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**Cost of Labor in Manufacturing Sectors of Turkey Compared with Other
Transition Countries: Hungary, Poland, Czech Republic and Slovakia**

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Abstract

This paper compares the competitiveness of Turkey in manufacturing in terms of unit labor cost with the transition countries including Poland, Hungary, Czech Republic and Slovakia. Unlike the pure wage rate comparison, Turkey performs better than other countries in the sample with respect to unit labor cost. Turkey has lower unit labor cost almost in all the sectors. In addition, unit labor costs and their growth rates are examined in detail specifically for the manufacturing sectors with rising and declining export shares in recent years.

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Cost of Labor in Manufacturing Sectors of Turkey Compared with Other Transition Countries: Hungary, Poland, Czech Republic and Slovakia

Introduction

This paper provides a new perspective on Turkey's international competitiveness in manufacturing using relative unit labor costs among Hungary, Slovakia, Czech Republic and Poland. We find that the unit labor cost of manufacturing in Turkey are about 25 %-50 % of the unit labor cost in Hungary, 20 %-40 % of the unit labor cost in Poland, 35 %-60 % of the unit labor cost in Slovakia and 25 %-40 % of the labor cost in Czech Republic. On the other hand; wage levels in manufacturing at current prices in Turkey are the highest among the sample countries. Especially since 2001, not only wage levels in manufacturing but also minimum wage levels have been much higher than the ones in rest of sample countries. The appreciation of domestic currency in Turkey explains high wage levels. Instead of focusing on wage rates, this paper primarily employs the unit labor cost comparison to derive more accurate and reliable labor cost measures to assess the competitiveness of Turkey with regard to Hungary, Poland, Czech Republic and Slovakia.

This paper is divided into three main sections. In section 1, we examine the minimum wage levels among sample countries. Among the member states, the gross minimum wage varied from 183 euros (Slovakia) to 261 euros (Czech Republic). It is apparent that minimum wage level is higher in Turkey that is 331 euros as compared to minimum wages in other sample countries. Since 2004 when they became the member of the EU, PPS in these countries have been increasing. In Turkey there was always an increase in PPS after the 2001 crisis. Moreover, the growth rates of minimum wages in Turkey in each period are higher than the sample countries.

For example; the growth rate of minimum wage level in Turkey in 2006 was 37.9 % that was about three folds of the ones in Czech Republic, 11.1 % and in Poland, 14.1 %.

In recent years, Turkey has shown a tendency of increasing wage level in manufacturing. Turkish Lira appreciation accounts for the most prominent reason why wage level of manufacturing sector in Turkey has been growing faster than other sample countries in recent years. Wage level in manufacturing declined between 1999-2001 in Turkey due to severe and frequent crises in 2000 and 2001. Until 2001, wages in manufacturing have been repressed. Since 2001, with the help of the appreciation of domestic currency, wages in manufacturing have been significantly increasing. For instance, average wage levels of manufacturing in 2003 were \$609.08 for Turkey, yet \$556.25 for Hungary, \$529.35 for Poland, \$404.46 for Slovakia. The wage level of manufacturing in Turkey was the highest among the sample countries.

Comparing wages earned by employees in manufacturing sectors is not a good measure to conduct a labor cost competitiveness assessment among these countries. The nominal wage levels include exchange rate effect albeit excludes purchasing power parity (PPP) considerations which are crucial when comparing the competitiveness of a country in international context. Hence, we proceed in this paper by calculating of relative unit labor cost instead of wage rates in each manufacturing sector for each country. More reliable and accurate results can be obtained through eliminating the effects of exchange rate fluctuations and incorporation of PPP statistics. Turner and Van't Duck (1993) and Turner and Golub (1997) survey the literature and conclude that the relative unit labor costs in manufacturing are the best single indicator of competitiveness. The relative unit labor cost in this paper is calculated following "Productivity and unit labor cost comparisons: database" by Bart van Ark and Erik Monnikhof in 2000. It consists of the ratio of nominal labor cost per month to real productivity per month. After calculating the unit labor costs in manufacturing from 1998 to 2005, the unit labor cost growth rate in each period is also

derived. Later, we divide these years into three sub-periods which are composed of respectively 1998-2000, 2000-2003, and 2003-2005 and calculated the average unit labor cost's growth rate for each period not only for Turkey but also for the other countries in our sample. The data set used for the comparison of the unit labor cost among our sample countries is available only for limited time period except for Turkey.

Unit labor costs in each manufacturing sector did not always move together. Unit labor costs in some of the sectors increased more in comparison. Hence, we categorize the sectors with respect to whether a particular sector displays an increasing growth rate of unit labor cost above the average growth rate or not. Average growth rates of unit labor costs in manufacturing are calculated for three periods in Turkey, for two periods in Hungary and Poland due to lack of available data set to construct the unit labor cost after 2002. Beside, we examine the unit labor cost in Slovakia in one period due to the unavailability of the data after 1999.

The unit labor costs of "Food products and beverages", "tobacco products", "textiles", "wearing apparel"; "luggage, saddlery and footwear", "manufacture of basic metals", "communication and apparatus", "other transport" and "furniture" were always increasing at a rate above the average growth rate for each period. These sectors failed to improve the labor productivity in proportion to their wage rate growths. The increase in unit labor cost appears to influence their relative export performance among other manufacturing sectors. Textiles, wearing apparel, and food and beverages industries have been showing a declining trend in the export share of total manufacturing in Turkey. For example, in the last period which corresponds to the period after 2001 crisis, the growth rate of unit labor cost in textiles was 15.63 % that was higher than the average 9.95 % in spite of the reduction in its export share in total manufacturing. Its export share reduced from 19.02 % in 1999 to 12.72 % in 2005.

Likewise, the other transport is the industry which has been displaying very striking growth rate of unit labor cost in all periods. In last period the growth rate was 51.62 % which was five times higher than the average, 9.95 %. In addition to this, this industry has paramount importance for the manufacturing export of Turkey. The growth rate of export share between 2003 and 2005 was 50.91 %. Communication and apparatus is the other sector that has displayed increasing growth rate in recent years similar to the other transport. These two sectors provide evidence that unit labor cost is only but not sole factor for the successful export performance.

Unit labor costs in “products of wood and cork”, “paper and paper products”, “printing and publishing”, “coke petroleum products and nuclear fuel”, “chemical and chemical products”, “rubber and plastic products”, “manufacture of fabricated metals”, “manufacture of machinery and equipment”, “office accounting and computing machinery” and “motor vehicles and trailers” have been increasing at a rate below the average growth rate in Turkey. For instance, the growth rate of unit labor cost in motor vehicles and trailers was 3.05 % that was one third of the average, 9.95 %. On the other hand; motor vehicles and trailers is the most prominent rising sector that has been showing increasing export share in recent years¹. International competition in this sector has led to higher productivity growth and lower wage increases. Turkey in this sector seemed to cope with the international competition quite successfully.

This paper also categorizes the manufacturing sectors with respect to whether export share of the sector showing an increasing trend or not in total manufacturing export. Then, unit labor costs and their growth rates are examined in detail under the headings of export share increasing sectors and export share decreasing sectors. Ultimately, we compare the unit labor cost and their

¹In addition to the motor vehicles and trailers, the other sectors in Turkey that have been displaying a decreasing trend in their unit labor cost growth rates in recent years are examined in section 2.

growth rates for the sectors having top importance for Turkey with our comparator countries. Lastly, we compare the unit labor cost in manufacturing of Turkey to of others and identify the point where Turkey stands among the sample countries. Moreover, we examine the growth rates of unit labor cost in each manufacturing sector from 1998 to 2005 for Turkey and also for the others by using the available data.

The sectors which have been showing an increasing trend in export shares as well as in the unit labor costs are “furniture”, “communication and apparatus” and “other transport”. For example, the growth rates of unit labor costs in other transport in 2000-2003 and 2003-2005 were respectively 22.74 % and 51.62 % that were above the average in each period. The increase in unit labor cost of the other transport is attributable to the sudden surge in its export share. In addition to the relationship between the growth rate of unit labor cost and the export share in other transport, overall, the unit labor costs in Turkey were much lower than the ones in our sample countries. For example, the unit labor cost in this sector was 0.4438 in 1997 in Poland while in Turkey corresponding unit labor cost was 0.1577.

The other major sector with increasing export share in Turkey is furniture. Unit labor cost has been increasing at a rate above the average growth rate in recent periods. For example; in 1998-2000, the growth rate was 4.39 % that was lower than the average, 7.65 % in this period. Beside, it can be seen from the rankings of unit labor cost in furniture in last period that furniture took its place among the top ten sectors in terms of its growth rates. In our sample country, Poland, the growth rates of unit labor cost in furniture were 1.15 % and 14 % which were above the average ones that were -3.52 % and -6.06 % for respectively 1997-2000 and 2000-2002. Another important point is to note that the differences in unit labor costs between Poland and Slovakia were not as high as the ones between Poland and Turkey or between Slovakia and Turkey in furniture. Moreover, the differences of unit labor costs between Poland and Slovakia in

furniture were not as high as the ones in other transport. This result reinforces the argument that technologically more intensive products allow for more labor cost differentials among competitors.

Another point is to note that in Turkey, unit labor costs in manufacture of machinery and motor vehicles and trailers which have vital importance in the total manufacturing export of Turkey have started to increase their average unit labor costs with the rate below the average growth rate of unit labor cost in recent years in order to compete in international markets.

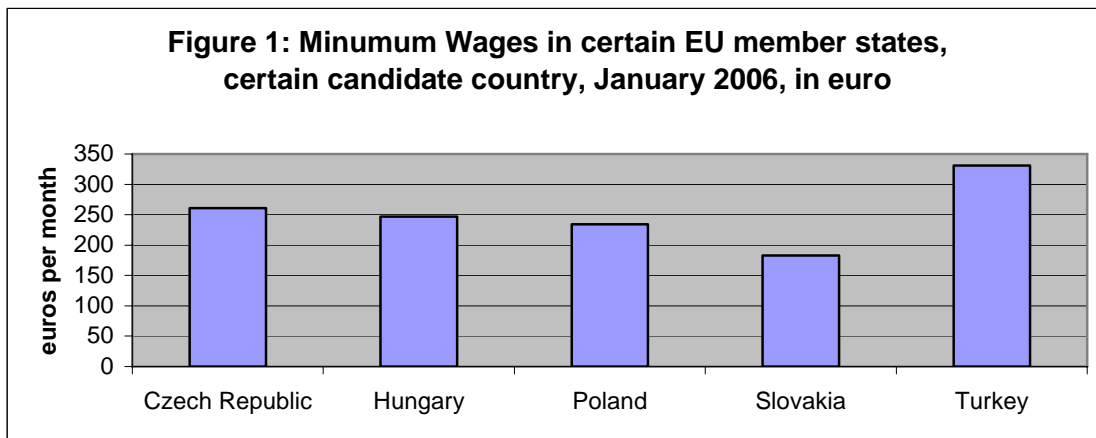
The sector that is very crucial in Turkey for the total manufacturing export is manufacture of machinery and equipment in which unit labor cost has been growing with a rate smaller than the average. The highest unit labor cost of manufacture of machinery and equipment in each period was in Czech Republic. It was 0.5947 in 1996, higher than the ones in Slovakia 0.3729; in Poland 0.3760, and in Hungary 0.3292. Hence, there appears to be a convergence among Hungary, Poland and Slovakia but not entirely for Turkey where the unit labor costs have been the lowest and for Czech Republic where they were the highest. The situation was the same for motor vehicles and trailers. The lowest unit labor cost level has taken place in Turkey in 1997. Then, there was a convergence between Turkey and the other sample countries except Poland in which unit labor cost continues to increase more than the the others.

Wearing apparel and food products and beverages are the export share decreasing sector, likely to be due to the increase in the unit labor cost in recent years. In Poland, the growth rates were -4.04% and -12.06% respectively for 1997-2000 and 2000-2002. In each period the growth rate of unit labor cost was smaller than the average ones. The growth rates of unit labor costs have been showing decreasing trend in Poland as the opposite of the ones in Turkey. The other sectors are examined in section 3.

Part I: Comparing Wages and Unit Labor Costs in General

In this section, we compare the competitiveness of Turkey to Slovakia, Czech Republic, Hungary and Poland that became the members of the EU in 2004. The comparison is mainly in terms of labor cost in manufacturing. Moreover, we seek to unravel whether manufacturing sectors with increasing export share in these countries offer higher salaries to employees.

Before examining the wages in various manufacturing sectors among these countries, we first compare the minimum wages among them and identify where Turkey stands among these countries.



Source: Eurostat, database on minimum wages

Figure 1 depicts the minimum wage levels in the member and the candidate country on January 1st 2006. Among the member states, the gross minimum wage varied from 183 euros (Slovakia) to 261 euros (Czech Republic). It is apparent that minimum wage level is higher in Turkey that is 331 euros as compared to minimum wages in other sample countries. Part of the reason for this higher minimum wage rate in Turkey is attributable to acclaimed appreciation of Turkey's currency (Lira) in recent years. For example, just in 2005, Turkish Lira has appreciated against Euro by 5.6 % while inflation rate was around 7.7 %. Table 1 also shows the minimum wage levels in national currencies, in Euro and Purchasing Power Statistics (PPS). It can be seen

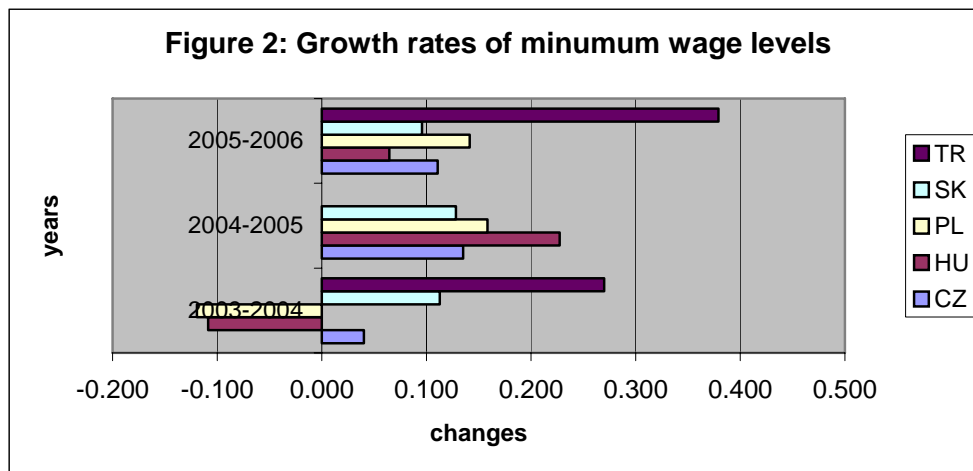
that between 2003 and 2006, the minimum wage level in Turkey is higher than the others in the sample.

Table 1: Minimum wages in certain EU Member States, certain candidate countries, 2003-2006, in national currencies, in Euro and in Purchasing Power Statistics (PPS)

	NAC				EUR				PPS			
	2003	2004	2005	2006	2003	2004	2005	2006	2003	2004	2005 (p)	2006 (p)
CZ	6200	6700	7185	7560	199	207	235	261	406	382	409	431
HU	50*	53*	57*	63*	212	189	232	247	364	340	366	401
PL	800	824	849	899	201	177	205	234	387	347	358	379
SK	5570	6080	6500	6900	133	148	167	183	294	277	296	314
TR	306**	423**	489**	531**	189	240	240	331	375	412	476	517

Source: Eurostat, database on minimum wages. *: in thousands of NAC **: in millions of NAC (p): provisional

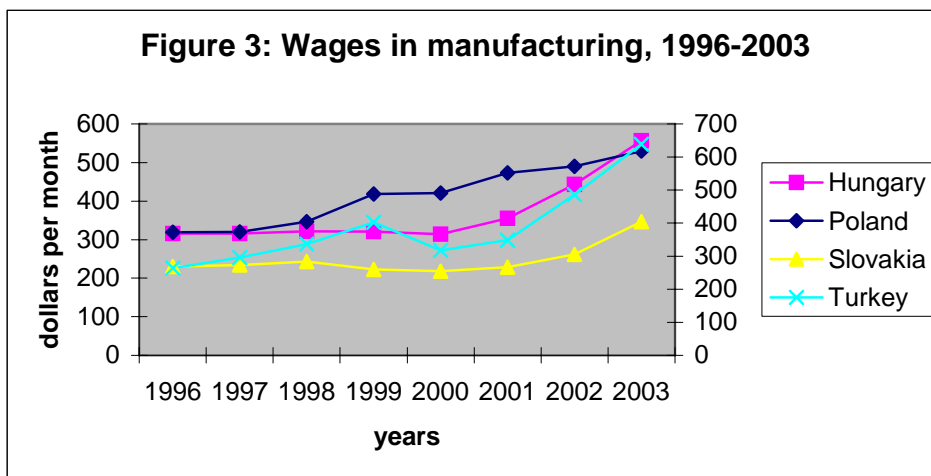
There was, furthermore, a decrease in PPS among the member countries between 2003 and 2004. After 2004 when they became the member of the EU, PPS in those countries started to increase. However; in Turkey there was always an increase in PPS after the 2001 crisis. Beside, Turkey has experienced highest growth rate of minimum wages among our sample countries in recent years (Figure 2).



Source: Eurostat, database on minimum wages

Part II: Cost of Labor in Manufacturing

As it can be seen from the Figure 3, the lowest wage level in dollars has taken place in Slovakia where wage level in manufacturing was \$404.46 in 2003 that is much lower than the ones in Hungary, Poland and Turkey (see also Table 2). The wage level in manufacturing in Turkey in 2003 was \$639.08. In Hungary and Poland, they were respectively \$556.25 and \$529.35 in 2003.



Source: Eurostat, database on minimum wages, 1996-2004

In recent years, Turkey has shown a tendency for increasing the wage level in manufacturing as Figure 3 shows. Turkish Lira appreciation accounts for the most prominent reason why wage level of manufacturing sector in Turkey has been growing faster than other countries in recent years. Another important point, as Table 2 illustrates, wage level in manufacturing in Turkey declined between 1999-2001 due to severe and frequent crises in 2000 and 2001. Until 2001, wages in manufacturing has been repressed. Since 2001, they have been increasing to \$486.38 and \$639.08 respectively for 2002 and 2003 with the help of the appreciation of domestic currency. Hence, wage level in manufacturing in Turkey was at the top

among our sample countries where wage levels in 2003 were \$556.25 for Hungary, \$529.35 for Poland, \$404.46 for Slovakia, and \$609.08 for Turkey.

Table 2: Wages in dollar for manufacturing, 1996-2004

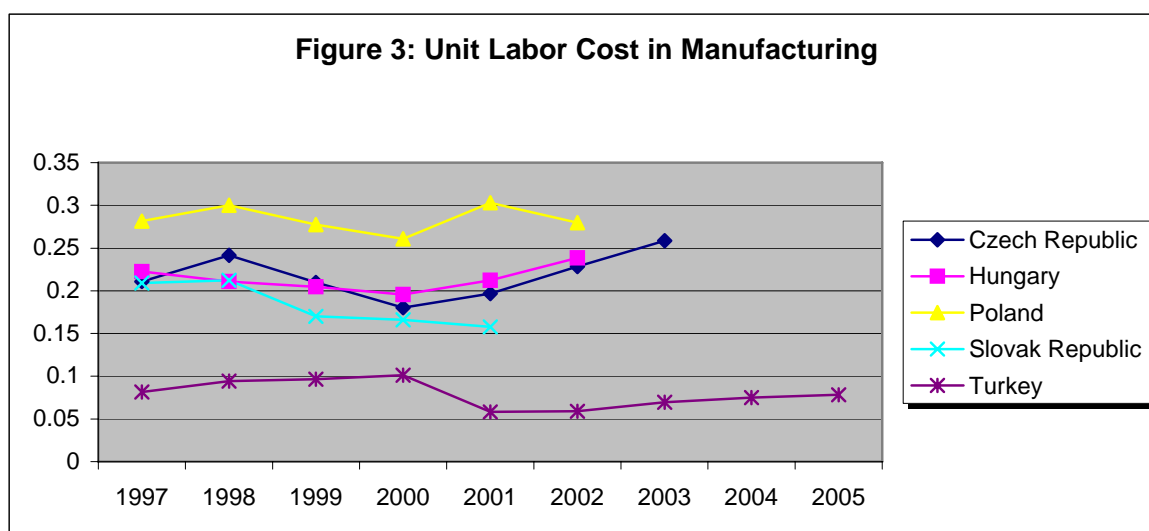
	1996	1997	1998	1999	2000	2001	2002	2003
Hungary	315.73	315.41	321.23	320.9	313.81	354.99	443.21	556.25
Poland	318.76	319.52	346.41	418.67	420.51	473.61	490.17	529.35
Slovakia	268.48	273.59	283.25	260.09	254.63	266.94	305.27	404.46
Turkey	264.08	295.99	335.93	402.18	317.72	348.44	486.38	639.08

Source: Wages in manufacturing from Laborsta, 1996-2004 in local currency and they are converted into dollars according to the data of weighted exchange rate data from IMF for those years.

Comparing wage levels in manufacturing sectors is not completely a precise measure to conduct an international labor cost comparison. The nominal wage levels include exchange rate effects. Moreover, one needs to take purchasing power parity statistics into account in comparing the competitiveness of a country. PPPs measures the amount of a local currency required to purchase a standard set of goods and services which worth one unit of the currency of benchmark country. When converting output measured in one currency into the currency of another, PPPs take account of the price differences between countries. The unit labor cost can be written as the ratio of nominal labor cost per month to real productivity per month (Ark and Monnikhof, 2000). Hence, the following equation characterizes the relative unit labor cost employed to conduct international unit labor cost comparisons.

$$ULC^{D(U)} = \frac{LCH^{DD} / ER^{DU}}{OH^{D(D)} / PPP^{DU}}$$

Where $ULC^{D(U)}$ is unit labor cost of country D in terms of dollars, ER^{DU} is the exchange rate between country D and the United States, PPP^{DU} is the purchasing power parity between country D and the United States and $OH^{D(D)}$ is the output per month in country D in prices of country D.



Source: Wages and output in manufacturing are from Laborsta, exchange rate and PPP are from World Development Indicators and SIMA database of the World Bank.

Table: Unit Labor cost in manufacturing

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hungary	0,2566	0,2225	0,2111	0,2047	0,1955	0,2124	0,2387	n/a	n/a	n/a
Poland	0,3031	0,2816	0,3002	0,2776	0,2608	0,3031	0,2799	n/a	n/a	n/a
Slovakia	0,2102	0,2090	0,2124	0,1702	0,1659	0,1577	n/a	n/a	n/a	n/a
Turkey	n/a	0,0816	0,0944	0,0967	0,1014	0,0581	0,0591	0,0697	0,0750	0,0783
Czech Republic	0,2230	0,2107	0,2413	0,2098	0,1804	0,1967	0,2285	0,2584	n/a	n/a

Source: Wages and output in manufacturing are from Laborsta, exchange rate and PPP are from World Development Indicators and SIMA database of the World Bank.

There are 22 sectors under manufacturing production. Unit labor costs in these sectors did not always move together. Unit labor costs in some of the sectors increased more than average unit labor cost growth in manufacturing sector. Hence, we categorize the sectors with respect to whether a particular sector displays an increasing growth rate of unit labor cost above the average growth rate or not. First, we calculate the unit labor costs in manufacturing from 1998 to 2005 according to the formula stated above. Then we calculate the unit labor cost growth rate in each year. Later, we divided these years into four sub-periods which are composed of respectively

1998-2000, 2000-2003, and 2003-2005 and calculated the average wage growth rate for each period not only for Turkey but also for the other countries in our sample. The data for Poland spans the years from 1997 to 2002, so we divide in a two period like before and after 2000. The data for Hungary are available between 1996 and 2002; the division of sub-periods is same as the one for Poland. Lastly, the data set for Slovakia is available only between 1996 and 1999, and we examine its data without dividing into sub-periods.

The unit labor cost in manufacturing sectors in Turkey has appeared to be the lowest relative to the others. Unit labor costs are more helpful than the wage levels in comparing the competitiveness of Turkey in terms of labor cost. More reliable and accurate results are obtained due to the elimination of exchange rate and the incorporation of PPP into the analysis. Turner and Van't Duck (1993) and Turner and Golub (1997) survey the literature and conclude that the relative unit labor costs in manufacturing are the best single indicator of competitiveness.

Table 3: Growth Rates of Unit Labor Cost in Manufacturing Sectors of Turkey Showing an Increasing Trend

	Average growth rate of unit labor cost	Food products and beverages	Tobacco products	Textiles	Wearing apparel	Luggage, saddlery and footwear	Manufacture of basic metals	Communication and apparatus	Other transport	Furniture
1998-2000	0.0765	0.0373	-0.1206	0.0278	0.0912	0.1012	0.2546	0.0975	0.2196	0.0439
ranking		16	22	18	11	9	1	10	2	15
2000-2003	-0.0455	0.0104	-0.0368	-0.0609	-0.0031	-0.0644	-0.0508	-0.0811	0.2274	-0.0627
ranking		4	11	15	5	17	13	20	1	16
2003-2005	0.0995	0.1990	0.5001	0.1563	0.1167	0.1716	0.1566	0.2142	0.5162	0.1476
ranking		4	2	7	9	5	6	3	1	8

Source: Wages and output in manufacturing are from Laborsta, exchange rate and PPP are from World Development Indicators and SIMA database of the World Bank.

Overall, in Turkey wages in “food products and beverages”, “tobacco products”, “textiles”, “wearing apparel”; “luggage, saddlery and footwear”, “manufacture of basic metals”, “communication and apparatus”, “other transport” and “furniture” were increasing at a rate above the average wage growth rate for each period as Table 3 shows. Growth rates of unit labor cost in

food products and beverages are 3.73 %, 1.04 %, 19.9 % for respectively 1998-2000, 2000-2003, and 2003-2005 in which average growth rates of unit labor cost were 7.65 %, -4.55 %, 9.95 % respectively. In last two periods, growth rates of unit labor cost in food products and beverages were higher than average growth rates. The rankings of growth rates of unit labor cost in food products and beverages also take its place among the top in all the manufacturing in recent years.

The situation for the other sectors listed in Table 3 was similar to the case of food products and beverages. Growth rates of unit labor cost in tobacco products were -12.06 %, -3.68 %, 50.01 % for respectively 1998-2000, 2000-2003, and 2003-2005 in which average growth rates of unit labor cost were 7.65 %, -4.55 %, 9.95 % respectively. In last two periods, growth rates of unit labor costs were above the average ones.

Recently, unit labor costs in manufacture of basic metals, and other transport have been showing an increasing trend as well. Their growth rates of unit labor cost growth rates in manufacture of basic metals have been 25.46 %, -5.08 %, and 15.66 % for respectively 1998-2000, 2000-2003, and 2003-2005 in which average growth rates of unit labor cost were 7.65 %, -4.55 %, 9.95 % respectively. The growth rates of unit labor cost in other transport have been higher than the average ones in each period as Table 3 shows above. Moreover, the growth rates in other transport have been always taking its top places among ranking of unit labor cost growth. For example, its growth rate attained the first place in 2003-2005.

Other sectors which have been showing an increasing trend in the growth rates of unit labor cost are textiles, wearing apparel, and luggage, saddlery and footwear in recent years. The unit labor cost growth rates in textiles were 2.78%, -6.09%, and 15.63% for respectively 1998-2000, 2000-2003, and 2003-2005. As it is apparent from these growth rates, the unit labor cost in

textiles has started to rise above the average growth rate in spite of the reduction in the share of textiles in total manufacturing export. The situation is same for wearing apparel in which growth rates were 9.12 %, -0.31 %, and 11.67 %. From the Table 3, the growth rates in luggage, saddlery and footwear were 10.12 %, -6.44 %, and 17.16 %. The ranking of this sector in term of growth of unit labor cost has come from 13th place to 6th place in the last period.

The last sectors in which growth rates of unit labor costs have been above the average are furniture and communication and apparatus. The growth rates of unit labor costs in furniture were 4.39 %, -6.27 %, 14.76 % for respectively 1998-2000, 2000-2003, and 2003-2005. The situation was same for communication and apparatus due to the higher than average growth rates in the sector. Unit labor cost growth was 21.42 % in 2003-2005. Whereas in 1998-2000 it was lower than the average growth rate of unit labor cost as Table 3 shows. In recent years, it exhibits an increasing trend in growth rate of unit labor cost as it is seen from the increasing rankings.

Table 4: Growth Rates of Unit Labor Cost in Manufacturing Sectors of Turkey Showing a Decreasing Trend

	Average growth rate of unit labor cost	Products of wood and cork	Paper and paper products	Printing and publishing	Coke, petroleum products and nuclear fuel	Chemicals and chemical products	Rubber and plastic products	Manufacture of fabricated metal products (exc machinery)	Manufacture of machinery and equipment	Office, accounting and computing machinery	Motor vehicles and trailers
1998-2000	0.0765	-0.0716	0.1093	0.2038	0.1880	0.1169	0.0647	0.0563	0.0911	-0.0592	0.1064
ranking		21	7	3	4	5	13	14	12	20	8
2000-2003	-0.0455	-0.0058	-0.1592	0.0209	-0.0220	-0.0226	-0.0750	-0.0135	-0.1210	-0.0298	-0.0725
ranking		6	22	3	8	9	19	7	21	10	18
2003-2005	0.0995	0.0700	-0.0012	-0.0462	0.0881	0.0625	0.0060	0.0681	0.0205	-0.0807	0.0305
ranking		14	20	21	12	16	19	15	18	22	17

Source: Wages and output in manufacturing are from Laborsta, exchange rate and PPP are from World Development Indicators and SIMA database of the World Bank.

Unit labor costs in “products of wood and cork”, “paper and paper products”, “printing and publishing”, “coke petroleum products and nuclear fuel”, “chemical and chemical products”, “rubber and plastic products”, “manufacture of fabricated metals”, “manufacture of machinery

and equipment”, “office accounting and computing machinery” and “motor vehicles and trailers” have increased at a rate below the average growth rates in recent years (see Table 4).

The growth rates of unit labor cost in products of wood and cork were -7.16% , -0.58% , and 7% for respectively 1998-2000, 2000-2003, and 2003-2005 in which average growth rates of unit labor cost were 7.65% , -4.55% , and 9.95% respectively. In all periods, the growth rates of unit labor cost in products of wood and cork were always smaller than the average ones.

Similarly, growth rates in office accounting and computing machinery were always lower as compare to the other manufacturing sectors. This can also be seen from the rankings which are 20th, 10th, and 22nd places in the Table 4.

Growth rates of unit labor cost in rubber and plastic products were 6.47% , -7.50% , and 0.60% that were below the each average growth rates for each sub-period.

Other sectors showing a declining trend in the growth rates of unit labor cost are “coke petroleum products and nuclear fuel”, and “chemical and chemical products”. The rankings of coke petroleum products and nuclear fuel have shown this declining trend as well. Its ranking has declined from 4th to 12th. This fall in rankings is also seen in chemical and chemical products. Its place was reduced to 16th in 2003-2005 among the 22 sectors.

The unit labor cost in “paper and paper products” and “printing and publishing” has not been increasing much as Table 4 reveals. The growth rate of “paper and paper products” was 0% between 2003 and 2005 that is too low in comparison to the average one in manufacturing, 9.95% . This situation for “paper and paper products” was also valid for 2000-2003. Moreover, the conclusion was also same for “printing and publishing” due to lower growth rates of unit

labor costs such that it was -4.62% in 2003-2005 that was much lower than the average unit labor cost growth.

The last sectors in which growth rates of unit labor costs were smaller than the average are “motor vehicles and trailers”, “manufacture of machinery and equipment”, and “manufacture of fabricated metals” as Table 4 shows above. The growth rates of unit labor cost in motor vehicles and trailers 10.64% and 3.65% for respectively 1998-2000 and 2003-2005. Furthermore, these rates revealed a decreasing trend despite of the increase in the export share of motor vehicles and transport in recent years. The growth rate in manufacture of fabricated metals only in 2000-2003 was higher than the average one in Table 4. The last unit labor cost declining sector is manufacture of machinery and equipment. The growth rates of unit labor costs were 9.11% in 1998-2000 and its ranking was 12th among the other sectors. However, in 2003-2005 the growth rate of unit labor cost was 2.05% that was much smaller than the average (9.95%).

Unit Labor Cost with Increasing Trend

TURKEY	POLAND	SLOVAKIA	HUNGARY
Food products and beverages Tobacco products Textiles Wearing apparel Luggage, saddlery and footwear Manufacture of basic metals Communication and apparatus Other transport Furniture	Rubber and plastic products Electrical machinery and apparatus Communication and apparatus Medical,precision and optical instruments, watches Other transport Furniture	Chemicals and chemical products Manufacture of machinery and equipment Office, accounting and computing machinery Communication and apparatus Medical,precision and optical instruments, watches Other transport Furniture	Textiles Wearing apparel Luggage, saddlery and footwear Products of wood and cork Printing and publishing Coke, petroleum products and nuclear fuel Manufacture of basic metals Office, accounting and computing machinery Motor vehicles and trailers

Unit Labor Cost with Decreasing Trend

TURKEY	POLAND	SLOVAKIA	HUNGARY
Products of wood and cork Paper and paper products Printing and publishing Coke, petroleum products and nuclear fuel Chemicals and chemical products Rubber and plastic products Manufacof fabricated metal prod(exc machinery) Manufacture of machinery and equipment Office, accounting and computing machinery Motor vehicles and trailers	Food products and beverages Wearing apparel Products of wood and cork Paper and paper products Coke, petroleum products and nuclear fuel Manufacture of basic metals Office, accounting and computing machinery Motor vehicles and trailers Recycling	Food products and beverages Tobacco products Textiles Wearing apparel Luggage, saddlery and footwear Rubber and plastic products Manufacof fabricated metal prod(exc machinery) Motor vehicles and trailers	Paper and paper products Chemicals and chemical products Rubber and plastic products Other non-metallic minerals Medical,precision and optical instruments, watches Other transport

Part III: Whether the sectors with increasing export shares in total manufacturing export have lower unit labor cost

In this section, we focus on the manufacturing sectors in Turkey whose export shares have prominently changed in recent years. Among these sectors, manufacture of machinery and equipment, communication and apparatus, motor vehicles and trailers, other transport, and furniture have expanded their shares in total manufacturing export while food products and beverages, textiles, and wearing apparel have had declining shares. Later, growth rates of unit labor costs in these sectors are assessed with respect to their export performance. The reason for this consideration is to find out the relationship between unit labor cost and export performance. In other words, we examine whether the increase in export shares is related to relative unit labor cost in international markets.

In Turkey, unit labor costs in other transport, communication and apparatus, food products, textiles, wearing apparel, and furniture are increasing above the average growth rates. The sectors whose export shares have been showing an increasing trend are “furniture”, “communication and apparatus” and “other transport” as Table 6 shows below.

Table 5: Growth rates of unit labor cost in Turkey

	Average growth rate of unit labor cost	Furniture	Communication and apparatus	Other transport
1998-2000	0.0765	0.0439	0.0975	0.2196
Ranking		15	10	2
2000-2003	-0.0455	-0.0627	-0.0811	0.2274
Ranking		16	20	1
2002-2005	0.0995	0.1476	0.2142	0.5162
Ranking		8	3	1

Table 6: Export Growth in % Turkey

	Furniture	Communication and apparatus	Other transport
1996-2000 export growth	26.19	36.54	64.59
Ranks_export	4	2	1
2000-2002 export growth	24.96	28.71	-7.43
Ranks_export	5	3	22
2002-2005 export growth	32.91	34.52	27.12
Ranks_export	6	4	8
2003-2005 export growth	33.4	26.98	50.91
Ranks_export	5	14	2

Source: Wages and output in manufacturing are from Laborsta, exchange rate and PPP are from World Development Indicators and SIMA database of the World Bank. Export data are from Turkish Statistics Foundation.

Other Transport: Growth rate of unit labor cost in other transport whose export share has been increasing in recent years was 21.96 % between 1998-2000 that was above the average growth rate, 7.65 % as Table 5 shows. The growth rates of unit labor costs in 2000-2003 and 2003-2005 were respectively 22.74 % and 51.62 % that were above the average ones in each period. The increase in unit labor cost of other transport is attributable to the surge in its export share as the Table 6 shows above. The export growth rate of motor vehicles and trailers are 41.16 % and 43.01 % in 2002-2005 and 2003-2005 respectively. The increase in export of motor vehicles and trailers appears to be transmitted to the employees in the form of higher earnings. Employees have been started to receive better than the previous period. Table 7 shows how much an average worker makes per month in dollars in other transport. In 2005, an average employee in this sector earns \$1249.48 that is three times higher than the minimum wage level. Moreover, for each year, the wages in this sector were much higher than the minimum wage levels. Another important point is that unit labor cost fell down after the 2001 crisis in Turkey as Table 8 shows below. The unit labor cost was 0.0923 in 2001 whereas in 2002 it was 0.0795. With the recovery of the crises, unit labor cost has started to increase. For example, in 2003 it reached 0.0833.

Table 7: Wages in dollars in Turkey

	Communication and apparatus	Other transport	Furniture
1996	550.64	416.69	162.56
1997	502.45	460.9	173.55
1998	638.6	488.28	195.67
1999	752.79	613.89	231.61
2000	657.92	546.25	179.41
2001	716.04	639.11	199.72
2002	980.81	878.63	300.64
2003	1212.33	1041.63	409.91
2004	1328.72	1229.13	505.42
2005	1444.56	1370.19	574.68

Table 8: Unit labor costs in Turkey

	Communication and apparatus	Other transport	Furniture
1996	n/a	n/a	n/a
1997	0.0911	0.0750	0.1577
1998	0.1096	0.1141	0.1886
1999	0.1027	0.1159	0.2184
2000	0.1184	0.0906	0.2850
2001	0.0568	0.0923	0.1529
2002	0.0460	0.0795	0.1467
2003	0.0567	0.0833	0.3093
2004	0.0637	0.0812	0.3944
2005	0.0819	0.0868	0.4593

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation.

Exchange rate and PPP are from World Development Indicators.

Furniture: Other major sector with increasing export share is furniture. Unit labor cost has been increasing at a rate above the average growth rate in recent periods. In 1998-2000, the growth rate of unit labor cost was 4.39 % that was lower than the average one that was 7.65 % in that period. In recent years, however, there is sizeable increase in unit labor cost in this sector. This can be seen from the rankings of the growth rate of unit labor cost in furniture in Table 5. Furniture took its place among the top ten sectors in the last period. On the other hand; unit labor costs were not as much as the ones in other transport. Wage level in furniture increased \$70 between 2004 and 2005 and wage level in any period has been significantly higher than the minimum wage level in this period. This increasing trend in wage level in furniture can be associated with the improvement in its exports in recent years. The export growth rate increased from 26.19 % between 1996 and 2000 to 33.40 % between 2003 and 2005. By 2005, the furniture export constituted 3.3 % of total manufacturing export rising from 1.2 % in 1996. The movement of unit labor cost in 2001 was same as the one in other transport. The unit labor cost was 0.1529 in 2001 while in 2002 it was 0.1467 due to the 2001 financial crisis. On the other hand; the unit labor cost in 2003 (0.4593) reached three folds of the one in 2002 (see Table 8).

Communication and Apparatus: The last sector characterized with an increasing export share as well as the unit labor cost in recent years is communication and apparatus. As it can be seen from the Table 5, the growth rates of unit labor cost were 9.75 %, -8.11 % and 21.42 % in respectively 1998-2000, 2000-2003 and 2003-2005. The growth rate was lower than the average only in 2000-2003. After 2001 crisis, the unit labor cost has started to increase with a rate 21.42 % in 2003-2005 that has been much higher than the average (9.95 %) as Table 5 reveals above. On the other hand; the export rankings in communication and apparatus has worsened in 2003-2005 as Table 6 shows above. The reason for this decline in rankings can be partly

explained by a steady increase unit labor costs. In this sector, Turkey appears to have lacked behind in competing with the low cost international rivals in recent years.

Unit Labor Cost Comparison in Other Transport: In terms of growth rates of unit labor costs in other transport sector, the situation in Turkey is similar to the case of Poland and Slovakia², but not for Hungary where unit labor costs have been increasing at a rate below the average one. In Poland, growth rate of unit labor cost was -5.65 % that is lower than the average growth rate (-3.52 %) in 1997-2000 and the growth rate was 0.79 % for 2000-2002 (see Table 9). It has been showing an increasing trend in recent years as it can be seen from the rankings among the other 22 sectors. Its ranking was 18th in 1997-2000 while it was 7th in 2000-2002. The unit labor costs in Poland were much higher than the ones in Turkey as Table 10 shows. The unit labor cost in this sector was 0.4438 in 1997 in Poland while in Turkey corresponding unit labor cost was 0.1577. Despite of the fact that unit labor cost in Poland was approximately four folds of Turkey, Poland's export of other transport has tended to increase without halt in recent years. Unit labor cost level was still 0.3804 in Poland in 2000 higher than the corresponding unit labor cost in Turkey that was 0.2850. Considering the increase of unit labor cost in recent years in Turkey, one denotes a convergence in unit labor cost in other transport sector between Poland and Turkey. However, Turkey's other transport export continues to grow remarkably as well. In 2005, export of this sector has increased by 50.91 %.

² The data for this sector of Czech Republic is not available.

Table 9: Growth rates of unit labor cost in other transport

	TURKEY			HUNGARY			POLAND			SLOVAKIA	
	Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost
1998-2000	0.0765	0.2196	1996-2000	-0.0621	-0.0209	1997-2000	-0.0352	-0.0565	1996-1999	-0.0397	0.0527
Ranking		2	Ranking		3	Ranking		18	Ranking		5
2000-2003	-0.0455	0.2274	2000-2002	0.0551	0.0114	2000-2002	-0.0606	0.0079	2000-2002	n/a	n/a
Ranking		1	Ranking		17	Ranking		7	Ranking		
2003-2005	0.0995	0.5162	2003-2005	n/a	n/a	2003-2005	n/a	n/a	2003-2005	n/a	n/a
Ranking		1	Ranking			Ranking			Ranking		

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

Unit labor costs in this sector were increasing at -2.09 % and 1.14 % in Hungary in 1996-2000 and 2000-2002. In first period, the growth rate of unit labor cost was above the average growth rate which was -6.21 % (see Table 9) whereas in the second period it was lower than the average one which was 5.51 %. In recent years, unit labor costs in other transport have started to increase with lower growth rates in comparing the average growth rates of manufacturing sectors in these years. Similarly, unit labor costs in Hungary were not as low as in the ones in Turkey but not higher than the ones in Poland and Slovakia. In 2002, it was 0.3225 which was higher than the one in Turkey, 0.1467.

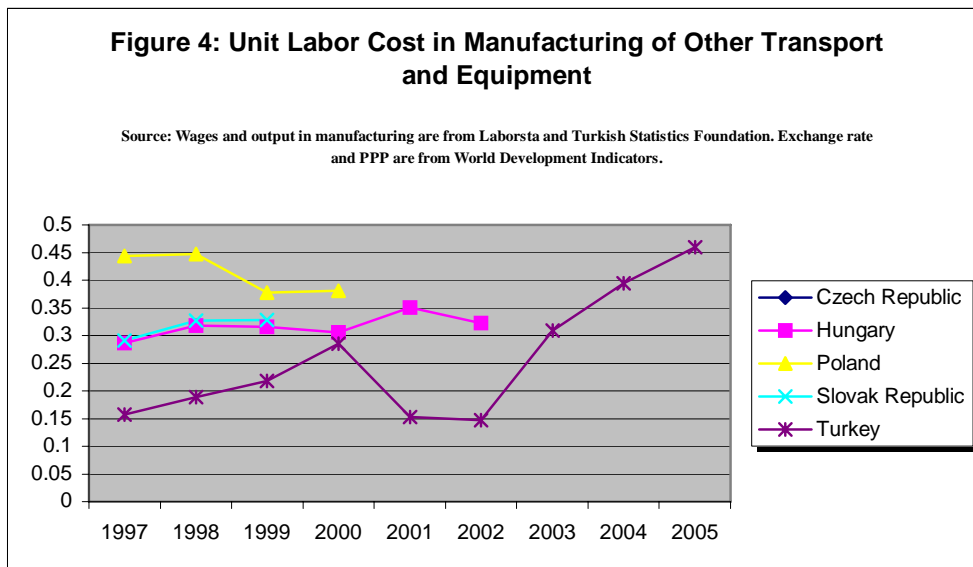
Table 10: Unit Labor Cost in Other Transport

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hungary	0.2920	0.2871	0.3184	0.3160	0.3054	0.3504	0.3225	n/a	n/a	n/a
Poland	0.4853	0.4438	0.4472	0.3774	0.3804	n/a	n/a	n/a	n/a	n/a
Slovakia	0.3159	0.2912	0.3273	0.3286	n/a	n/a	n/a	n/a	n/a	n/a
Turkey	n/a	0.1577	0.1886	0.2184	0.2850	0.1529	0.1467	0.3093	0.3944	0.4593

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

The last country is Slovakia where unit labor costs were higher than the ones in Turkey and has the 2nd highest unit labor cost in other transport sector among the comparator countries. The data for this sector in Slovakia was only available from 1996 to 1999. We take this data as a

whole and then compare the average growth rates of unit labor cost among these years. The growth rate of unit labor cost was 5.27 % that was much higher than the average one that was – 3.97 %. Moreover, the unit labor cost in 1999 in Slovakia was 0.3286 that was 50 percent higher than the ones in Turkey (0.2184).



Unit Labor Cost Comparison in Furniture: Another important sector that has been showing an increasing trend in its export share in Turkey is furniture. Furniture export has grown by 26 % in 2005 and succeeded to constitute 3.3 % of total manufacturing export. Growth rates of unit labor cost in furniture sector in Turkey were 4.39 %, -6.27 % and 14.76 %, showing an increasing trend. Moreover, the ranking of unit labor cost in furniture was 15th place in 1998-2000 while it came to 8th place among the other manufacturing sector in 2003 and 2005. Unit labor costs were 0.0823 in 1997 and went on increasing till 2001 (see Table 12). After 2001, there was a reduction in unit labor cost in furniture like the other manufacturing sectors. Then, in

2003 the unit labor cost started to increase and reached 0.0679. The unit labor cost in furniture was not as high as the ones in other transport.

Table 11: Growth Rates of Unit Labor Cost in Furniture

	TURKEY			HUNGARY			POLAND			SLOVAKIA	
	Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost
1998-2000	0.0765	0.0439	1996-2000	-0.0621	n/a	1997-2000	-0.0352	0.0115	1996-1999	-0.0397	-0.0144
Ranking		15	Ranking			Ranking		5	Ranking		12
2000-2003	-0.0455	-0.0627	2000-2002	0.0551	n/a	2000-2002	-0.0606	0.1400	2000-2002	n/a	n/a
Ranking		16	Ranking			Ranking		5	Ranking		
2003-2005	0.0995	0.1476	2003-2005	n/a	n/a	2003-2005	n/a	n/a	2003-2005	n/a	n/a
Ranking		8	Ranking			Ranking			Ranking		

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

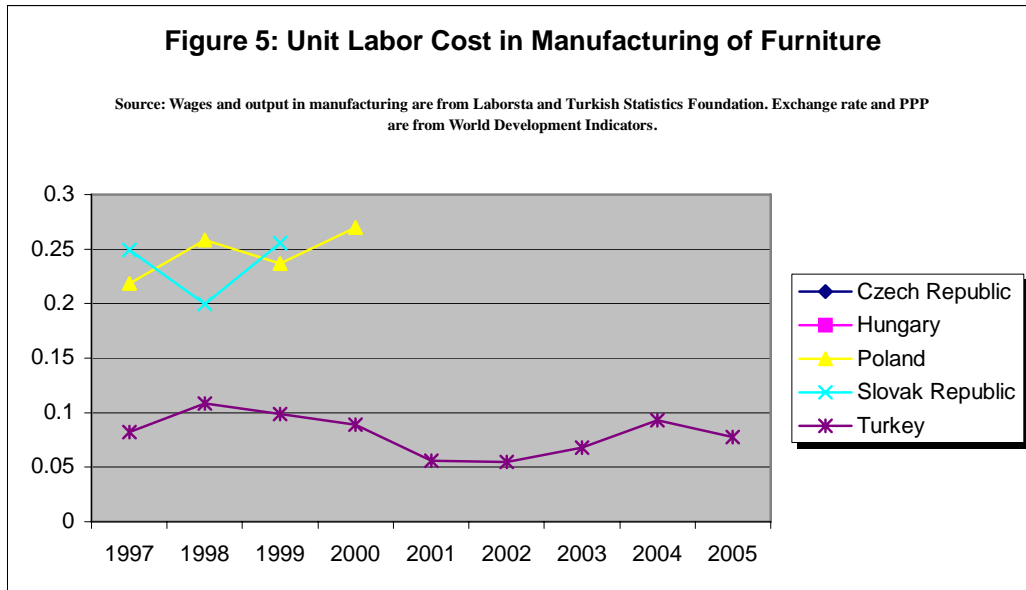
In Poland, the growth rates of unit labor cost in furniture were 1.15 % and 14 % which were above the average ones that were -3.52 % and -6.06 % for respectively 1997-2000 and 2000-2002. Another important point is to note that the differences in unit labor costs between Poland and Slovakia were not as high as the ones between Poland and Turkey or between Slovakia and Turkey in furniture. Moreover, the differences of unit labor costs between Poland and Slovakia in furniture were not as high as the ones in other transport. This result reinforces the argument that technologically more intensive products like other transport allow for more wage differentials among competitors.

In Slovakia, the growth rate of unit labor cost in furniture was -1.44 % in 1996-1999 and that was above the average one, -3.97 %. Also the unit labor costs from 1997 to 1999 were always higher than the ones in Turkey as Table 10 shows below. The unit labor cost was 0.2555 in Slovakia when it was 0.0988 in Turkey.

Table 12: Unit Labor Cost in Furniture

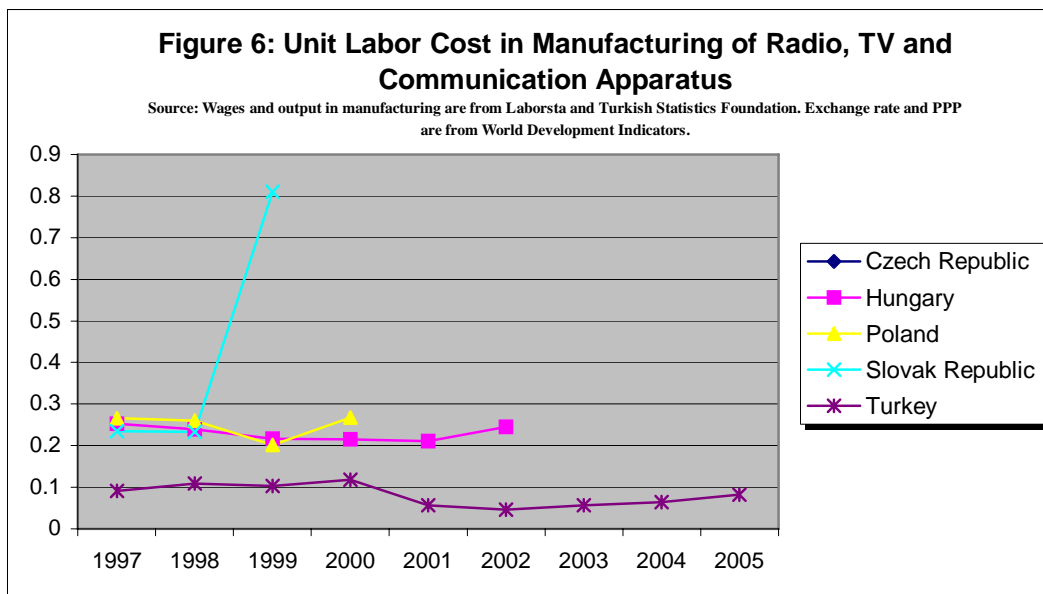
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hungary	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Poland	0.2707	0.2185	0.2581	0.2368	0.2699	n/a	n/a	n/a	n/a	n/a
Slovakia	0.2786	0.2493	0.1995	0.2555	n/a	n/a	n/a	n/a	n/a	n/a
Turkey	n/a	0.0823	0.1084	0.0988	0.0892	0.0558	0.0548	0.0679	0.0930	0.0775

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.



Unit Labor Cost Comparison in Radio, TV and Communication Apparatus:

Communication and apparatus is one of the export share increasing sector among all the countries in our sample. In Slovakia, unit labor costs in communication sector were always increasing at a rate above the average growth rate as Figure 6 shows. The growth rate was 59.41 % that was much higher than the average, -3.97 % in Slovakia in 1996-1999 (See Table 13). Also the ranking of the growth rate of unit labor cost among the other manufacturing sectors was the 1st place. Moreover, the unit labor costs in Slovakia jumped from 0.2329 to 0.8105 between 1998 and 1999. This striking increase is depicted in Figure 6. Hence; the difference of unit labor cost in communication and apparatus between Turkey and Slovakia was 0.7078 in 1999 while it was 0.1233 in 1998 that was 17 % of the difference between unit labor costs in these countries.



Unit labor cost of Turkey in this sector has begun to increase at a rate below the average growth rate in 2000-2003 as Table 14 shows. The growth rates were 9.75 %, -8.11 %, and 21.42 % for respectively 1998-2000, 2000-2003, and 2003-2005. On the other hand; in recent years, unit labor costs in this sector have been increasing above the average growth rate in all the sample countries and Turkey except in Hungary. In Hungary, growth rates were -5.87 % and 4.41 % in respectively 1996-2000 and 2000-2002 and those rates were not much higher than the average ones that were respectively 6.21 % and 5.51 %. Another very crucial point is the decrease in unit labor cost from 1996 (0.3097) to 2001 (0.2101) in Hungary. After 2001, it started to increase and reached 0.2445 that was a little higher than the one in 2001. The situation in Slovakia was the opposite of Hungary. Slovakia has begun to follow a more divergent path from the other sample countries in unit labor cost as Figure 6 shows above. The unit labor costs were always smaller in Turkey than the ones in Hungary. In 2002 the unit labor cost of Turkey was 0.0460 and the one in Hungary was 0.2445 that was approximately six folds of the one in Turkey.

Table 13: Unit Labor Costs in Radio, TV and Communication Apparatus

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hungary	0.3097	0.2530	0.2390	0.2169	0.2159	0.2101	0.2445		n/a	n/a
Poland	0.3104	0.2658	0.2606	0.2025	0.2675	n/a	n/a	n/a	n/a	n/a
Slovakia	0.2973	0.2354	0.2329	0.8105	n/a	n/a	n/a	n/a	n/a	n/a
Turkey	n/a	0.0911	0.1096	0.1027	0.1184	0.0568	0.0460	0.0567	0.0637	0.0819

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

The movement of unit labor cost in Poland resembles the ones in Turkey and Slovakia. The growth rates of unit labor cost were -1.63 % and 32.11 % for respectively 1997-2000 and 2000-2002 and they were above the average ones that were respectively -3.52 % and -6.06 %. The difference between the growth rates in the second period and the average was approximately 40 %. The unit labor costs in Poland were above than the ones in Turkey but they were very close to the ones in Hungary.

Table 14: Growth Rates of Unit labor Costs in Radio, TV and Communication Apparatus

	TURKEY			HUNGARY			POLAND			SLOVAKIA	
	Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost
1998-2000	0.0765	0.0975	1996-2000	-0.0621	-0.0587	1997-2000	-0.0352	-0.0163	1996-1999	-0.0397	0.5941
Ranking		10	Ranking		15	Ranking		10	Ranking		1
2000-2003	-0.0455	-0.0811	2000-2002	0.0551	0.0441	2000-2002	-0.0606	0.3211	2000-2002	n/a	n/a
Ranking		20	Ranking		13	Ranking		2	Ranking		
2003-2005	0.0995	0.2142	2003-2005	n/a	n/a	2003-2005	n/a	n/a	2003-2005	n/a	n/a
Ranking		3	Ranking			Ranking			Ranking		

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

Unit Labor Cost Comparison in “Manufacture of Machinery” and “Motor vehicles and Trailers”: In Turkey, unit labor costs in manufacture of machinery and motor vehicles and trailers which were the export share increasing sectors as Table 15 shows have started to increase their average unit labor costs with the rate below the average growth rate of unit labor cost in recent years in order to compete in international markets.

Table 14: Export Growth Rate in Turkey

		Manufacture of machinery and equipment	Motor vehicles and trailers
1998-2000	export growth	0.0911	0.1064
	Ranks_export	12	8
2000-2003	export growth	-0.1210	-0.0725
	Ranks_export	21	18
2003-2005	export growth	0.0205	0.0305
	Ranks_export	18	17

Table 15: Unit Labor Costs in Turkey

	Manufacture of machinery and equipment	Motor vehicles and trailers
1997	0.1052	0.0750
1998	0.1168	0.1141
1999	0.1375	0.1159
2000	0.1356	0.0906
2001	0.0803	0.0923
2002	0.0663	0.0795
2003	0.0737	0.0833
2004	0.0668	0.0812
2005	0.0697	0.0868

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation.

Exchange rate and PPP are from World Development Indicators.

As it can be seen from Table 14, the export shares of manufacture of machinery and motor vehicles and trailers have been declining in recent years. The ranking of manufacture of machinery and equipment has declined from 12th place to 18th place. The decrease was shown not only in the export share of manufacture of machinery and equipment but also in the export share of manufacture of basic metals. The ranking of manufacture of basic metals has gone back from 8th place to 17th place. Another important point is to note that the difference between manufacture of machinery and equipment and manufacture of basic metals has been smaller as time passes (see Table 15).

The unit labor costs of manufacture of machinery and equipment in Turkey were always smaller than the ones in all sample countries as Table 16 shows below. For instance, in 2000 the unit labor cost in manufacture of machinery was 0.0803 whereas they were 0.3436 and 0.3445 in respectively Slovakia and Poland. In addition to Poland and Slovakia, the unit labor costs in Hungary and Czech Republic were higher than the ones in Turkey. The unit labor cost in Czech Republic was 0.6906 in 2000 that was six times higher than the one in Turkey. This situation has not changed so much in recent years. On the other hand; in Turkey there was a break in the

increase of unit labor cost in manufacture of machinery and equipment like the other manufacturing sectors in 2001 due to the 2001 financial crisis in Turkey.

Table 16: Unit Labor Costs in Manufacture of Machinery and Equipment

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hungary	0.3292	0.2729	0.2760	0.2556	0.2396	0.2528	0.2890	n/a	n/a	n/a
Poland	0.3875	0.3760	0.4031	0.3599	0.3445	n/a	n/a	n/a	n/a	n/a
Slovakia	0.3729	0.2866	0.3288	0.3485	0.3436	0.2280	n/a	n/a	n/a	n/a
Turkey	0.1052	0.1168	0.1375	0.1356	0.0803	0.0663	0.0737	0.0668	0.0697	0.0819
Czech Republic	0.5947	0.6395	0.6783	0.6949	0.6916	0.6596	0.6917	0.6729	n/a	n/a

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

The highest unit labor cost of manufacture of machinery and equipment in each period was in Czech Republic. It was 0.5947 in 1996 and it was higher than the ones in Slovakia, 0.3729; in Poland; 0.3760; and in Hungary 0.3292. Hence, it can be said that there was a convergence among Hungary, Poland and Slovakia except Turkey where the unit labor costs have been the lowest ones and Czech Republic where they were the highest ones as Table 16 displays above.

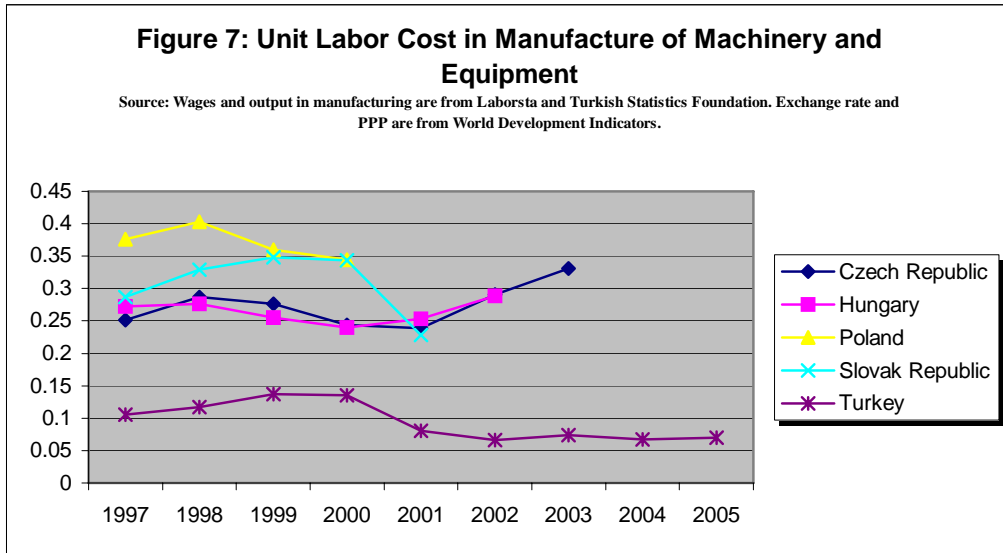
Table 17: Growth Rates of Unit Labor Costs in Manufacture of Machinery

	TURKEY			HUNGARY			POLAND			SLOVAKIA			CZECH REPUBLIC	
	Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost
1998-2000	0.0765	0.0911	1996-2000	-0.0621	-0.0664	1997-2000	-0.0352	-0.0269	1996-1999	-0.0397	0.0495	1997-2000	-0.0451	-0.0083
Ranking		12	Ranking		17	Ranking		13	Ranking		6	Ranking		n/a
2000-2003	-0.0455	-0.1210	2000-2002	0.0551	0.0453	2000-2002	-0.0606	-0.0429	2000-2002	n/a	n/a	2000-2002	0.0373	0.0261
Ranking		21	Ranking		12	Ranking		11	Ranking			Ranking		n/a
2003-2005	0.0995	0.0205	2003-2005	n/a	n/a	2003-2005	n/a	n/a	2003-2005	n/a	n/a	2002-2004	0.0976	-0.0082
Ranking		18	Ranking			Ranking			Ranking			Ranking		n/a

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

The growth rates of unit labor cost in Turkey has been showing a decreasing trend (see Table 17). The growth rates were 9.11 %, -12.10 % and 2.05 % that were always smaller than the average unit labor cost that were respectively 7.65 %, -4.55 % and 2.05 % in each period. This

situation was same for Hungary, Poland and Slovakia. Also the unit labor costs in these countries started to fall significantly in 2000 as Figure 7 shows below.



Another vital exporting sector for Turkey is motor vehicles and trailers. The unit labor cost has been increasing in this sector with the rate below average growth rates as Table 18 shows. However; in Hungary, unit labor costs have been increasing with the rate above average growth rates. In Hungary growth rate of unit labor costs in motor vehicles and trailers were -12.93% and 18.41% which were higher than the average ones in each period. Unit labor cost was 0.1828 in Hungary in 1996 whereas in Slovakia and Poland they were respectively 0.2069 and 0.3206 almost twice of the unit labor cost in Hungary. This was the general case not only in 1996 but also in each year.

Table 18: Growth Rates of Unit Labor Costs in Motor Vehicles and Trailers

	TURKEY			HUNGARY			POLAND			SLOVAKIA	
	Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost
1998-2000	0.0765	0.1064	1996-2000	-0.0621	-0.1293	1997-2000	-0.0352	0.0292	1996-1999	-0.0397	-0.2375
Ranking		8	Ranking		20	Ranking		2	Ranking		23
2000-2003	-0.0455	-0.0725	2000-2002	0.0551	0.1841	2000-2002	-0.0606	-0.2524	2000-2002	n/a	n/a
Ranking		18	Ranking		2	Ranking		23	Ranking		
2003-2005	0.0995	0.0305	2003-2005	n/a	n/a	2003-2005	n/a	n/a	2003-2005	n/a	n/a
Ranking		17	Ranking			Ranking			Ranking		

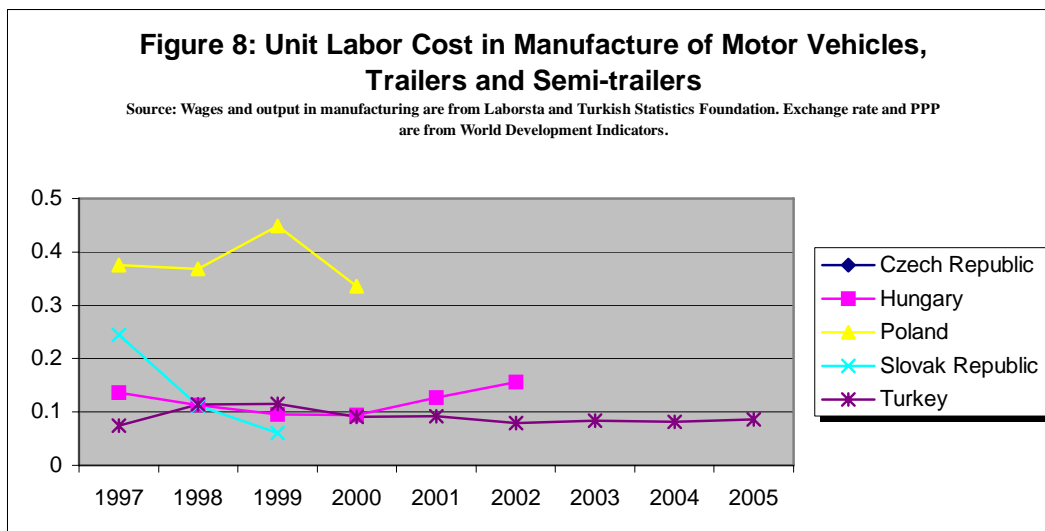
Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

The lowest unit labor cost level has taken place in Turkey in 1997. Then there was a convergence between Turkey and the other sample countries except Poland in which unit labor cost continues to increase more than the others. On the other hand; the growth rate of unit labor cost in Poland in motor vehicles and trailers when comparing the other manufacturing sectors has shown a striking decline between 2000 and 2002. Its ranking worsened to 23th place. Also the growth rate of unit labor cost was -23.75 % that was much lower than the average (-3.97 %).

Table 19: Unit Labor Costs in Motor Vehicles and Trailers

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hungary	0.1828	0.1365	0.1133	0.0961	0.0947	0.1268	0.1556		n/a	n/a
Poland	0.3206	0.3752	0.3683	0.4485	0.3353	n/a	n/a	n/a	n/a	n/a
Slovakia	0.2069	0.2445	0.1119	0.0602	n/a	n/a	n/a		n/a	n/a
Turkey	n/a	0.0750	0.1141	0.1159	0.0906	0.0923	0.0795	0.0833	0.0812	0.0868

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.



Unit Labor Cost Comparison of Manufacturing Sectors with Declining Export

Shares: It is now time to look at the manufacturing sectors whose export shares have started to decline in recent years as Table 2? shows. Food products and beverages, textiles and wearing apparel are among these sectors. Export share of food products and beverages has declined from 11.96 % in 1996 to 6.21 % in 2005. For textiles, its share has been declining from 18.60 % to 12.71 %. The last one that has been showing a persistent decline in export share is wearing apparel of which export share has come from 23.53 % to 14.42 %. On the other hand; unit labor cost in food products and beverages has been increasing with 19.90 % in 2003-2005 that is higher than the average growth rate of unit labor cost for this period in Table 20. Unit labor cost in this sector was 0.1296 in 2005 that was higher than the ones in textiles and wearing apparel. However, unit labor cost level in textiles was 0.0983 in 2000 and then there occurred a sharp decrease in the unit labor cost of textile in 2001 like the other manufacturing sectors. Also growth rates of unit labor costs in textiles that were 2.78 %, 3.03 %, 22.07 %, and 19.28 % were always below the average ones that were respectively 3.55 %, -6.09 %, and 15.63 % for 1997-2000, 2000-2003,

and 2003-2005. The result is also same for wearing apparel. Its export share has been declining as Table 21 shows and came from 23.53 % in 1996 to 14.4 % in 2005. On the other hand; unit labor costs in wearing apparel has been increasing with the rate above the average growth rate. The ranking of growth rate of unit labor cost in textiles was 7th, it was 9th for wearing apparel in 2003-2005, and the ranking of food products and beverages was 4th in 2003-2005.

Table 20: Growth Rates of Unit Labor Costs in Turkey

	Average wage growth rate	Food products and beverages	Textiles	Wearing apparel
1997-2000	0.0765	0.0373	0.0278	0.0912
ranking		16	18	11
2000-2003	-0.0455	0.0104	-0.0609	-0.0031
ranking		4	15	5
2003-2005	0.0995	0.1990	0.1563	0.1167
ranking		4	7	9

Table 21: Unit Labor Costs in Turkey

	Food products and beverages	Textiles	Wearing apparel
1997	0.0960	0.1461	0.1103
1998	0.0938	0.1165	0.1177
1999	0.0988	0.1006	0.1296
2000	0.1068	0.0983	0.1187
2001	0.0672	0.0235	0.0639
2002	0.0754	0.0303	0.0693
2003	0.0912	0.0409	0.0844
2004	0.1148	0.0729	0.0941
2005	0.1296	0.0999	0.1068

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

Table 22: Export rates in Turkey

		Food products and beverages	Textiles	Wearing apparel
1996-2000	Export growth	-6.48	5.15	3.18
	Ranks_export	22	14	16
2000-2002	Export growth	-2.30	6.77	8.33
	Ranks_export	20	17	16
2002-2005	Export growth	22.03	15.45	16.66
	Ranks_export	14	20	18
2003-2005	Export growth	31.61	16.62	14.69
	Ranks_export	9	20	21

Table 23: Export shares in Turkey

	Food products and beverages	Textiles	Wearing apparel
1996	11.96	18.60	23.53
1997	11.73	19.09	23.34
1998	9.79	19.92	23.75
1999	8.51	19.02	22.00
2000	7.19	18.08	21.23
2001	6.99	17.15	18.72
2002	5.58	16.42	19.63
2003	5.97	15.42	18.37
2004	5.62	13.42	15.68
2005	6.21	12.71	14.42

Source: Turkish Statistics Foundation

Table 24: Growth Rates of Unit Labor Costs in Food Products and Beverages

	TURKEY			HUNGARY			POLAND			SLOVAKIA	
	Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost
1998-2000	0.0765	0.0373	1996-2000	-0.0621	-0.0491	1997-2000	-0.0352	-0.0404	1996-1999	-0.0397	-0.0721
Ranking		16	Ranking		11	Ranking		15	Ranking		21
2000-2003	-0.0455	0.0104	2000-2002	0.0551	n/a	2000-2002	-0.0606	-0.1206	2000-2002	n/a	n/a
Ranking		4	Ranking			Ranking		17	Ranking		
2003-2005	0.0995	0.1990	2003-2005	n/a	n/a	2003-2005	n/a	n/a	2003-2005	n/a	n/a
Ranking		4	Ranking			Ranking			Ranking		

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

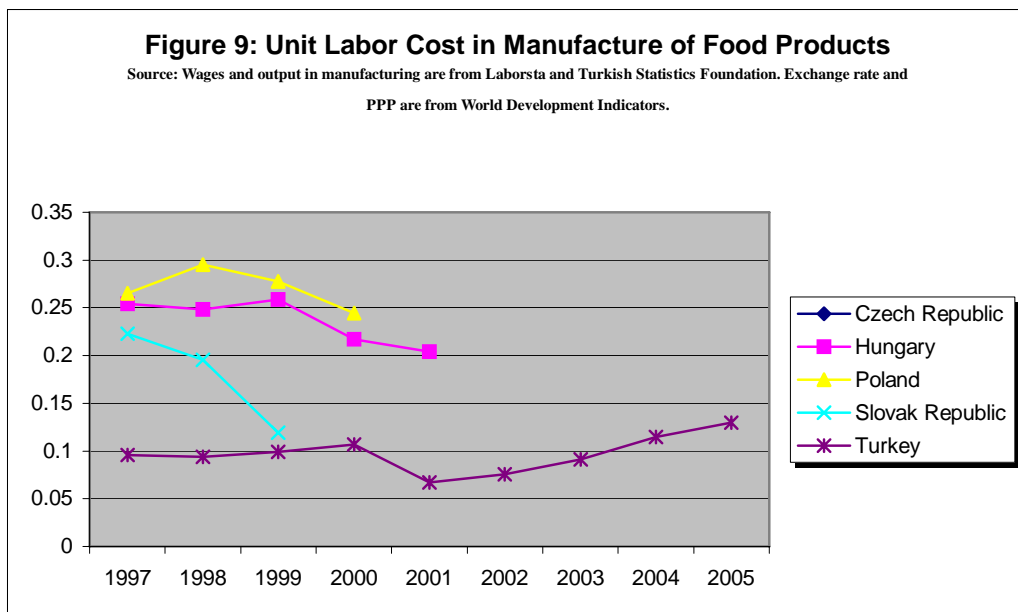
First, we look at unit labor cost in food products and beverages in the other countries. In Poland, the growth rates were -4.04% and -12.06% respectively for 1997-2000 and 2000-2002. In each period the growth rate of unit labor cost was smaller than the average ones. It can be said that the growth rates of unit labor costs have been showing decreasing trend in Poland as the opposite of the ones in Turkey.

In Hungary the wage growth rates in food products and beverages were a little higher than the average one in 1996-2000 as Table 24 shows above. Lastly, in Slovakia, growth rate of unit labor cost was not much different from the average similar to Hungary.

Table 25: Unit Labor Costs in Food Products and Beverages

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hungary	0.2737	0.2541	0.2486	0.2588	0.2168	0.2038	n/a	n/a	n/a	n/a
Poland	0.2930	0.2654	0.2952	0.2778	0.2442	n/a	n/a	n/a	n/a	n/a
Slovakia	0.1798	0.2228	0.1953	0.1191	n/a	n/a	n/a	n/a	n/a	n/a
Turkey	n/a	0.0960	0.0938	0.0988	0.1068	0.0672	0.0754	0.0912	0.1148	0.1296

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.



The lowest unit labor cost was always in Turkey as Table 25 shows in each period. For example; in 2000 it was 0.1068 in Turkey that was approximately half of the one in Poland and Hungary.

Table 26: Growth Rates of Unit Labor Costs in Textiles

	TURKEY			HUNGARY			POLAND			SLOVAKIA	
	Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost		Average growth rate of unit labor cost	Growth rate of unit labor cost
1998-2000	0.0765	0.0278	1996-2000	-0.0621	-0.0506	1997-2000	-0.0352	-0.0201	1996-1999	-0.0397	-0.0794
Ranking		18	Ranking		12	Ranking		12	Ranking		22
2000-2003	-0.0455	-0.0609	2000-2002	0.0551	0.0955	2000-2002	-0.0606	0.1788	2000-2002	n/a	n/a
Ranking		15	Ranking		4	Ranking		4	Ranking		
2003-2005	0.0995	0.1563	2003-2005	n/a	n/a	2003-2005	n/a	n/a	2003-2005	n/a	n/a
Ranking		7	Ranking			Ranking			Ranking		

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

As it is seen from the Table 26, wage levels in textile has increased with the rate 2.78 % that was below the average one, 7.65 % in Turkey between 1998 and 2000. However, unit labor costs in textiles have exceeded the average wage growth rate in Turkey in 2003-2005. For example, in Turkey the growth rate was 15.63 % that was much higher than the average one, 9.95 % between 2003 and 2005. The increasing trend in the growth rate of unit labor cost was

noticed in Hungary and Poland. The growth rates were 9.55 % that was higher than the average one, 5.51 % in 2003-2005 in Hungary. In Poland the rankings of the growth rates has come from 12th place to 4th place (See Table 26). Moreover, the highest unit labor costs in textiles have taken place in Poland in each year as Table 23 shows below. Then Hungary and Slovakia followed Poland. The lowest unit labor cost was in Turkey such as in 1999, when the data for unit labor cost was available for all sample countries, 0.1296 whereas in Poland it was 0.2729 that is two folds of the one in Turkey.

Table 27: Unit Labor Costs in Textiles

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hungary	0.3134	0.2994	0.2897	0.2713	0.2611	0.2788	0.3502		n/a	n/a
Poland	0.3735	0.3518	0.3806	0.2729	0.3217	n/a	n/a	n/a	n/a	n/a
Slovakia	0.2874	0.3111	0.3076	0.2134	n/a	n/a	n/a	n/a	n/a	n/a
Turkey	n/a	0.1103	0.1177	0.1296	0.1187	0.0639	0.0693	0.0844	0.0941	0.1068

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

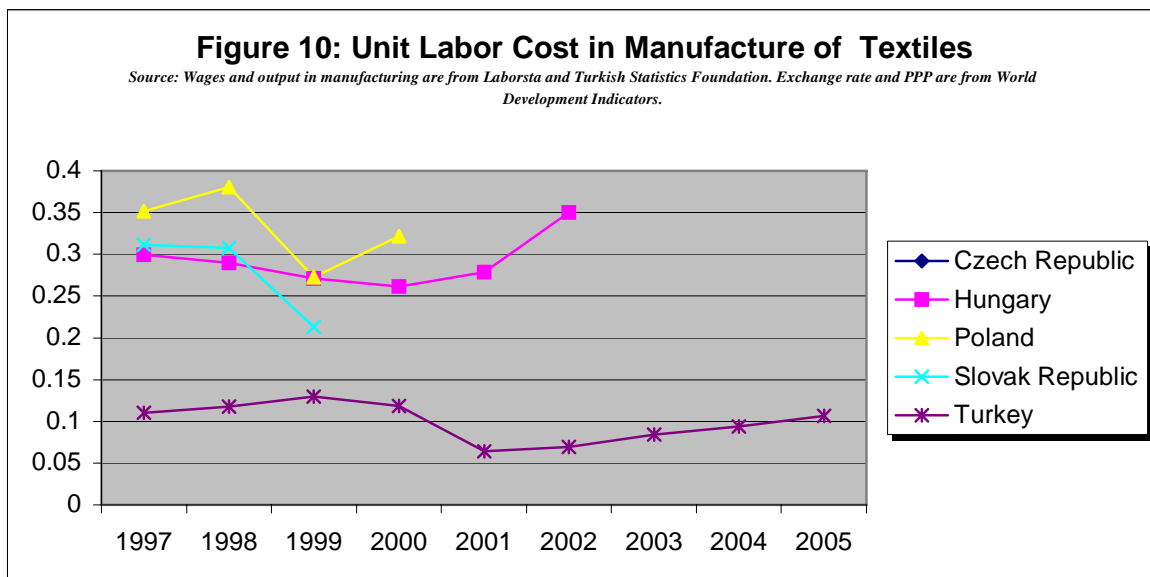


Table 28: Growth Rates of Unit Labor Costs in Wearing Apparel

	TURKEY			HUNGARY			POLAND			SLOVAKIA	
	average growth rate of unit labor cost	growth rate of unit labor cost		average growth rate of unit labor cost	growth rate of unit labor cost		average growth rate of unit labor cost	growth rate of unit labor cost		average growth rate of unit labor cost	growth rate of unit labor cost
1998-2000	0.0765	0.0912	1996-2000	-0.0621	-0.0310	1997-2000	-0.0352	-0.0118	1996-1999	-0.0397	-0.0188
Ranking		11	Ranking		5	Ranking		8	Ranking		14
2000-2003	-0.0455	-0.0031	2000-2002	0.0551	0.0709	2000-2002	-0.0606	-0.0951	2000-2002	n/a	n/a
Ranking		5	Ranking		7	Ranking		16	Ranking		
2003-2005	0.0995	0.1167	2003-2005	n/a	n/a	2003-2005	n/a	n/a	2003-2005	n/a	n/a
Ranking		9	Ranking			Ranking			Ranking		

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

The last declining sector in terms of export shares is wearing apparel in which unit labor cost has increased with the rate above the average growth rate like the one in Hungary. Recently; Hungary and Turkey are the ones where unit labor costs have increased with the rate above the average ones as Figure 11 shows. In Hungary, the growth rates were 7.09 % in 2000-2002 that was higher than the average, 5.51%. On the other hand; in Poland the unit labor cost has been increasing with the rate below the average. For instance, the growth rate of unit labor cost was – 9.51 % was much lower than the average in this period, -6.06 %. In addition to the growth rate comparison, the unit labor costs in Turkey in each period were always the lowest ones when comparing to the sample countries. In 2002, the unit labor cost in Hungary was 0.3554 while in Turkey it was 0.0845 (see Table 29).

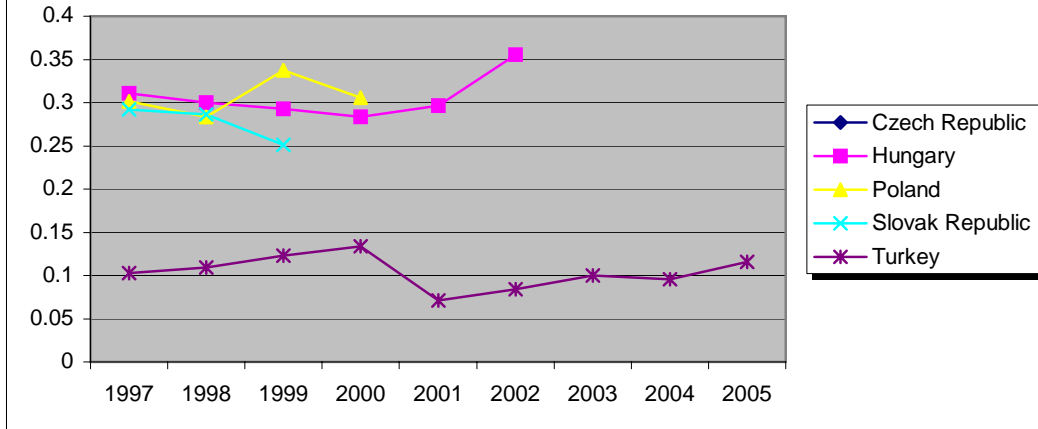
Table 29: Unit Labor Costs in Wearing Apparel

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hungary	0.3316	0.3109	0.2996	0.2928	0.2837	0.2965	0.3554		n/a	n/a
Poland	0.3288	0.3017	0.2836	0.3377	0.3055	n/a	n/a	n/a	n/a	n/a
Slovakia	0.2969	0.2924	0.2862	0.2509	n/a	n/a	n/a		n/a	n/a
Turkey	n/a	0.1029	0.1090	0.1233	0.1336	0.0709	0.0845	0.0999	0.0958	0.1158

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.

Figure 11: Unit Labor Cost in Manufacture of Wearing Apparel

Source: Wages and output in manufacturing are from Laborsta and Turkish Statistics Foundation. Exchange rate and PPP are from World Development Indicators.



Conclusion

This paper provides new insights on Turkish manufacturing competitiveness using relative unit labor cost constructed from wages in domestic currency per month, exchange rate, PPP and the output per month. Unlike the pure wage rate comparison, Turkey seems to be better performing than other countries in the sample with respect to unit labor cost.

Our analysis reveals the labor cost advantage of Turkey given that Turkey has lower unit labor cost almost in all the sectors. On the other hand; since the 2001 crisis Turkey has had slightly increasing unit labor cost in recent years in almost all the sectors. Nevertheless, they are still lower than other countries.

Another important point is to note that motor vehicles and trailers are the export share increasing sectors while its unit labor costs have not been increasing so much in recent years. The unit labor costs in motor vehicles and trailers were much lower than the others before 2000. On

the other hand; in recent years there has been a convergence between Turkey and the sample countries except Poland where unit labor costs continues to be increasing more than the others.

Another sector that resembles “motor vehicles and trailers” is the “manufacture of machinery and equipment” in which there has been a convergence among the sample countries except in Czech Republic where unit labor cost was the highest and in Turkey where unit labor cost was the lowest. In contrast to this, “food and beverages” as declining sector has rather increasing unit labor cost in recent years. Similarly, as declining sectors textiles and wearing apparels have increased their unit labor cost. The growth rates of unit labor costs in food products and beverages in Poland have been displaying a declining trend in contrary to Turkey.

Another important point is to note that unit labor cost differences among the sample countries vary according to whether the sector is technologically more intensive or not. The differences of unit labor cost in other transport between Slovakia and Poland were much higher than the ones in furniture. This result reinforces this argument stated above.

Another important point is that the differences of unit labor cost in other transport between Turkey and the sample countries were much higher than the differences among the sample countries in spite of the rising trend in the growth rate of unit labor cost in other transport in Turkey. Also, the increasing trend in unit labor cost in other transport has been associated with the increasing trend in its export share in total manufacturing. The other rising sector is furniture which resembles to the other transport in terms of the relationship between the export share and the movement of unit labor cost growth rate. The unit labor cost growth rate in furniture was generally increasing at the rates higher than the average ones for each country in the sample. Communication and apparatus is the other sector which has been typically displaying a rising trend in the growth rate of unit labor cost in the sample countries. Beside, the export shares of

communication and apparatus in total manufacturing have been increasing in the sample countries.

Finally, Turkey has lower unit labor costs almost in all the sectors relative to the sample countries. Hence, Turkey has more capability to compete with the other countries in the sample and have lower unit labor cost advantage in the manufacturing sectors despite of the sectors that have displayed higher growth rate of unit labor cost in recent years.

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