Research and Monetary Policy Department
Working Paper No:07/01

The Evolution and Determinants of Profitability in Turkish Manufacturing Industry, 1997-2006

Rauf GÖNENÇ
Gökhan YILMAZ

January 2007

The Central Bank of the Republic of Turkey

THE EVOLUTION AND DETERMINANTS OF PROFITABILITY IN TURKISH MANUFACTURING INDUSTRY, 1997-2006[φ]

Rauf Gönenç[δ]
Gökhan Yılmaz[ϕ]

January 2007

ABSTRACT

The objective of this study is to analyse the response capacity of Turkish manufacturing industry to growing international competition from low-wage countries and to real exchange rate fluctuations. To analyse these competitive pressures and the responses of enterprises, developments in profit margins on exports and domestic sales and their main determinants have been estimated in a range of manufacturing sectors. This analysis reveals the emergence of three clusters in Turkish manufacturing industry: highly competitive, intermediary and declining sectors. The respective profitability performances of these clusters reflect on their growth dynamics: more profitable activities produce, export and create employment more than the others.

Keywords: Turkey, manufacturing industry profitability, profitability measures, profitability determinants, clustering in sectors.

***JEL Classification*:** L1, L6, O5, L16, L25

[φ] The views expressed in the paper are those of the authors and should not be attributed to the Central Bank of the Republic of Turkey (CBRT) or to the Organisation for Economic Cooperation and Development (OECD).
Corresponding author: Gökhan Yılmaz. E-mail: Gokhan.Yilmaz@tcmb.gov.tr

[δ] OECD Economics Department. E-mail: Rauf.Gonenc@oecd.org

[ϕ] CBRT Research and Monetary Policy Department.

THE EVOLUTION AND DETERMINANTS OF PROFITABILITY IN TURKISH MANUFACTURING INDUSTRY FOR 1997-2006

1. Introduction

1.1 The objective of this study is to analyse the response capacity of Turkish manufacturing industry to increasing international competition and to real exchange rate fluctuations, with the help of detailed profitability indices.[1] The analysis was performed for the period 1997Q4-2006Q1 which encompasses two different exchange rate regimes: the fixed and quasi-fixed exchange rate regime between 1997Q4-2001Q1, and the floating regime after 2001Q1. The study focuses in particular on the profitability of exports under successive exchange rate depreciations and appreciations in the flexible exchange rate regime period.

1.2 The intensity of international competition and the effects of exchange rate volatility vary across sectors and have resulted in uneven pressures on their prices and profits. In particular, the degree of exposure of manufacturers to competition from low-wage Asian countries depends closely on their sector of activity.

1.3 Enterprises' responses to these pressures also vary across sectors. These differences have motivated a detailed analysis of the competitive and profitability performances of sixteen sectors of private manufacturing industry, along with an aggregate analysis of total manufacturing.

1.4 To document the varying degree of competitive pressures and the responses of business sectors, the evolution of profit margins and their principal determinants have been analysed for export, domestic and total sales.[2]

1.5 Profit margins have been analysed at aggregate and sectoral levels with the help of a model inspired by the standard methodology of unit labour costs. The analysis of profitability is therefore based on a model-based estimator and not on direct accounting data (which would have been highly perilous because of the massive underreporting of accounting profits in Turkey).

---

1 The analytical framework within which this analysis was conducted is presented in R.Gönenç, W.Leibfritz, G.Yılmaz, "Enhancing Turkey's Growth Prospects by Improving Formal Sector Business Conditions", OECD Economics Department Working paper, 2007. This research was effected as background to the 2006 OECD Economic Survey of Turkey.

2 All sectors of the economy – tradable and non-tradable activities, manufacturing and service sectors – should have been ideally covered but data availability (of the needed price, wage and productivity data) imposed the restriction of the analysis to manufacturing.

1.6 Three response channels of manufacturing sectors to global competitive pressures and real exchange rate fluctuations have been tracked: i) the "*productivity channel"*, which measures the gains in output per hour worked, ii) the "*pricing power channel",* which measures the degree of product differentiation (and innovation) and the improvement in profit margins that this entails, iii) and the "*real wage channel"*, which reflects the adjustment achieved through labour markets and wage settlement.

1.7 The study has six sections. Section 2 describes the methodology. Section 3 presents the profitability analysis at aggregate level. Section 4 investigates the determinants of export profitability with the help of the detailed model in hand. Section 5 discusses the resulting evolution of profitability in different sectors, and their clustering according to performances. And the conclusion follows.

2. Methodology

2.1 Two models (the "simple" and the "extended" models) have been used to analyse the aggregate and sectoral profitability performances of the Turkish manufacturing industry between 1997-2006.

2.1 The Simple Model

2.3 In the **Simple Model** labor is the single production factor. Profitability analysis is performed with *unit labor costs* as the unique cost factor. Export profit margins and domestic profit margins have been estimated with the help of this model.

2.3.1 **Export profit margins** have been estimated through an **Index of Export Profit Margins (EPMI)** dividing the growth of export prices by the growth of unit labour costs:

(EPMI)= (EXPr) / (ULC)[3]
EXPr: Index of Export Prices
ULC: Index of Unit Labor Costs
ULC = (Wn * PWH)/ (IP)
Wn: Index of Nominal Wages per Worked Hour
PWH: Index of Worked Hours
IP: Index of Industrial Production
(EPMI)= (EXPr*IP)/ (Wn*PWH) (1)

[3] All figures are four quarter moving average values.

2.3.2 **Domestic profit margins** have been estimated through an **Index of Profit Margins on Domestic Sales (DPMI). DPMI** has been calculated by substituting export prices with producer prices, taken as a proxy of domestic market prices and reflecting the degree of domestic passthrough from international prices.

2.2 The Extended Model

2.4 This second model extends the simple model by adding *unit capital* and *unit energy costs* to the unit cost component. As capital and energy costs differ significantly in Turkey from competitor countries, both in level and trend, their inclusion enhances the monitoring of profitability. Instead of estimating export and domestic profit margins separately, a **general profit margins index (GPMI)** [4] was calculated in this model. In GPMI, a *composite price index* is constructed by weighting export prices and producer prices by the shares of the export and domestic sales in the total output of each sector:

(GPMI)= (WPr) / {0.5*ULC+a*UCC+ b*UEC} (2)

WPr: Weighted Price index

UCC: Index of interest rates for real sector credits

UEC: Index of Unit Energy Costs

a: Coefficient of sectoral unit capital costs.

b: Coefficient of sectoral unit energy costs.

2.3 The Determinants of Export Profitability

2.5 The **determinants of export profitability** are decomposed by distinguishing the impact of i) changes in prices[5], ii) changes in wages and iii) changes in labour productivity. These three determinants have been calculated for quarterly (quarter over quarter) and yearly periods, as contributions to estimated changes in profitability.[6] To estimate the contributions of individual factors a logarithmic differentiation of equation (1) was used:

---

4 *Interest rates* and *energy costs* varied strongly between 1997Q4 and 2006Q1, as a result of fluctuations in *credit* and *currency* markets, and changing *energy taxes*. The weight of debt service (interest) in total enterprise costs was estimated using the Turkish Central Bank's sectoral balance sheets database. The measure of "interest rates for real sector credits" published by the Central Bank was used to estimate the rates of change in capital costs. For energy costs, sector-specific energy intensity matrixes from the State Planning Organization were used to estimate sector-specific cost weights and the "wholesale energy price index" of the Central Bank was used to estimate the rates of change in energy costs.

5 The export prices of manufacturers depend both on the level of international prices (reflecting the unit labor cost performance of trade competitors) and domestic manufacturers' ability to earn a product differentiation rent over international prices.

6 Only the export profit margins model has been used in the analysis. The simple model was preferred to the extended model because of the simplicity of mathematical decomposition. The simple EPMI model was preferred to the simple DPMI model also because of the discontinuity of price indexes (WPI and PPI) in the DPMI model.

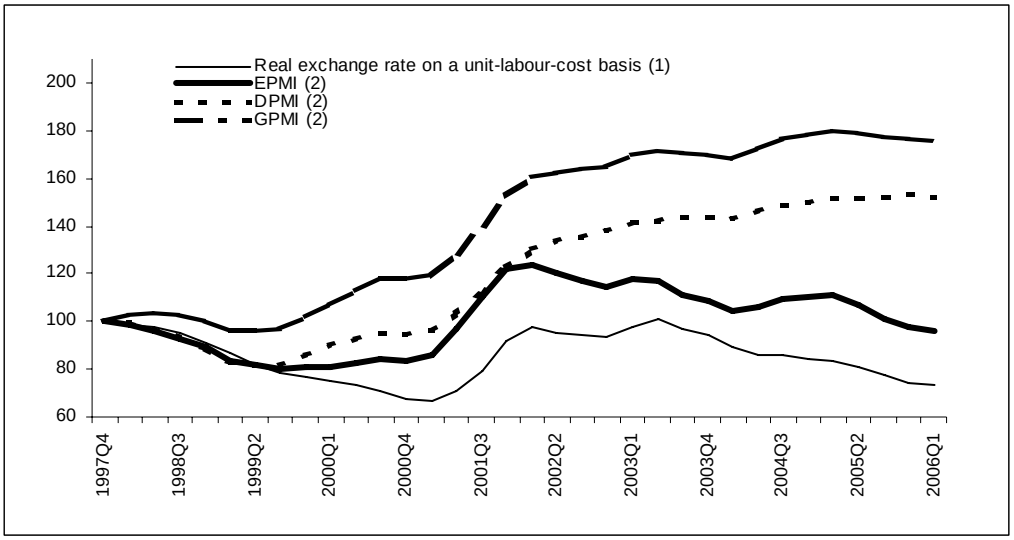
$$d(EPMI)/ EPMI = (d(EXPr)/EXPr)+ (d(IP)/ IP))- (d(Wn)/Wn)- (d(PWH)/PWH) \quad (3)$$

3. The profitability of the manufacturing industry

3.1 The profitability of manufacturing according to the Simple Model

3.1.1 Between 1997 and 2006, the average profitability of exports (EPMI) stayed at 100.7 (1997Q1:100) but attained 119.8 for domestic sales (DPMI). The profitability of domestic sales has also varied more than the profitability of export sales[7] (Figure 1).

Figure 1. The profitability of the manufacturing industry according to the simple and extended models
1997Q4=100



1.An increase shows depreciation.
2.The estimation methodology of profit margins is summarised in the paragraphs 2.3-2.4.
Source: SIS, OECD and own calculations.

3.1.2 The profitability of domestic and international sales, after evolving in parallel until the first quarter of 2002 have diverged in the post-crisis stabilisation period[8]. While profit margins on domestic

7 While the coefficient of variation for DPMI is 22%, it is 13% for EPMI.

8 While the correlation coefficient between EPMI and DPMI is (+0.95) in the period of 1997Q4-2002Q1, the same figure is (-0.80) in the period of 2002Q2-2006Q1.

sales continued to grow, exports margins have been compressed under apparently stronger price competition in international markets and strong real currency appreciation.

3.1.3 According to these findings, three phases can be distinguished in the evolution of export profitability: a) the 1997Q4-2000Q4 period saw a slight erosion then stagnation in aggregate export profitability (according to the subsequent analysis, as a result of decreases in export prices and increases in real wages); b) in the 2001Q1-2002Q1 period, the subsequent analysis reveals that *sharp* real currency depreciation and real wage declines permitted a spectacular restoration of profitability; c) in the post-crisis reform period (2002Q2-2006Q1), positive structural changes in industry on the one hand with positive impacts on profitability, and strong real currency appreciation on the other hand with negative impacts on prices generated mixed influences on profitability (Figure 1).

3.1.4 For domestic profitability, three phases can also be distinguished: a) the 1997Q4-1999Q3 period saw a regular erosion in domestic profit margins (as for export profit margins, and under the same influences); b) in the 1999Q4-2002Q1 period, the subsequent analysis shows that price increases, productivity gains and real wage declines permitted a major improvement of profitability; c) in the post-crisis reform period, the subsequent analysis demonstrates that price increases and productivity gains improved domestic profitability.

3.1.5 As a consequence, the estimated export profit margins for the manufacturing industry as a whole appeared above their 1999 level (but below of their 1997 level) at the end of 2006Q1, while domestic margins attained even higher levels (Figure 1).

3.1.6 Estimated export profit margins for aggregate manufacturing closely track the real exchange rate on a unit labour cost basis, reiterating the relevance of this traditional competitiveness indicator. The correlation between profit margins and the real exchange rate is particularly strong in export sales while, in domestic markets, profitability grows with depreciation but diminishes less with appreciation. The correlation between the real exchange rate and export profit margins became even stronger in the recent post-crisis period.[9]

3.1.7 Starting from the second quarter of 2003 and ensuing currency appreciation, the decline in export profit margins becomes more evident. The standard indicator of competitiveness also indicates that the Turkish business sector came under strong pressure through 2003Q2-2006Q1, although not enough to fully

[9] For the period of 2001Q2-2006Q1, the correlation coefficient between EPMI and ULC based real exchange rate is 0.85.

offset the strong competitive gains generated by the sharp currency depreciation and real wage falls of 2000-2001 (Figure 1).

3.2 The profitability of manufacturing according to the Extended Model

3.2.1 The *extended* model confirms the main findings of the simple model and provides additional insights (Results can be seen in the GPMI line in Figure 1). When capital and energy costs are taken into account: a) profitability slightly improves through 1997Q4-2000Q4; b) it accelerates through the currency depreciation in 2001Q1-2002Q1; c) it continues to improve in the post-crisis reform period.

3.2.2 Changes in *interest rates* have a non-negligible influence on the evolution of the estimated profitability.[10] Credit costs soared in the periods of macroeconomic strain and currency depreciation, and declined in periods of macroeconomic stabilisation and currency appreciation. The variation of capital costs therefore partially offsets the impact of the exchange rate fluctuations on profitability. In particular, the sharp decline of capital costs in the post-crisis stabilisation period made an important contribution.

3.2.3 *Energy costs* also showed a high variation and directly affected profit margins.[11] However, estimated effects have been more limited than the effect of interest rates.

4. The determinants of export profitability

4.1 The respective contributions of price-making power, productivity gains and real wage growth to export profit margins have been estimated on a quarterly and yearly basis (Figure 2).

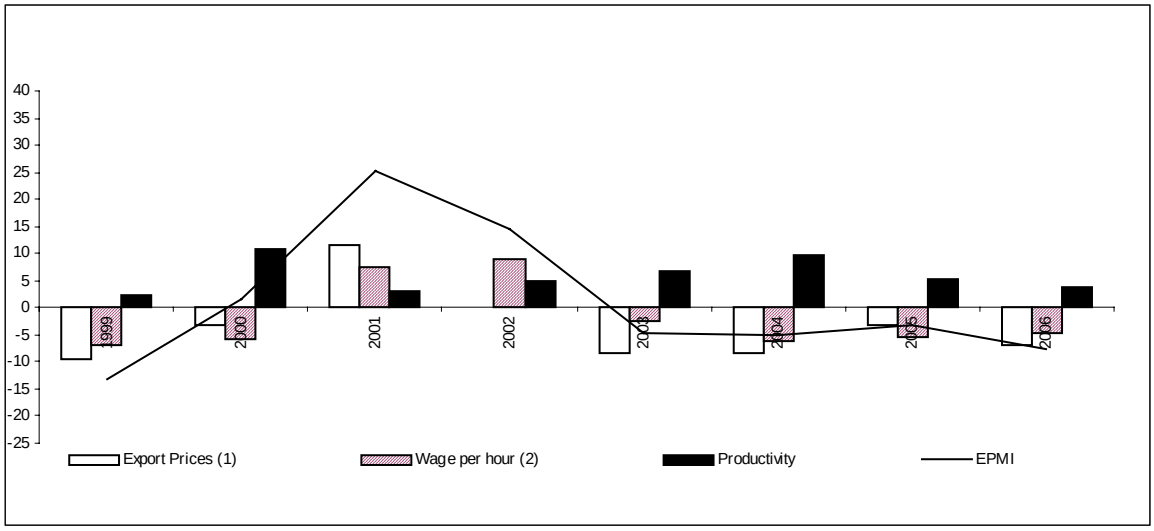
4.2 Three phases can be distinguished: a) In 1999 and 2000, productivity gains contribute positively to export profitability but price and real wage developments affect it negatively; b) In the 2001-2002 period, the contributions of all three profitability determinants are positive; c) in the post-crisis reform period (2003-2006) the contribution of productivity is positive while export price growth is too slow because of real currency appreciation and real wage growth too high because of minimum wage increases and the latter two factors contribute negatively.

---

10 Their share in total enterprise costs is limited but their high variance ensures that they play an important role. The decline of real interest rates before 2000-2001 helped to offset the pressures of currency appreciation, their subsequent sharp increase during the crisis moderated the (otherwise) stronger surge in profitability.

11 The variation of energy costs is high because of the high share of imported fuels in total energy consumption, the fluctuations in exchange rates, and the high variation of energy taxes. Discretionary political control of electricity prices has also made them subject to cycles of price repression, followed by (frequently abrupt) adjustments.

Figure 2. Determinants of export profit margins in manufacturing industry (1998-2006)
Percentage change in real profit margins and estimated contributions of prices, wages and productivity

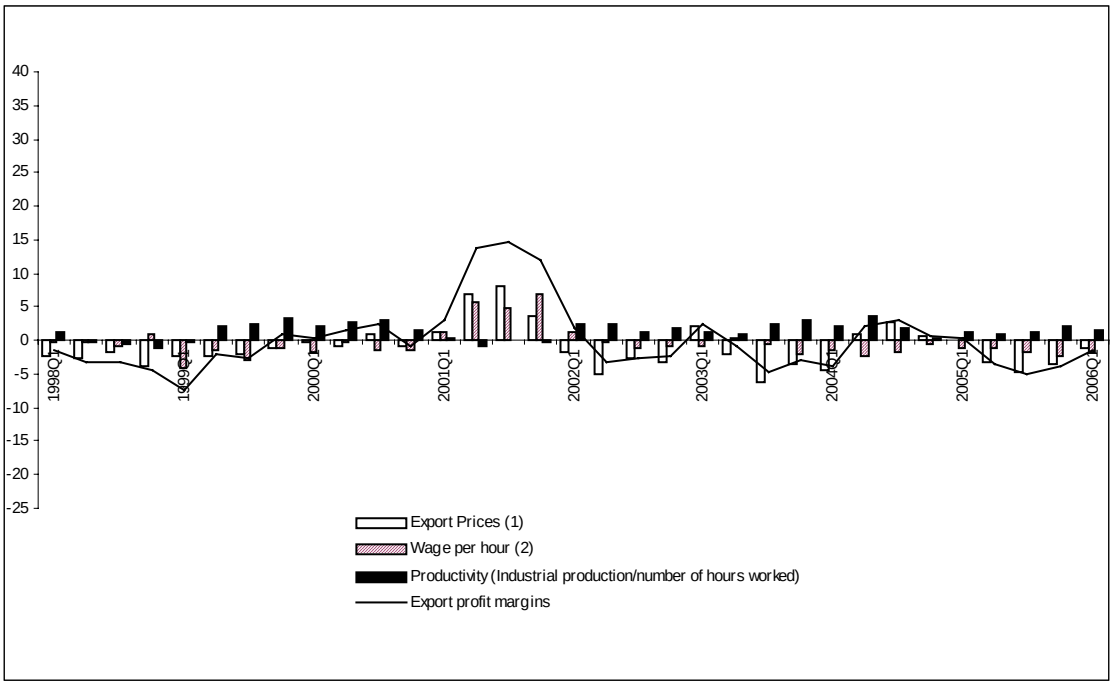


Note: For the decomposition formula of determinants, please refer to paragraph 2.5.
1. Real price increases contribute positively.
2. Real wage increases contribute negatively.
Source: SIS and own calculations.

4.3 The only year-on-year improvement in estimated export profit margins occurred in the crisis period. This reflects the very strong pass-through from exchange rates to export prices, as most exporters are price-takers and can only increase prices through currency depreciations. The decline of real wages in the economic depression also helped. In contrast, export profit margins declined in the post crisis reform period despite important improvements in productivity, because of currency appreciation pressures and the real wage growth entailed by the strong recovery.

4.4 The more detailed inspection of quarterly influences on export profitability confirm these trends: a) In the 1998Q1-2000Q4 pre-crisis period, quarterly productivity gains contribute usually positively but prices and real wages contribute usually negatively; b) In the 2001Q1-2001Q4 crisis year, prices and wages are the main determinants of profitability and contribute positively; c) In the 2002Q1-2006Q1 post-crisis reform period the acceleration of productivity affects export profits positively, but prices and wages contribute negatively. Starting from 2002Q1, the contribution of productivity gains to export profits is always positive and strong (Figure 3).

Figure 3. Determinants of export profit margins in manufacturing industry (1998Q1-2006Q1)
Percentage change in profit margins and estimated contributions of prices, wages and productivity

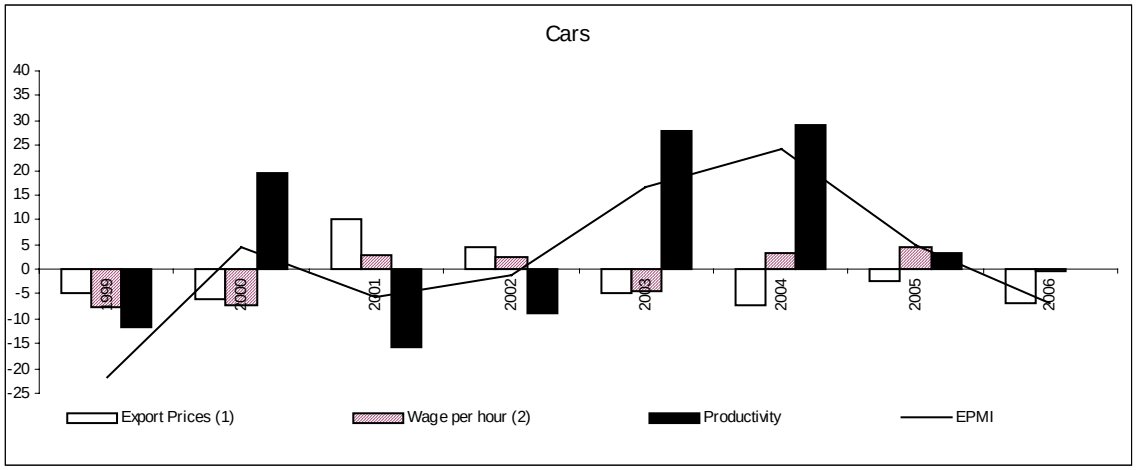


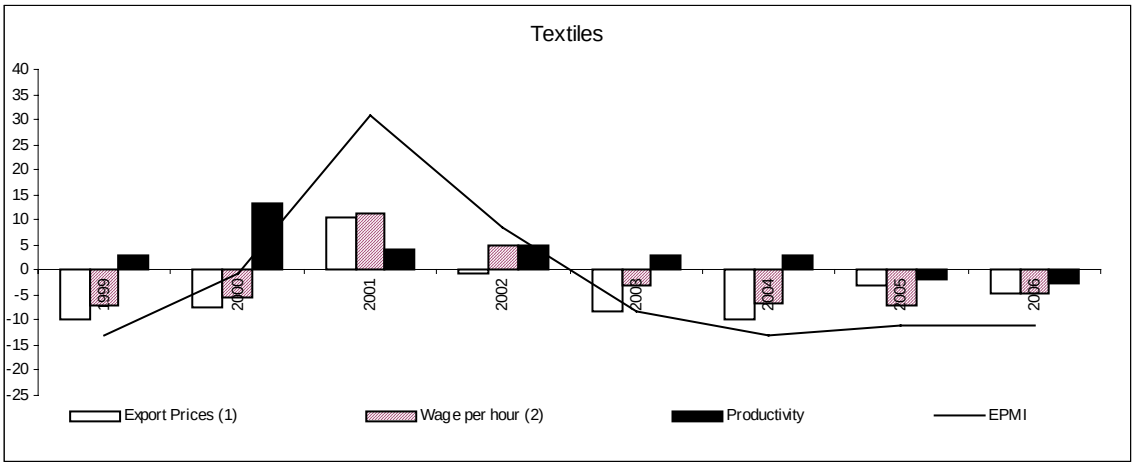
Note: For the decomposition formula of determinants, please refer to paragraph 2.5.
1. Price increases contribute positively.
2. Wage increases contribute negatively.
Source: SIS and own calculations.

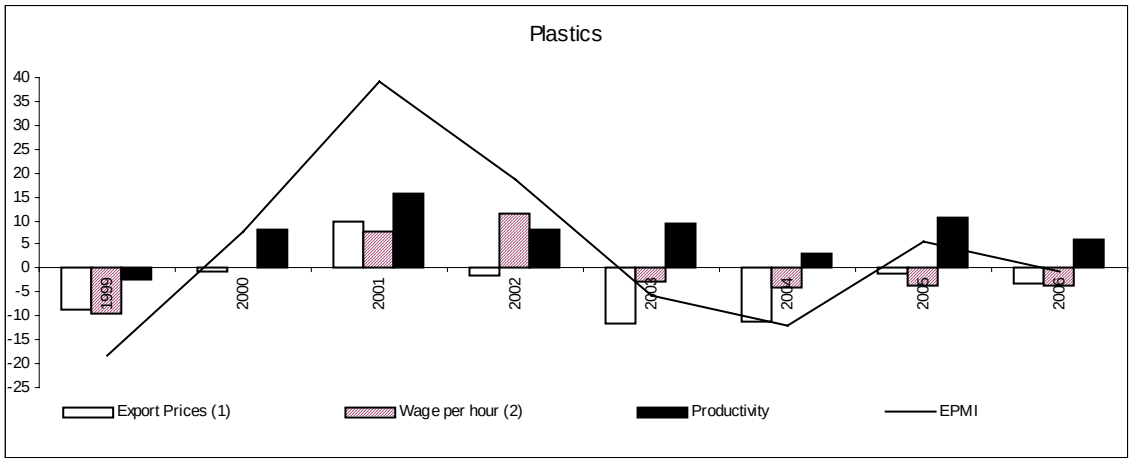
4.5 In the 2001Q2-2006Q1 period the average quarter-on-quarter change in export profit margins was +0.8%; the strongest improvement was observed in 2001Q3 at +15%; and the least favourable development occurred in 2005Q3 at [-5] %.

4.6 Contributions to export profit margins were also decomposed in selected areas. The car industry representing a highly competitive sector, textiles representing a competitively challenged activity, and plastics representing an intermediary sector were analysed (Figure 4). During 1999-2000, price developments contributed negatively in all three areas. In the currency depreciation year 2001, the acceleration of prices made an important contribution in all of them. In 2002, the positive contribution from prices continued for cars, but became mildly negative for textiles and plastics. After 2002, currency appreciation affected margins negatively in all three sectors. During this post crisis period, strong wage growth –reflecting merely the increases in the official minimum wage—undermined profits further in the textiles and plastics. In the face of growing international competition during this period, the car industry reacted merely by increasing productivity and moderating its wage growth (having a rather skilled labour force it was less affected by minimum wage increases). The plastics sector's key reaction channel was productivity growth. In textiles, significant productivity gains could only be achieved in 2003 and 2004 and have not been sufficient to compensate negative developments in sectoral wages and prices.

Figures 4. Yearly determinants of export profit margins in some representative sectors (2001-2006)
Percentage change in profit margins and estimated contributions of prices, wages and productivity







Note: For the decomposition formula of determinants, please refer to the paragraph 2.5.
1. Price increases contribute positively.
2. Wage increases contribute negatively.
Source: SIS and own calculations.

4.7 The quarterly contributions to export profit margins for all sectors have also been calculated. The related graphs can be seen in Annex. The short term reactions of individual sectors to increasing international competition and exchange rate fluctuations can therefore be observed. Some outstanding observations are:

- **The car industry**: The contribution of productivity growth has been decisive but also somewhat volatile. It was outstanding from 2002Q1 to 2004Q3 and then declined. The recent deceleration in export prices affected profits negatively (since 2005Q1).

- **Electronics**: The contribution of price developments since 2002Q1 has been consistently negative (reflecting probably mounting competition from Asia). Electronics firms reacted with important productivity gains and, more recently, with wage moderation. However, all three factors contributed negatively in 2006Q1.

- **The food industry**: Strong wage growth affected profits negatively since 2003Q4. Since 2005Q2, strong productivity gains made a major contribution.

- **Plastics**: Since 1999Q4 productivity growth made a consistently positive contribution (except in three quarters). In 2006Q1, contributions from all three factors were negative.

- **Textiles**: The three main profitability factors affected profits negatively since 2004Q4. Prices contributed negatively since 2002Q1. The major productivity gains obtained between 1999Q2-2000Q3 could not be maintained.

- **Clothing**: Strong wage growth since 2002Q3 affected profits negatively. Prices contributed negatively since 2002Q1 (except in three quarters).

4.8 The most important contributor to changes in export profitability was productivity in the 2001Q2-2006Q1 period in all sectors, except in nonmetal manufacturing. In nonmetal manufacturing, the strongest contributions stemed from real wages. In the same period, the average contribution of productivity growth to quarterly changes in export profitability was 1.46 percentage points, the highest productivity contribution to profitability was observed in electronics (2.27 points) and the lowest contribution was observed in the furniture industry (-0.01 points). The average contribution of productivity in the textiles, clothing, car, plastics and food industries were respectively 0.39 points, 0.11 points, 1.62 points, 2.02 points and 1.43 points (Table 1).

Table 1: Selected statistics on the contribution of productivity growth to export profit margins

Productivity contribution to EPMI (2001Q2-2006Q1)	*Average*	*Standard Deviation*	*Coefficient of variation*	*The latest contribution*
Priv. Man Ind.	1.46	1.10	0.76	1.39
Electronics	2.27	3.31	1.46	-2.47
Wood	1.79	3.65	2.04	-0.42
Textiles	0.39	1.00	2.52	-1.10
Furniture	-0.01	5.39	-382.62	5.57
Cars	1.62	6.99	4.32	1.04
Plastics	2.02	1.64	0.81	-0.94
Basic Metals	1.50	1.82	1.21	0.29
Leather	0.52	3.97	7.70	7.90
Mach. Equip.	2.00	2.95	1.48	2.60
Clothing	0.11	2.47	22.24	-0.42
Metal Products	1.46	3.28	2.24	0.04
Chemicals	2.18	2.15	0.99	1.78
Food	1.43	1.54	1.07	2.03
Nonmetallic Min.	0.53	1.42	2.69	0.51
Electr. Mach. Apparatus	1.44	3.93	2.72	0.73
Paper and Paper Products	2.09	3.43	1.64	-5.64

Source: SIS and own calculations.

5. Profitability level analysis according to sectors

5.1 The profitability performances of different sectors were estimated and analysed, with a particular focus on the post crisis structural adjustment period.

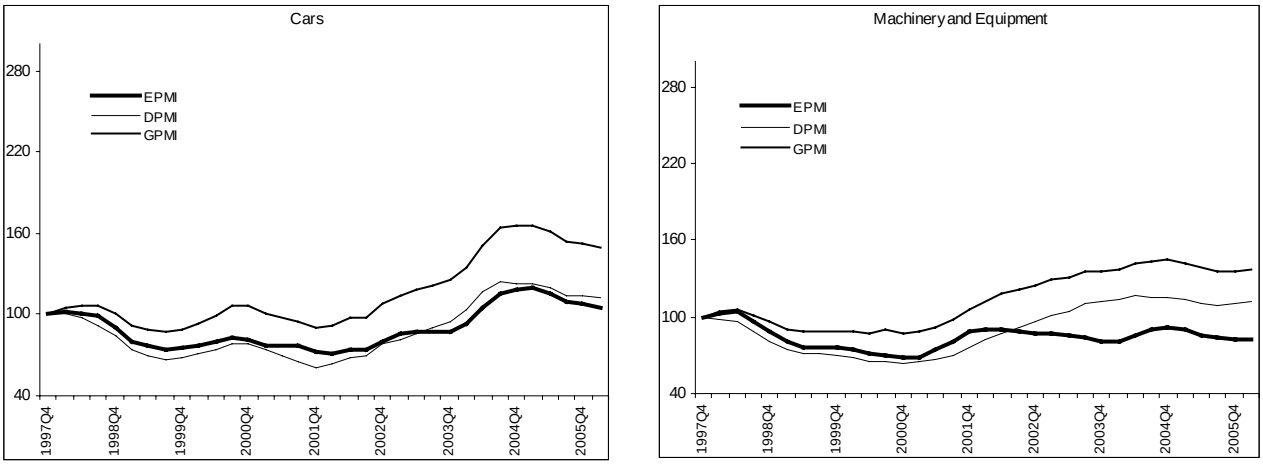
5.2 The analysis makes clear that individual sectors' profitability has increasingly diverged, and that this divergence is deeper in export markets than in the domestic market. The divergence of sectoral profitabilities reflects mainly weakening sectors' loosing their margins more severely in export markets than at home, while sectors which succeeded to preserve their profitability achieved a comparable performance in foreign and domestic markets.

5.3 The analysis indicates that the profit squeeze was strongest in the industries which suffered from a fall in output prices, as these firms were not able to raise productivity or cut wages sufficiently to protect their profit margins. By contrast, the more successful industries faced less pressure on prices (due to product specialisation, high demand, and/or less competition from low wage countries) and also achieved more wage restraint, as their more skilled labour force was less affected by the sharp increase in minimum wages, so that their profit margins remained larger.

5.4 The comparative analysis of sectoral profit margins and their determinants indicate sectoral clustering around three groups:

i) Sectors which do consistently well along the three determinants of profitability[12] and, as a result, cope successfully with the pressures of appreciation. These sectors include electronics, industrial machinery, steel and car manufacturing (*highly-competitive sectors*). Generally, these sectors do well in both EPMI and DPMI (Figure 5).

Figure 5. Profit margins in the selected highly competitive sectors[1] (1997Q4-2006Q1) (1997Q4=100)

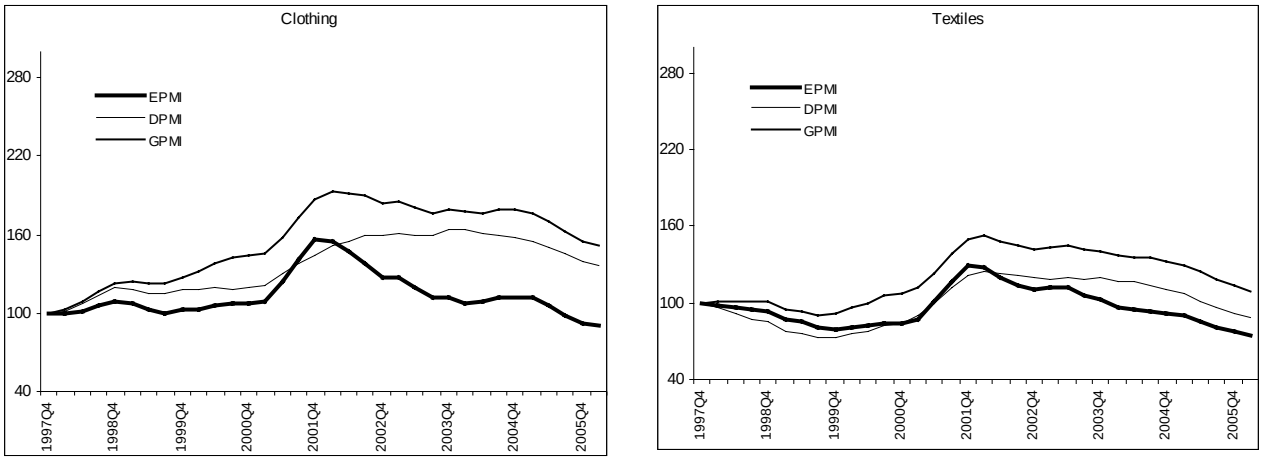


1.The estimation methodology of profit margins is summarised in the paragraphs 2.3-2.4.
Source: SIS and own calculations.

ii) Sectors which, in contrast, tend to under-perform in all three dimensions and consequently face a severe deterioration in their profitability. Textile, clothing and leather industries are in this situation (*declining sectors*). Generally, these sectors face difficulties and pressures both in EPMI and DPMI (Figure 6).

12 Or in at least two of them, together with an average performance in the third.

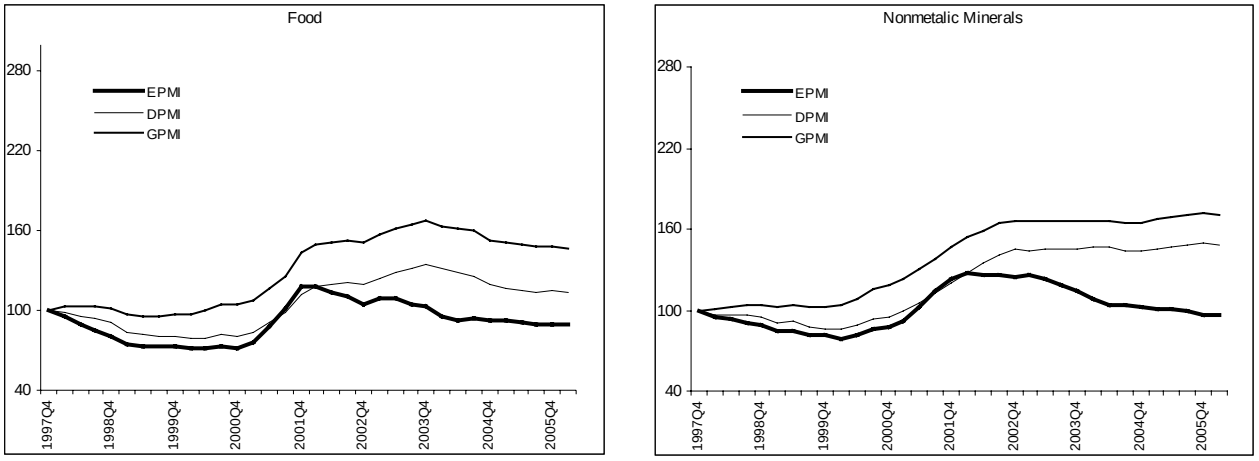
Figure 6. Profit margins in the selected declining sectors[1] (1997Q4-2006Q1)
(1997Q4=100)



1.The estimation methodology of profit margins is summarised in the paragraphs 2.3-2.4.
Source: SIS and own calculations.

iii) Sectors with a mixed performance, either because they combine good and bad performances in different determinants of profitability or achieve only average performance in all of them (*intermediary sectors*). Several industries such as plastics, electrical equipment, metal product and furniture manufacturing are in this case. They have resisted generally well to the pressures of appreciation to date but remain vulnerable. Generally, they face more difficulties and pressures in export margins (EPMI) than domestic margins (DPMI). But this is probably a temporary relief and they should prepare themselves to face more pressures with the globalization of competition (Figure 7).

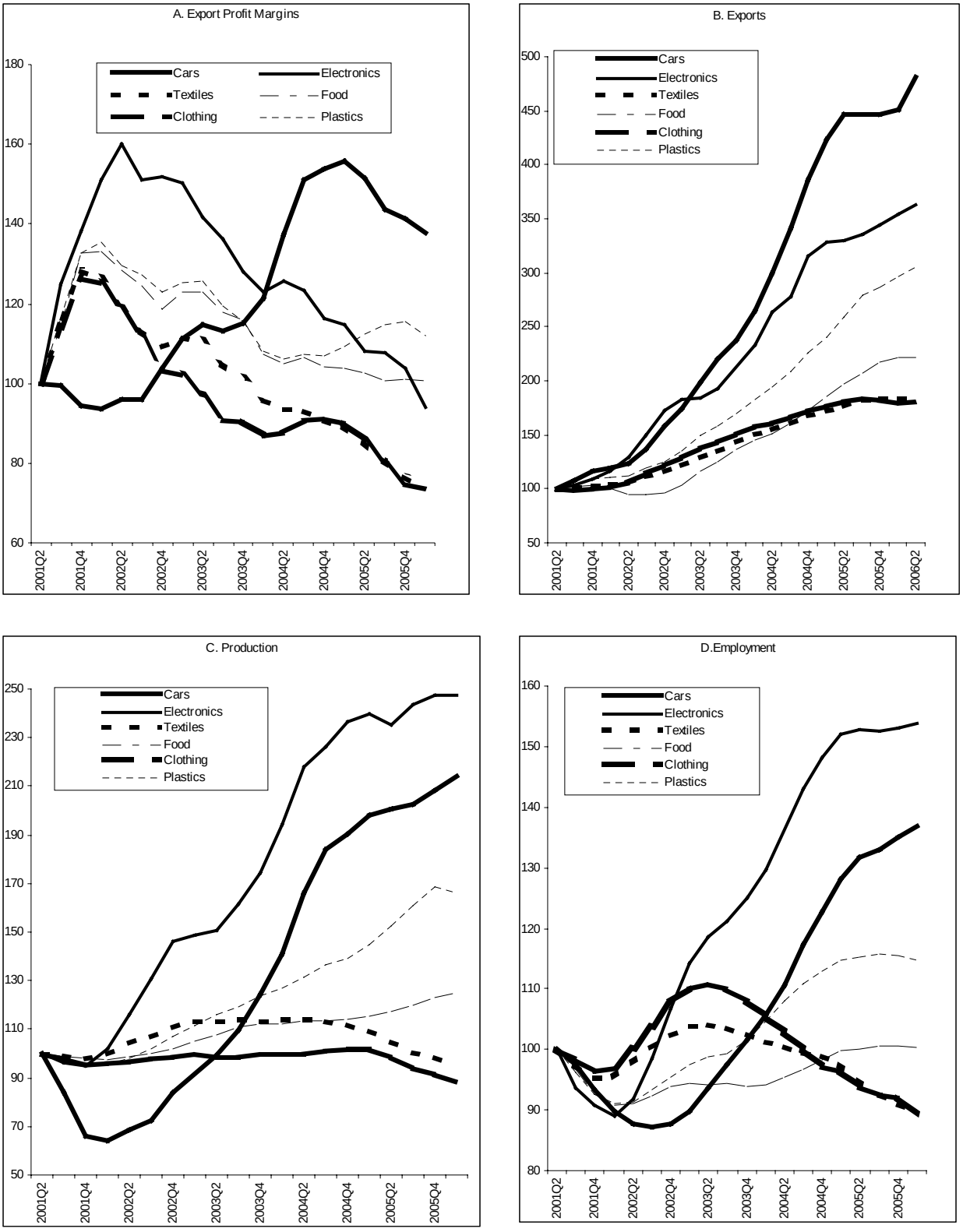
Figure 7. Profit margins in the selected intermediary sectors[1] (1997Q4-2006Q1)
(1997Q4=100)



1.The estimation methodology of profit margins is summarised in the paragraphs 2.3-2.4.
Source: SIS and own calculations.

5.5 The clustering among sectors becomes clearer after the 2000-2001 crisis. Export profitability performances then reflect strongly on their production and employment dynamics. Figure 8 displays the post-2000 profitability, export, output and employment performances of six representative sectors. The car and electronics industries represent the highly competitive sector, textiles and clothing the declining sector, and food and plastics the intermediary sector.

Figure 8. Recent performance in some representative sectors (2001Q2-2006Q1)
2001Q2=100



Note: Highly competitive sectors are shown with thick lines, declining sectors with dashed lines and intermediary sectors with dotted lines.
Source: SIS and own calculations.

5.6 The analysis of the level and determinants of export profitability across sectors inspire some additional observations, which are summarised in Table 2.

Table 2. Additional observations on sector specific performances

Sectors	**Performance**
Highly competitive sectors	
Car manufacturers	Firms have succeeded to achieve remarkable wage restraint over the past two years despite a successful pickup in their prices and profits.
Electronic goods	Manufacturers have achieved significant wage moderation under strong downward pressures on prices and profits. The pressures on prices have been increasing recently.
Basic Metals	The sector benefited from exceptional price and profitability increases (due to excess demand in international markets) but avoided wage drifts.
Intermediary sectors	
Electrical machines	In response to growing import competition (basically from China) producers have shifted to higher value-added products.
Metal products	Firms have not stopped developing their international activity in spite of narrowing export profit margins.
Furniture	Manufacturers responded to a sharp loss of profitability by accelerating productivity gains and by shifting to higher value-added products.
Plastics	Manufacturers reacted to a sharp fall in international prices with very strong productivity gains. And it has a tendency to become one of the highly competitive sectors.
Declining sectors	
Textiles	In spite of steep price declines and mediocre productivity gains, firms were effectively forced to grant above-average wage increases, due to large increases in the minimum wage.
Clothing	Protection measures against Chinese exports in OECD markets in 2005 permitted some restoration in margins, without however slowing down sharp employment adjustments.
Leather manufacturing	Producers recently improved their product differentiation and pricing power. A pickup of exports ensued but employment adjustments continue.

6. Conclusion

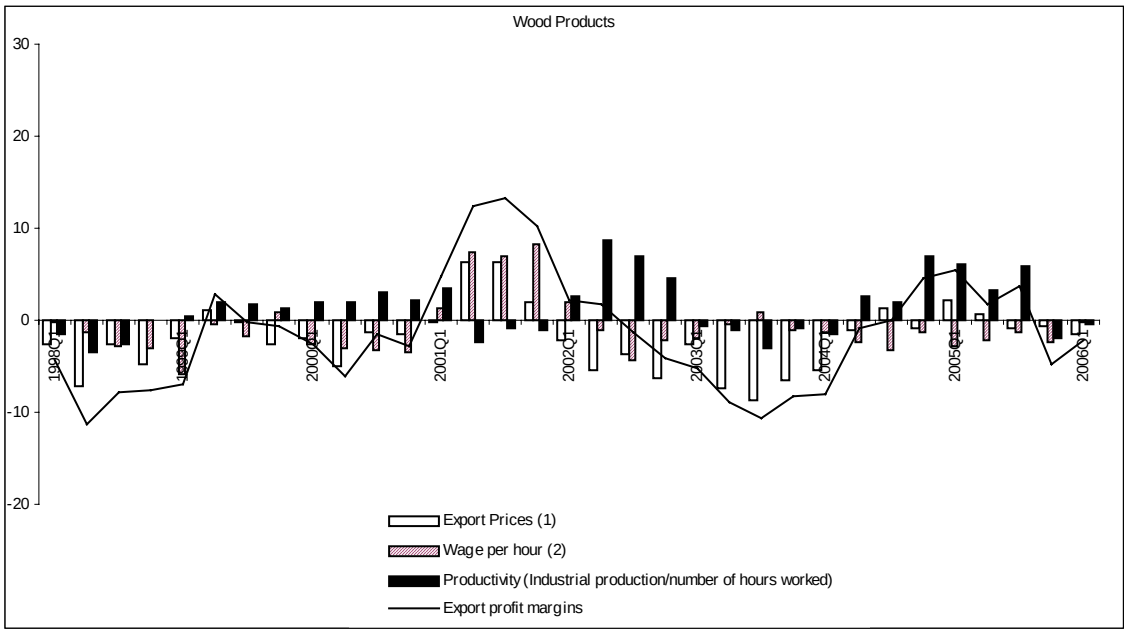
6.1 The analysis reveals the emergence of three clusters in Turkish manufacturing industry: highly competitive, intermediary and declining sectors. The respective profitability performances of these clusters reflect on their growth dynamics: more profitable activities produce, export and create employment more than the others.

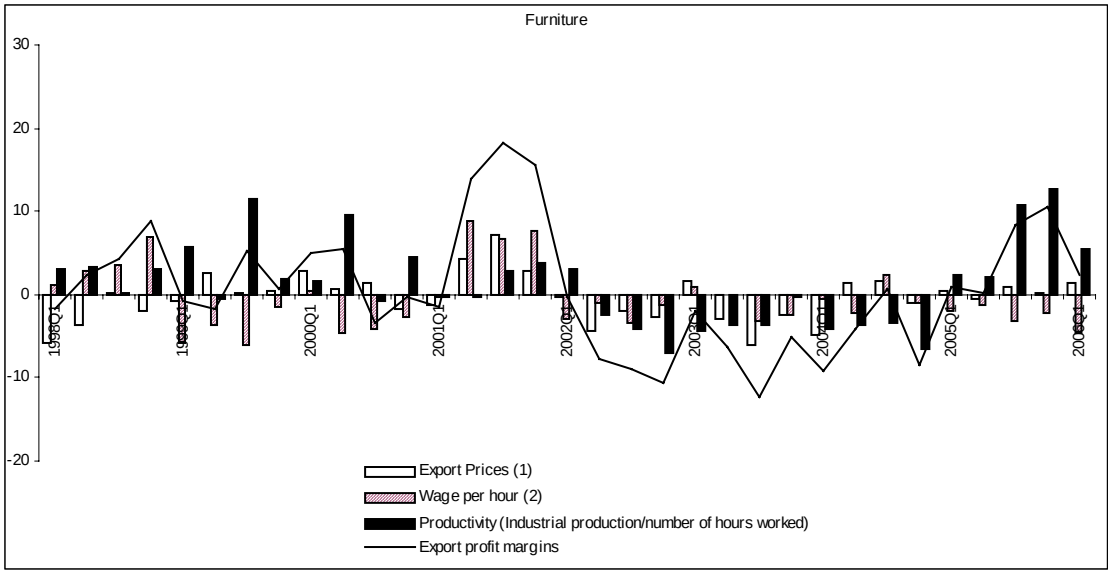
References

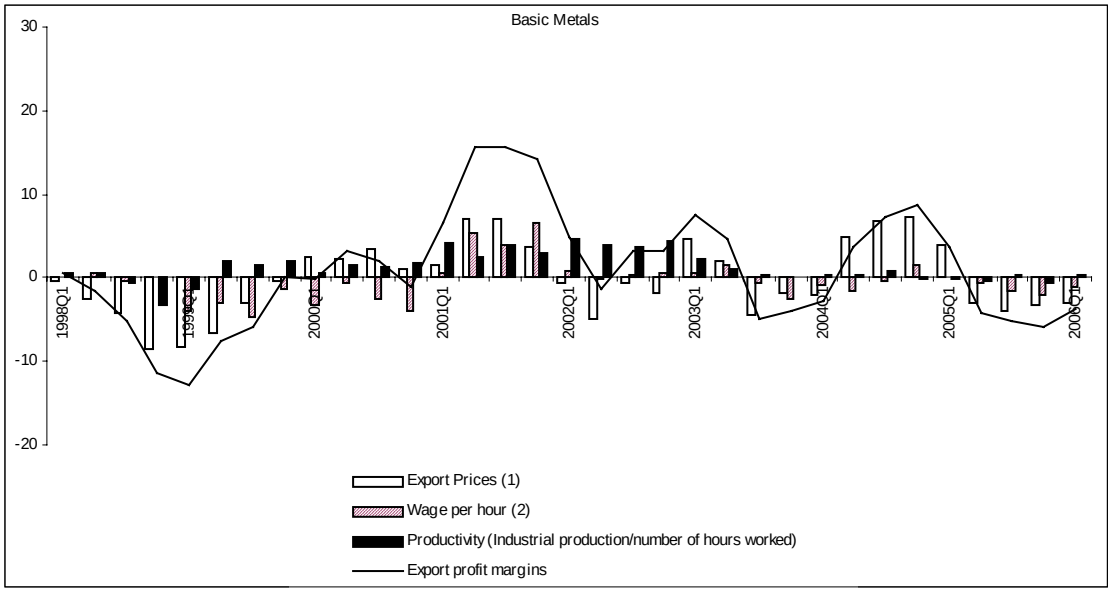
Gönenç, R., W. Leibfritz and G. Yılmaz (2007), "Enhancing Turkey's Growth Prospects by Improving Formal Sector Business Conditions", OECD Economics Department Working Paper.

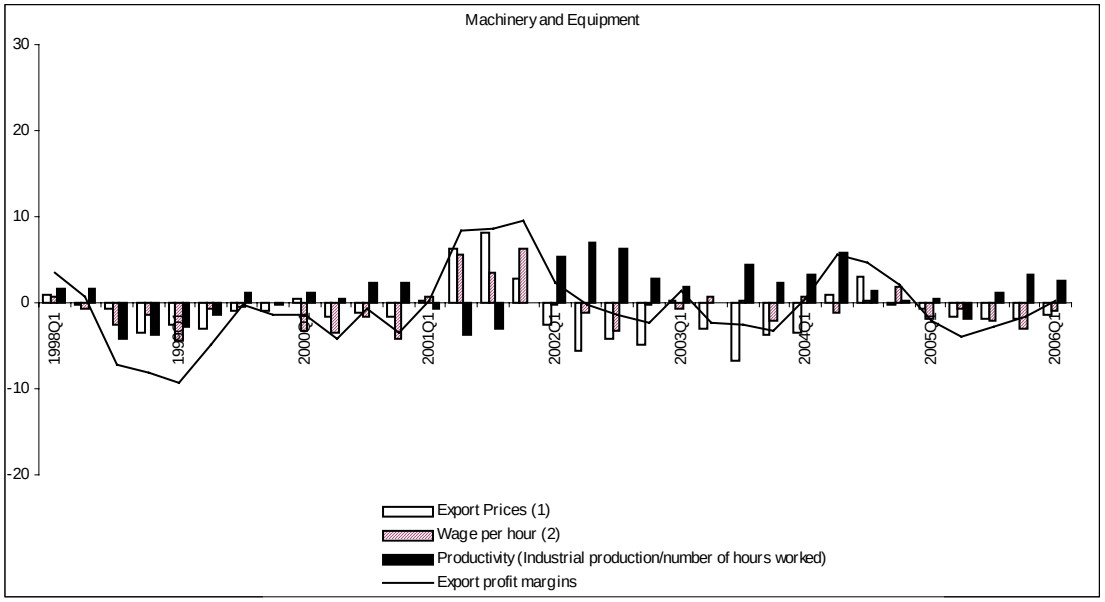
ANNEX

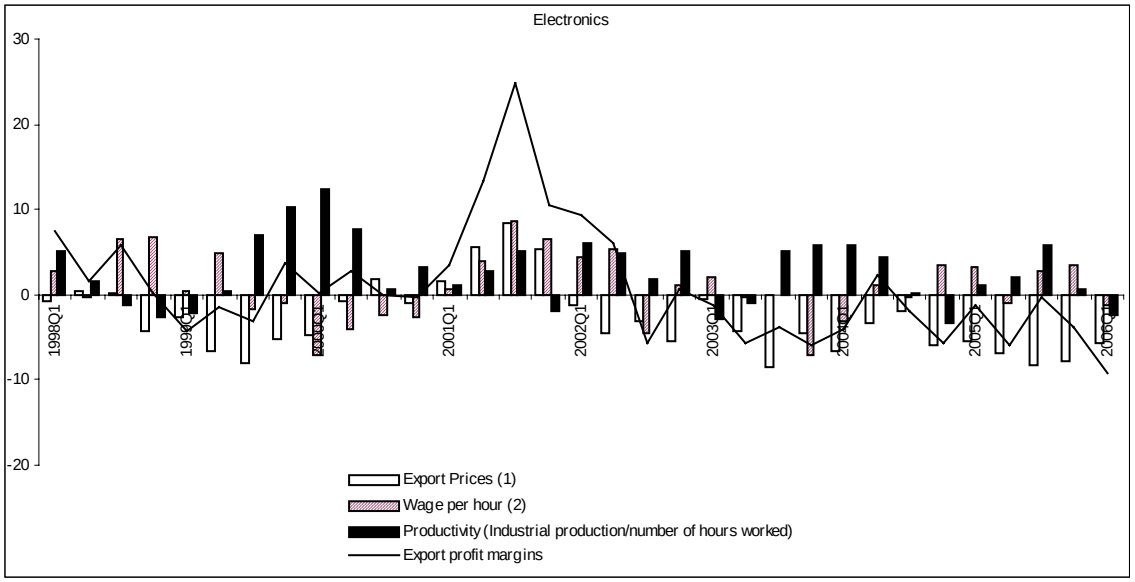
Figures: Quarterly Determinants of Sectoral Export Profit Margins

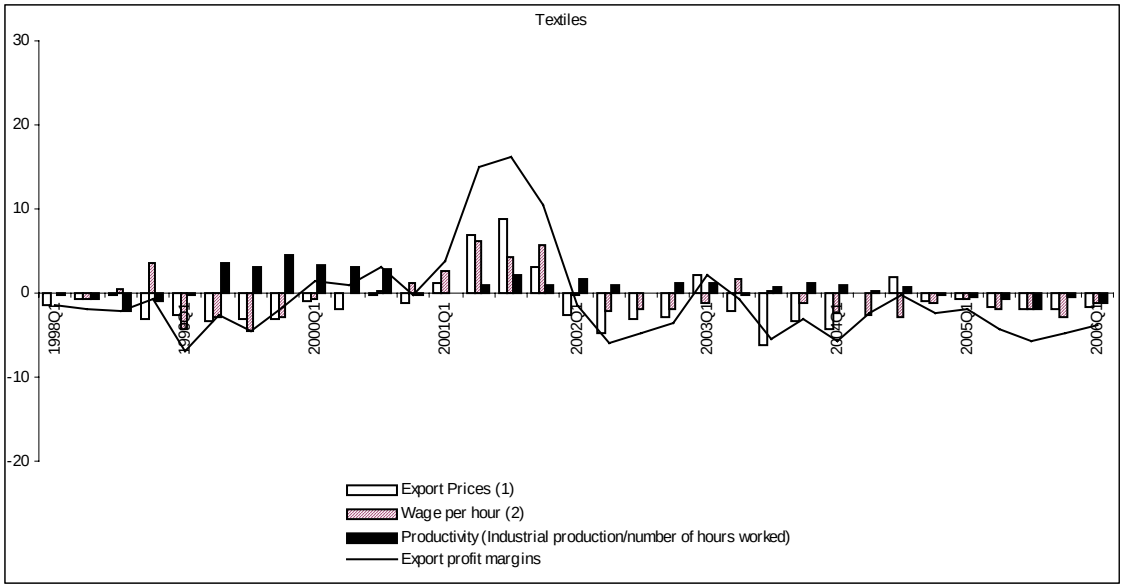


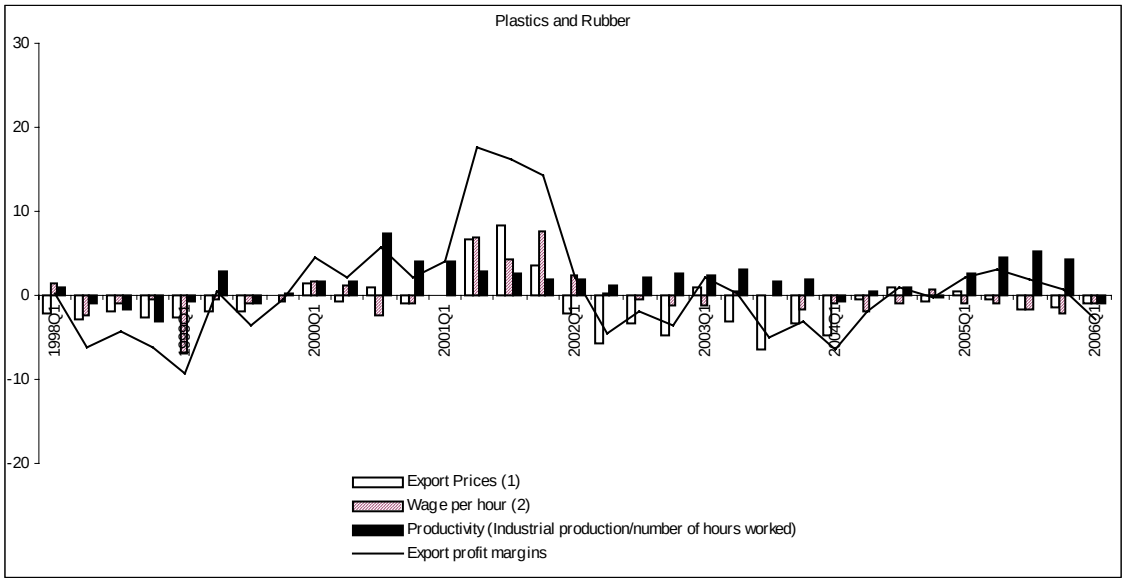


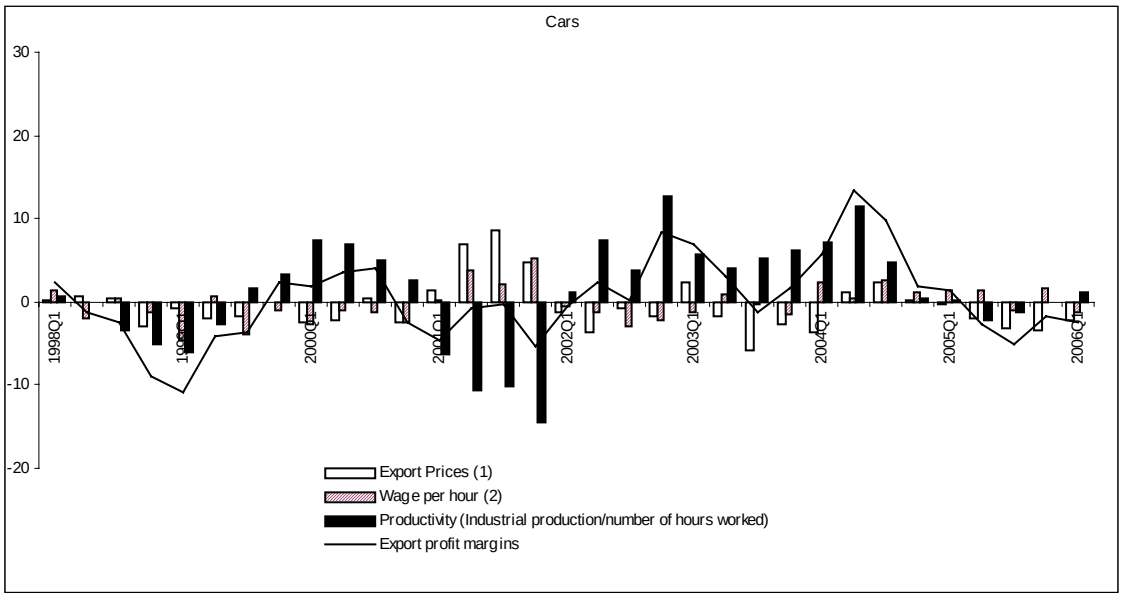

Basic Metals
30
20
10
0
-10
-20
1998Q1
1999Q1
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins

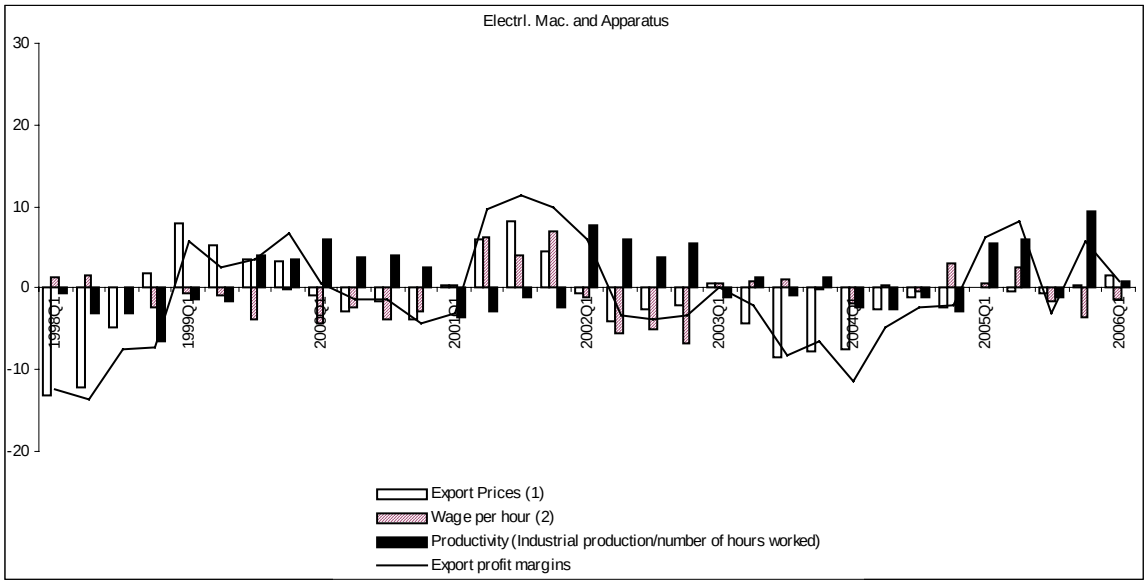

Machinery and Equipment
30
20
10
0
-10
-20
1998Q1
1999Q1
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins

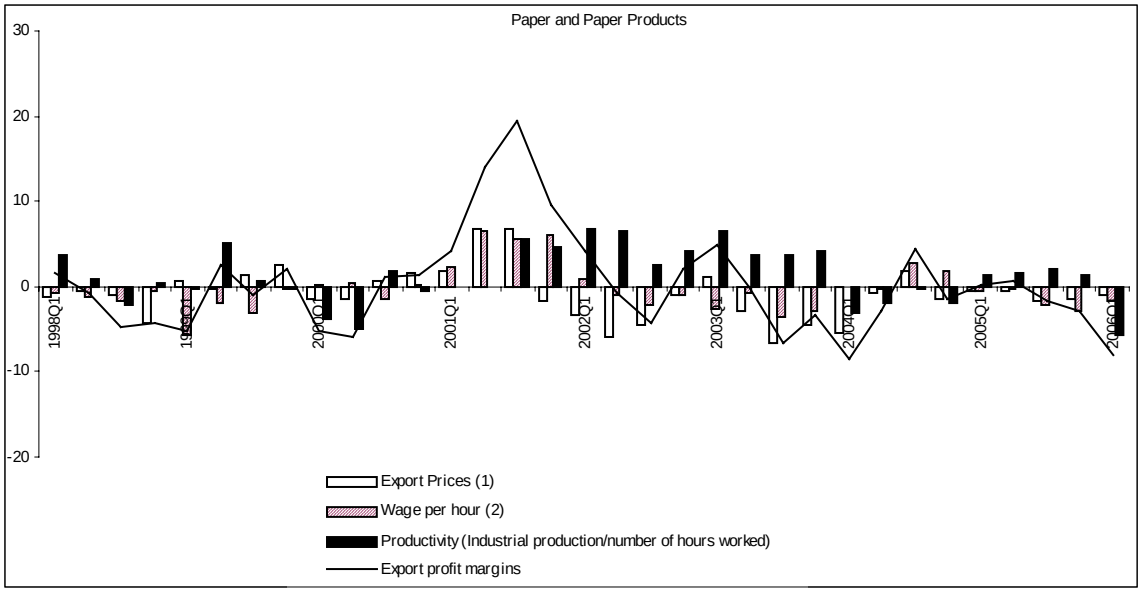

Electronics
30
20
10
0
-10
-20
1998Q1
1999Q1
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins

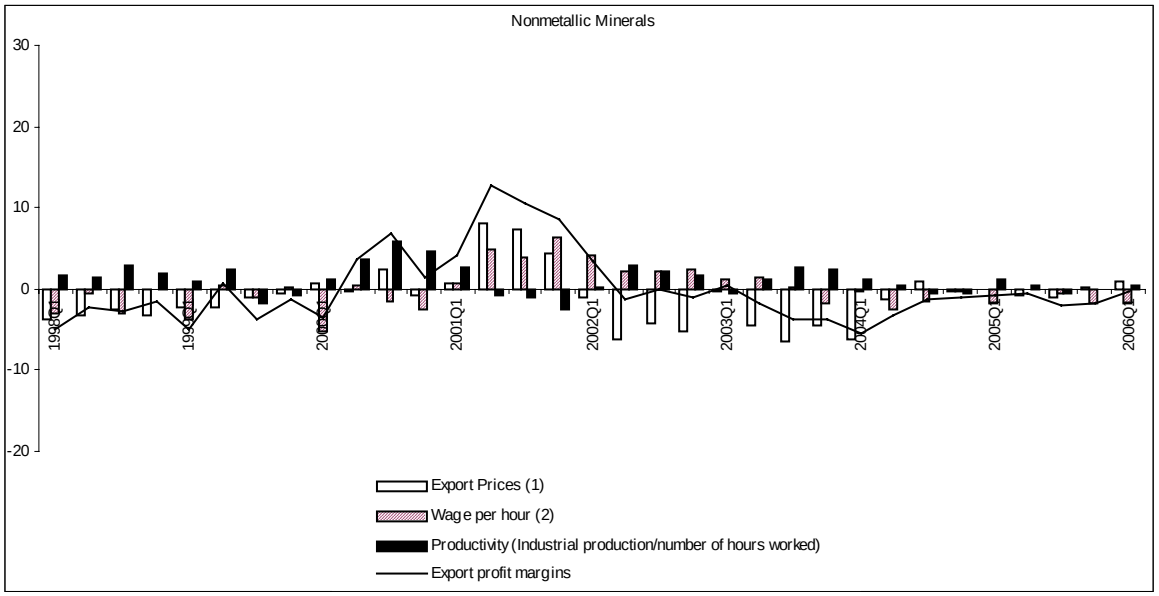

Textiles
30
20
10
0
-10
-20
1998Q1
1999Q1
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins

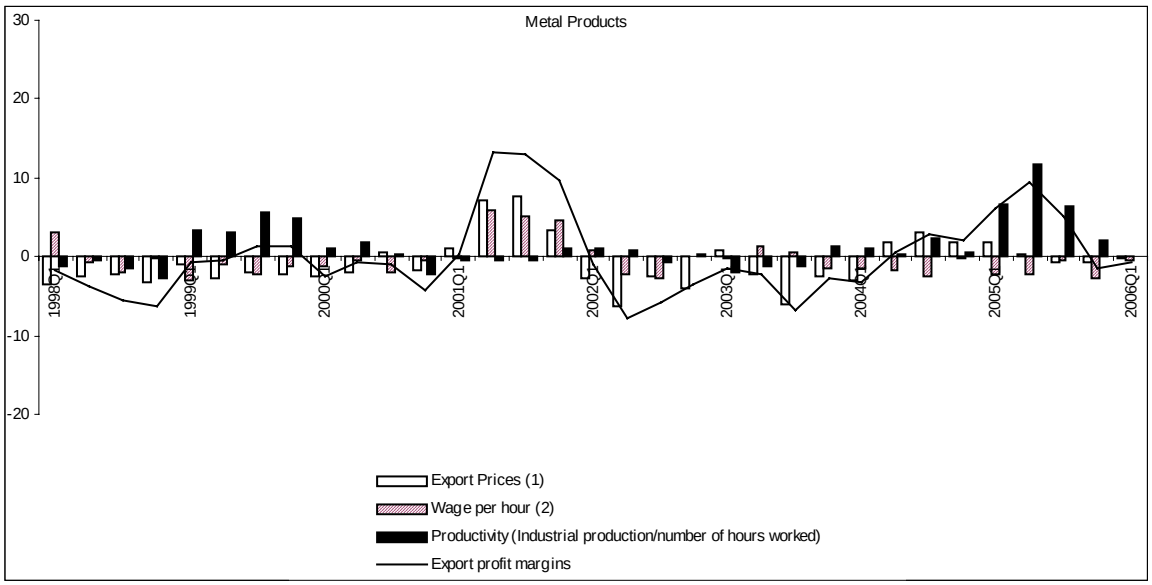

Plastics and Rubber
30
20
10
0
-10
-20
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins

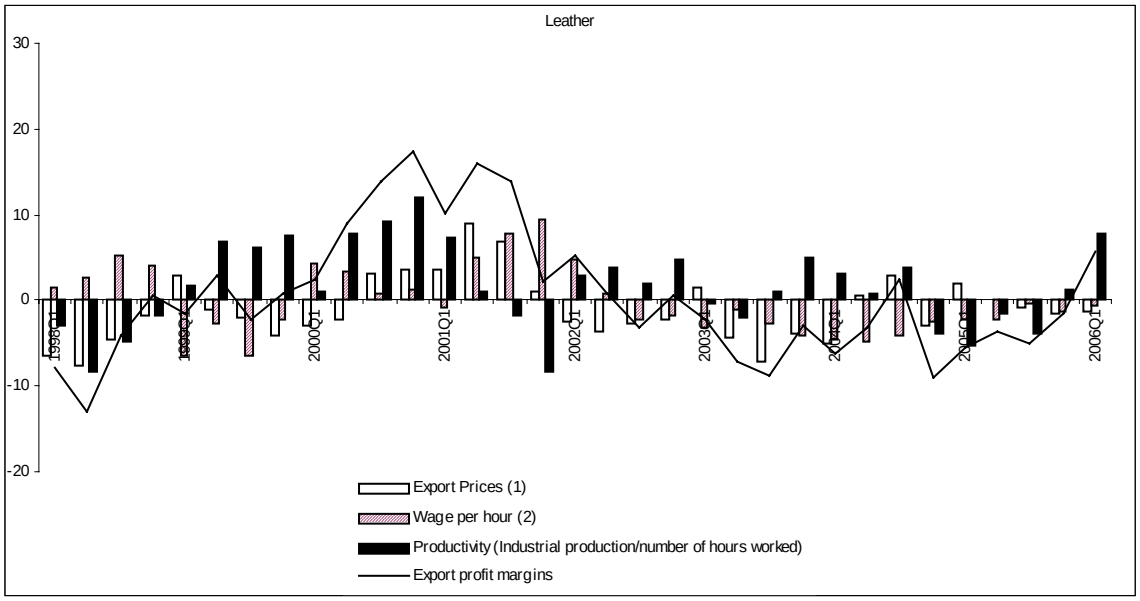

Cars
30
20
10
0
-10
-20
1998Q1
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins

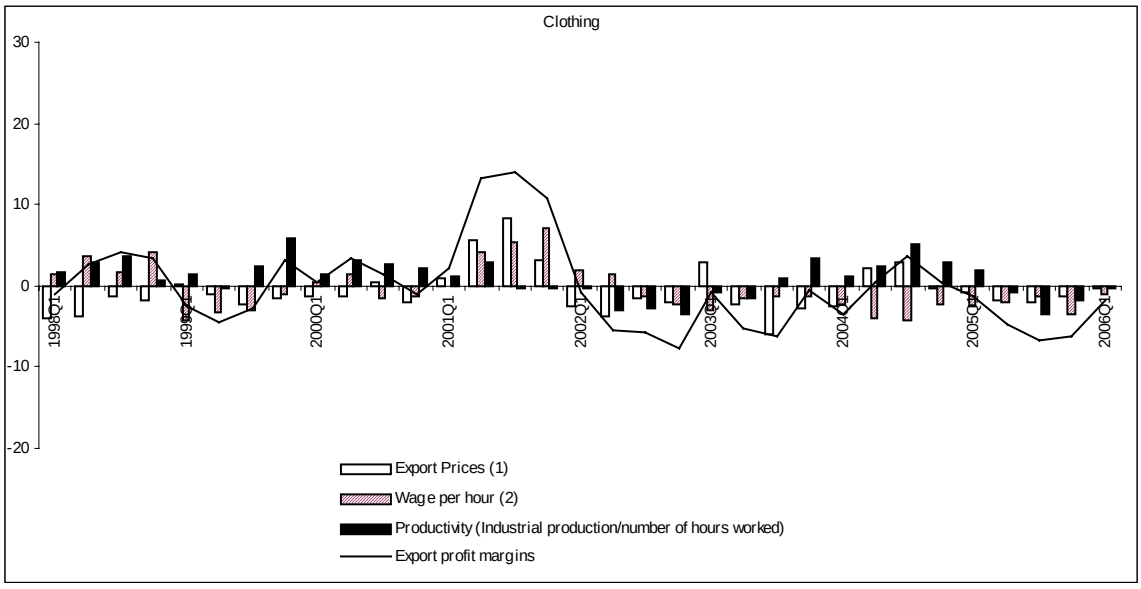

Electrl. Mac. and Apparatus
30
20
10
0
-10
-20
1998Q1
1999Q1
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins

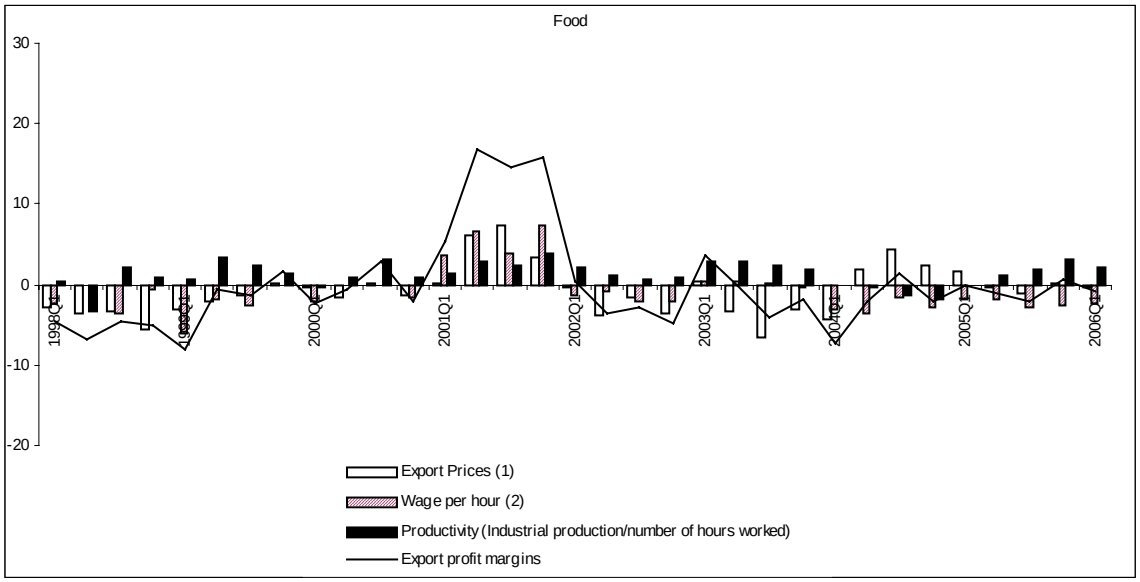

Paper and Paper Products
30
20
10
0
-10
-20
1998Q1
1999Q1
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins

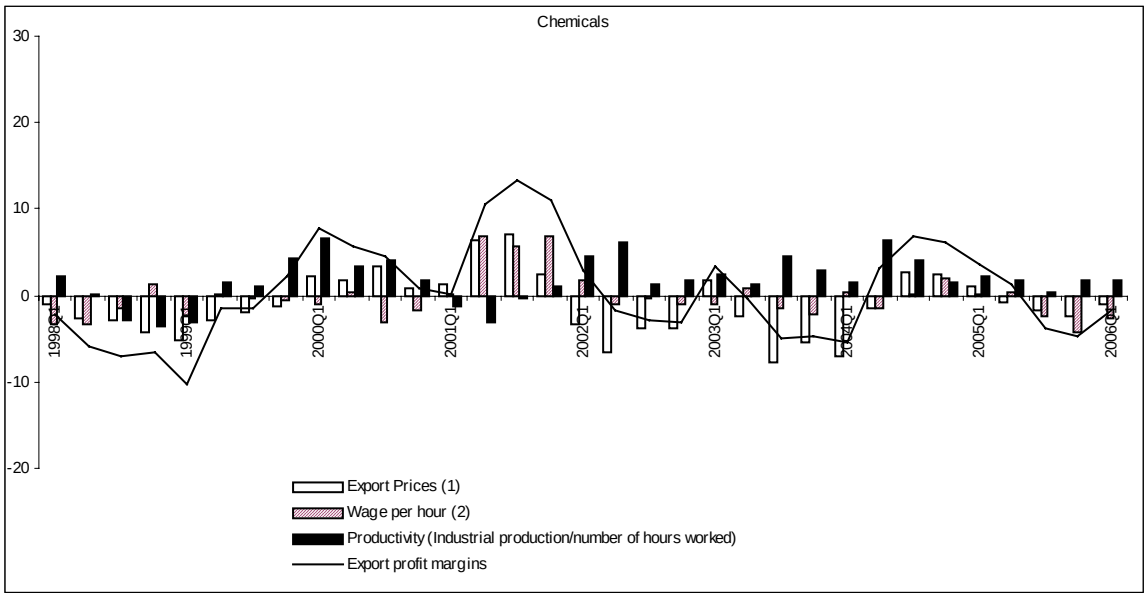

Nonmetallic Minerals
30
20
10
0
-10
-20
1998Q1
1999Q1
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins


Metal Products
30
20
10
0
-10
-20
1998Q1
1999Q1
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins


Leather
30
20
10
0
-10
-20
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins


Clothing
30
20
10
0
-10
-20
1998Q1
1999Q1
2000Q1
2001Q1
2002Q1
2003Q1
2004Q1
2005Q1
2006Q1
Export Prices (1)
Wage per hour (2)
Productivity (Industrial production/number of hours worked)
Export profit margins





Source: SIS and own calculations.