products except machinery and equipment
382	Manufacture of machinery (except electrical)
383	Manufacture of electrical machinery, apparatus, repairing, appliances and supplies
384	Manufacture of transport equipment
385	Manufacture of professional, scientific measuring and photographic and optical goods
390	Other manufacturing industries