

PRICE BEHAVIOR
OF AUSTRIAN EXPORTING INDUSTRY

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Abstract

Many macroeconomic models for open economies assume a price taking behavior in the exposed sector of an economy. Entrepreneurs of exposed sectors are considered to produce for a perfect competitive world market. This study conceptualizes price behavior in a more realistic way. Exporting firms are assumed to operate on markets with oligopolistic competition. The work investigates whether Austrian exporting firms calculate their prices on the basis of costs. The empirical findings for eleven Austrian exporting industries supported the price hypothesis for most industries. Only for the paper, the glass, and the food industry the null hypothesis the exporters calculate prices on the basis of costs had to be rejected at the 5 per cent level of significance. The empirical findings suggest that the assumption of price taking behavior in many macroeconomic models for open economies need to be reexamined in its validity.

Zusammenfassung

Viele der jüngsten makroökonomischen Modelle offener Wirtschaften gehen von einem Preisnehmerverhalten des exponierten Sektors einer Wirtschaft aus, da angenommen wird, daß die Unternehmungen des exponierten Sektors auf den internationalen Märkten mit vollständiger Konkurrenz konfrontiert sind. Ausgangspunkt dieser Arbeit ist eine realistischere Beschreibung des Preisverhaltens im internationalen Handel. Dabei wird angenommen, daß die Exporteure auf Märkten mit oligopolistischer Konkurrenz operieren. Die Arbeit untersucht, ob die österreichischen Exportfirmen ihre Preise nach einer Aufschlagskalkulation bestimmen. Die empirischen Ergebnisse für elf österreichische Exportindustrien unterstützten die Preishypothese für die meisten Industrien. Nur in der Papier-, Glas- und der Nahrungs- und Genußmittelindustrie mußte die Nullhypothese bei 5% Irrtumswahrscheinlichkeit verworfen werden. Die empirischen Ergebnisse legen nahe, die Preisnehmerannahme in vielen makroökonomischen Modellen offener Wirtschaften in ihrer Gültigkeit zu überprüfen.

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1. Introduction

In many recent macroeconomic models for open economies it is assumed that industries exposed to international competition are price takers on the world market. Entrepreneurs of exposed sectors produce for a perfect competitive world market. They have an infinitely elastic demand curve so that they adjust to a given world market price by quantity produced. According to these theories, prices of the exposed sector of a country will be identical with world market prices in the same currency.¹⁾

This assumption of price behavior in exposed sectors, however, is based on an unrealistic market concept for international trade. In most international markets - especially for manufactures - commodities with substantial product differentiation are traded. Domestic and foreign products are not perfect substitutes. Therefore, a homogeneous world market does not exist. International markets are split into numerous partial markets on which similar products for different prices are exchanged. Furthermore, most of these markets are oligopolistically organized. A limited number of suppliers has a downward sloping demand curve which gives them some price autonomy. The way this autonomy is used depends also on the behavior of the demand side. Incomplete information on market opportunities, uncertainty on the reliability of new suppliers and the resistance to abandon an established business relationship make demanders hesitate to react directly to price disparities.²⁾

The price behavior in the exposed sector is of critical importance for economic policy. For it decides whether exchange rate changes influence the current account. If entrepreneurs in the exposed sector are price takers on international markets, revaluations (devaluations) of the exchange rate lead to a corresponding reduction (increase) of prices in home currency. Thus, possible price induced export reductions (increases) and import increases (reductions) will not occur. If, on the contrary, entrepreneurs in the exposed sector determine their prices in an other way, a revaluation of the exchange rate in general induces export price increases in foreign currency and import price reductions in home currency resulting in a deterioration of the current account (depending on the size of elasticities in foreign trade).

Furthermore, price behavior in the exposed sector determines among other factors to what extent profits in this sector are affected by variations in the exchange rate. A strong market position in many cases allows entrepreneurs to pass on an exchange rate revaluation to foreign demand without considerable losses in market shares and hence without profit change. Price taking behavior on the contrary, results in revaluations induced price reductions in home currency leading at given costs to a corresponding profit squeeze. Whether the Austrian revaluation policy during the seventies has deteriorated the current-account and/or profits in the exposed sector depends, therefore, also on price behavior in the exposed sector.

The present study of export price behavior of Austrian manufacturing industry conceptualizes the structural characteristics of international markets in a more realistic way. Firms are allowed to break away from the passive role of price taking behavior and to adopt active pricing policies. The investigation of pricing behavior in the Austrian export sector is pursued in the following way. Export price behavior is analyzed theoretically in part 2, part 3 discusses some of the data problems and describes the methodological procedure in testing the price hypothesis, whereas part 4 presents the empirical results for eleven different Austrian exporting industries. Part 5 summarizes the findings.³⁾

2. Export Price Hypothesis

In contrast to perfect competition, firms under conditions of oligopoly have to take into account the reaction of rivals and customers. In general, however, oligopolists have inadequate knowledge of consumer preferences and the strategies of competitors. The high degree of uncertainty on responses of rivals and customers to price changes induces oligopoly producers to use rules of thumb in price decision making. According to these rules, prices are calculated on the basis of costs.⁴⁾

The use of such rules of thumb in price decision making is also hypothesized for the Austrian exporting firms which are assumed to operate on oligopolistic markets. Exporting industries calculate their prices according to the following hypothesis

$$P_{EX} = (1+m) \left(\frac{w\alpha L}{X} + \frac{P_{IMI}^{\alpha VOR_{AUS}}}{X} + \frac{P_I^{\alpha VOR_{INL}}}{X} \right) \quad (1)$$

$$P_{EX} = \left(1 + \frac{\frac{\alpha F}{X_0} + g_0}{\frac{V}{X}} \right) \left(\frac{V}{X} \right) \quad (1a)$$

$$P_{EX} = \frac{V}{X} + \frac{\alpha F}{X_0} + g_0 = \frac{V}{X} + \bar{m} \quad (1b)$$

P_{EX} Export price in home currency

$\frac{w\alpha L}{X} = w\lambda$ Unit labour costs

$P_{IMI}^{\alpha VOR_{AUS}}$ Unit costs for foreign inputs

$P_I^{\alpha VOR_{INL}}$ Unit costs for domestic inputs

$\frac{V}{X} = w\lambda + \frac{P_{IMI}^{\alpha VOR_{AUS}}}{X} + \frac{P_I^{\alpha VOR_{INL}}}{X}$ Variable unit costs

$m = \frac{\frac{\alpha F}{X_0} + g_0}{\frac{V}{X}}$ Percentage mark up

$\bar{m} = m \left(\frac{V}{X} \right) = \frac{\alpha F}{X_0} + g_0$ Nominal mark up

g_0 Normal profit per unit of output

α Export share

$\frac{\alpha F}{X_0}$ Fixed unit costs at normal output

A constant nominal mark up \bar{m} is added to variable unit cost $\frac{V}{X}$. The mark up assures entrepreneurs the target level of the profit margin under conditions of normal capacity utilization g_0 and covers fixed unit costs at normal output $\frac{\alpha F}{X_0}$. The size of the mark up is determined by long run considerations like the level of investment, expected long run demand and potential competition. Once, the nominal mark up is determined, short run changes of demand and fixed unit costs do not influence the mark up and export prices. Only changes in variable unit costs will increase prices at an unchanged nominal mark up \bar{m} . Changes in the nominal mark up will only occur, when the cost structure of the firm will be substantially shifted, e.g. when the firm introduces technical change.⁵⁾

Mark up and Technical Change

Increases in investment costs which generally accompany technical change make a recalculation of the mark up necessary. For entrepreneurs want increased investment costs to be covered by prices. Entrepreneurs determine the new mark up in such a way as to cover the increase in fixed costs at normal output $\frac{\alpha F}{X_0}$ caused by the new production technique, leaving the profit margin g_0 unchanged. The new nominal mark up \bar{m}' , increases, therefore, by the same amount as fixed costs at normal output have increased due to technical innovation.

$$\bar{m}' - \bar{m} = \left(\frac{\alpha F'}{X_0} + g_0 \right) - \left(\frac{\alpha F}{X_0} + g_0 \right) = \frac{\alpha F'}{X_0} - \frac{\alpha F}{X_0} \quad (2)$$

\bar{m} nominal mark up at the old production technique

\bar{m}' nominal mark up at the new production technique

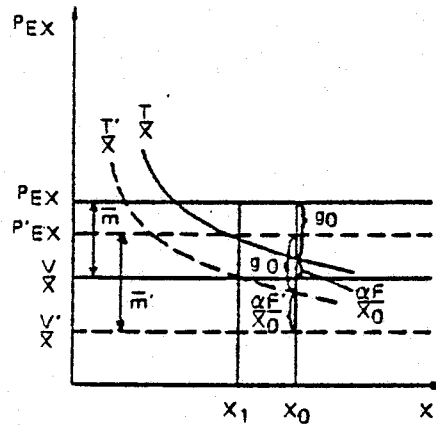
$\frac{\alpha F}{X_0}$ fixed costs at normal output at the old production technique

$\frac{\alpha F'}{X_0}$ fixed costs at normal output at the new production technique

This is also shown in figure 1. Technical change reduces variable costs from $\frac{V}{X}$ to $\frac{V'}{X}$ and increases fixed costs at normal output from $\frac{\alpha F}{X_0}$ to $\frac{\alpha F'}{X_0}$; T and T' are the corresponding total average cost curves. The entrepreneur increases,

therefore, his mark up on prices from \bar{m} to \bar{m}' ; the new mark up \bar{m}' exactly covers increased fixed costs at normal output $\frac{\alpha F'}{X_0}$ leaving the profit margin g_0 unchanged. Lower variable unit costs $\frac{V'}{X}$ together with the new mark up \bar{m}' , in turn, allow entrepreneurs to reduce the Schilling export price from P_{EX} to P'_{EX} .

Figure 1



Dynamic Price Setting

The preceding analysis was pursued under the assumption that firms work under conditions of normal capacity utilization. But this need not be the case. Beside other factors, exchange rate changes may influence firms capacity utilization. By using mark up pricing procedures, entrepreneurs pass on exchange rate revaluations to foreign demanders which spoils competitiveness leading to reduced exports and hence lower capacity utilization.

In this disequilibrium - entrepreneurs do not sell the export level X_0 which secures 'normal' utilized capacities - firms base their price calculation on the following profit aim:

$$g_t = g_0 - \left(\frac{\alpha F_t}{X_t} - \frac{\alpha F_t}{X_0} \right) \quad (3)$$

- g_t disequilibrium profit margin
- g_0 target level of the profit margin
- F_t fixed costs changing through time due to technical change
- $\frac{\alpha F_t}{X_0}$ fixed costs at normal output under changing production technique
- $\frac{\alpha F_t}{X_t}$ actual fixed unit costs under changing production technique

When exports are reduced, entrepreneurs are prepared to accept a diminished profit margin g_t . They do not want actual fixed unit costs $\frac{\alpha F_t}{X_t}$ to be covered by prices, but only fixed costs with regard to (in the moment not realized) 'normal' capacity utilization $\frac{\alpha F_t}{X_0}$. They deduct, therefore, the costs of under utilized capacities ($\frac{\alpha F_t}{X_t} - \frac{\alpha F_t}{X_0}$) from their normal profit margin g_0 . Based on this profit aim, firms disequilibrium export prices while production technique is changing are

$$P_{EX_t} = (1+m_t) \left(\frac{V_t}{X_t} \right) \tag{1'}$$

$$P_{EX_t} = \left(1 + \frac{\frac{\alpha F_t}{X_0} + g_0}{\frac{V_t}{X_t}} \right) \left(\frac{V_t}{X_t} \right) \tag{1a'}$$

$$P_{EX_t} = \frac{V_t}{X_t} + \frac{\alpha F_t}{X_0} + g_0 \tag{1b'}$$

P_{EX_t} disequilibrium Schilling export price under changing production technique

$\frac{V_t}{X_t}$ variable unit costs under changing production technique

$m = \frac{\frac{\alpha F_t}{X_0} + g_0}{\frac{V_t}{X_0}}$ percentage mark up under changing production technique

$\frac{\alpha F_t}{X_0}$ fixed unit costs at 'normal' output under changing production technique

g_0 target level of profit margin

At time t a percentage mark up m_t is added due to technical change decreased variable unit costs $\frac{V_t}{X_t}$. The mark up m_t consists of due to technical change increased fixed unit costs at 'normal' output $\frac{\alpha F_t}{X_0}$ at time t and the unchanged 'normal' profit margin g_0 . The Schilling export price at time t P_{EX_t} does not reflect the costs of under utilized capacities. According to the profit aim (3), entrepreneurs carry these costs themselves.

Export price equation (1b') is obtained by substituting the profit aim (3) into price equation (1c')

$$P_{EX_t} = \frac{V_t}{X_t} + \frac{\alpha F_t}{X_t} + g_t \quad (1c')$$

$$P_{EX_t} = \frac{V_t}{X_t} + \frac{\alpha F_t}{X_0} + g_0 \quad (1b')$$

Equation (1b') was used for the empirical test of the price hypothesis.

3. Testing the Price Hypothesis

Data used

The estimation of price equation (1b') for eleven Austrian industries required data for export prices on industry level. Since the Austrian trade statistics are organized by an international classification system (Standard International Trade Classification - SITC) which has no connection to the Austrian industry classification, a special computation was done which related the trade statistics to the industry statistics so that export unit values on industry level could be calculated after the Paasche formula.⁶⁾

For testing the export price hypothesis, the following procedure was chosen. Export prices for the industries were calculated according to price equation (1b'). These hypothetical export prices were then regressed against the actual export price development of the different industries.

The price hypothesis was tested twice. The hypothetical export prices PXBRT for the eleven industries were on the one hand regressed against the one-digit SITC-export price indices PXBR76 and on the other hand against the newly calculated export price indices of the industries BRGS76. The regression of the hypothetical export prices against the SITC-export price indices caused the following problems. The SITC-export price indices are aggregated according to an international classification which has no direct connection to the Austrian industry classification. The one-digit SITC-export price indices consist, therefore, in many cases of two or more Austrian industries. So, for example, the SITC 6 export price index. It includes products of the casting, leather, paper, and of the textile industry. The SITC 5 export price index in turn contains only products of the chemical industry while the SITC 7 export price index mainly includes products of the electrical and the machine industry.

In the regression of the hypothetical export prices against the newly calculated export price indices of the industries BRGS76, the following industry classification differences between the two prices have to be taken into account. The hypothetical export prices PXBRT are based on the organizational structure of the Chamber of Commerce (Fachverbandsgliederung), whereas the new export price indices of the industries are calculated according to the Input-Output-Classification. Since the components of the hypothetical export prices (variable unit costs, fixed costs, profits) were not available in the required IO-Classification, the hypothetical export prices had to be calculated according to the Chamber of Commerce classification. These differences in the aggregation of the statistical material should be borne in mind when the empirical results are interpreted.

Methodological Procedure

In order to calculate the hypothetical export prices for the different industries, price equation (1b') had to be modified. Since data for foreign inputs on industry level were only available for the year 1976, it was assumed, that the required foreign VOR_{AUS} and home inputs VOR_{INL} for the production of one unit output Q of an industry staid constant over time. The assumption of constant input coefficients was especially implausible for those industries with a high share of inputs on variable costs. For, these industries might have made great efforts to reduce costs by rationalizing on inputs.

The constant foreign and domestic input coefficients are ⁷⁾

$$\frac{VOR_{AUS}}{Q} = a \quad \frac{VOR_{INL}}{Q} = i$$

so that export price equation (1b')

$$P_{EX_t} = \frac{wL_t}{Q_t} + \frac{P_{IMI_t} VOR_{AUS}}{Q} + \frac{P_{I_t} VOR_{INL}}{Q} + \frac{F_t}{Q_0} + g_0 \quad (1b')$$

changes to

$$P_{EX_t} = \frac{wL_t}{Q_t} + P_{IMI_t} \cdot a + P_{I_t} \cdot i + \frac{F_t}{Q_0} + g_0 \quad (1b'')$$

Equation (1b'') was used for the calculation of the hypothetical export prices. Normal output Q_0 in price equation (1b'') was thereby defined as

$$Q_0 = \frac{Q_t}{K_t}$$

K_t capacity utilization at time t (WIFO-Data base)

Q_t actual output at time t (WIFO-Data base)

Q_0 normal output

As a proxy for the target level of profit margin g_0 , the real (deflated by the inflation rate) average profit margin during the investigation period was taken.

The following equations were estimated in testing the export price hypothesis

$$PXBR76 = e \text{ PXBRT } 1970-79 \quad (A)$$

$$BRGS76 = f \text{ PXBRT } 1971-79 \quad (B)$$

PXBR76 SITC-export price indices

PXBRT hypothetical export prices calculated according to equation (1b'')

BRGS76 new calculated export price indices of the industries

Equation (A) estimated how well the hypothetical export prices explained the SITC export price development and equation (B) investigated how good the hypothetical export prices fitted the export price indices of the industries. Thus, the export price hypothesis would have a high explanatory power, when the estimated regression coefficients e and f were near one. Equations (A) and (B) were estimated in levels as well as in first differences because of two reasons. First, in the estimation of first differences a statistical significance of the regression coefficients e and f caused by trend could be avoided. Second, in many cases the Durbin-Watson-Test indicated that a first order autocorrelation existed. The satisfying results of the Durbin-Watson-Test in the estimation in first differences suggested that the bad results for the Durbin-Watson-Test in the estimation in levels were caused by first order autocorrelation.

4. Empirical Findings

The empirical test of price behavior in the Austrian export sector shows that the export price hypothesis can give a good explanation of the actual price development (measured by SITC-export prices as well as by the export prices of the industries) in most industries. Only for the paper, the glass and the food industry the null hypothesis that exporters calculate their prices on the basis of costs, had to be rejected at the 5 per cent level of significance. In most industries, the regression coefficients e and f were near one in the estimation in levels as well as in first differences (tables 1 and 2). In those industries in which the estimated regression coefficient deviated from one substantially (as for example in the chemical industry), it was tested whether the coefficient differed significantly from one. As tables 1 and 2 show, the coefficient e_2 and f_2 were not significantly different from one in the iron and metal goods, machine and steel, non-ferrous metal, leather and the chemical industry.

As expected, the constant term was not significant in the estimation in levels except in equation (A) in the electrical, motor and the iron and metal goods industry and in equation (B) in the chemical, textile, motor and the iron and metal goods industry. The significant constant term in these industries might have been caused by the following factors. First, the difference in the aggregation between the hypothetical and the industry export prices might have been

caught by the constant term. Second, the higher actual export prices of the textile, iron and metal goods, non ferrous metal, motor and chemical industry than expected theoretically might have been a result of product innovation and structural changes in these industries. As an unit value, the SITC export price indices as well as the export price indices of the industries increase as a result of changes in the product composition to higher quality products. An increase in the export unit value indicates, therefore, an increase in price and/or structural changes in the commodity composition. These structural changes, however, would only be reflected in the hypothetical export prices at the same time when they are accompanied by increases in costs. Therefore, the significant constant term might have caught this difference in response to structural changes between the hypothetical export prices and the export unit values. Third, the assumed constant input coefficients of the year 1976 might have underestimated the level of export prices before 1976 and overestimated them after 1976. Furthermore, the use of the average profit margin of the investigation period as a proxy for the 'normal' profit margin might have biased the level of prices as well.

In many industries, the statistical results in the estimation in first differences were improved by introducing a dummy variable for an untypical year. These were especially the years 1973 and 1975, in which extraordinary high cost increases occurred which could not be passed on to prices; and the years 1974 and 1979, when the oil price increases allowed entrepreneurs to increase prices more than proportionally to cost increases. For the year 1974, a dummy variable was used in the chemical industry, for 1973 in the iron and metal goods and the non-ferrous metal industry and for 1979 in the motor and electrical industry.

In the electrical, motor, machine and steel and the leather industry the actual export prices followed the hypothetical export prices one year behind. Thus, in these industries cost changes were not immediately passed on to prices but only after the elapse of one year, as the satisfying statistical results for the one year lagged hypothetical export price of these industries indicate.

As a comparison of the statistical results in table 1 and 2 shows, in most industries the export price hypothesis explained the SITC export prices better than the export prices of the industries. Despite of this difference in the

goodness of the statistical results, the conclusions to be drawn from equation (A) and (B) are very similar. In both equations the export price hypothesis proved to be best supported in the iron and metal goods, machine and steel, electrical, textile and the non-ferrous metal industry, while in the glass and the food industry the hypothetical export prices were not significant for the SITC export prices as well as for the export prices of the industries. Only in the paper industry the results for the hypothetical export prices differed in significance.

The empirical findings for the price hypothesis were further supported by the relative low export price elasticities of most industries.⁸⁾ (See last column in tables 1 and 2). The export price elasticity reflects the size of market power an industry possesses. The relative low export price elasticities of most industries indicate that by using mark up pricing Austrian exporters could pass on exchange rate revaluations to foreign demanders without losing market shares substantially.

Table 1

Regression of the hypothetical export prices against the SITC-export prices
1970 - 79

$$PXBR76 = ePXBR75 + c \quad (A)$$

industry	e_1	e_2	t-statistics	R^2	DW	η_{RP}
iron and metal goods	1,02	0,86 ⁺)	103,38 4,16	0,970 0,409	1,14 2,06	-0,25
machine and steel	0,99	0,83(1) ⁺)	129,46 4,83	0,978 0,424	1,95	-0,43
electricals	0,99	0,99	159,06 11,36	0,991 0,866	0,654 2,09	-0,14
textiles	1,00	1,09	165,17 6,14	0,981 0,700	1,68 1,67	-0,001
non-ferrous metals	0,94	1,3 ⁺)	53,56 3,67	0,905 0,611	2,3 2,6	-0,07
chemicals	1,01	1,85 ⁺)	31,76 3,16	0,606 0,863	1,82 0,82	-1,12
motor	0,98	0,76 ⁺)	53,44 6,58	0,963 0,621	0,40 2,03	-0,86
leather	0,96(1)	0,86(1) ⁺)	68,91 3,57	0,882 0,615	.	-0,34
paper	1,00	1,2	101,14 3,17	0,947 0,374	1,9 2,2	-0,59
glass	1,00	0,27*	38,13 0,45	0,741 0,012	1,31 1,82	-0,69
food	0,97	0,64*	49,4 1,23	0,683 0,20	0,89 1,92	-0,82

e_1 regression coefficient in the estimation in levels

e_2 regression coefficient in the estimation in first differences

+ not significantly different from one (at the 5 per cent level of significance)

* not significantly different from zero (at the 5 per cent level of significance)

η_{RP} export price elasticities of the industries

(1) the hypothetical export prices PXBR75 were estimated one year lagged

Table 2

Regression of the hypothetical export prices against the export prices for the industries 1971 - 79

$$\text{BRGS76} = f \text{ PXBRT} + c \quad (\text{B})$$

industry	f_1	f_2	t-statistics	R^2	DW	η_{RP}
iron and metal goods	1,00	1,58	32,19 7,11	0,988 0,804	0,243 2,3	-0,25
machine and steel	1,00	1,3(1) ⁺	96,15 6,27	0,959 0,750	2,5	-0,43
electricals	0,97(1)	1,2(1)	54,76 4,46	0,843 0,711		-0,14
textiles	1,01	0,58	67,14 4,44	0,939 0,424	0,374 1,10	-0,001
non-ferrous metals	1,04	1,57 ⁺	33,97 3,89	0,618 0,793	2,7 2,4	-0,07
chemicals	0,91	3,08 ⁺	12,15 2,72	0,882 0,482	0,23 1,29	-1,12
motor	1,00(1)	1,2(1)	43,54 3,99	0,946 0,450		-0,86
leather	0,93(1)	0,79(1)	37,04 2,16	0,804 0,342		-0,34
paper	0,97	1,27*	32,83 1,49	0,502 0,383	1,08 1,9	-0,59
glass	1,2	1,25*	19,81 0,97	0,154 0,068	1,17 2,5	-0,69
food	1,19	0,31*	30,24 0,29	0,238 0,008	1,24 2,2	-0,82

f_1 regression coefficient in the estimation in levels

f_2 regression coefficient in the estimation in first differences

+ not significantly different from one (at the 5 per cent level of significance)

* not significantly different from zero (at the 5 per cent level of significance)

η_{RP} export price elasticities of the industries

(1) the hypothetical export prices PXBRT were estimated one year lagged

5. Summary

The empirical study of export price behavior in eleven Austrian exporting industries came to the following conclusion. The price hypothesis that Austrian exporters calculate their prices on the basis of costs was supported at the 5 per cent level of significance for most industries except for the paper, the glass and the food industry. These results were obtained for the SITC export prices as well as for the industry export prices as a measure for the actual export price development.

As the relative low export price elasticities for most industries indicate, this price behavior of Austrian exporters turned out to be rational, since exchange rate induced export price increases led only to small export and hence export profit reductions. Furthermore, the low export price elasticities suggest that Austrian exporters possess relative high market power on foreign markets which gives them some autonomy in setting their prices. The empirical findings suggest that the assumption of price taking behavior in many macroeconomic models for open economies needs to be reexamined in its validity.

FOOTNOTES

- 1) Macroeconomic Models AUKRUST (1977), DORNBUSCH (1975) and CALMFORS (1979).
- 2) On monopolistic competition in international trade see KRUGMAN (1980), for the slow reaction of demand to changed market conditions OKUN (1981).
- 3) For empirical findings in other studies see MARIN (1984).
- 4) For the use of rules of thumb in price decision making in oligopolistic markets see HALL & HITCH (1939), SIMON (1965), CYERT & MARCH (1963).
- 5) In order to leave the nominal mark up \bar{m} constant, the percentage mark up m always changes when variable unit costs change.
- 6) Many thanks are due to Harald Hilscher and Mag. Gerhard Skolarz for carrying out the computations.
- 7) Assuming that input coefficients for the export production are the same as for the whole production.
- 8) For the estimation of export price elasticities for the Austrian industries see MARIN (1983b).

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