Is It Possible to Deindustrialize before Industrialization? The Turkish Case

*Ilyas SIKLAR – Ozgur TONUS**

Abstract

The main focus of the study is to examine the existence of deindustrialization patterns as observed in the Turkish economy in late 90's and continued to date. A common feature of such deindustrialization has been the overvaluation of the domestic currency. While the nominal GDP share of manufacturing industry is decreasing, the sector can has not been able to create sufficient employment increases, and, services sectors confronted a great deal of labor surplus to absorb. After liberalizing its international economic relations in late 80s, Turkish economy frequently suffered from overvalued Turkish lira and faced both financial and balance of payments crises. Together with the overvalued Turkish lira and deindustrialization tendencies, this study analyses the interrelations of these processes. We found that developments in the real exchange rate affect the share of manufacturing in GDP and employment via interim factors such as real wages, productivity and investments.

Keywords: *de-industrialization, Turkish manufacturing industry, real appreciation*

JEL Classifications: F43, O14, J21

Introduction

It is a well-known feature of economic development that the share of agricultural sector in employment falls and that of industry rises. This process is generally defined as industrialization. However, the share of industry in total employment begins to fall back after reaching a certain level, and the share of services sector begins to rise (Rowthorn and Wells, 1987). It is observed that the relative weight of industry in overall employment has decreased and the services sector's share has begun to increase beginning from the mid 60s in the U.S, during 70s in European countries and Japan (Rowthorn and Ramaswamy, 1997, p. 7). Hong Kong, People's Republic of China, South Korea, Singapore and Taiwan in later

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dates faced the same development patterns called as "deindustrialization" in the economics literature. That decreased employment level in manufacturing relative to services does not mean concomitant reduction in output supplied should be emphasized as the main point here (Rowthorn and Coutts, 2004, p. 768).

1. Literature Review

There is a debate on the definition of deindustrialization in the economics literature. While Rowthorn and Wells (1987) evaluate deindustrialization as an expected outcome for industrialized-developed countries, Baumol et al. (1989) consider the effects of increasing employment share of services on economic growth. Rowthorn and Ramaswamy (1997, p. 18) conclude that labor productivity increases more slowly than manufacturing and, therefore, relative prices reflect total output share of services sector in developed economies for the 1970 – 1994 period. The productivity differences among the economic sectors, some exogenous distortions such as the appreciation of the domestic currency or the rapid globalization of the market can explain the decreasing employment and/or GDP share of manufacturing in the economy (Kang, 2004, p. 162; Tatom, 1994, p. 8; Lim, 2004, p. 118).

Empirical analyses related to causes of deindustrialization have been performed in various ways by a number of researchers since the 1980s when exports from the newly industrialized economies such as South Korea, Taiwan and Hong Kong began to show dramatic increases (Lim, 2005, pp. 122 – 123). It is worth to note that there are some studies in the economics literature (for detailed review see Shafaeddin, 2005, pp. 17 – 20), which propose that it is possible to deindustrialize before completing the industrialization process when developing countries are considered. However, these studies do not reach a common conclusion about the concept of deindustrialization and whether the liberalization of trade contributes to this process. Particularly in 70s and in the beginning of 90s, upon excessive increases in oil prices, petroleum exporter countries faced Dutch disease, which can cause deindustrialization and the GDP and employment share of manufacturing decreased substantially. Moreover, Dutch disease also occurred in developing countries' important service-exporting sectors, such as tourism and financial services (see, Palma, 2005, pp. 10 – 14).

The Pitelis and Antonakis' (2003) study conducted for the Greece, which we thought as to have some critical similarities with Turkey, tries to explain the relationship between competitiveness and deindustrialization and concludes that the share of manufacturing in employment and GDP would increase with an increasing competitiveness.

In recent years, Turkish economy attracts attention with its high economic growth rates reaching an annual average of almost 9% between 2002 and 2005. Despite rapid growth, the open unemployment rate increased from 6.5% in 2000 to 10.3% in 2005. Consequently, the phenomenon known as "jobless growth" became a major discussion matter in academics and politics. Telli et al. (2006) claims that the jobless-growth problem is regarded as a direct symptom of the current structural transformation policies implemented under the International Monetary Fund (IMF) supervision. Similar to our approach, national currency appreciation under the IMF program leads not only to inflame import but also to contraction of traditional export industries. While the jobless growth concept is a subject to a different study, it is worth to analyze whether Turkey runs into a deindustrialization process, which is widely known as an economic situation related to industrialized countries. The low employment creation capacity of the industrial sectors critically increases the importance of analyzing the deindustrialization process and the role of real exchange rate as a driving force (Dasgupta and Singh, 2006; Tatom, 1994; Filiztekin, 2004).

The study is organized as follows. The next section describes the short presentation of the phases of industrialization process in Turkish economy. Section 3 analyses the existence of deindustrialization tendency and the role of overvaluation of domestic currency while the Section 4 presents the results of the estimated vector error-correction model including causality tests. Finally, some conclusions follow.

2. Structural Change in the Turkish Economy

Turkish economy can be analyzed with two main periods taking 1980 as a critical year. During in the import substitution period, which is characterized by a foreign trade regime with fixed exchange rate, strict controls over foreign exchange and import quotas, the main goal of the economic policy was to reduce import dependency of the economy. Contrary to expectations, however, dependency on the imported inputs rapidly expanded because of forcefully growing manufacturing sector the production at which was totally oriented for domestic markets. In this process which can be defined as negative import substitution the resource requirement of the economy was recovered by the foreign resources. The crisis of the late 1970s was the biggest that Turkey had experienced since the days of the early republic. That crisis was in many aspects, a typical crisis of the inward-oriented, import-substituting model of industrialization (ISI) based on a heavily protected domestic market, that impact of which was magnified by successive, externally generated oil price shocks (for a comprehensive discussion of the import-substituting process in Turkey and the crisis of the late 1970s see, Barkey, 1990; Onis, 2000).

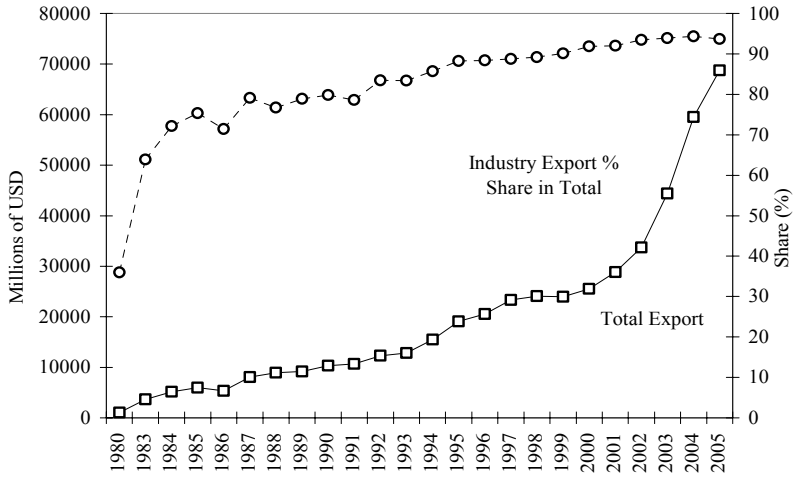
In the import substitutive industrialization process, external deficits became a chronic problem and the pressures to liberalize its foreign trade and foreign exchange regimes seriously started. As a result, with the January 24th, 1980 stabilization program, Turkey changed its industrialization strategy from import substituting to export-leading one. The main characteristics of this strategy transformation were (1) continuous depreciation of domestic currency, (2) greatly liberalized import regime and (3) encouragingly taken measures to promote export-oriented production such as lower interest rates, differenced exchange rate and tax return for export activities (Boratav, 2004, p. 149). With these promoting policies, industrialization has been viewed as the basic element for export oriented development strategy, and the previous development strategy based on planned state entrepreneurship was abandoned.

After mobilizing its resources for export promotion, Turkey introduced new legal and institutional changes and took a serious step on the way for financial liberalization in 1989. By liberalizing its exchange rate regime, Turkey intended to finance its accelerating industrialization efforts and growing government deficits by attracting international financial resources to the economy. In retrospect, short--term capital inflows on substantial scale have proved to be something of a mixed blessing for the Turkish economy. In other words, Turkey has been confronted with both the positive and negative sides of financial globalization (see, Akyuz and Boratav, 2003; Yeldan, 2001; Ertugrul and Selcuk, 2001; Yenturk, 1999 for an extensive evaluations of the Turkish financial liberalization experiences). Large inflows of short-term capital, mostly in response to high domestic interest rates, have been instrumental in Turkey's ability to achieve reasonably high rates of expansion and growth in the 1990s (Onis, 2000, pp. 9 – 10). It is generally emphasized by many studies (Rodrik, 1990; Cizre and Yeldan, 2005; Onis and Bakir, 2005) that while macroeconomic instability and political uncertainty prevailed, the decision of liberalization of capital account was not timely and premature.

As a result of export oriented industrialization strategy, manufacturing production increased with an annual average of 7.3% for the period 1980 – 1990 and 4.4% for the period 1990 – 2000. Most important reflection of this relatively high growth of manufacturing production was observed in the foreign trade of the country. Export volume of the country increased sharply after 1980 and showed a drastically structural change. For instance, while the 36% of total export volume of 2.9 billion USD in 1980 consists of industrial products, this ratio reached the 94% of 68.8 billion USD in 2005 (Figure 1). It should be noted, however, that in spite of rapid increase in industrial production and foreign trade volume, a majority of the exported industrial products consist of agricultural manufacturing industry.

F i g u r e 1

Exports by Main Sectors*



(*) Based on ISIC-Rev3 classification from 1989 onward.

Source: Turkish State Planning Organization, Turkish Statistical Institute.

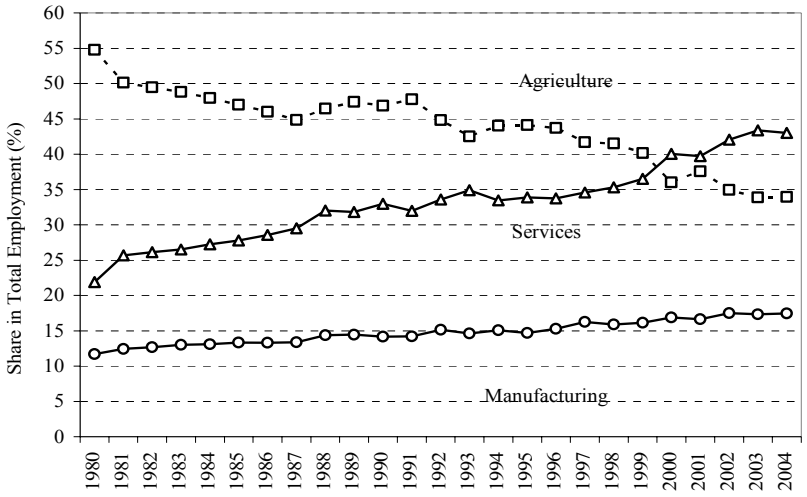
Besides the World Trade Organization's regulation, Turkey's other important step to complete the process of trade liberalization which had already started in the early 1980s was the Customs Union (CU) with the European Union (EU). On January 1st in 1996, the CU came into effect and Turkey abolished all duties and equivalent charges on imports of industrial goods from the EU. Furthermore, Turkey started to harmonize its tariffs and equivalent charges on the imports from third countries with the EU's Common External Tariff. Therefore, manufacturing sector was opened to international competition more heavily after the establishment of the CU.

As far as the empirical literature on the impacts of CU is concerned, Harrison et al. (1997) estimate that Turkey stand to gain between 1 and 1.5% of GDP annually from the CU. By contrast, Mercenier and Yeldan (1997) suggest that the net impact of the CU be against to Turkey. In the same way, Bekmez (2002) suggest that customs union lead to revenue losses for the government sector and reduction in GDP, though it benefits the private sector. Some studies (Hartler and Laid, 1999; Neyapti et al., 2003; Soguk, 2002; TUSIAD, 2003) concluded that the CU has contributed to the increasing volume of trade between Turkey and the EU. Yilmaz (2003) empirically finds that Turkey has a strong comparative advantage in raw and labor intensive goods. Erzan and Filiztekin (1997)

found that the CU had a depressing effect on small firms' employment and value added growth. They show that the SMEs managed to maintain their productivity by labor reduction.

It is worth to note another leading development in the Turkish manufacturing sector that problems related to fighting against inflation and financing balance of payments deficits became more severe together with the structural problems of the economy in 90s. In order to cope with the structural problems, Turkey has frequently felt obliged to apply to the IMF for the formulation of remedies. Following the Asian Crisis, Turkey has signed a *Staff Monitoring Program* with the IMF in 1998, which is envisaged to cover a period of 10 years. This relation with the IMF carries a special significance for Turkey who had acquired the status of a candidate country to the EU membership (see, The Independent Social Scientists' Alliance, 2006).

F i g u r e 2
Share of Employed People



Source: Turkish Statistical Institute, Statistical Indicators.

The real appreciation of Turkish lira has been the main instrument of the IMF-led disinflation program (Figure 2). Especially, after the 2001 financial crisis, the overvalued lira policy made imported materials cheaper and caused to increase import dependency of the manufacturing sector. At the same time, Turkey lost the ability to follow an independent foreign trade policy including export incentives because of the CU. While the export volume increased 14.2% annually

in 1996 – 2005 period, the annual growth rate of the manufacturing output was only 4.8% and increasing export volume could not motivated the industrial production. It is possible to say that the main reason brought about this situation is the increasing dependency of exports on imported materials. These factors together caused an asymmetric growth and structural distortions in the sector. For instance, these structural distortions in manufacturing are evaluated as a principal factor causing to increase current account deficits in the period of 2001 – 2005 (TEPAV, 2006, p. 4).

Except the period of economic crisis, industry together with the Turkish economy has presented a significant development and structural change since 1980. Total value added of the industrial sector, export volume and export share of manufacturing have shown important increases and these developments show a continuing industrialization in Turkish economy. The main point that should be stressed here is that the industrialization process that must go on confronts a deindustrialization tendency because of policy preferences.

3. Deindustrialization Tendency in Turkish Economy

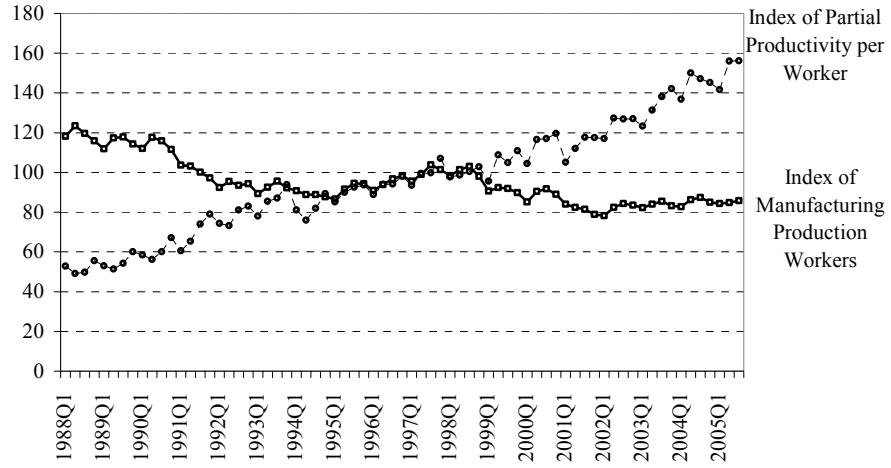
In order to talk about the existence of "deindustrialization" we must first speak of an industrialized economy. Analyzing this progression for Turkish economy with an incomplete industrialization brings some critical problems. In industrialized countries, employment share of services is greater than the industry, but there isn't any big change in agricultural sector's share. When we consider the Turkish economy, employment shares of services and industry have shown a balanced course until 1950 and after that date decreases in agricultural employment has been greatly absorbed by the services. It can be obviously seen from this reality that import substitution strategy toward industrialization before 1980 was not able to create the desired increase in employment capacity. Particularly, after 1980, decreases in agricultural employment and increases in the services sector's employment keep on in an accelerating manner (Figure 3). This is the main factor that affects the sectoral distribution of employment throughout the period under consideration. Finally, since 2000, employment share of services has been greater than that of agriculture.

Although the agriculture sector has a large share in employment, it has the lowest contribution to GDP. In 1970, the contribution of industry to GDP was about 17% while its share in employment was only about 10%. In addition to this, the services sector's shares contributions to GDP were 40% and 19%, respectively. When we consider the openness period after 1980 in order to see the effects of this strategy change, in 1989, the contribution of manufacturing to

GDP reached to 23% while its share in employment was 14.5%. At the end of 15-year period in which the manufacturing sector's production and export were increasing, the share of services in GDP reached to 55.5% in 2005 although it produced nontradables. In the same year, the contribution of manufacturing to GDP dropped to almost 21%. As it can be seen from this information that Turkey could realize the desired progress in industrialization neither by using import substitution nor export oriented strategies to industrialize. Although we face a decreasing GDP share of agriculture, rapidly growing sector of the economy is the services sector, not the manufacturing.

F i g u r e 3

Index of Partial Productivity per Worker – Production Workers Working in Manufacturing Industry



Source: Central Bank of the Republic of Turkey.

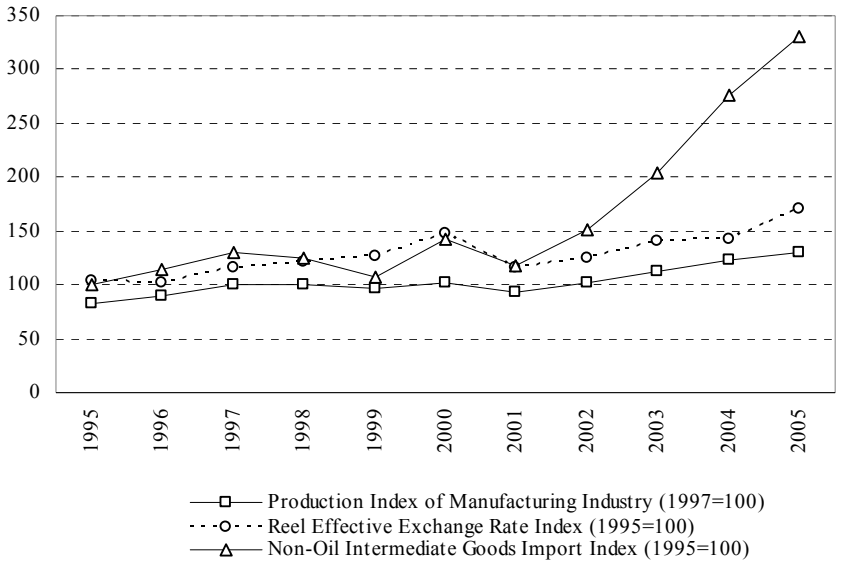
Increases in productivity which bring about less labor use in manufacturing indicate that the Turkish manufacturing turns to a sector which gradually creates less and less employment from year to year (Bicerli, 2004, pp. 268 – 272). As it can be seen from the Figure 4, the partial productivity index per worker shows an increasing trend throughout the entire period although the index for production workers displays a decreasing trend.

In general terms, manufacturing production increased annually 7.8% in 1980 – 1990, 4.2% in 1991 – 2000 and 5.2% in 2001 – 2005 periods. While the total manufacturing production was increasing, public sector's manufacturing production increased 5.9%, 0.1% and 1.6%, respectively. Although manufacturing sector increased its production capacity, it couldn't create employment in the same

manner. Average annual increase in employment was –2.3% during the 1991 – 2000 period. Public and private sector's average in the same period were –7.8% and –0.8%, respectively. In 2001 – 2005 period, above-mentioned trend did not change and public sector's average became –8.3% while that of private sector was 0.1%.

F i g u r e 4

The Progress of Real Effective Exchange Rate and Import Dependency



Source: Turkish State Planning Organization and our calculations.

When we consider the productivity indicators of the manufacturing, we can see an increasing trend such as 6.7% in 1991 – 2000 and 5.8% in 2001 – 2005. Although the number of workers rapidly decreased, growth rates of productivity for the same periods were 7.8% and 8.0%, respectively. It is obvious that public sector did not create a healthy productivity increase. Since fewer workers employed in the public sector, we confront a situation in which an increasing value added per worker.

Together with the export promoting growth strategy, Turkish manufacturing industry has reached high growth rates from time to time and has lasted its development with longer working hours and fewer workers per unit of production. The main factor that underlies the "jobless growth" concept is above outlined structure of the manufacturing sector and unemployment rate continues to rise (The Independent Social Scientists' Alliance, 2006, pp. 20 – 28).

Macroeconomic instability, decreasing investments of public sector, crowding-out effect of privatization activities and FDIs preferring mainly services sector can be listed exactly as the other factors effecting the development of manufacturing in this period.

Depending upon the indications listed, decreasing employment creation capacity of manufacturing and excessively increasing activities in the service sectors make us think about the existence of deindustrialization phenomenon in Turkish economy. Together with the macroeconomic instabilities, foreign trade and exchange rate policies followed in the last two decades are the principal determinants of these developments. Because of analyzing the contribution of liberalizing foreign trade regime to this process is out of this paper's scope, we will concentrate only on the relationship between overvalued domestic currency and deindustrialization tendency after 1989 in Turkish economy.

4. Model, Methodology and the Estimation Results

The hypothesis which supports that there is an inverse linkage between a country's real exchange rate and its industrial performance treats real exchange rate movements as exogenous. When a country's currency rises (falls) in value, or the real exchange rate rises (falls), domestic prices of imported goods fall and foreign prices of domestic exports rise. As a result, domestic consumers switch from local, import-competing goods to foreign suppliers, and foreigners switch from imports to their own import-competing sector. The appreciating-currency country loses production for exporting and its import-competing sector shrinks, so the traded goods sector contracts. At the same time, the traded goods sector abroad will expand; the demand for its import-competing sector rises, as well as for its exports. According to this hypothesis, referred as the "deindustrialization", domestic factors related to industrial performance act as interim factors during the deindustrialization process such as real wages, investment, productivity and employment in the manufacturing sector of the economy. These interim factors together with the real exchange rate cause to shrink manufacturing industry proportionally.

In this paper a non-structural vector-error correction model is used to investigate the interaction among the real exchange rate, manufacturing share of output, the real wage, investment, overall employment and productivity. An advantage of this approach is that it allows us to study these issues from both long- and short-run perspectives. This is particularly suitable for studying the effects of real exchange rate because, while the effects of real exchange rate are essentially felt in the long run, it also has potential short-term effects as it directly affects

foreign trade and the trade makes up a component of GDP so that movements in the trade balance can cause swings in real GDP and employment in the short run.

We begin our long-run analysis by testing whether there is a stable long-run relationship (cointegration) among the elements of the vector of domestic above mentioned interim variables and real exchange rate. Next, we examine short-run effects of real exchange rate by estimating a dynamic model of the relationships in question and using it to perform Granger non-causality tests. And also we estimate a set of impulse response functions and variance decomposition.

We apply this methodology to quarterly data for Turkey covering the period from 1989.1 to 2005.4. The domestic interim variables consist of manufacturing share of output (MAN), the real earning index of the workers in manufacturing (ERN), labor productivity in manufacturing (PRO), total investment relative to GDP (INV) and the civilian employment (EMP). Trade weighted real exchange rate calculated by the Central Bank is used to represent the real exchange rate (REX).

We start the empirical analysis by testing the variables for unit root using the Augmented Dickey-Fuller (ADF) test. In performing the ADF test we choose the lag length on the augmentation term based on Akaike Information Criterion. The ADF unit-root test results, which are reported in Table 1, indicate that with no exception, all variables are *I* (1); in other terms, they are integrated of order 1.

T a b l e 1

Augmented Dickey-Fuller Unit-Root Tests

Variable	Level	Lag	First Dif.	Lag
REX	–1.756	0	–5,653*	3
INV	–2.154	1	–6.614*	0
ERN	–1,.811	0	–8.573*	0
EMP	–2.322	2	–3.799*	1
PRO	–1.348	4	–5.998*	3
MAN	–0.872	4	–6.369*	3

* Requires rejection of the null hypothesis of "series has a unit-root" at 1% level of significance.

Source: Our calculations.

We are now in a position to test for cointegration among variables under consideration. On this purpose, we use Johansen's maximum likelihood procedure. Again, we choose the shortest lag that renders the test equation's error white noise, which turns out to be two quarters. The cointegration test results are found in Table 2. Both the maximum eigenvalue (lambda-max) and trace tests reject the null hypothesis of no cointegration at the 5% level of significance. This is also the case with the null of a single cointegration relation. Turning to the null of two and three relations, we observe that they are rejected by the maximum eigenvalue test, not by the trace test. On the other hand, neither the tests rejects the null hypothesis of four cointegrating relations. An examination of the roots

of the companion matrix reveals that there are four roots close to the boundary of the unit circle and all of them lie clearly on the boundary suggesting that there are four cointegrating vector relating the six variables under consideration. The fact that we find multiple cointegrating relations suggests that the long-run relationship among the six variables is rather stable in the sense that following a shock there are several ways in which they can get back together. Therefore, we accept the validity of four cointegrating vectors in the rest of the analysis.

T a b l e 2

Johansen Cointegration Tests

Number of Hypothesized Cointegrated Equations	Eigenvalue	Trace Test	Maximum Eigenvalue Test
0	0.635	172.123*	59.420*
1	0.514	112.707*	50.473*
2	0.479	62.234*	26.154
3	0.246	36.080*	17.029
4	0.157	19.051	14.570
5	0.053	4.482	4.482

* Requires rejection of the null hypothesis at 5% level of significance.

Source: Our calculations.

The existence of multiple long-run equilibrium relations poses an identification problem, which prevents us to determine the exact effect of real exchange rate on the manufacturing industry related variables in the model. In order to overcome this difficulty, instead of imposing some unknown restrictions, we use normalized unconstrained cointegrating coefficients given in Table 3 below. This table contains only normalized cointegrating coefficients with respect to real exchange rate since we are dealing with the its effect on domestic manufacturing related variables mentioned already.

T a b l e 3

Normalized Cointegrating Coefficients Estimates

Variable	Cointegrating Coefficient	Standard Error	Adjustment Coefficient	Standard Error
REX	1.000	–	–0.315	0.148
ERN	–0.135	0.075	0.177	0.132
INV	0.007	0.003	0.451	2.938
PRO	–1.324	0.166	0.089	0.068
EMP	–1.478	0.305	–0.128	0.037
MAN	0.164	0.032	–2.586	0.705

Source: Our calculations.

When the related cointegrating coefficients are normalized with respect to exchange rate, it affects real earnings obtained, employment level and overall productivity in the manufacturing industry negatively; investment level and the

manufacturing share of output are positively correlated with the real exchange rate. Except the last mentioned positive relationships, other results should be expected during deindustrialization process as we discussed earlier. Although we estimated a positive correlation between the manufacturing share of output and the real exchange rate, since the adjustment coefficient of that variable has a negative sign and relatively high value (and low standard error), some doubt should be put on the above-mentioned positive relationship.

T a b l e 4
Granger-noncausality Tests

Hypothesis	F Value	Probability
REX does not cause ERN	4.072	0.022
ERN does not cause REX	0.963	0.387
REX does not cause INV	4.722	0.012
INV does not cause REX	2.006	0.143
REX does not cause PRO	3.395	0.040
PRO does not cause REX	0.926	0.402
REX does not cause EMP	3.880	0.026
EMP does not cause REX	0.710	0.496
REX does not cause MAN	7.348	0.001
MAN does not cause REX	1.654	0.200

Source: Our calculations.

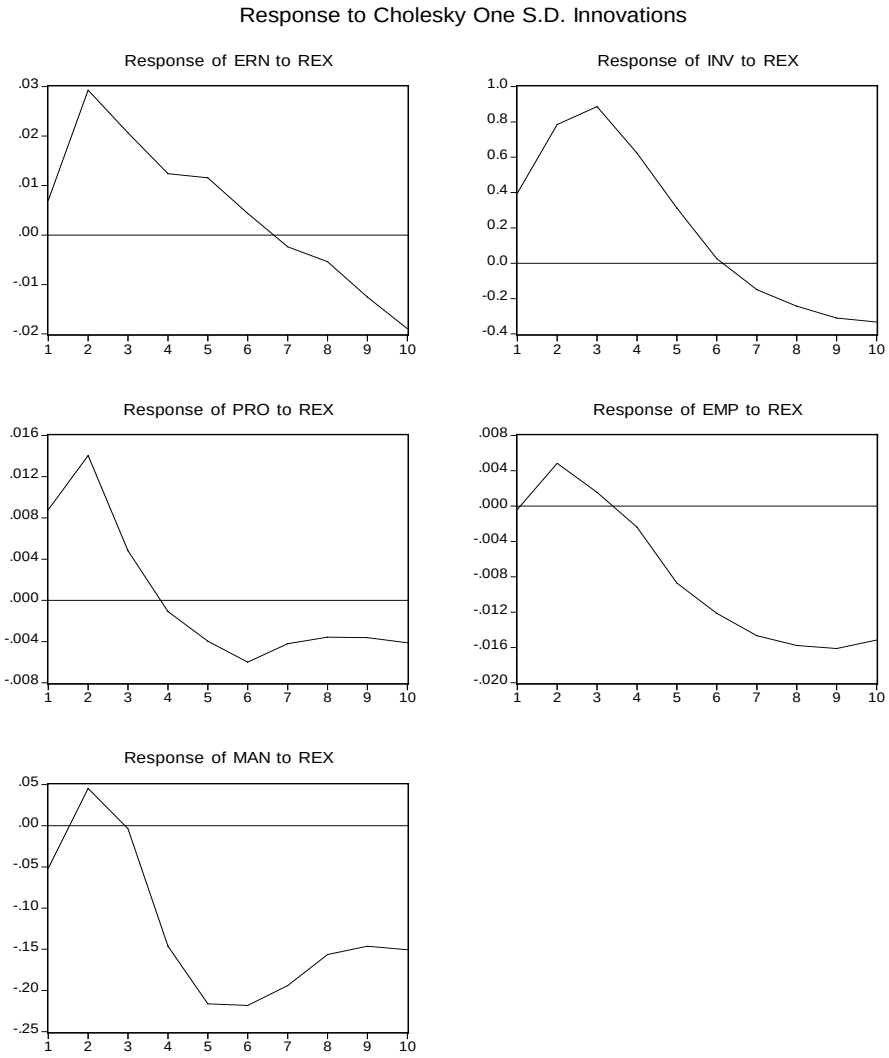
For two reasons, we must exercise caution while interpreting these results. One is the existence of multiple cointegrating vectors, which means we do not know whether the relations we described above are the equilibrium one-s. The second reason for caution is the fact that, while cointegrating implies causality in at least one direction, cointegration tests cannot determine the direction in which causality flows. This would have to be ascertained from Granger-noncausality tests that incorporate the cointegrating relation, which is what we should examine next. The results of Granger-non causality test conducted to determine the direction of causality are summarized in Table 4, which reports the p-values for F-tests in each test. In estimating each related equation during the test process, we used two quarter lagged differences as a standard lag level. According the results reported in the table, direction of the causality works from real exchange rate to all other variables used in the analysis at 5% level of significance. In fact, unidirectional causality running from real exchange rate to the other variables in the model should be evaluated as a result of multiple equilibrium relation we have already discussed.

The finding that the six variables are cointegrated means that the short-run dynamics of the relationship between them must be specified as a vector error-correction (VEC) mechanism rather than a conventional unrestricted vector autoregression (VAR) specification. Thus, we estimate a six-equation VEC of order two and use the results to obtain impulse response functions and variance decompositions.

Here only the impulse responses of the variables in the model to real exchange rate innovations are reported in order to gain some space. Figure 5 shows the response of manufacturing industry related variables to real exchange rate innovations.

F i g u r e 5

Summarized Impulse Response Functions



Source: Our calculations.

Now consider the estimated impulse response functions, which map the response of each variable to innovations in the other variables over time. According to Figure 5, following a shock to real exchange rate all the variables decline

and give a negative response in general over time. Together with the conclusions that the existence of a multiple equilibrium and unidirectional causality, these responses of the variables in the model to real exchange rate innovations show that the overvaluation of the domestic currency is the main driving force of deindustrialization process in the sample examined, which we have already discussed. Because of the fact that there are cointegrating vectors among the variables under consideration, standard error bands for impulse-response functions obtained from VEC cannot be used to evaluate the statistical significance of responses (Sims and Zha, 1999). To overcome this difficulty a general applied way is to estimate variance decompositions of the VEC model. Variance decompositions of the manufacturing share of output are given in Table 5. In order to examine the sensitivity of the results to the ordering of the variables, forecast error variances were decomposed using different orderings.

However, the results did not appear to be markedly different than those found in Table 5.

T a b l e 5

Variance Decompositions of Manufacturing Share of Output (MAN)

Period	S.E.	REX	ERN	INV	PRO	EMP	MAN
1	0.329	2.477	9.736	0.001	31.949	13.957	41.877
2	0.395	3.024	19.998	0.645	31.873	9.723	34.735
3	0.454	2.289	20.231	6.597	35.528	8.861	26.492
4	0.515	9.858	18.119	5.616	36.623	8.642	21.139
5	0.575	22.011	15.744	4.990	31.753	7.972	17.527
6	0.634	29.977	13.358	5.163	28.003	7.703	15.794
7	0.681	34.034	12.196	5.444	25.741	7.447	15.134
8	0.713	35.909	12.087	5.213	25.075	7.209	14.505
9	0.741	37.158	12.097	4.882	24.962	7.021	13.876
10	0.767	38.538	12.137	4.633	24.649	6.727	13.314

Source: Our calculations.

Variance decomposition separates the variation in an endogenous variable into the component shocks to the VEC. Thus, the variance decomposition provides information about the relative importance of each random innovation in affecting the variables in the VEC. According to Table 5, which explains the sources of the one to ten periods ahead forecast error variation in the MAN named variable (representing the manufacturing share of gross domestic product), main driving force behind these variations is the real exchange rate followed by the manufacturing sector productivity and manufacturing share of output itself. The result that the real exchange rate is the main variable explaining the forecast error variation of manufacturing share of output gives support to the conclusion that the overvaluation of the domestic currency is an important determinant of the deindustrialization process in Turkey for the period 1989 – 2005.

Conclusion

Decreasing trends of employment and GDP shares of industry in an economy is defined as "deindustrialization". Most of the developing countries today experience this process, which is generally accepted as a natural result of economic development. In the literature, some studies suggest that countries with uncompleted industrialization can also be deindustrialized.

Excluding foreign trade policies followed, starting point of this study is that overvalued domestic currency could affect the performance of manufacturing sector in an economy. It is claimed that developments in the real exchange rate affect the earnings of workers, productivity, investments, the employment share of the manufacturing sector and, consequently, sector's contribution to GDP begins to decrease in Turkish economy.

Whereas the Turkish economy has already entered the stage of deindustrialization in terms of employment and nominal output of a manufacturing since the late 1990s, deindustrialization has not begun in terms of real output. It is estimated that deindustrialization in the case of the Turkish economy is not attributable to successful economic growth mainly caused by the relatively faster growth of productivity in the manufacturing sector and the shift of consumption patterns according to rising income standards but is predominantly the consequence of a failure in international competitiveness in domestic manufacturing. Obtained results support the view that the loss of international competitiveness due to overvalued domestic currency contributes to the loss of manufacturing base, productivity and level of overall employment in the economy. Findings of the study indicate that it is necessary to revise supply side policies promoting the competitiveness of the manufacturing sector besides the price competition.

For the Turkish economy, industrialization is a *sine qua non* target since it is the most important factor on export, productivity and economic growth besides its contribution to solve unemployment, fight against poverty, improve income distribution and accelerate the EU membership process.

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