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**DETERMINANTS OF INDUSTRIAL RESTRUCTURING
IN THE PRE-ACCESSION TRANSITION ECONOMIES:
THE CASE OF THE CZECH REPUBLIC, HUNGARY
AND POLAND**



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SUMMARY

In this paper we have investigated the impact of changes in demand and supply conditions and government policy instruments on output and employment responses at industry level. The output response seems to be in line with the general expectation: firms respond positively to changes in domestic or foreign demand (and the industry output increases too). Unit labour costs seem to have a negative impact while investment activities have a positive impact on the response. Government policy instruments, on the other hand, do not seem to impact the output response of firms (and thus of industries).

We have measured industrial restructuring in a particular way: the absolute value of changes in the relative share of each industry in total manufacturing employment, *i.e.*, restructuring is the outcome of the intervention by the firms' management irrespective of whether it has resulted in a reduction or an increase in employment (and whether the reduction in employment has been the outcome of passive or active restructuring). Had we not used the absolute value of change, the implication would have been that a decrease in demand, *e.g.*, would have slowed down the restructuring process.

Given our definition of restructuring, we have shown that adversity forces firms' managers to react. A decline in domestic demand or exports, an increase in labour cost, and a decline in profitability will all lead to restructuring. The relationship is stronger in some countries than others and depends on the functional form used. Again, government policy instruments do not seem to have a strong impact on the process. This will support the view that the ultimate motives for firms to lobby governments (sometime successfully) to use their resources in an attempt to speed up the restructuring process through beneficial taxes and subsidies are to maintain the status quo and postpone the painful restructuring process.

INTRODUCTION^{*}

The period of transition to a market system has been associated with massive industrial restructuring in most transition economies. Not only has the relative importance and contribution of different economic activities changed, there has also been a significant change within the manufacturing sector. Changes in industrial structure reflect the changing market conditions, both domestic and international, and the state of competition as well as the behaviour of the economic agents involved. A major dimension of the change in industrial structure, or perhaps an outcome of this change, has been the changing competitiveness of industries in these economies, on both domestic and on international markets.¹ A significant increase in international trade in almost all countries of the region has further speeded up the restructuring process.

The restructuring process and changing competitiveness have been studied in detail by many authors, though mostly either at firm level or national (macro) level. This paper considers the restructuring process at the industry level and attempts to unravel the causes and effects of this process. Unlike much of the research on this WP (which have

employed rank correlation methodology), this paper attempts to use OLS and panel data techniques to investigate the factors influencing industrial restructuring. More specifically, the aim of this paper is to identify the relative strength of demand and supply side factors and government policy instruments which contribute to the process of industrial restructuring. In the next stage of research, using the same methodology, the relationship between industrial restructuring and changing competitiveness will be investigated.

The paper is divided into four sections. In the first section we discuss the mechanism through which changing market conditions affect the firms' decision to increase or decrease its output/employment. In the second section, we introduce a model of industrial restructuring based on variations in both demand and supply conditions. In the third section we provide the empirical evidence on the restructuring process. Section four concludes.

1) WHAT CAUSES STRUCTURAL CHANGE?

Changes in the structure of the national economy and the manufacturing sector have been a fundamental feature of the process of transition. The structure of the economy, and the manufacturing sector, were severely distorted under the socialist system because of the particular method of resource allocation and the dominance or political criteria over economic criteria associated with central planning. As a result, the industrial sector (particularly the heavy industry, chemicals and extractive branches) had grown beyond that justified by the particular level of development while the light industries, trade and services made a much smaller contribution to the total

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¹ In this paper, the term industry refers to the collection of firms producing similar goods (close substitutes and goods produced by technologically similar processes). In statistical terms, it is represented by the three-digit industries according to NACE classification.

economic activity. The national output was characterised by the low level of international trade, a small number of products competitive on the international market, and a large volume of low quality goods not demanded by the consumers (see Winiński, 1988; Lipowski, 1998, among others).

With the introduction of competition, the old economic structure began to change. The freedom of entry and the liberalisation of foreign trade meant that the market for unwanted or low quality goods disappeared and that for new products and services began to develop and enlarge. Similarly, as the hard budget constraint set in, enterprises producing non-viable (loss making) products had to either reduce or cease the production of such goods, or exit the market altogether. Although in majority of enterprises, the initial restructuring measures (reductions in output and employment) were passive, or defensive, embarked upon as short term survival measures, they had to be followed by more long term and strategic measures for enterprises to prosper and grow (Grosfeld and Roland, 1995).

In the course of systemic change, these economies went through an 'adjustment' process, one in which the structure of the economy and the manufacturing industry changed and became more compatible with those of a market economy involved in international trade. The massive expansion and reorientation of exports and imports of these countries contributed significantly to this adjustment process.

The analysis of motivations or incentives for restructuring was an important question which attracted the attention of many transition economists in the first decade of transition, and to which no conclusive answer has yet been given. Was it changes in demand that led firms to produce goods wanted by the consumers and discontinue or reduce the output of unwanted goods? Was it the

enterprise managers' desire to improve the performance of their company by altering the organisation of the production process in order to increase productivity and stay in business? Or was it the pressure of competition, especially from imported goods that imposed a bankruptcy threat on firms and forced them to embark on effective restructuring? While there is no doubt that all these factors (and some others) have contributed to the restructuring process, the relative importance of these factors are not known. Furthermore, it should be remembered that decisions which ultimately result in the restructuring of a firm are made by firm managers operating under uncertain conditions and aiming to optimise their own and their firms' positions. These motives and their impact on individual firms are of course unobservable – especially in a study which concentrates on 'industries' and not on 'firms' – but their impact on employment and output decisions are known and allow us to draw inferences on the process.

The restructuring of a firm, and by implication the industry to which the firm (and similar firms) belong, may take a number of forms. In the initial stage, given the overstaffing typical of socialist enterprises, a major task facing most firms was to reduce the level of employment. In most cases, this was a defensive mechanism, a response to pressures of competition and a means of survival. Depending on the hardness of budget constraint facing each firm, a certain amount of labour shedding took place (more in some and less in others). In all the three countries under consideration, firms underwent this adjustment process – with very similar results (Balcerowicz, *et al.*, 1998). It is important to note that although a decline in employment may be regarded as an undesirable side effect of the adjustment process, especially from the politicians' point of view, it nevertheless represents the firm's attempt to restructure – and a positive

step from the point of view of the firm's long term survival. At the same time, firms which are managed better and have better market conditions and opportunities and may be able to increase employment, will also have been undergoing the restructuring process. In other words, jobs lost and jobs created are both indicators of restructuring (see Mancellari *et al.*, 1996 and Jackman and Pauna, 1994 for a similar approach).

We start by looking at the impact of various factors on firms' output and employment decisions.

1.1. The impact of demand

The basic argument is that changes in demand for a product will result in changes in output of firms producing that product, or a change in that industry's output. Depending on how rapidly producers respond to changes in demand, prices may also change, providing additional information and incentive for producers to change their output. Thus

$$\text{SALES}(t) = a + b D(t) + c \text{EXP}(t) + d P(t) + e \text{SECTOR} + \varepsilon$$

SAL represents the value of output (or sales) of an industry, D is domestic demand, X is the industry's exports (foreign demand), P is the producers' price index for that industry and I is a dummy representing industry groups (two-digit industries). Substituting D with SALES + M - X, the following estimatable equation will be obtained:

$$\text{SALES}_t = a + b (\text{SALES}_t + \text{IMP}_t - \text{EXP}_t) + c \text{EXP}_t + d P_t + e I + \varepsilon$$

$$\text{Or: } \text{SALES}_t = a_1 + a_2 \text{IMP}_t + a_3 \text{EXP}_t + a_4 P_t + a_5 \text{SECTOR} + \varepsilon \quad (1)$$

Although this is a simple model of identifying the impact of demand on firms (and industries) decisions, it can unambiguously point to the impact of demand and provide the initial step to-

wards a broader estimation of output and employment decisions of firms. Using our data set of around 90 three-digit industries for the period under consideration for each country, we can estimate this simple model for the three countries under consideration (see Section 3).

A different version of this idea has been put forward by Havlik (1995 and 2000) where he argues that the adjustment process is guided by and reflected in the reorientation of trade (which are included in the above equations).

1.2. The impact of supply factors

The change in output and employment of firms, which ultimately results in the restructuring of the manufacturing industry, may also be motivated by supply side factors such as changes in input prices and the firm's choice of technology and input combinations. In particular, under competitive conditions (and a hard budget constraint regime), firms will try to reduce their unit costs to ensure their survival as well as increasing their profits. Enterprise managers play a particularly important part here: those with foresight and initiative embark actively on reducing input costs, improving the production process, reducing waste, raising the quality of their products (and their firms' image and standing) and increase productivity. In short, they engage in active restructuring. Furthermore, firms may embark on policies or strategies designed to strengthen their market position - investment, research and development, advertising, product differentiation, *etc.* Consequently, we can develop another simple model to assess the impact of supply condition on an industry's output and employment:

$$\text{SALES}_t = a_1 + a_2 \text{ULC}_t + a_3 \text{UMC}_t + a_4 \text{INVEMP}_t + a_5 \text{SECTOR} + \varepsilon \quad (2)$$

ULC and UMC represent unit labour cost and unit material cost, and INVEMP is the investment per employee of the industry (its capital intensity). As with Model (1), it is possible to use this simple model to assess the broad direction of the impact of supply side factors on industries' output and employment. The results are presented in Section 3.

1.3. The impact of government instruments

The restructuring process may also be affected by policy instruments such as taxes and subsidies. Many policy makers believe that by offering tax incentives or subsidies they will provide the firms with a breathing space in which they can withstand the financial stress during the adjustment process and will be encouraged to undertake restructuring. Alternatively, it has been argued that the government's attempt to provide a cushion for the enterprise during financial distress will be treated as the continuation of the soft budget constraint regime and would only distort the incentive system by giving the wrong signal to enterprise managers and enable them to postpone unpopular decisions.²

The main instruments of government policy are taxes, direct subsidies, grants, cheap loans, guarantees and ultimately equity participation. Most, though not all, of these areas are governed by laws on 'state aid' which came into being in the long period of pre-accession negotiations (see Hashi and Hajdukovic, 2004 for details). While state

² For the example of large loss making Polish enterprises (iron and steel, coal, railways, shipyards, *etc.*) which absorbed huge quantities of direct and indirect subsidies during the 1990s without significant restructuring, see Neneman and Sowa (2002) and Hashi and Balcerowicz (2004). For a related study on the impact of state aid in EU countries, see Fingleton, *et al.* (1999).

aid aimed at 'rescue and restructuring' is allowed under certain conditions, its distortionary effect is never denied – it is rather argued that the positive impact of restructuring outweighs the distortionary effect of intervention. However, there is no empirical evidence to support this argument.³ For the purpose of the present paper, we identify two main indicators of government policy instruments, taxes and subsidies, which affect the firms' decision making process, and by implication the output and employment levels of industries. Taxes refer to all types of taxes paid by firms (corporate income tax, wage tax, local taxes, *etc.*) and subsidies refer to the total of the variety of supports firms receive from the state (or a portion of these, depending on the availability of data).

We can now combine the above three sets of factors in order to estimate a model including all factors which could potentially influence the industry's output and employment levels.

$$\begin{aligned} \text{SALESt} = & a_1 + a_2 \text{IMPt} + a_3 \text{EXPt} + \\ & a_4 \text{Pt} + a_5 \text{ULC}_t + a_6 \text{UMC}_t + \\ & a_7 \text{INVEMPt} + a_7 \text{TAXt} + a_8 \text{SUBt} + \\ & a_9 \text{SECTOR} + \varepsilon \end{aligned} \quad (3)$$

The results of the estimation procedure are presented and discussed in Section 3.

2) MEASURING STRUCTURAL CHANGE

Industrial restructuring is the outcome of a number of processes. Output and employment in different industries change

³ It is sometimes stated that many companies receiving state aid are operating efficiently and are even quoted on foreign stock markets (the example of such companies in Israel was put forward at the Project's mid-term conference in Brussels in November 2004). But such casual observations cannot be used as substitutes for empirical investigations.

at different rates because: (a) they face different demands; (b) they are subject to different production conditions with respect to the intensity of factor usage and technology; and (c) firms' managers behave differently in the uncertain conditions of transition. The restructuring at firm level leads to changes in output and employment in the industry and as different firms in different industries have managers with differing abilities and react differently to changes in input prices and technological possibilities, the pace of change in different industries will be different – thus industrial restructuring. Thus, in principle, the three sets of factors explained above will also influence industrial restructuring.

The measurement of structural change, particularly its representation by one indicator, has always been a problem for researchers (including those involved in this WP). Changes in output of different industries, referred to in the preceding section, will also be associated with changes in employment levels though these will not be proportionate to each other or have the same ranking as each other, because of differences in productivity changes taking place in the economy at the same time. Given the social and political difficulties of reducing employment in the countries under consideration, it seems sensible to use changes in employment as the main indicator of restructuring – and whether this change is positive or negative, it still represents a contribution to the structural change effort. We therefore use the absolute value of changes in the share of each industry in total manufacturing employment (from one year to next) as the main indicator of industrial restructuring.

In addition to the above demand and supply factors, enterprise managers also change their performance (especially if negative). When firms do badly, effective managers may take poor performance as warning and are spurred into action. They have to engage in more se-

rious restructuring in order to turn the tide. Profitability, measured by the ratio of profits (after tax) to sales, lagged once, will be used to demonstrate this. We propose to use the following model to investigate the impact of the four sets of factors (discussed earlier) on the restructuring process.

$$RI_t = a_1 + a_2 D_t + a_3 EXP_t + a_4 P_t + a_5 ULC_t + a_6 UMC_t + a_7 INVEMP_t + a_8 TAX_t + a_9 SUB_t + a_{10} PROF_{(t-1)} + \varepsilon \quad (4)$$

Where RI_t is the index of restructuring, showing the change in the industry's share of employment in total manufacturing from $t-1$ to t , TAX and SUB are the total of taxes paid and subsidies received by the firms in each industry. As with the previous equations, it is also important to check the lagged version of this model, *i.e.*, changes in demand, costs, *etc.* will affect the employment levels in subsequent years.

In some cases, such as Hungary, where the information on changes in employment are available at firm level, it is possible to disaggregate changes in an industry's employment level by separating those firms that have had to reduce their employment level from those that have been able to expand their workforce. The structural change indicator should provide information, and take into consideration both employment decrease and employment increase, thus the idea of using the sum of jobs lost and jobs created in each industry.⁴

3) EMPIRICAL RESULTS

In this section, we present the result of the estimation process applied to models 1 to 4 in the above sections. We shall

⁴ This result is not reported here but is available from the authors. It will appear in the next revision of the paper.

first briefly explain the data used in the research and then discuss the empirical results.

3.1. Data

The empirical work in this paper is based on the data for around 90 three-digit industries in the manufacturing sector of the three countries under consideration. Industries have been classified according to the NACE classification (Rev. 3). The period of analysis varies from country to country depending on the availability of data, with the longest time period being available for Poland (1995–2001), followed by the Czech Republic (1997–2001) and Hungary (1998–2001).

The data used for this study has been obtained from a variety of sources. For the Czech Republic, the data on the domestic operation of industries is based on P-501 questionnaire and is obtained from the Czech Statistical Office. The foreign trade data originates from foreign trade statistics of the office. All data used were converted to euros, using average annual exchange rates published by the Czech National Bank. Data is restricted to companies employing more than 20 individuals.

The data on Hungarian manufacturing industries are based on the firm-level dataset obtained from the Hungarian Tax Authority. The data on foreign trade was extrapolated from COMEXT database. Data from these databases were predominantly in Hungarian forints. As some variables were provided in euros, average annual foreign exchange rates published by the Hungarian National Bank were applied to convert the data into forints.

The Polish data is based on the F01 questionnaire form completed by all firms and processed by the Central Sta-

tistical Office. Trade data was based on KWIU form, which includes re-exports and also broader categories compared to the F01 form. These two datasets show strong correlation and are based on classification comparable to NACE classification. We have opted for KWIU form since, unlike F01, it provides data for both imports and exports, thus making comparison and calculations possible.

Although the data used in this study comes from reliable sources such as the national statistical agencies and Eurostat, the method of collection and the coverage of data are different in various countries, with some including all firms and others including only firms with over 20 employees. Moreover, the foreign trade data is generally collected according to ‘trade classification’ and then converted to ‘industrial classification’, thus introducing some element of inaccuracy in the process. Moreover, the foreign trade data sometime include ‘re-exports’ which, if large, can distort the calculations.⁵

The precise definition of variables used is given in *Table 1*. *Table 2* provides the summary statistics for all variables used in the estimation process.

3.2. Results

We start with Model (1), trying to check the impact of demand factors on the output and employment of industries.⁶ *Table 3* represents the results of the estimation process.

Although, as we said earlier, this model is fairly simple, it does reflect a basic underlying principle – that firms

⁵ If re-exports are large (sales – exports) may be negative and market shares may be negative.

⁶ At this stage we present the results for variations in output (or value of output to be more precise) only. The estimation will also be repeated for employment.

will have an incentive (or will be forced) to respond to changes in domestic and/or foreign demand by increasing or reducing their output and employment. If sufficient firms respond in this form, there will be an identical response at industry level. Clearly, as expected, both domestic and foreign demand have a positive and significant impact on the output of industries. The same pattern is displayed in all three countries too. Moreover, although we have only presented one functional form (Log-Log) in Table 3, the impact is quite robust and remains significant in a whole variety of other functional forms too. The test of 'joint significance' and chi-sq test also produce satisfactory results.⁷

We can now turn to Model (2), showing the impact of costs and supply factors. *Table 4* represents the results. Unit labour cost always has a negative and significant impact on output while unit material cost is rather insignificant. An increase in unit labour cost, other things being unchanged, will lead to a reduction in use of labour and thus a fall in employment. The same relation does not seem to hold for material cost. Investment intensity, measured by investment per employee also has a positive and significant impact on output. Again, this should be expected – investment is an important signal of the managers' active engagement and their intent to restructure, and will have a positive impact on sales. As in the previous model, the reactions at firm level, if present in sufficient number of firms, will also be displayed at industry level. Interestingly, the relationship is the same in all three countries and, as in Model (1), is robust and remains unchanged under different functional forms.

The result of the estimation of Model (3) is presented in *Table 5* where the impact of demand and supply factors as well as government policy instruments are all brought together in one equation. The most interesting aspect of this table is that the main variables (which were looked at separately) have retained their significance and sign. Exports and imports are both positive and significant, and unit labour cost is negative and significant, in all three countries. The relationships are again robust and remain the same in a variety of functional forms, though only the logarithmic form is reported in Table 3. The investment intensity is less robust – it remains positive and significant only in some functional forms in all countries.

Taxes and subsidies do not seem to have any significant impact on firms' output decisions, and are certainly not robust. In the functional forms presented in Table 3, taxes are significant and negative only in Hungary. Subsidies are not significant in any country. In all these countries, there is a commonly held view that an increase in taxes will have a negative impact on the output of firms while an increase in subsidy will have the opposite effect. This view is not supported by the evidence encountered in this study. Taxes and subsidies may also generate other effects (firms trying to attract government support in order to maintain the status quo and postpone the restructuring process) which would weaken the expected impact. Thus, overall, it seems government intervention through taxes and subsidies is unlikely to have a definitive positive impact on the firms' (and industries') adjustment process. In the light of the continuing debate on the effectiveness of government policy in the transition period, this is an important conclusion.

Finally, we can turn to the estimation of the Restructuring, *i.e.*, Model (4). The results for this estimation are presented in *Table 6*. The estimation of the restructuring equations is less straight

⁷ We need to check for the non-linearity of the relationship by introducing squared terms in the model. This will be done in the next revision. Similarly, we need to choose between the fixed and random effect models using appropriate tests.

forward than those of 'output response' equations. Before discussing the specific features of this table, we should point out that here we consider the adjustment process not in terms of output of individual industries (as in Table 5) but in terms of the relative employment response of each industry (relative to total manufacturing employment). The impact of the same independent variables are therefore different now that in the previous table, partly because we look at a different variable and partly because they are moderated by the nature of the dependent variable.

Here, the main feature of the table is that industrial restructuring is a response to adverse conditions: when domestic demand or export demand falls, firms have to react and engage in policies which enable them to survive (*i.e.*, restructure). Of course various firms in various industries respond differently and the final outcome in various industries will be different. In Hungary and the Czech Republic domestic demand has a negative and significant impact while in Poland the impact is insignificant. The same principle seems to apply to unit labour costs – when costs rise, firms begin to react and adjust their inputs. But here the impact is significant only in the Czech Republic but not in the other two countries. The impact of unit material cost is positive (most probably due to the improvement in the quality of inputs). But this is only significant in one country (the Czech Republic), and even there, only in some functional forms.

Profitability seems to impact the process in the same way: when it declines, firms react and try to improve their situation, thus engaging in restructuring. In both Poland and Hungary, where the profitability data is available, they are significant and negative. Taxes and subsidies are in general insignificant (with the exception of subsidies in Poland), generally supporting the view expressed earlier (that government inter-

vention is unlikely to speed up restructuring).

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Table 1
Definition of variables and their measurement*

Variables	Definition and measurement
D	Total domestic demand for an industry's products (which is equal to domestic production plus imports minus exports).
EXP	Total exports of an industry
IMP	Total imports of an industry
INVEMP	Investment to employment ratio; the value of investment divided by the number of employee in each industry.
P	Producers' price index for the industry. For Hungary, this is at 3-digit level and for the other two countries at two-digit level.
PROF _(t-1)	Earnings after tax as a proportion of sales for each industry, lagged one period.
RI	Restructuring index; measured by the change in an industry's share of employment in total manufacturing employment between t-1 and t. The absolute value of the change is used in regressions.
RI2	Restructuring index; measured by the sum of jobs lost and jobs created in the constituent firms of an industry, divided by industry employment, between t-1 and t. This index is used for Hungary only where firm level data is available.
SALES	Total sales of an industry
SECTOR	Dummy variable indicating the sector (two-digit level) to which each industry belongs.
SUB	Subsidies received by firms in an industry as a proportion of industry's sales.
TAX	Total taxes paid by firms in an industry, including profit tax, social and health contributions, local taxes, <i>etc.</i> as a proportion of industry's sales.
ULC	Unit labour cost; calculated as total cost related to labour (gross wages and salaries plus social and health contributions paid by employers) divided by sales of the industry.
UMC	Unit material cost; calculated as total cost of material used in production divided by sales of the industry.

* Some variables are squared for the identification of non-linear relation. In these cases 'SQ' is added to their notations.

Table 2
Summary statistics for all variables

	No. of Observations	Mean	Standard. Deviation	Min	Max
<i>Poland</i>					
D	456	4907907	5299303	61733.07	4.23E+07
EXP	456	1104477	1572761	15193.68	1.38E+07
INVEM	379	14.18313	17.53491	0.268758	170.4369
Prof _(t-1)	455	0.014921	0.049992	-0.23956	0.238289
RI1	455	0.079525	0.129633	6.69E-06	2.181858
SUB	456	0.003657	0.016278	0	0.225626
TAX	456	0.01604	0.010523	9.97E-05	0.064234
ULC	375	0.194064	0.085611	0.020723	0.4963
UMC	456	0.439804	0.12014	0.133131	0.709189
<i>Logarithms:</i>					
D	456	14.93056	1.039391	11.03057	17.5603
EXP	456	13.22584	1.228916	9.628634	16.44018
IMP	456	13.74873	1.306172	9.036074	16.30042
INVEM	379	2.223883	0.900369	-1.31394	5.138365
SALES	456	14.67724	1.14348	9.700281	17.49938
SUB	438	-7.2612	1.931245	-15.4845	-1.48888
TAX	456	-4.39514	0.847652	-9.21318	-2.74523
ULC	375	-1.74981	0.503958	-3.87651	-0.70057
UMC	456	-0.86534	0.312736	-2.01642	-0.34363
<i>Czech Republic</i>					
<i>Logarithms:</i>					
D	340	12.40053	1.344937	7.452103	14.8169
EXP	429	11.79605	1.366783	7.852194	15.07612
IMP	430	11.9155	1.330109	8.389853	14.45007
INVEM	340	4.353753	0.857655	1.443218	7.187701
RI1	423	-2.29657	1.706236	-9.35193	4.585599
SALES	425	12.35024	1.385032	7.976647	15.41558
SUB	403	-7.96037	1.880501	-15.065	-3.50266
TAX	425	-6.16783	0.684075	-8.60212	-3.2142
ULC	340	-1.80352	0.461828	-2.9505	-0.70187
UMC	340	-0.77588	0.293462	-2.18011	-0.18627
<i>Hungary</i>					
SAL	393	1.03e+08	1.75e+08	285729	1.41e+09
<i>Logarithms:</i>					
D	190	17.37117	1.581513	12.69506	21.06024
EXP	295	16.56049	1.942372	6.47728	20.94423
IMP	297	16.32363	1.88822	10.51825	20.67216
INVEM	294	-2.96487	0.698883	-7.14221	0.829667
P	294	4.669921	0.062459	4.220977	5.149237
PROF _(t-1)	263	-3.21194	0.884821	-7.16282	-1.23722
RI1	294	-2.52718	1.254785	-7.50599	0.587484
SUB	282	-7.12218	2.515374	-15.4375	-3.37281
TAX	293	-5.18263	1.090777	-11.7168	-3.1542
ULC	196	-1.87715	0.510973	-3.66126	-0.9208
UMC	295	-0.36737	0.155693	-1.3043	0.015601

For the Czech Republic and Hungary only logarithmic versions of variables have been used (except for the 'Sales' variable which has been used in a semi-log form). For Poland, both ordinary values and logarithmic versions have been used.

Table 3
The impact of demand on firms' output in the three new member states

	Dependent Variable: SALES		
	Hungary 98-01	Poland 95-01	Czech Republic 97-01
IMP	0.241*** (0.001)	0.086*** (0.000)	0.222*** (0.000)
EXP	0.320*** (0.000)	0.485*** (0.000)	0.568*** (0.000)
P	-0.089 (0.778)		
Model Estimation	Re	Re	Re
SECTOR dummies	Yes	Yes	Yes
Functional form	Log log	Log log	Log log
No. of observations	292	531	424
R ²	0.571	0.675	0.826

Notes: All equations include a constant term.

* significant at 10%; ** significant at 5%; and *** significant at 1%. For the precise definition of variables, see Table 1.

Table 4
The impact of supply factors on firms' output in the three new member states

	Dependent Variable: SALES		
	Hungary 98-01	Poland 95-01	Czech Republic 97-01
ULC	-2.720e+08*** (0.000)	-0.875*** (0.000)	-0.994*** (0.000)
UMC	-1.630e+08 (0.139)	0.051 (0.678)	0.010 (0.911)
INVEMP	2.170e+07* (0.108)	0.095*** (0.006)	0.090*** (0.001)
Estimation method	RE	RE	RE
SECTOR dummies	Yes	Yes	Yes
Functional form	Semi log	Log log	Log log
No. of observations	196	300	340
R ²	0.351	0.419	0.348

Notes: All equations include a constant term.

* significant at 10%; ** significant at 5%; and *** significant at 1%. For the precise definition of variables, see Table 1.

Table 5
Factors influencing firms' output decisions in the three new member states

	Dependent Variable: SALES		
	Hungary 98-01	Poland 95-01	Czech Republic 97-01
IMP	0.216*** (0.001)	0.065*** (0.005)	0.106* (0.10)
EXP	0.196*** (0.006)	0.389*** (0.000)	0.511*** (0.000)
P	0.041 (0.877)		
ULC	-1.036*** (0.000)	-0.509*** (0.000)	-0.739*** (0.000)
UMC	-0.590* (0.096)	-0.127 (0.231)	0.010 (0.912)
INVEMP	0.050 (0.151)	0.032 (0.316)	0.072*** (0.012)
TAX	-0.053* (0.073)	0.026 (0.213)	0.051 (0.168)
SUB	0.016 (0.159)	0.007 (0.530)	-0.010 (0.269)
Estimation method	RE	RE	RE
SECTOR dummies	Yes	Yes	Yes
Functional form	Log log	Log log	Log log
No. of observations	192	290	319
R ²	0.613	0.736	0.802

Notes: All equations include a constant term.

* significant at 10%;

** significant at 5%; and

*** significant at 1%.

For the precise definition of variables, see Table 1.

Table 6
Determinants of industrial restructuring in the three new member states

	Dependent Variable: R1		
	HUNGARY 98-01	POLAND 95-01	CZECH REP 97-01
D	-0.218* (0.051)	1.51e-09 (0.281)	-0.189* (0.063)
EXP	-0.044 (0.622)	-3.76e-09 (0.397)	-0.237** (0.019)
ULC	-0.317 (0.383)	-0.151 (0.156)	-0.175 (0.581)
UMC	-0.097 (0.931)	0.010 (0.866)	0.686** (0.024)
INVEMP	0.068 (0.707)	9.11e-05 (0.819)	0.394*** (0.002)
PROF _(t-1)	-0.259** (0.042)	-0.476*** (0.000)	
TAX	-0.119 (0.396)	-0.109 (0.873)	-0.108 (0.461)
SUB	0.005 (0.930)	2.853*** (0.000)	0.016 (0.691)
Estimation method	RE	RE	RE
SECTOR dummies	Yes	Yes	Yes
Functional form	Log log	Levels	Log log
No. of observations	170	300	239
R ²	0.177	0.304	0.298

Notes: All equations include a constant term.

* significant at 10%;

** significant at 5%; and

*** significant at 1%.

For the precise definition of variables, see Table 1.