

Tourism and the Business Cycle

**Econometric Models for the Purpose
of Analysis and Forecasting of Short-Term
Changes in the Demand for Tourism**

STEPHAN SCHULMEISTER

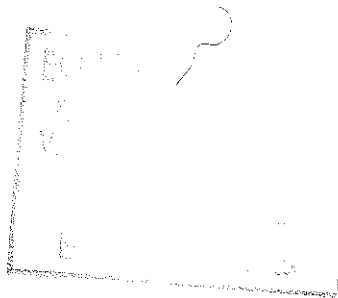


**AUSTRIAN INSTITUTE
FOR ECONOMIC RESEARCH**

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Preface

The central role which tourism plays in the Austrian economy for the well-being of a large number of its citizens has been recognized for a long time. But until now the lack of suitable analytical tools prevented this role from becoming fully visible in its macroeconomic aspects. Such aspects were therefore not always given full consideration in economic and tourism policy decisions. The fact that tourism is not treated as a separate production sector in the National Income Accounts is just one aspect of this analytical deficiency.

This state of affairs prompted me already in 1973 to ask the Austrian Institute for Economic Research to investigate, in how far it seemed possible to create a clearer and more precise picture of the role of tourism within the Austrian economy. The result of this research effort by the Austrian Institute was a general model for the purpose of description and analysis of tourism [65]. This first step was followed up by another study (also financially supported by the Austrian Ministry of Commerce, Trade and Industry) in which the Austrian Institute for Economic Research built a model depicting the longer-term development of international tourism [67]. A short version of this study was also translated into English [68].

A third study, again financed by this Ministry, set out to investigate the causal relationships between tourism and the general business cycle. This study covers the period from 1961 to 1973 and shows to what extent short-term determinants, such as variations in total income or in price levels, and some other factors, e.g. school vacations or weather conditions, influence the demand for tourism in Austria [70].

The so-called "energy crisis" of 1973 was accompanied, among others, by a change in the demand pattern for tourism. This new development made it necessary to check, whether and to what extent the existing econometric models of tourism behavior also applied to the years after 1973, and whether these models could still be used to make sensible forecasts. Again, the Ministry of Commerce, Trade and Industry supported this supplementary study, which has been finished in the meantime [73].

I have decided to have an abbreviated version of these two latter studies translated into English, in order to facilitate access to these important results for a larger international readership. I am convinced that the present study will contribute towards an intensive international exchange of opinion and experience on the role of tourism in our economies.

Dr. Josef Staribacher
Federal Minister of Commerce,
Trade and Industry

Vienna, March 1979

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Tourism and the Business Cycle

Econometric Models for the Purpose of Analysis and Forecasting of Short-Term Changes in the Demand for Tourism

Stephan Schulmeister

1. Introduction

Up to now two major studies concerning the connections between the demand for tourism and the business cycle in general have been drawn up by the Austrian Institute for Economic Research:

- Tourism and the Business Cycle [70]
- Forecasting Models for Tourism [73]

The first study described the short-term changes in tourism during the sixties and the early seventies by means of econometric methods.

The second investigation dealt with changes in tourism which had occurred since the "energy crisis". Special emphasis was put on the question, to which degree models of tourism which had been estimated on the basis of data up to 1973 were able to "explain" the developments in tourism since the "energy crisis". Quarterly forecasts for 1978 and 1979 demonstrated the practical value of these models.

The present investigation represents a summary of these two studies. Objects of analysis are the demand for tourism by Austrians within Austria and abroad, as well as the demand by foreigners for tourism in Austria. In order to get a good grasp of the latter, total demand of the most important countries of origin in international tourism had to be investigated. Short-term changes in travels abroad by West-Germans are the most important variable in the analysis.

So far no study has been published in Austria or abroad which analyses short-term fluctuations in tourism in such detail. For this reason this paper was translated into English with financial assistance by the Austrian Ministry of Trade, Commerce and Industry: the case of Austria shall serve as an example for the explanatory power and practical value of econometric models of the demand for tourism. The models presented contain also variables which have hitherto been neglected in empirical analyses of tourism, such as the influence

of consumer expectations, of weather conditions or of changes in vacations dates. Thus the present study attempts to contribute towards a better understanding of international tourism.

2. Objectives, Methods and Structure of the Study

In the first section we shall analyze short-term changes in tourism starting with the beginning of the sixties up to the "energy crisis". Emphasis is put on qualitative and quantitative analysis. This requires the following investigations:

- Identification of the most important determinants for the demand for tourism.
- Investigation to what degree simultaneous effects of such determinants explain short-term fluctuations in tourism.
- Estimation of the quantitative influence of each determinant and of the time lag with which it affects tourism.

The case of Austria has been chosen to analyze these relationships. Thus the study comprises all forms of tourism connected with Austria, such as:

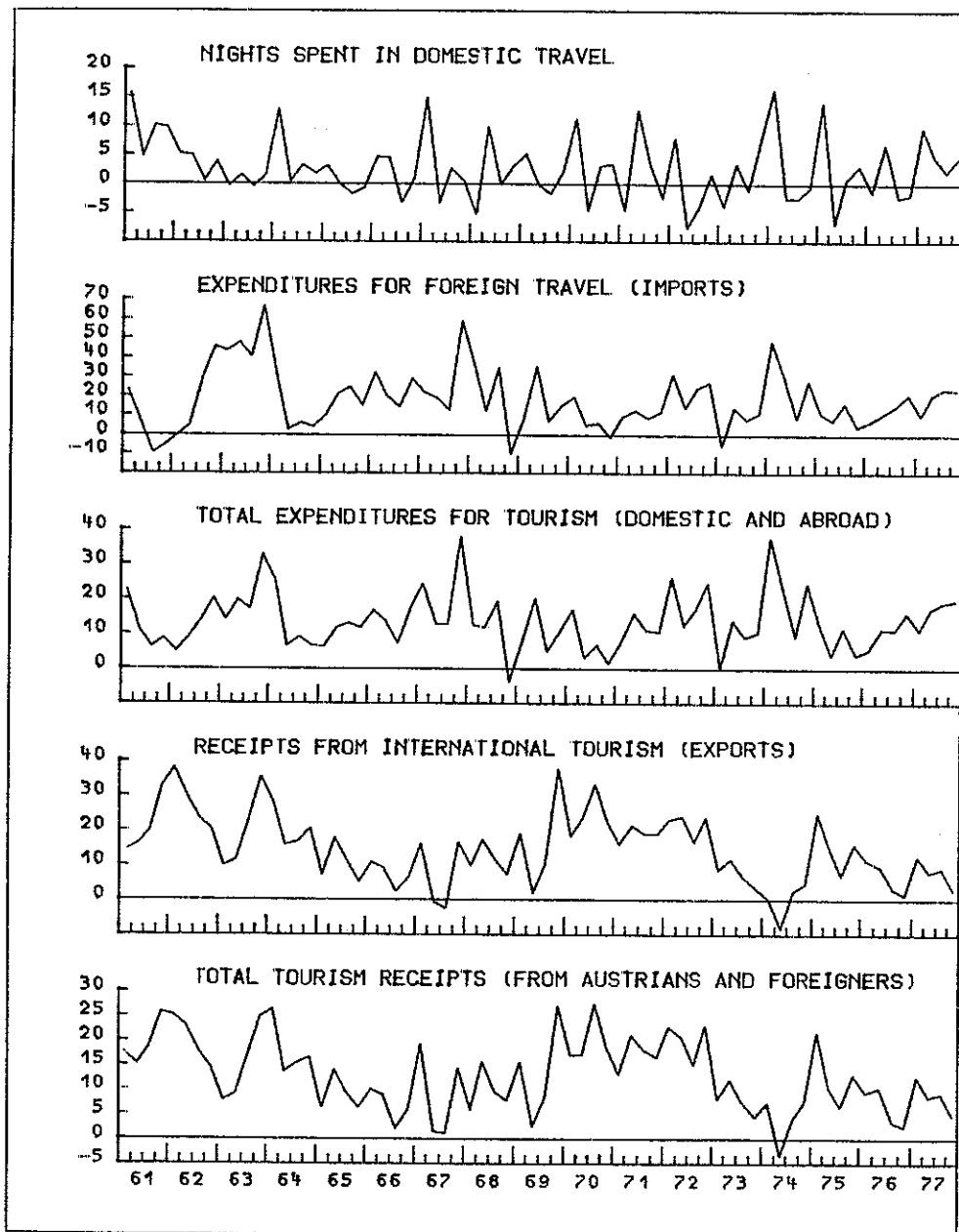
- Demand for tourism by Austrians within Austria (domestic tourism).
- Demand for Tourism abroad by Austrians (Austria's imports in international tourism).
- Demand for tourism by foreigners in Austria (Austria's exports in international tourism).
- Total demand for tourism by Austrians in Austria and abroad (Austria's total demand for tourism)
- Demand for tourism by Austrians and foreigners in Austria (total demand for tourism within Austria)(1).

Figure 1 presents the objectives of this section more concretely: it shows the quarterly changes in the five types of demand for tourism investigated, measured in annual rates of growth. At the center of this investigation are those determinants which together can best explain these seemingly erratic changes in the growth rates. This is realized with the aid of

(1) For the role of the various tourism demand flows within the total economy see [72]

Short-Term Fluctuations in the Demand for Tourism
Annual Change in Percent

Figure 1



econometric equations which make economic as well as statistical sense. The values derived from the equations shall fit the actual data as close as possible. The coefficients in the equations quantify the influence of the various determinants (independent or explanatory variables) on the demand for tourism (dependent variable). Thus the latter is "explained" by the combined and simultaneous effects of the determinants. This method allows to find answers to the following questions:

- How strong is the influence of economic determinants, such as income, prices and other factors on the demand for tourism?
- How long does it take these influences to become effective?
- What is the importance of extra-economic variables, such as weather and changes in vacation dates?
- How strong is the reaction of the demand for tourism to changes in expectations on the economic situation (socio-psychological variable)?
- What is the contribution of each independent variable during certain sub-periods, and which part of the demand for tourism remains unexplained by the model?

The second section (Chapter 4) deals with tourism since the "energy crisis". It comprises the following items:

- Thorough investigation and description of tourism developments since the "energy crisis".
- Analysis of the determinants which contributed to this situation.

Two approaches are employed:

- Qualitative inter-disciplinary analysis of the rupture in the expansion of tourism; the influence of socio-psychological and political factors on tourism and its demand structure is investigated.
- Application of the models estimated with data up to 1973 to the period after the "energy crisis". A comparison of ex-post-model forecasts with actual data gives an answer to the question whether tourism behavior has changed since the "energy crisis".

The following questions will be answered by this investigation:

- To what degree did the “energy crisis” and its economic and socio—psychological effects generate a break in the expansion of tourism of the sixties and early seventies?
- Was Austria more or less affected by this situation than her most important competitor countries?
- Which shifts in the structure of demand for tourism were caused by the “energy crisis”?
- What were the most important determinants of these developments?
- What are the effects of the international economic situation since 1973 on the future of tourism and thus on its short— and medium—term forecasts?

The third section (Chapter 5) contains model forecasts for 1978 and 1979. They are supposed to demonstrate the value of econometric methods for practical purposes

These three sections form the first and most important part of the study. The results of the econometric analysis and of the forecasts are presented in non—technical language. The second part (Chapters 6 to 8) contains a more technical documentation of the various investigations.

In the fourth section (Chapter 6) the connection between tourism and general economic theory is discussed. This leads to the formulation of hypotheses on the determinants of the demand for tourism; finally a general economic model of tourism is developed (Chapter 7).

The fifth and last section (Chapter 8) deals with empirical—statistical problems in the individual variables and with the formulation and estimation of relationships between the variables for the purpose of developing an econometric model of tourism. The results are presented in mathematical form.

The second part of the study puts emphasis on theoretical and methodological problems, which requires a more formal presentation. This part presupposes a basic knowledge of economic theory and econometrics on the part of the reader.

3. Determinants of Short—Term Fluctuations in the Demand for Tourism

3.1 Overview

In this section the investigation is limited to the period from the beginning of the sixties to the “energy crisis” at the end of 1973. Earlier periods have been neglected because

they were still influenced by special factors of the post-war reconstruction period. This is especially true for the demand for tourism: between 1951 and 1961 the number of nights spent by Austrians in Austria increased by an average annual rate of 5,0 %, those by foreigners by 18,0 %. During the following decade the average growth rates fell to 1,7 % and 8,4 %, respectively. In the first instance, the period since 1973 is neglected, because there are indications that the "energy crisis" changed the behavior patterns in tourism, at least in the short run. This question will subsequently be examined in detail.

The present study measures and analyzes demand for tourism in the form of annual growth rates. This type of transformation is justified by the following – mainly economic – considerations:

- Short term developments are best represented by changes in annual growth rates.
- Since the end of World War II cyclical changes manifested themselves in changes in growth rates and no longer in changes in the absolute levels of production and demand (at least up to the recession 1974/75).

The transformation into growth rates offers two additional advantages:

- Elimination of the seasonal pattern which is very strong for tourism.
- A high degree of variation in the individual variables which facilitates identification of their respective quantitative influence (avoidance of multi-collinearity).

3.2 Domestic Tourism in Austria

3.2.1 Development 1961 to 1973

Table 1 shows demand of Austrians for tourism in Austria and abroad as well as the most important determinants for its cyclical fluctuations. We start out with an analysis of these connections for domestic tourism

The variables which represent domestic demand for tourism are the number of nights spent by Austrians within Austria as well as the number of arrivals. Monetary variables, such as tourism expenditures offer no additional information, since they are estimated on the basis of the number of nights spent [65].

A comparison of columns 1 and 5 exhibits no common pattern between domestic demand for tourism and the business cycle (measured by the fluctuations of real Gross National Product). It would appear that the boom years of 1960/61 correspond to the highest growth

rate in nights spent by Austrians, but on the other hand the economic situation of 1963 would not have led one to expect stagnating nights. In the same way the increase in domestic tourism 1964 and the backlash in the following year cannot be explained by the economic situation, but must rather have been influenced by the Olympic Games in Innsbruck [69] which represent a special factor.

The severest recession during the period surveyed (1967) coincided with an above-average expansion of domestic tourism, which however slowed down considerably during the two following years. On the other hand, the relatively strong increases in nights spent during 1970 and 1971 seem to correspond to the general business situation, but this concurrence is again voided by a reduction in 1972 and a stagnation in 1973

If one considers a multitude of determinants for the demand for tourism (table 1 contains a number of the most important ones), fluctuations in domestic tourism can be explained more easily. We will attempt to portray this simultaneous process using the years with the highest and the lowest growth rates in nights spent by Austrians.

The very high growth rate of 1961 is easily explained by the increase in real incomes (column 7) as well as by the significant drop in unemployment (column 13) and by very favorable weather conditions (in relation to the previous year; column 15). To measure unemployment we used unemployment by females, because households with more than one income earner travel more than those with a single earner; in addition, this variable fluctuates more than that of total unemployment and thus achieves higher explanatory power as a proxy for economic expectations. The weather index combines snowfall in winter with the number of sunshine days during the summer; since this variable fluctuates widely, its change (in absolute terms) in relation to the previous year is used for these calculations. The high value of the weather variable in 1961 shows that in no other year weather conditions improved more (with the exception of 1973). Extremely rapid expansion of domestic tourism in conjunction with a fall in the number of nights spent by Austrians abroad (column 4) is a very unusual constellation. Thus we suspect that disturbances occurred abroad which caused a shift of the demand for tourism towards Austria.

The year 1964 was highly influenced by the event of the Olympic Winter Games [69]; in addition, the relatively low expansion of private consumption (column 8) in conjunction with the significant increase in incomes (in nominal term + 9 %) might have caused a deflection of expenditures in favor of domestic tourism. Furthermore, vacations in Austria had become slightly cheaper (relative to foreign countries) in 1964 and the two previous years (column 12).

In 1967 the number of nights still increased more than average in spite of the recession, since incomes were still rising and weather conditions were quite favorable compared with the previous year.

Table 1

Demand for Tourism by Austrians and its Determinants in the Business Cycle

	Domestic Tourism	International Tourism		Business Cycle	Determinants of the Demand for Tourism			
	Number of Nights	Expenditures		Nights Spent Abroad	GNP	Wages and Pensions		Private Consumption
		Nominal	Real		Real	Nominal	Real	Nominal
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Annual Growth Rates								
1961	+ 9,7	- 1,3	- 3,9	- 0,6	+ 5,6	+ 11,1	+ 7,0	+ 9,2
1962	+ 2,6	+ 21,8	+ 16,8	+ 10,7	+ 2,6	+ 10,7	+ 6,4	+ 9,6
1963	+ 0,2	+ 48,4	+ 42,0	+ 11,2	+ 4,2	+ 8,6	+ 5,3	+ 8,7
1964	+ 3,9	+ 7,6	+ 2,6	- 2,5	+ 6,2	+ 9,2	+ 6,1	+ 7,1
1965	- 0,5	+ 20 0	+ 16,3	+ 10,0	+ 3,4	+ 8,5	+ 4,3	+ 8,7
1966	+ 0,2	+ 21,2	+ 18,0	+ 11,4	+ 5,0	+ 9,7	+ 7,0	+ 6,5
1967	+ 3,3	+ 26,6	+ 22,8	+ 2,9	+ 2,4	+ 9,2	+ 5,3	+ 7,2
1968	+ 1,3	+ 16,7	+ 14,9	- 1,4	+ 4,4	+ 7,0	+ 4,4	+ 6,5
1969	+ 0,4	+ 15,1	+ 11,7	+ 14,8	+ 5,9	+ 7,4	+ 4,1	+ 6,5
1970	+ 3,0	+ 6,2	- 2,5	+ 0,7	+ 7,8	+ 8,2	+ 4,1	+ 9,6
1st Qu.	+ 11,3	+ 19,9	+ 12,8		+ 7,2	+ 8,7	+ 5,5	+ 10,0
2nd Qu.	- 4,7	+ 5,1	- 3,1		+ 8,3	+ 8,2	+ 4,1	+ 8,1
3rd Qu.	+ 3,1	+ 6,3	- 3,4		+ 7,5	+ 7,9	+ 3,4	+ 10,5
4th Qu.	+ 3,5	- 1,2	- 9,8		+ 7,9	+ 8,2	+ 3,7	+ 9,6
1971	+ 3,1	+ 10,7	+ 5,8	+ 4,7	+ 5,3	+ 14,6	+ 10,1	+ 10,6
1972	- 1,8	+ 23,7	+ 16,0	- 1,7	+ 6,4	+ 12,6	+ 6,2	+ 14,8
1973	+ 0,4	+ 7,9	+ 3,9	+ 11,7	+ 5,8	+ 16,5	+ 9,4	+ 10,9

In 1972 the number of nights spent by Austrians fell by 2 % in spite of a rapid increase in incomes. This was probably caused by a shift of expenditures towards other types of consumption and relatively unpleasant weather conditions.

The low growth rate in 1965 was not only caused by the direct effect of the Olympics, but also by bad weather and price increases (column 10) as a consequence of the Olympic Games.

Demand for Tourism by Austrians and its Determinants in the Business Cycle

Determinants of the Demand for Tourism

	CPI	Tourism Prices			Expectations	Special Factors	
	in Austria	Abroad	Relative Austria/ Abroad	Female Unemployment Rate	School Vacation Days ¹⁾	Weather ¹⁾	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Annual Growth Rates							
1961	+ 3,5	+ 3,5	+ 2,5	+ 2,2	- 24,1	+ 3,0	+ 48,7
1962	+ 4,4	+ 4,4	+ 4,3	- 0,5	- 1,9	- 1,0	- 14,6
1963	+ 2,7	+ 2,7	+ 4,6	- 1,9	+ 6,3	- 1,0	- 17,3
1964	+ 3,9	+ 3,9	+ 4,7	- 1,4	- 1,2	- 2,0	+ 8,2
1965	+ 4,9	+ 4,9	+ 3,8	+ 1,4	+ 1,4	+ 1,0	- 35,1
1966	+ 2,2	+ 2,2	+ 2,3	+ 0,1	- 2,4	+ 3,0	+ 24,6
1967	+ 4,0	+ 6,0	+ 3,1	+ 2,8	+ 5,8	+ 1,0	+ 23,3
1968	+ 2,8	+ 2,3	+ 1,7	0,0	+ 1,2	- 4,0	- 42,3
1969	+ 3,0	+ 2,8	+ 3,2	- 0,2	- 6,4	0,0	+ 36,2
1970	+ 4,4	+ 3,1	+ 8,6	- 5,0	- 5,8	+ 1,0	- 1,2
1st Qu.	+ 3,9	+ 2,3	+ 6,3	- 3,8	- 9,0	+ 9,0	+ 111,4
2nd Qu.	+ 4,2	+ 2,8	+ 8,5	- 5,6	- 3,7	- 9,5	- 74,1
3rd Qu.	+ 4,7	+ 3,1	+ 10,0	- 6,4	- 3,5	+ 0,5	+ 6,6
4th Qu.	+ 4,8	+ 4,4	+ 9,5	- 4,1	- 5,2	0,0	- 48,7
1971	+ 4,7	+ 5,4	+ 4,9	+ 1,6	- 3,5	- 1,0	+ 5,0
1972	+ 6,4	+ 8,6	+ 6,3	+ 2,5	- 3,6	+ 3,0	- 83,7
1973	+ 7,5	+ 12,4	+ 4,6	+ 9,8	- 14,7	+ 1,0	+ 57,2

1) First order differences against the previous year.

The pattern becomes even more complicated when one attempts to analyze quarterly data. Quarterly data actually lie at the core of this investigation; for the sake of simplicity of presentation in table 1 only the year 1970 is subdivided into quarters. During the 1st quarter of that year the number of nights increased by 11 1/2 %, during the second quarter it fell by 4 1/2 %. This can be primarily explained by a shift in vacation days between quarters due to the timing of Easter (column 14). For statistical reasons this shift is also

measured in terms of first order differences (in the 1st quarter of 1970 there were 9 vacation days more, in the next quarter 9 1/2 days less than one year earlier).

The above remarks are intended to show that the short-term development of domestic tourism has to be understood as the result of a complex combination of various factors. It takes more formal (econometric) procedures to analyze them satisfactorily. Such an analysis is designed to answer the following questions:

- Which combination of determinants explains best short-term fluctuations in domestic tourism?
- Which is the direction of influence of each of the determining variables (positive or negative)?
- How long does it take for each of the determinants to exert its influence?
- How high is the specific influence of each explanatory variable (quantitative influence)?

3.2.2 Econometric Results

A series of estimation attempts showed that in general the following combination of variables can best explain change in the number of nights and of arrivals:

	Direction of influence ¹⁾	Time lag (in quarters)
Average income during the previous year	+	0
Private consumption (in nominal terms)	-	1
Tourism Prices		
within Austria	-	0
relative prices Austria/competitors	-	2
Number of school vacation days	+	0
Weather in Austria	+	0
Tendency towards a second vacation in winter	+	-

1) The sign shows the qualitative influence: thus increases in income have a positive effect on domestic travel, those in private consumption, however, a negative one.

	Direction of influence ¹⁾	Time lag (in quarters)
In specific cases the following variables were added:		
Income distribution (ratio of per-capita income between employees and self-employed)	—	0
Unemployment (indicator for economic expectations of households)	—	0
Population pattern (share of inhabitants in communities with more than 10.000)	+	2

1) The sign shows the qualitative influence: thus increases in income have a positive effect on domestic travel, those in private consumption, however, a negative one

Changes in income take some time before they influence the domestic demand for tourism. Thus domestic travel is not influenced directly by one-time changes in income, but rather by the flow of income during the previous four quarters (which probably income earners consider to persist also into the future).

The difference in price changes for tourist services between Austria and abroad also takes one to two quarters to become effective. This is probably due to the fact that in general the decision between a vacation at home or abroad is made about one half year before the vacation actually starts.

Private consumption exhibits a time lag of only one quarter. This could mean that immediately after a push in consumption expenditures consumer cut down short vacations.

Changes in the urbanization patterns of the population have a lagged effect on domestic travel (by about two quarters).

All the other variables exert an immediate effect on tourism.

The quantitative influence of the explanatory variables on short-term fluctuations in tourism is estimated in the form of partial elasticities. Such an elasticity shows, by what percentage demand for tourism changes, when a determinant increases by 1%. The elasticities are called "partial" in order to emphasize the fact that one deals with the influence of one variable at a time. The simultaneous concurrence of all variables then determines the total changes in demand for tourism.

We can make this clearer using as an example the influence of changes in income on domestic travel. Disposable real income of wage and salary earners plus transfers (e.g. pensions)

proved to be the best income variable. An increase in income by 1 % was calculated to lead to a partial increase in nights spent by Austrians of around 1,2 %. Since the average length of stay increases in the long run (from 1961 to 1973 by 9,5 %), arrivals increase slightly less than nights; their income elasticity is around one. If instead of the income variable described above total income is used (real disposable income of all households) for the explanation, the elasticity coefficients increase slightly: a change in total income by 1 % leads to an increase in the number of nights of 1,4 % and of arrivals in the amount of 1,1 %.

A negative elasticity exists between domestic tourism and consumption expenditures (in nominal terms) of private households: its value is around $-0,5$. An increase in private consumption of 1 % thus leads to a partial fall in the number of nights and arrivals by Austrians of around 0,5 %.

Domestic price increases have diverse effects on domestic demand for travel. A price increase of 1 % leads to a fall in the number of nights by 0,3 % to 0,5 %. The reaction of arrivals is much weaker: the elasticity is only around $-0,2$ and is not statistically significant. This result appears plausible when one considers that price changes are normally only realized at the place of vacation; thus the only variable that can be influenced at that time is the number of nights spent.

Relative price changes have a similar effect on nights and arrivals: if prices for tourist services increase in Austria by 1 % more than abroad, domestic travel falls by around 0,2 %. It seems that price comparisons do have an influence on the choice between a domestic vacation and one abroad, even though their quantitative influence is low.

The timing of school vacations has the strongest effect on demand fluctuations between quarters (because of Easter vacations especially the 1st and 2nd quarters are affected): one additional vacation day relative to the previous year increases domestic travel by about 0,5 %.

Changes in weather conditions also have an effect on the demand for travel. For the period under investigation they explain up to 4 % of the increase in the number of nights and arrivals. The more snow in winter and the more sunshine in summer (relative to the previous year), the faster demand for domestic travel increases.

Finally, the analysis shows a marked tendency in favor of the winter season. This trend influences the demand for nights much more than that for arrivals: on the average the number of nights increased in winter by 4 % more than in summer, that of arrivals by 3 % more.

The six variables described above enter nearly all equations selected. With the exception of the price variables they are statistically highly significant. Their combined effect explains

short-term fluctuations in domestic travel quite satisfactorily. In addition to the above six other determinants showed significant influence, but did not enter all equations:

The shift in income distribution towards wage incomes in the short run has a negative effect on domestic tourism demand. When the incomes of employees increase 1 % faster than those of the self-employed, the number of nights spent and of arrivals falls by around 0,15 % in the same quarter. The interpretation of this result is not altogether clear, its quantitative influence rather minor.

The rate of (female) unemployment seems to be a good indicator for the influence of expectations on domestic travel. When it increases by 1 %, the number of nights and of arrivals falls by around 0,15 %.

The urbanization variable also seems to be well-chosen. As the share of the population living in towns with more than 10.000 inhabitants increases by 1 %, the number of nights rises by 5,5 %, that of arrivals by 4 %. At first sight these elasticity coefficients seem to be high. The contribution of this variable is quite low, however, since the urbanization structure of the Austrian population changes very slowly in the short run (normally only by 0,1 % or 0,2 %). The quality of this data is also quite low, so that the results have to be interpreted with caution.

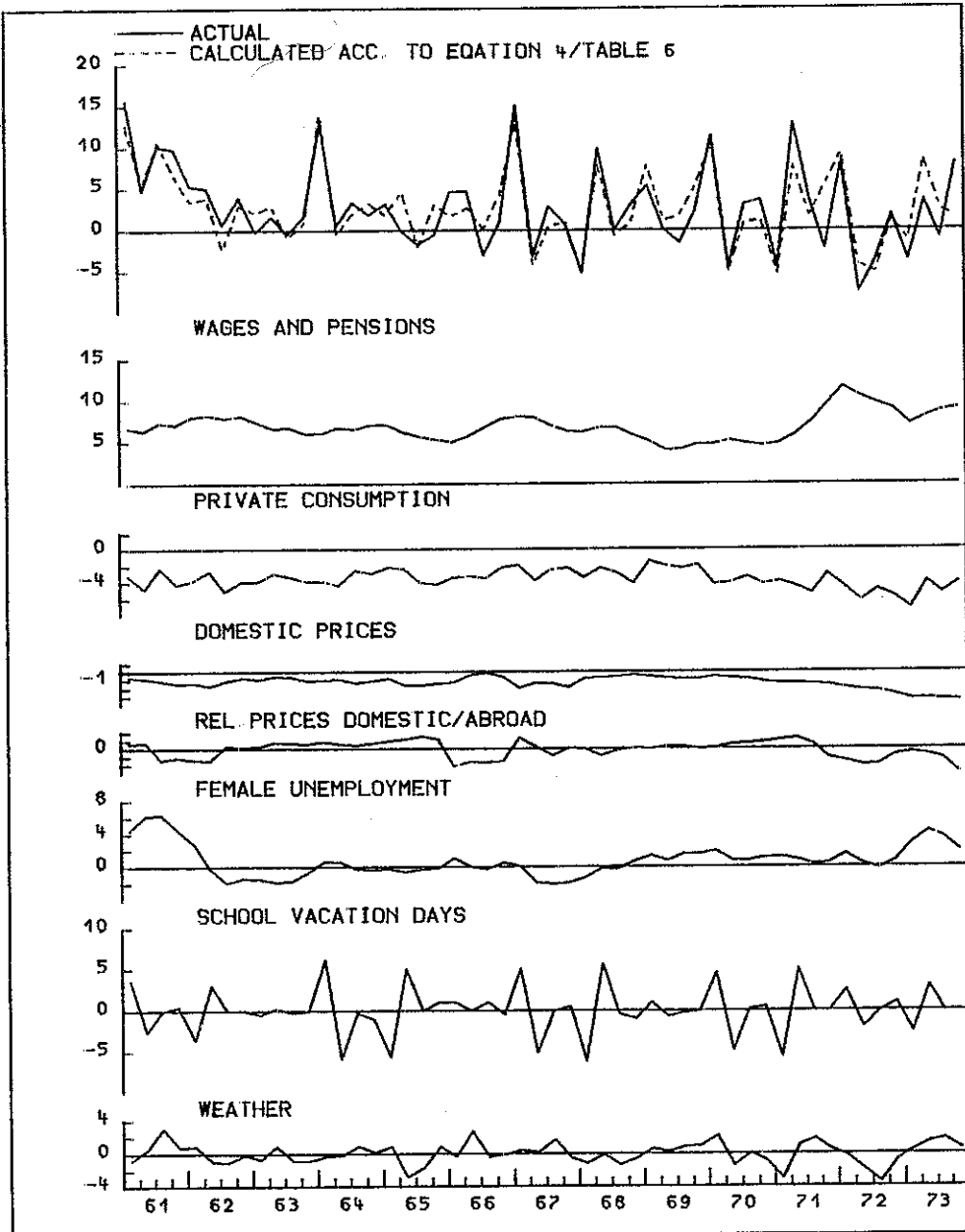
Figure 2 shows, how and to what extent the combined effects of the individual determinants explain actual changes in the number of nights. The top diagram shows that the model results give a good picture of actual fluctuations. Below we show the contribution of each individual variable, their sum yields the respective total value of the calculation. This is explained more clearly using the example of the 1st quarter of 1970.

Real income had increased by 4 %. Given an elasticity of 1,2, the contribution of the change in income to the increase in the number of nights is around 5 % ($4 \times 1,2 = 4,8$). Private consumption in the previous quarter had increased by 10 %, thus its contribution amounts to around - 4 % (elasticity: - 0,4). If all other factors had not changed, the model would have calculated an increase in the number of nights of around 1 %. In reality, however, changes in the number of vacation days, in weather conditions, a fall in unemployment and the trend towards winter vacations, all these also exerted a positive influence on the demand for tourism. (The last-mentioned variable is not contained in the diagram, because its contribution per quarter remains constant over time: + 1,7 % in the 1st quarter, - 0,6 % in the 2nd, - 1,7 % in the 3rd and + 0,6 % in the 4th quarter). The sum of these individual "contributions" yields the total value calculated by the model.

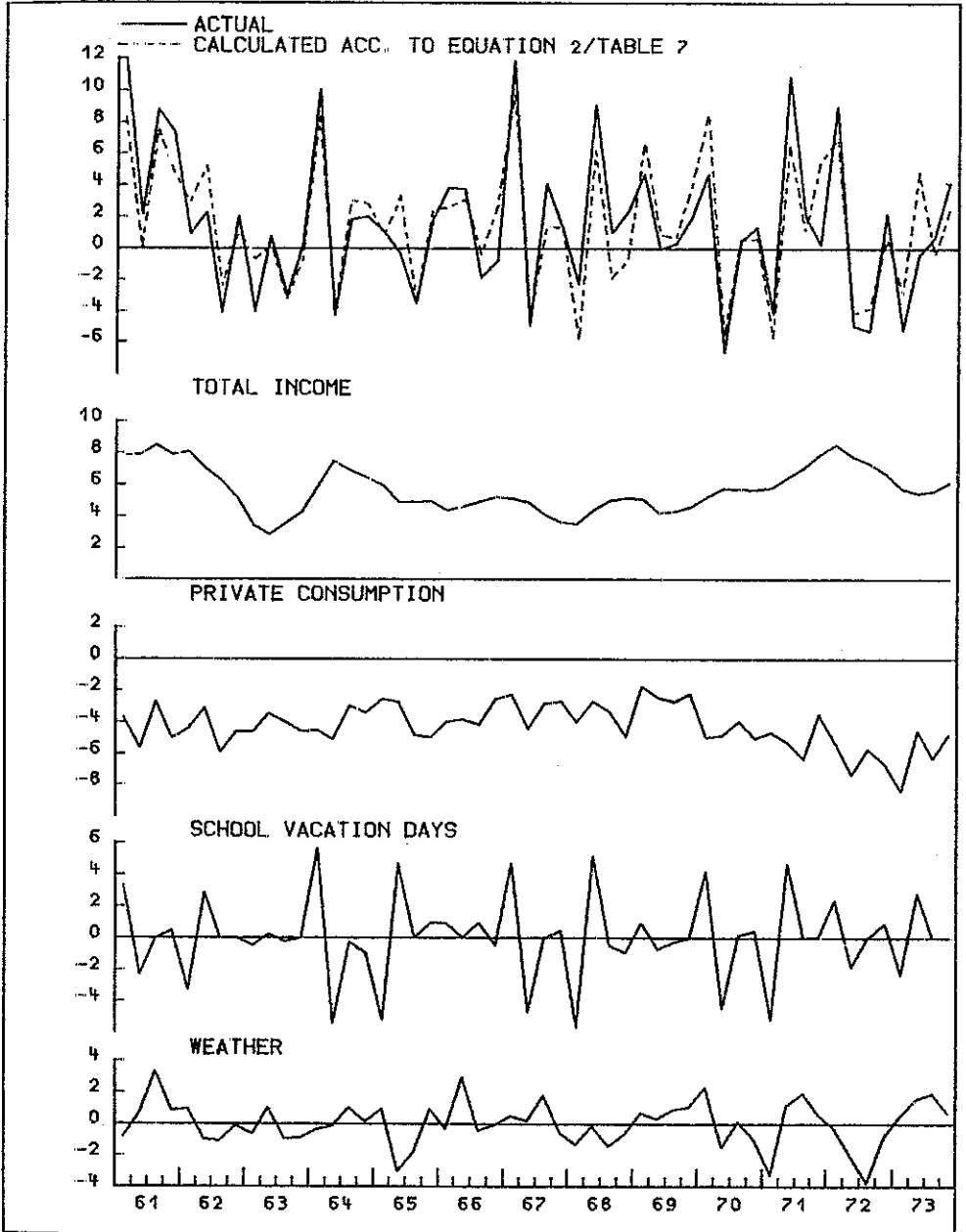
In this way one can examine every quarter, how well the model explains the actual situation and - expressed in a simplified way - for what reasons: the result of the simultaneous effects of various factors can thus be decomposed into its various components

Figure 2

Domestic Travel by Austrians
Dependent Variable: Nights



Domestic Travel by Austrians
Dependent Variable: Arrivals



In general it can be stated that the low, but in the long run continuous, growth in the number of nights spent by Austrians, is mainly due to the increase in income, while short-term fluctuations are primarily influenced by changes in school vacations, in weather conditions and by fluctuations in private consumption. Unemployment as an indicator for expectations about the business situation has its strongest effects during extreme business conditions (1961/62, 1967, 1969/70, 1973). The quantitative effect of the price variables remains quite low.

Figure 3 shows actual changes in arrivals and their explanation by means of a simple model which contains only total income, private consumption, vacation days and weather conditions as explanatory variables. Close inspection reveals that in spite of the simple model structure, actual fluctuations in arrivals are explained remarkably well.

3.3 Austria's Expenditures for International Tourism

3.3.1 Development 1961 to 1973

Table 1 presents data on the development of Austria's demand for foreign travel. Since quarterly data on the number of nights spent (column 4) are not available, this investigation will concentrate on an analysis of monetary flows (columns 2 and 3).

At first sight no clear connection between the general business cycle and Austria's demand for international tourism can be found. Expenditures for foreign travel increased fastest in 1963 when production (column 5) and income (columns 6 and 7) rose at average speed and unemployment (column 13) increased slightly. On the other hand, in 1961 the Austrians demand for foreign travel fell even though incomes had risen sharply and unemployment had gone down. Moreover, in 1961 a vacation in Austria had become more expensive relative to one abroad, in 1963 it had been the other way round (columns 10, 11 and 12). The combined effect of these factors would have led one to conclude that foreign travel should have been much higher in 1961 than in 1963. The opposite development was caused by special factors which frequently tend to bias money flows in international tourism. Two types of disturbance factors are of special importance:

- Political crises abroad: they have a strongly adverse effect on international tourism, and in general cause reversals in receipts and also in the number of nights. The year 1961 shows this clearly: the number of nights spent by Austrians abroad decreased by 1/2 %, their real expenditures even by 4 %. The reason for this slowdown was the renewed requirement of a visa for trips to Italy on account of the conflict about South Tyrol. The number of nights spent by Austrians in Italy went down by 25 %. In addition, the psychological effects of the Berlin crisis of August 1961 dampened the general demand for foreign travel (during the second half of 1961 expenditures fell much more).

- Monetary transactions between domestic and foreign institutions on account of political crises and because of speculation: these of course have nothing to do with actual demand for tourism, but are entered into the tourism accounts because of statistical flaws. Such biases have occurred frequently: expenditures increased by 46 % during the 4th quarter of 1962 (Cuba crisis), one year later even by 66 1/2 % (Kennedy's assassination). Speculative transactions caused expenditures to increase by 59 1/2 % in the 4th quarter of 1967 (devaluation of the pound sterling).

For the purpose of analyzing the relationship between expenditures in international tourism and their determinants, the dependent variable must be corrected for these biases. For this reason two "artificial" variables were created (crisis dummy and speculation dummy): their coefficients reflect the general reaction of touristic or speculative demand to political crisis or expected changes in exchange rates during the period investigated.

The peculiarities of collecting statistics on foreign currency transactions in Austria account for additional biases in the data on foreign travel:

- Up to the mid-sixties the Austrian National Bank did not account for the fact that Austrian tourists took schilling banknotes along. On the other hand the money transfers of foreign workers were included in tourist expenditures. A data revision undertaken by the Austrian Institute for Economic Research eliminated both these biases. These revised data [65] form the basis of the present calculations.
- On top of all that even these revised data on expenditures in international tourism are only an insufficient indicator of travel demand, because a large part of these expenditures (in 1970 about 40 %) represents spending for mainly durable consumption goods in Germany, Liechtenstein and Switzerland [65]. These *direct commodity imports* of private households increased especially since 1972 because of marked devaluations of important other currencies. Estimates of expenditures for tourism proper could be carried out only on yearly basis.

If one takes all these special factors into account, close inspection of the variables in table 1 does reveal a general development pattern in the demand for foreign travel. The years which show the highest increases in income (1966 and 1971) are each followed by especially high increases in touristic imports; thus it seems that changes in income influence foreign travel by Austrians with a time lag of about one year. The choice of a country of destination for vacations is also influenced by diverging price changes: nominal expenditures abroad increased least during the year in which Austria was relatively the cheapest country, in real terms they even fell (1970). Changes in weather conditions also seem to have some influence: in 1965 and 1972 weather conditions in Austria had deteriorated most, expenditures for foreign travel in both years increased above average. Opposite changes in the years 1961 and 1973 seem to corroborate this relationship.

3.3.2 Econometric Results

The following combination of independent variables explains best the fluctuations in Austria's expenditures for foreign travel.

	Direction of Influence	Time Lag (in quarters)
Average income during the previous year	+	4 to 5
Private consumption	-	2
or		
Consumer price index	-	2
or		
Price index for consumer durables	-	2
Prices for tourist services		
abroad (price and exchange rate effects)	-	1
exchange rates	-	1
relative prices Austria/abroad	+	2
Number of school vacation days	+	0
Weather in Austria	-	0
Crisis dummy	-	0
Speculation dummy	+	0
Number of foreign workers employed in Austria ¹⁾	+	1

In several cases the following variable is added:

Income distribution (ratio of per-capita income of employed to self-employed)	-	2
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1) Contained in all equations using foreign currency expenditures according to Austrian National Bank data

All determinants which are important in the planning of vacations abroad and which are not known in advance like the timing of school vacations, exert a lagged influence on travel expenditures. The time lags are in general longer than those for domestic travel. This seems plausible, since in general vacations abroad are planned a longer time ahead than domestic vacations. In most cases the time lag is around one half year. This implies that the final

decision on a vacation abroad is in general made about half a year ahead. The most important determinant, the change in income, takes much longer to take effect, however (around 1 1/2 years). Two reasons might explain this. Firstly, growth rates in expenditures for foreign travel are primarily influenced by those households which go abroad for the first time. In such a case it seems plausible that planning takes a longer time. Secondly, the income variable also contains such longer-term effects as automobile ownership, urbanization tendencies, improvements in the infra-structure, etc. [67]. A time lag of about the same size between the general business situation and demand for tourism was recently also found in several other studies [16, 61, 66, 67].

The following quantitative relationship between expenditures by Austrians for foreign travel and their determinants was derived from the present analysis: the strongest and most permanent influence is exerted by increases in income: an increase in income by 1 % eventually results in an increase in travel expenditures of around 2,5 %. This elasticity was even higher (3,5) when the equations were estimated in real terms. Changes in income thus are shown to have a much stronger effect on foreign travel than on domestic travel.

Private consumption expenditures have a negative effect also on foreign travel demand: an increase in private consumption (in nominal terms) of 1 % leads to a partial fall in foreign travel expenditures by 0,8 %. It seems that this effect is mainly caused by price increases: if instead of the consumption variable the consumer price index enters the equations, a decrease in foreign travel demand of 1,1 % to 2,4 % results. The following mechanism might be at work: if consumer prices rise, nominal consumption expenditures increase, since the demand for other non-durables is inelastic. This effect leads to a relative fall in travel expenditures, since it is relatively easy to forego them (luxury good). It may also be true, however, that the demand for durable consumption goods is inelastic — at least in relation to demand for tourism — and thus "competes" with foreign travel: when durables become 1 % more expensive, travel expenditures fall by around 1,8 %. This hypothesis is reinforced by the obverse development of automobile purchases and tourism expenditures in 1976. This example might also point into the reverse direction, however: because total consumption expenditures increase or shift to certain commodities, prices increase. It is not possible to determine which mechanism dominates.

Demand for foreign travel reacts to changes in prices for tourism services stronger than domestic travel demand. When prices for foreign travel (including exchange rate effects) increase by 1 %, nominal expenditures fall by around 0,8 %, and real expenditures by around 1,3 %. The reaction to changes in exchange rates alone is slightly weaker: when the Austrian schilling is de (re-) valued by 1 % in relation to the currencies of the most important countries of destination, real expenditures for foreign travel fall (rise) by around 0,9 %. Demand also reacts to changes in relative prices: if prices for tourism services increase in Austria by 1 % more than abroad, Austria's expenditures increase in nominal terms by 0,6 % and in real terms by about 1,0 %.

The influence of the number of school vacation days is smaller than for domestic travel: one more day than a year previously increases expenditures by 0,4 %.

Austria's weather also plays a significant role: the worse it is in relation to last year, the more foreign travel increases.

Political crises abroad account for a fall in foreign travel of about 14 % on the average; monetary transactions not connected to tourism were responsible for increases in foreign currency outflows of around 15 %.

When using the foreign currency expenditure variable as collected by the National Bank, the biasing effect of the transfers by foreign workers contained in those data becomes clear: when the number of foreign workers employed in Austria increases by 10.000, unrevised expenditures increase by around 2 %.

Foreign as well as domestic travel is negatively influenced by an income redistribution in favor of wages. When wages increase by 1 % more than profits, travel expenditures for foreign travel fall by 0,3 %. The theoretically deduced hypothesis runs as follows: during the period investigated only one fourth of all households undertook at least one vacation trip. Thus it can be assumed that travel frequency of self-employed households (exclusive of the agricultural sector) is higher than that of employed persons. This assumption also corresponds to considerations on the position of tourism in the hierarchy of needs. For these reasons it can be assumed that a redistribution to non-wage incomes has a positive effect on the demand for tourism.

In spite of these considerations the statistical results of this variable are rather inconclusive, for domestic as well as foreign travel:

- The income distribution variable yields useful results only when used with wage and pension incomes, but not in conjunction with total income. Thus it might also reflect the short-term effect of the business situation on demand for tourism (via business trips).
- The coefficients are not very significant.

When the various equations for German demand for tourism were estimated, the statistical significance was higher and more stable; the variable entered the equations mostly together with total income, the coefficient was consistent with the coefficients of the simultaneously estimated wage and non-wage incomes. The inferior results for Austria may be due to the lower statistical quality of data for non-wage incomes.

International Tourism

Figure 4

Dependent Variable: Austria's Expenditures (Nominal)

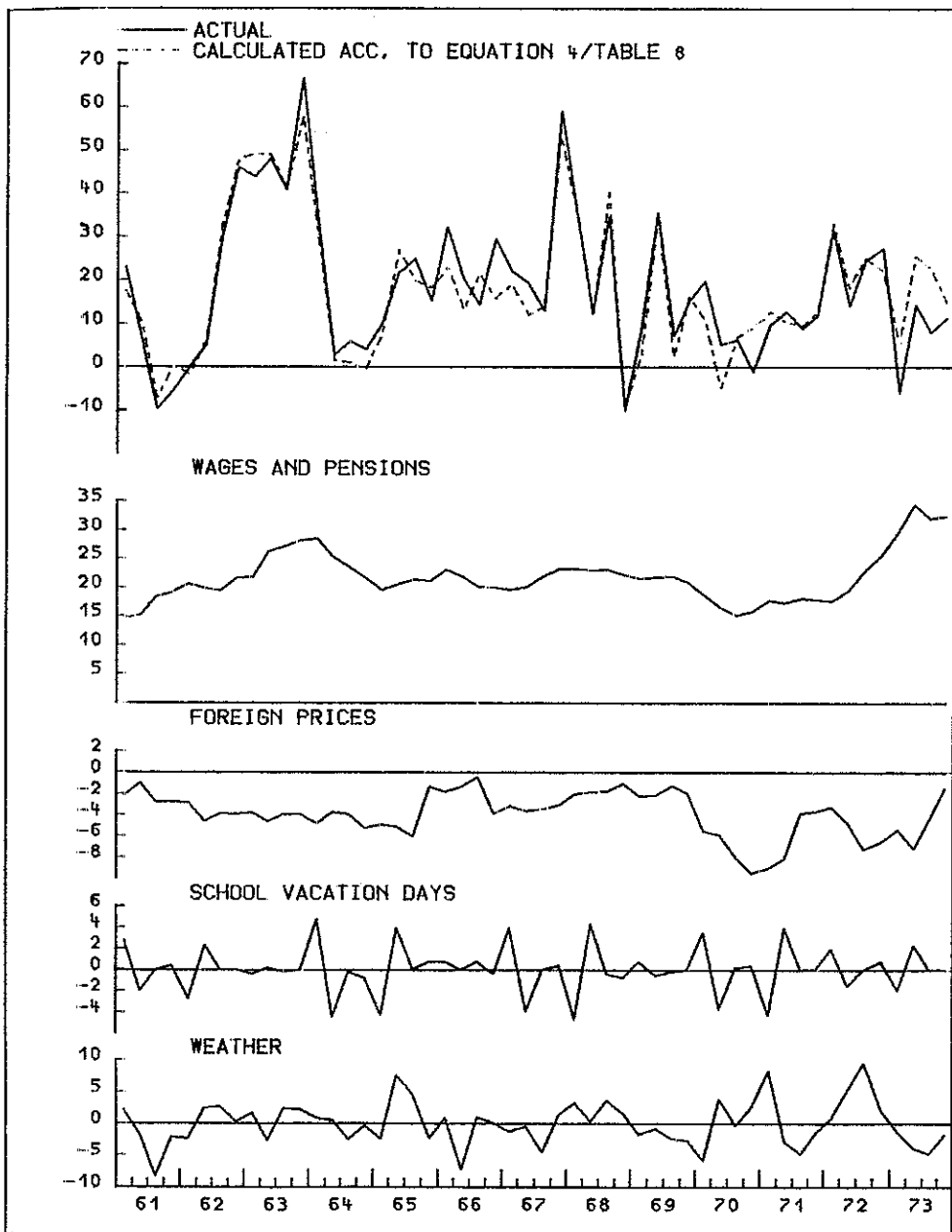


Figure 4 shows the actual development of nominal expenditures, the model calculations and their decomposition into the contributions of the individual determinants (without the contributions of the crisis and speculation dummies).

The development of income exerts the strongest and most continuous influence (on the average it contributes about 25 % to the growth in travel expenditures). Short-term fluctuations are especially marked due to disturbance terms. Their strongest effects occur between 1961 and 1964 (crisis in Berlin, South Tyrol, Cuba, Kennedy assassination, pound sterling devaluation) and again in 1967/68 (second pound devaluation, May rebellion in Paris, Warsaw Pact intervention in Prague). The remaining fluctuations are explained by changes in vacation days, weather conditions and price developments (the latter have a markedly stronger influence than in domestic travel).

Figure 5 presents the same analysis using the National Bank data. The most interesting feature here is the effect of foreign worker transfers. Between 1971 and 1973 it explains about 10 % of the growth in expenditures. The number of foreigners employed increased considerably during these years. Contrary to the results for domestic travel no influence of unemployment on touristic imports could be found: since during the period investigated only around 10 % of all Austrians travelled abroad, it seems plausible to assume that this social stratum was hardly affected by unemployment.

3.4 Total Tourism of Austrians: Domestic and International

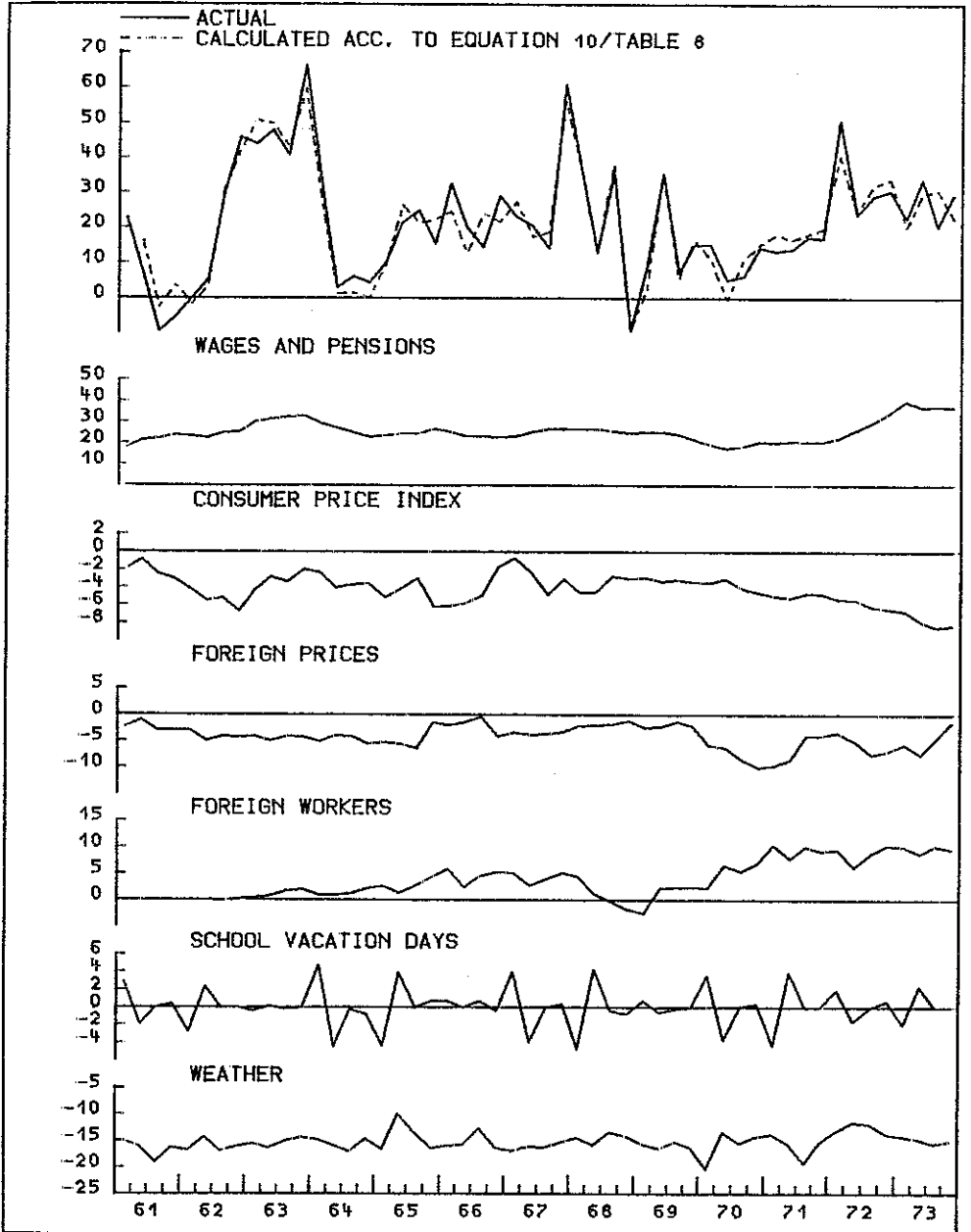
3.4.1 Development 1961 to 1973

No statistical data is collected on the Austrians' expenditures for domestic travel. Therefore such data had to be estimated by the Austrian Institute for Economic Research. Nominal as well as real values were estimated in order to obtain a complete set of information on tourism. The basic pieces of information used for this estimate were the number of nights spent by Austrians and prices for tourism services. Estimates were developed for expenditures per night, using surveys by the Central Statistical Office [65]. The same procedure was used to estimate values for the expenditure flows in domestic tourism from the model results for domestic nights spent.

In contrast to expenditures for foreign travel which increased by an annual average of 18,3 % between 1961 and 1973 (real + 13,5 %), expenditures by Austrians for domestic travel increased only by annually 8,2 % (in real terms + 3,2 %). This difference emphasizes the long-term shift from domestic to foreign travel, which is characteristic of most developed industrial countries.

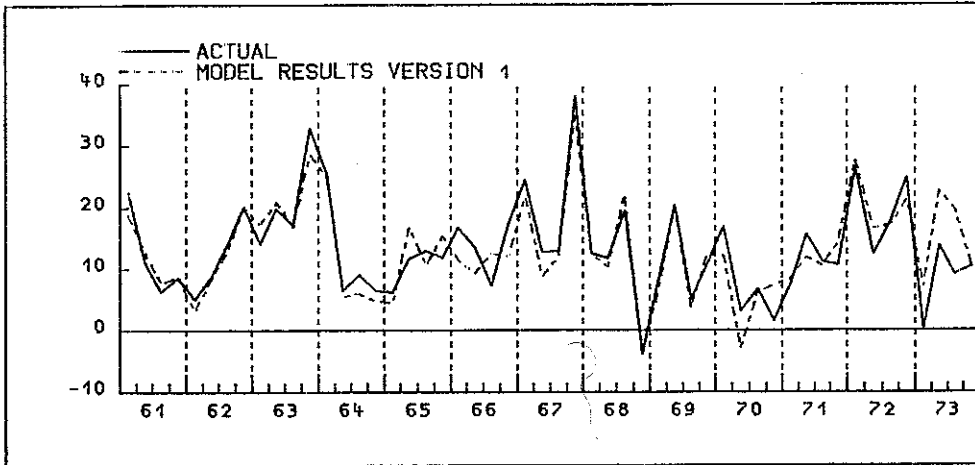
International Tourism

Dependent Variable: Expenditures According to Austrian National Bank



Total Travel by Austrians in Austria and Abroad
Dependent Variable: Nominal Expenditures

Figure 6



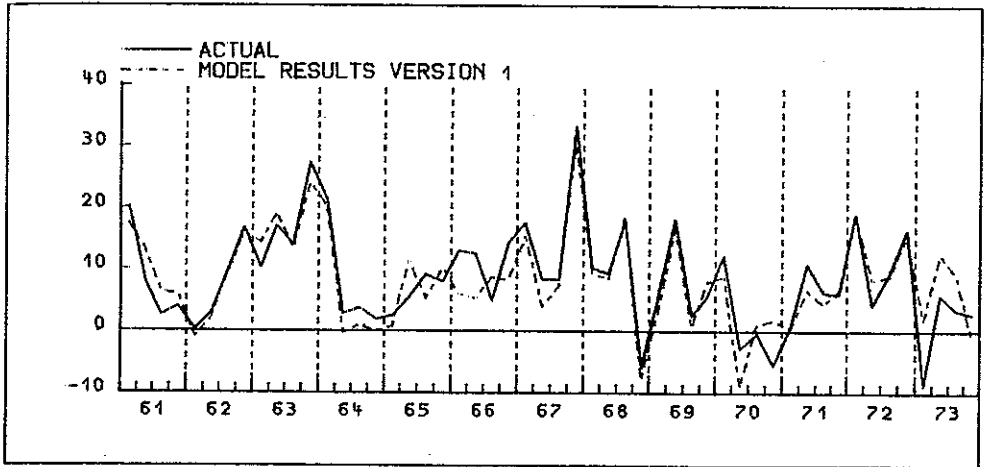
Total demand for tourism by Austrians, which is represented by the sum of expenditures within Austria and abroad, increased by 12,7 % annually in nominal terms and by 8,0 % in real terms. This increase was much faster than that of private consumption (8,9 %, respectively 4,7 %). As a result the share of tourism expenditures in the total expenditures of private households rose continually. This corresponds to the assumption of established consumption theory according to which expenditures for luxury goods grow faster than the average: their income elasticity lies above one. Our own results on domestic and foreign travel corroborate these hypotheses.

3.4.2 Econometric Results

Figures 6 and 7 compare the results from the models with actual development during the period 1961 to 1973. Nominal expenditures were best explained by the equations shown in Figures 2 and 4. Thus total demand for tourism by Austrians is determined by the following combination of factors:

- Wage and pensions incomes
- Private consumption
- Prices for tourism services
 - within Austria
 - abroad

Total Travel by Austrians in Austria and Abroad
Dependent Variable: Real Expenditures



- Unemployment
- Number of school vacations days
- Tendency towards a second vacation in winter.

Other data combinations were tested, but the above "Version 1" yielded the best results.

Figure 7 presents the analogous results for the real expenditure flows. They are determined by a similar combination of variables

3.5 Austria's Receipts from International Tourism

3.5.1 Model Approaches

While demand for tourism by a country of origin is essentially determined by economic factors and other determinants originating in that same country, the causal links for receipts are more complex. On the one hand, demand is exerted by a number of countries, on the other hand economic factors in the competitor countries also influence the developments in a given country of destination. For that reason all important countries of origin and destination (competitors) have to be included in the investigation of the foreign demand for travel for a specific country [67].

Table 2

Demand for Tourism by Foreigners and its Determinants in the Business Cycle (Nominal)

	Dependent Variable						
	Total Expenditures by Germans	Austria's Share in the German Markets	Austria's Receipts from Germany	Total Expenditures of all Other Countries	Austria's Share in the Market of all Other Countries	Austria's Receipts from all Other Countries	Austria's Total Receipts
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Annual Growth Rates						
1964	+ 8,1	+ 7,8	+ 16,4	+ 10,1	+ 11,2	+ 22,4	+ 18,9
1965	+ 16,5	- 2,7	+ 13,3	+ 12,9	- 3,2	+ 9,3	+ 11,3
1966	+ 14,9	- 10,1	+ 3,3	+ 9,0	+ 1,0	+ 10,1	+ 5,9
1967	- 0,9	+ 0,3	- 0,6	+ 8,2	+ 1,4	+ 9,8	+ 3,6
1968	+ 3,8	+ 8,1	+ 12,2	- 2,7	+ 15,1	+ 12,0	+ 12,1
1969	+ 18,5	- 1,8	+ 16,3	+ 12,6	- 3,5	+ 8,6	+ 14,0
1970	+ 18,4	+ 4,7	+ 24,0	+ 15,6	- 0,6	+ 14,9	+ 26,6
1971	+ 20,1	- 2,3	+ 17,3	+ 10,3	+ 8,3	+ 19,5	+ 19,0
1972	+ 18,3	+ 0,1	+ 18,5	+ 10,5	+ 11,1	+ 22,8	+ 20,7
1973	+ 19,3	- 5,9	+ 12,3	+ 2,1	- 5,0	- 3,0	+ 7,7

Austria occupies a special position in international tourism: 75 % of all nights spent by foreigners in Austria originate in the Federal Republic of Germany (which at the same time is the most important country of origin for all of international tourism). Of all the other countries of origin none has a share significantly above 5 %. This situation facilitates the modelling, because the countries of origin can be separated into two groups, namely Germany and other countries of origin (henceforth referred to as rest countries). Austria's receipts from Germany are determined by two major factors: total expenditures by Germans for foreign travel and Austria's share in Germany's travel market (as a competitor to the other countries of destination) This definitional connection is made clear in table 2. In 1970 Austria's receipts from Germany (column 3) increased by 24 %, i.e. faster than the total of German expenditures (column 1: + 18 1/2 %). Thus Austria's market share increased by 4 1/2 % (column 2: $1,184 \times 1,047 = 1,24$). The same holds for the rest countries. In 1973

Demand for Tourism by Foreigners and its Determinants in the Business Cycle (Nominal)

Determinants of the Demand for Tourism

	Net	Expectations		Relative Prices		
	National Income, Germany	German Unemployment Rate	Germany/ Abroad for Germany	Austria/ Competitors for Germany	Germany/ Austria for Germany	Austria/ Competitors for Rest Countries
	(8)	(9)	(10)	(11)	(12)	(13)
Annual Growth Rates						
1964	+ 10,3	- 11,9	- 2,0	- 1,2	- 1,2	- 0,5
1965	+ 11,1	- 11,2	- 2,1	- 0,2	- 1,9	- 0,8
1966	+ 5,0	+ 21,5	+ 0,6	- 0,8	+ 1,2	- 1,5
1967	- 0,9	+ 170,8	- 2,6	+ 2,6	- 4,3	+ 3,4
1968	+ 10,8	- 30,8	+ 1,0	+ 1,7	- 0,1	+ 4,7
1969	+ 8,7	- 43,9	+ 0,4	+ 1,1	- 0,4	+ 1,1
1970	+ 14,4	- 17,8	+ 6,7	- 1,6	+ 7,9	- 2,2
1971	+ 8,6	+ 25,3	+ 2,3	+ 1,0	+ 1,6	- 0,7
1972	+ 9,2	+ 30,8	+ 1,0	+ 2,1	- 0,5	+ 1,8
1973	+ 6,7	+ 11,8	+ 2,8	+ 12,9	- 5,3	+ 14,6

their total expenditures for foreign travel increased by 2 % (column 4), but Austria lost 5 % of its market share (column 5). This resulted in a reduction of Austria's receipts from these countries by 3 % (column 6).

Austria's total receipts from international tourism are investigated by the following steps:

- Germany's total expenditures for foreign travel are explained by the fluctuations in income, tourism prices in Germany and in the most important countries of destination, expectation indicators and some special factors.
- Austria's share in the German travel market is primarily explained by Austria's competitiveness as a tourist country (Austria's prices relative to those of other countries of destination for German tourists) and by cyclical and distributional variables.

- A combination of these two types of equations yields Austria's receipts from Germany.
- Total expenditures by the rest countries are treated as exogenous, but the Austrian market share is estimated on the basis of the developments of Austria's prices and exchange rate in relation to those of the most important competitor countries. From this Austria's receipts from the rest countries can be calculated.
- Austria's total receipts from international tourism then are calculated as the sum of the receipts of both groups of countries of origin.

This modelling approach will be called the "*market share*" concept.

Germany's demand for travel in Austria is estimated by an additional approach, the "*direct approach*". The number of nights and the expenditures by German tourists in Austria are estimated directly from the cyclical situation and the price ratio between Germany and Austria. This approach implies that Austria competes primarily with domestic tourism within Germany and less with other foreign countries of destination. We assume a special preference for vacations in Austria, which seems plausible on account of the same language and similar landscape features (in contrast to, e.g. the Mediterranean countries).

Austria's receipts could only be analyzed for the period 1964 to 1973, since certain international data were not available for earlier periods.

3.5.2 Germany's Expenditures for International Tourism

3.5.2.1 Development 1964 to 1973

A comparison of columns 1 and 8 in table 2 reveals a close connection between fluctuations in income and demand for foreign travel in Germany. A time lag of about one year is apparent. When the rate of unemployment (column 9) is included as an indicator for expectations, strong relationships become apparent for the extreme years: the year exhibiting the strongest increase in unemployment was at the same time the weakest year for foreign travel (1967). Conversely in 1969 the significant reduction in unemployment went hand in hand with a very strong increase in German travel expenditures. Inspection of column 10 shows that from 1967 on a vacation within Germany became increasingly more expensive relative to one abroad. This effect was especially strong after 1970 as a result of the revaluation of the DM. At the same time German demand for foreign travel has increased especially strongly.

3.5.2.2 Econometric Results

The following combination of variables explains the fluctuations in German demand for foreign travel best:

	Direction of influence	Time lag (in quarters)
Income in the previous year		
total income	+	3
or		
wage bill by itself	+	3
together with non-wage income	+	2
Unemployment	-	0
Number of school vacation days	+	0

To these in specific cases are added:

Tourism prices		
in Germany	+	2
relative prices Germany/abroad	+	1-2
Nights spent by Germans within Germany	+	0
Income distribution (relation wages/profits)	-	2
Tendency towards second vacation in winter	+	-

The time lags calculated for the explanatory variables correspond to our expectations: fluctuations in income in general exert their effect on foreign travel after 5 to 6 quarters. Price changes influence consumers primarily at the time the vacation is planned, which normally happens around 1/2 year before the vacation starts.

The strongest influence on the demand for tourism is exerted by variations in income: when total net income of German households increases by 1%, their expenditures for foreign travel on the average increase by 1,7%. The elasticity with respect to real income is slightly higher, similar to Austria. When total income is split into wages and profits, the following results are obtained: when the wage bill increases by 1%, demand for tourism increases by 0,9% (in nominal terms) and by 1,2% (in real terms). The corresponding elasticities for non-wage incomes are 0,5 (nominal) and 0,7 (real).

The influence of the unemployment rate is also highly significant. When it increases by 1 %, demand for foreign travel falls by 0,03 %. The size of this coefficient is only seemingly small: since the unemployment rate in Germany fluctuates more strongly than in Austria, and increases quickly during recessions (e.g. it rose by 300 % in the 2nd quarter of 1967), it has a marked influence during peaks and troughs (especially in 1967 and 1974).

Change in vacation lengths and dates also exert a strong influence. If in the quarter under consideration there is one more vacation day than in the previous year, demand for foreign travel increases by around 0,5 %.

Tourism prices have a smaller, but in some cases still significant influence. When prices in Germany rise by 1 %, an increase in demand for foreign travel by around 0,7 % is recorded. When a domestic vacation becomes 1 % more expensive than a foreign vacation (including effects of changes in exchange rates), a shift from domestic to foreign tourism results: German expenditures increase by about 0,4 %.

During the course of the business cycle domestic and foreign tourism show similar patterns: when the number of nights spent by Germans within Germany goes up, the number of foreign nights abroad also increases. Both types of travel seem to be connected to each other by means of a third variable, namely household expectations.

In the short run it seems that the trend towards foreign travel is stronger for self-employed than for wage earners. When non-wage income goes up by 1 % faster than wage income, German expenditures for foreign travel increase by around 0,3 %.

Figure 8 shows to what extent a simple model can explain nominal expenditures by German tourists. Already a visual inspection of the curves shows the close similarity between fluctuations in income and demand for tourism. Unemployment became primarily important during 1967. In that year it explains why tourism decreased in spite of still rising incomes. The extremely low value for the 4th quarter of 1967 and the extremely high value for the 4th quarter of 1969, however, can be explained by speculative transactions due to the devaluation of the pound sterling, and the revaluation of the DM. Quarterly changes in expenditures are explained to a large extent by the number of vacation days.

3.5.3 Austria's Share in the German Tourism Market

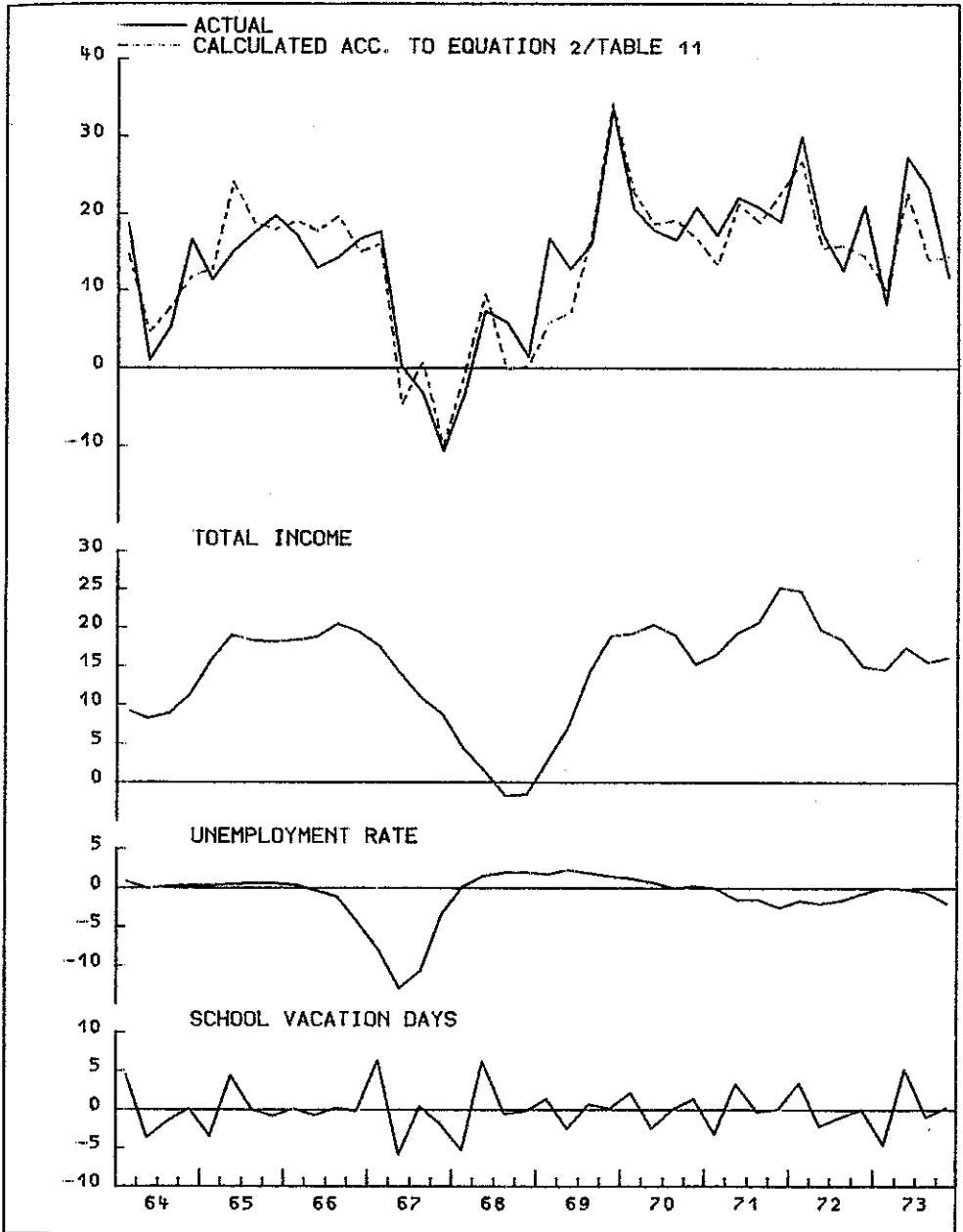
3.5.3.1 Development 1964 to 1973

The analysis of foreign tourism and the interpretation of its results require a distinction between real and nominal market shares. Austria's share in the total real expenditures by Germans (corrected for price and exchange rate fluctuations, thus representing the develop-

International Tourism

Figure 8

Dependent Variable: Nominal Expenditures by Germany



ment of goods and services consumed in tourism) fell from 27 1/2 % in 1964 to 21 1/2 % in 1973. Austria's nominal share, however, only fell from 27 % to 24 %. Since Austria was cheaper than its competitor countries in 1964, its real share lay above its nominal share. In 1973 the contrary was true. German demand did not react very strongly to the relative price increases of Austria. The shift of real demand to Austria's competitors was nearly completely compensated by price effects; thus Austria's share in nominal expenditures fell only slightly.

Table 2 shows the development of nominal market shares (column 2) and of relative price relations between Austria and her competitors (column 11). Up to 1966 a vacation in Austria became relatively cheaper, thereafter it became continually more expensive with the exception of 1970. Relative price increases were especially strong in 1973. As a result of heavy domestic price increases in connection with the introduction of the value added tax and with devaluations in important countries of destination (Italy, Great Britain), tourism prices in Austria increased by 13 % more than abroad. In that year Austria's market share fell significantly (by 6 % in nominal, and by 14 % in real terms).

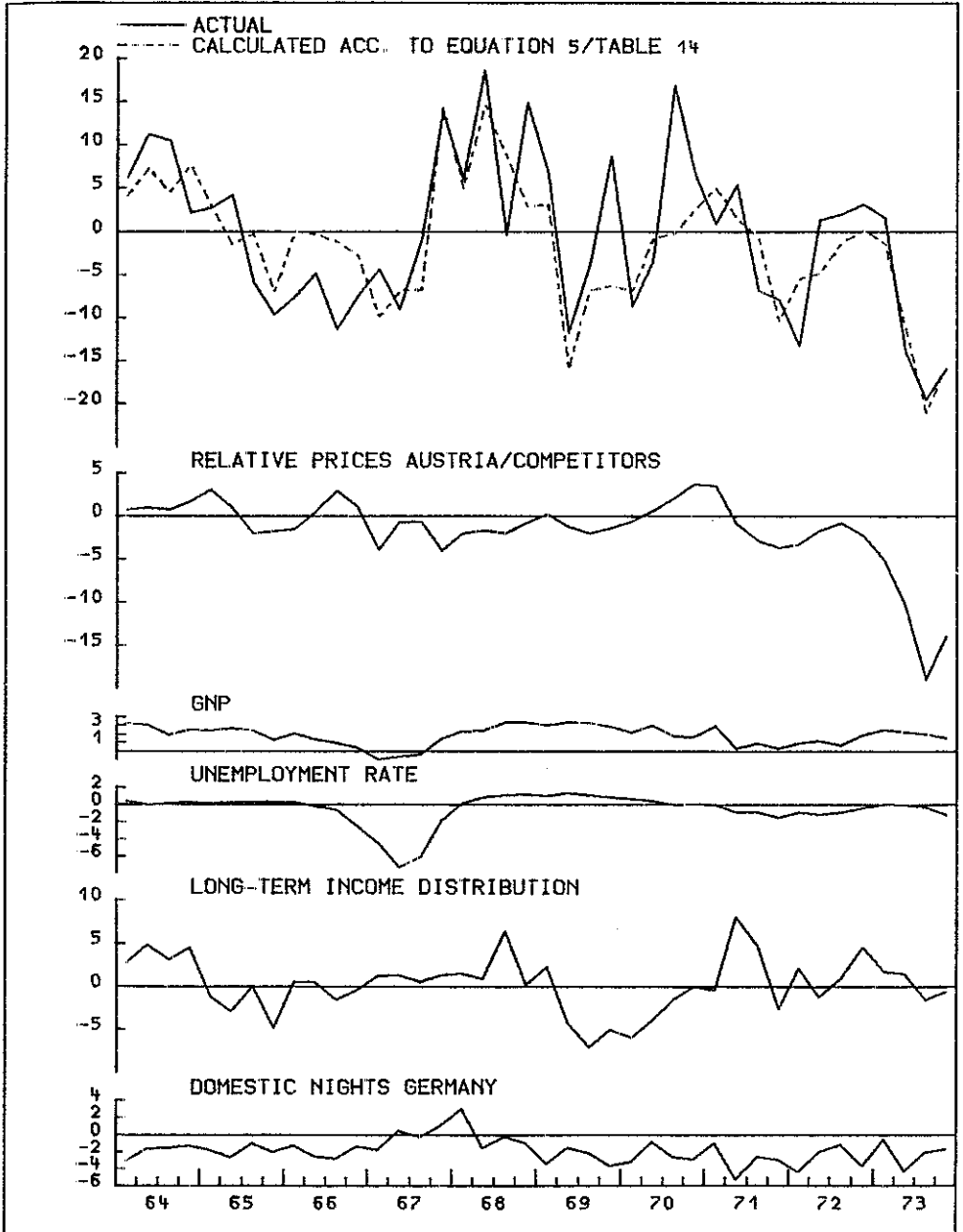
3.5.3.2 Econometric Results

Austria's share in the German market for travel must also be explained by the combined effects of several determinants. Only one variable, i.e. relative prices for tourism between Austria and its competitors, shows up in every equation, however. It has a negative and immediate effect. When a vacation in Austria becomes by 1 % more expensive than in the competitor countries, Austria's market share falls by 0,3 % (nominal) and by 1 % (real). In other words: if relative prices go up by 1 %, German expenditures in Austria grow by 0,3 % (1 %) less than in the competitor countries. As can be expected, the coefficients for the nominal equations are statistically less significant.

Consumer expectations in Germany have also a strong effect. When unemployment increases by 1 %, Austria's share falls by 0,03 %. Expectations thus seem to have a stronger effect on Germans travelling to Austria than on those travelling to other countries. This result coincides with the findings of another study, according to which visitors to Austria come from lower social strata than Germans travelling to other countries [66].

In order to capture also the effects of improvements in expectations the development of real German GNP was introduced. When it rises by 1 %, Austria's share improves by 0,4 %. This means that during boom phases Austria's position in the German market improves, while during recessions Austria loses shares. This phenomenon can also be explained by the "social strata theory" [66].

International Tourism in Austria
Dependent Variable: Real Share in German Travel Market



The same language and similar landscape in Austria and Germany are responsible for the fact that a vacation in Austria is more readily replaced by a domestic vacation than travels to other foreign countries, e.g. the Mediterranean countries. When the number of domestic nights in Germany rises by 1 %, Austria's share falls by 0,5 %. For this reason Austria competes more strongly with German domestic tourism than other countries of destination.

Changes in income distribution in Germany have a double effect on tourism. In the short run a redistribution towards non-wage incomes exerts a positive influence on the Austrian share (elasticities 0,6 %), in the long run, however, such a positive influence is caused by a redistribution to wages (0,3 %). The latter effect seems more plausible, also because its time lag (around 1 1/2 years) coincides with that of the wage bill in the equations explaining total demand for tourism. This long run effect is also covered by the "social strata theory". The short run effect warrants closer investigation.

Good weather conditions tend to have a positive effect on the development of the Austrian market share; the correlation is not statistically significant, however.

Figure 9 shows the development of the real market share and the corresponding model results. The influence of prices seems to have increased since 1969, but was still rather weak up to 1972, since tourism prices in the various countries of destination developed rather similarly, and few changes in exchange rates occurred. Only in 1973 a vacation in Austria became markedly more expensive than in the competitor countries. This led to a corresponding fall in the market share.

The development of real GNP indicates the slow improvement of expectations in the recovery period of the business cycle, the unemployment rate shows their rapid deterioration during recessions.

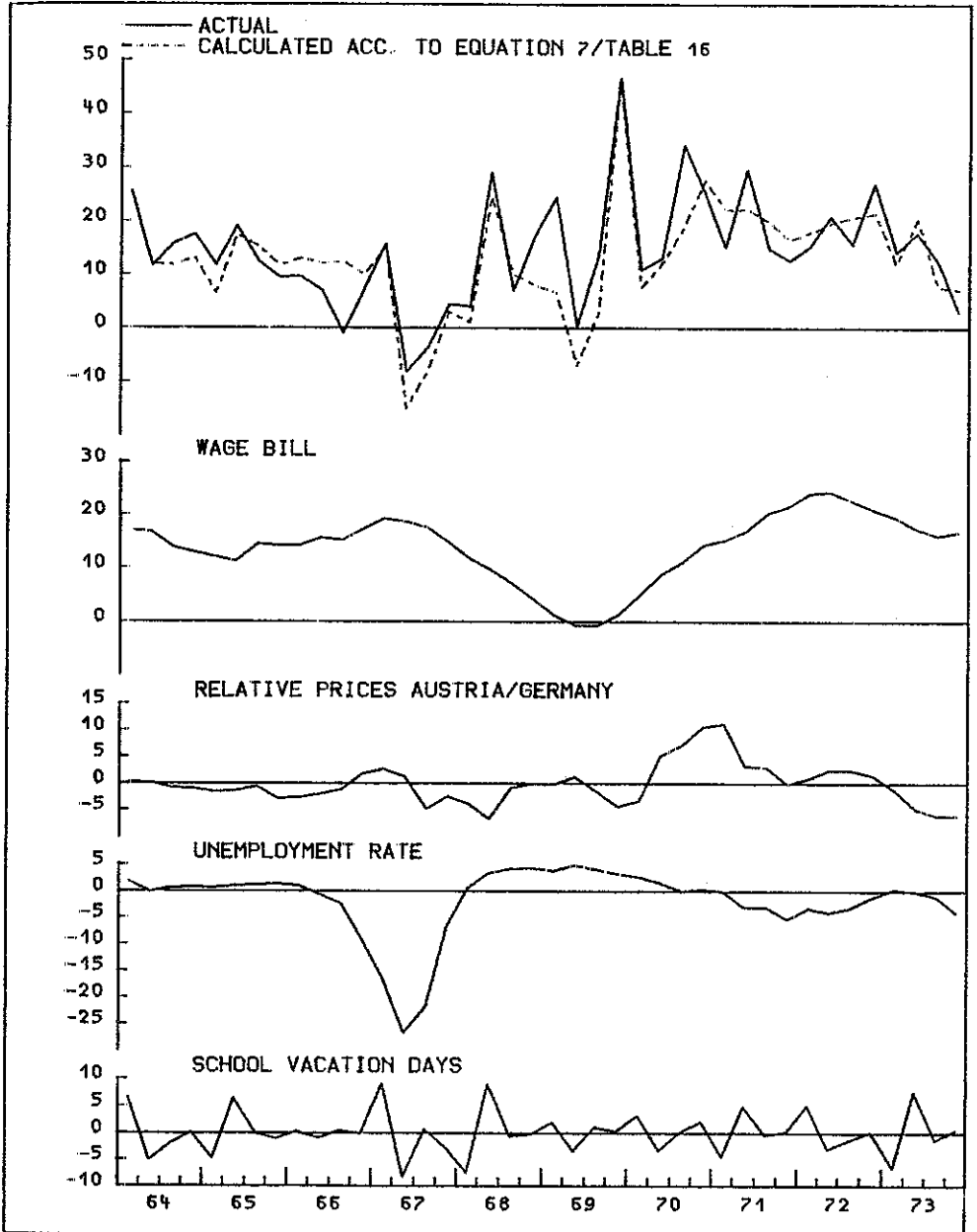
3.5.4 Austria's Receipts from Germany

German demand for travel in Austria can be analyzed by means of two approaches: the market share approach and the direct concept. The two variations of the former have already been explained. Now we would like to present the results from applying the direct concept and compare them to those of the market share approach.

3.5.4.1 Development 1964 to 1973

Column 3 in table 2 shows Austria's nominal receipts from Germany. By definition they are the result of the development of Germany's total expenditures (column 1) and Austria's share (column 2). The market share approach explicitly follows this division.

International Tourism in Austria
Dependent Variable: Receipts from Germany (Nominal)



In the direct concept it is assumed that Austria competes primarily with the German domestic market. Thus Austria's receipts are determined primarily by German incomes (column 8) and by the relative prices between German and Austrian tourism (column 12). This approach intentionally neglects price developments in the other competitor countries.

With the exception of 1966, 1970 and 1971 vacations in Germany became cheaper relative to those in Austria. In 1976 the price level for tourism services in Germany was only 4 % above the Austrian level.

3.5.4.2 Econometric Results

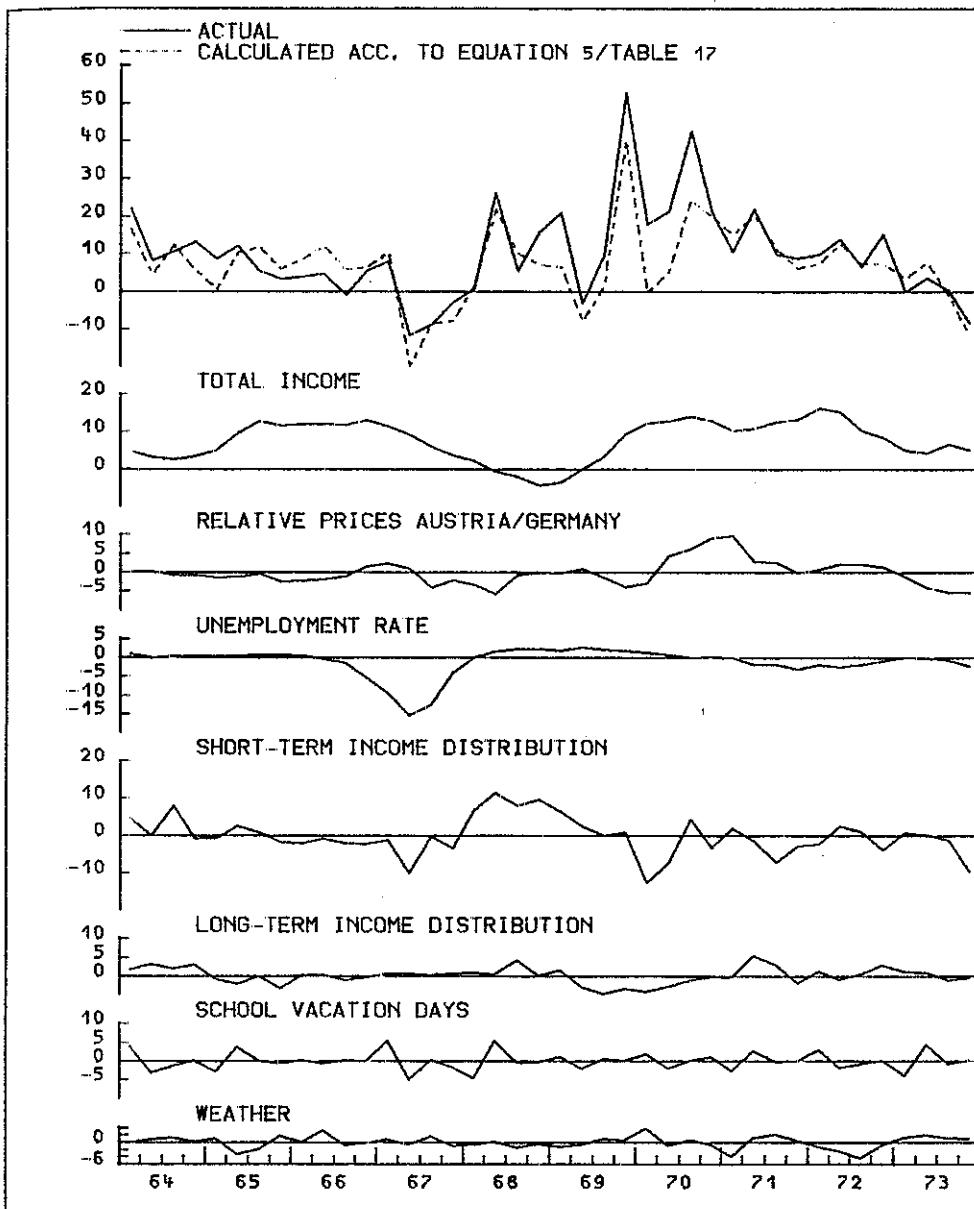
The following combination of determinants explains best German demand for travel in Austria:

	Direction of influence	Time lag (in quarters)
Income during previous year		
total income	+	4
or		
wage bill by itself	+	5
or		
together with non—wage income	+	3
Tourism prices		
in Germany	+	1
relative prices Germany/Austria	+	2
Unemployment	—	0
School vacation days	+	0

In some specific cases the following variables are added:

Income distribution		
(relation wage bill/profits)		
short— term	—	1—2
long— term	+	6
Weather in Austria	+	0

International Tourism in Austria
 Dependent Variable: Receipts from Germany (Real)



The time lags shown correspond to the time profile of the demand for tourism which we found already above. Only wage income has a significantly longer time lag. Here wages influence the demand for vacations in Austria half a year later than expenditures in all foreign countries combined. Maybe the percentage of persons who go abroad for the first time is especially high for travellers to Austria.

When total incomes go up by 1 %, expenditures in Austria increase by 1,6 %, the number of nights spent by Germans by 1,5 %. This income elasticity is slightly smaller than that for Germany's total demand for foreign travel. When incomes are split into wages and profits one can observe that an increase in wages by 1 % increases the demand for vacations in Austria by around 1,2 %, while the elasticity of profits is only around 0,4 % (expenditures), and 0,3 % (nights) respectively. Thus the demand for vacations in Austria is influenced more strongly by the development of wages (relative to that of non-wages) than that for foreign travel in general. This shows again that the share of wage earners is higher for visitors to Austria than for all tourists ("social strata theory").

Relative tourism prices between Germany and Austria do not play a very significant role. When a vacation in Germany becomes 1 % more expensive than one in Austria, Austria's receipts increase by around 0,8 %. The elasticity coefficients varies between 0,5 % and 1,2 %, however.

The effect of unemployment on vacations to Austria is twice as strong as on that for total foreign travel. When unemployment goes up by 1 %, Austria's receipts fall by around 0,06 %, the number of nights by 0,04 %. This shows that Germans households react to deteriorating expectations not only by reducing the number of nights or vacations, but also by reducing their real expenditures per night. In such cases peripheral expenses are cut. Visitors to Austria are apparently much more influenced by fear to unemployment. This again corresponds to the assumptions of the "social strata theory" mentioned above.

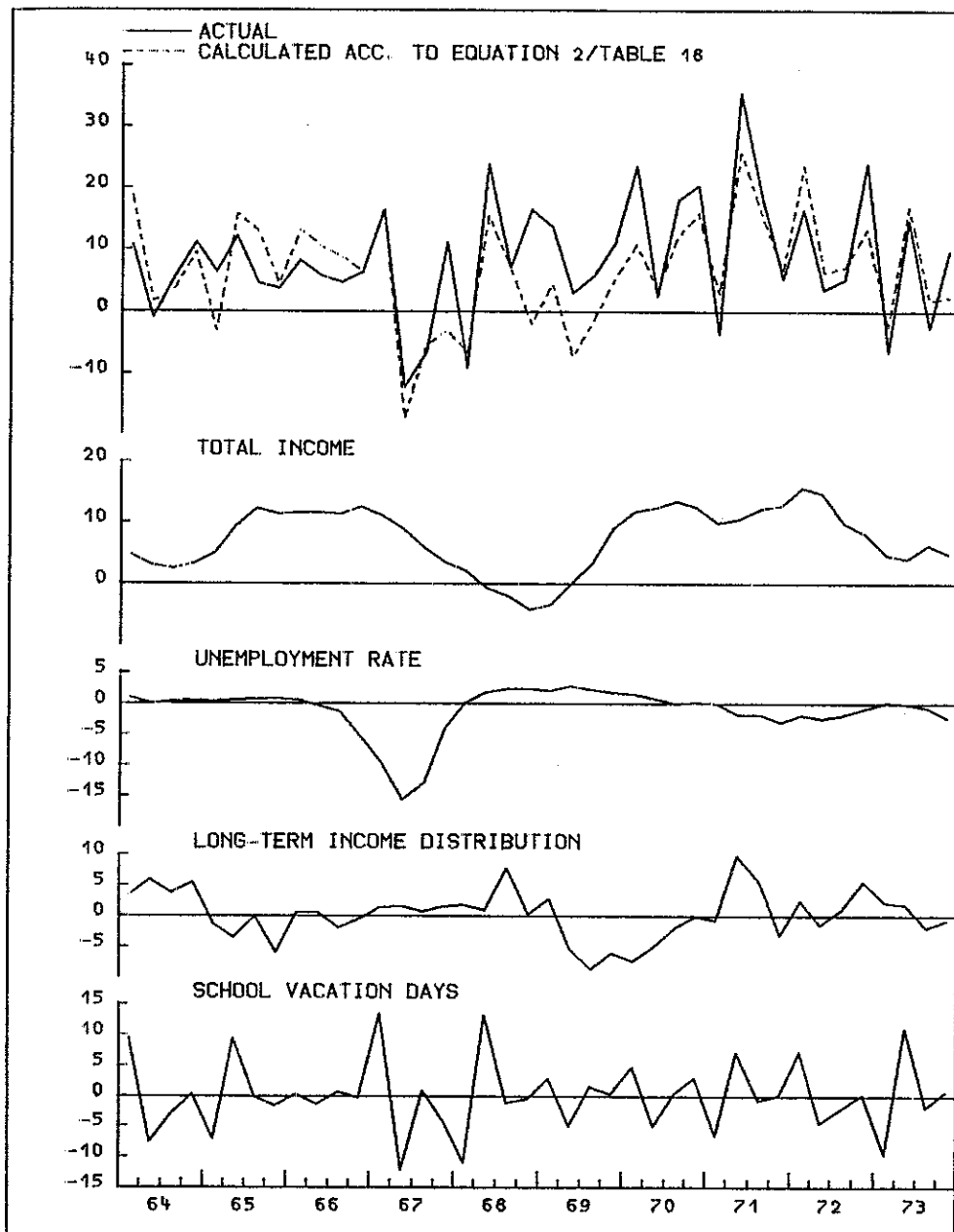
The number of school vacation days has a very strong influence on the quarterly changes in the demand for vacations in Austria. An extra day increases expenditures by 0,5 % and the number of nights by around 0,9 %.

The influence of income distribution changes is similar to our previous results. In the short run redistribution towards profits increases the demand for tourism (elasticity 0,6), in the long run this is effected by redistribution to wage incomes (elasticity 0,4).

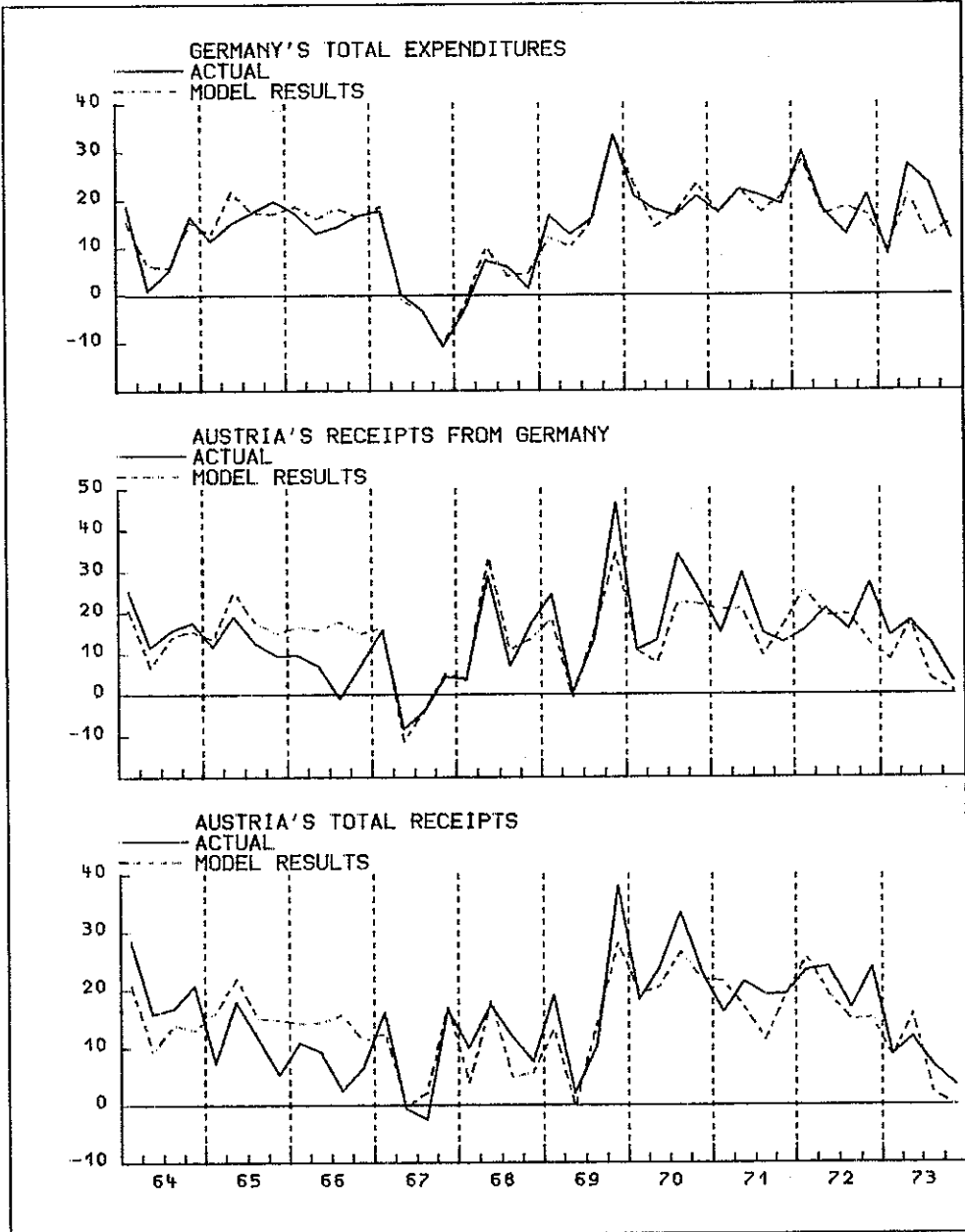
The weather conditions in Austria influence strongest the number of nights: they always go down when the weather is bad, while expenditures may still rise.

Figures 10 to 12 show the development of German demand for vacations in Austria. The models yield good results both for the explanation of monetary flows and for the number of nights

International Tourism in Austria
Dependent Variable: Nights Spent by Germans



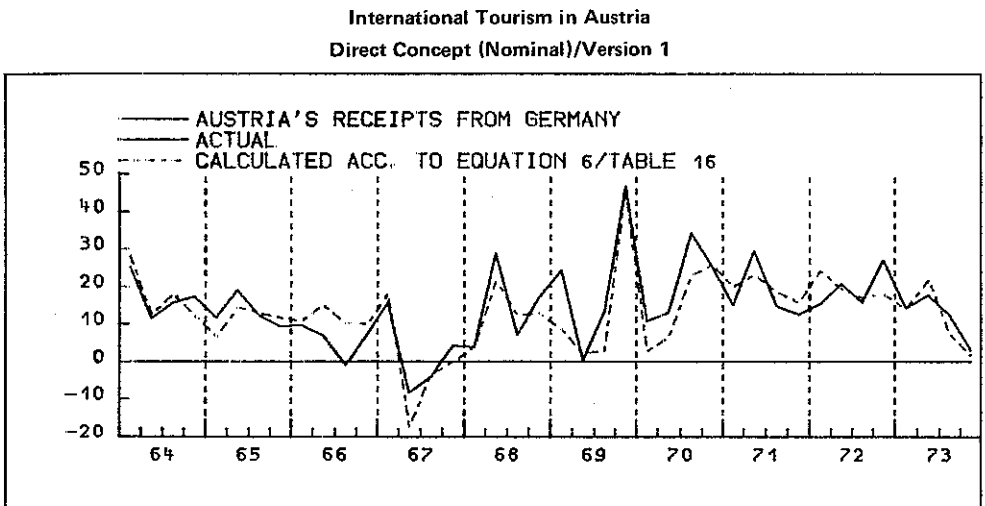
International Tourism in Austria
Market Share Concept (Nominal)/Version 1



3.5.4.3 Comparison of the Market Share Approach with the Direct Approach

Figures 13 to 16 compare the results of these two approaches. At first sight both approaches seem to explain the development of Austria's receipts from German tourists equally well. Apparently Austria competes within the total German demand for tourism with other foreign countries of destination as well as with Germany itself. The results from the market share models depict the actual development since the recession of 1967 better than before. This could mean that since then international competition has increased. This seems plausible in the light of increased motorization and thus much higher mobility since that year.

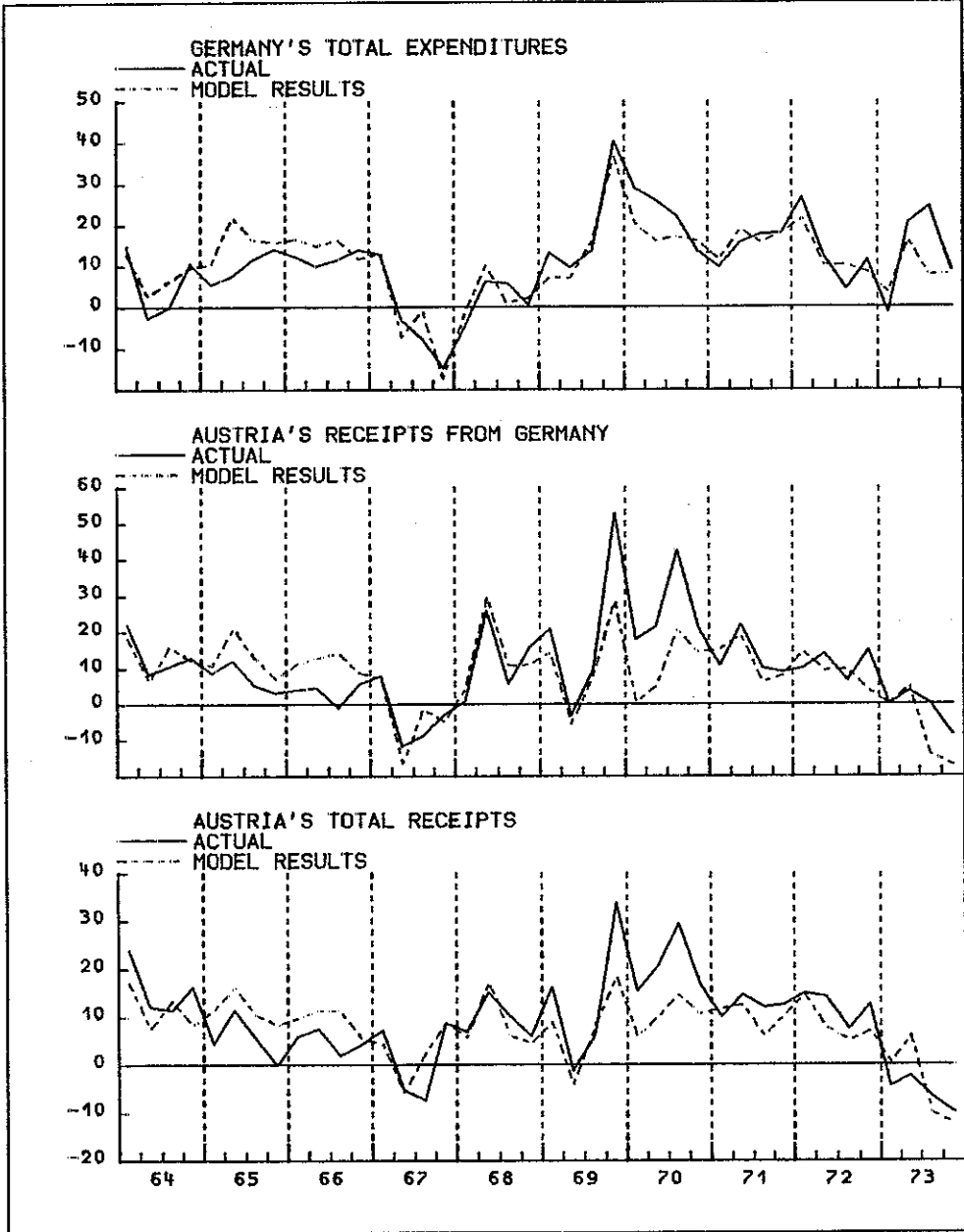
Figure 14



3.5.5 Austria's Receipts from the Rest Countries

Column 4 in table 2 shows the development of total tourism expenditures of the rest countries (Belgium, France, Great Britain, Netherlands, USA; all other countries are of no importance for Austria's tourism with the exception of Switzerland which lacks quarterly data, however). These are not analyzed econometrically, but treated as given. Column 5 shows Austria's share in the travel market of these countries. Austria's receipts from these countries (column 6) result by definition from total expenditures times the market share.

International Tourism in Austria
Market Share Concept (Real)/Version 1



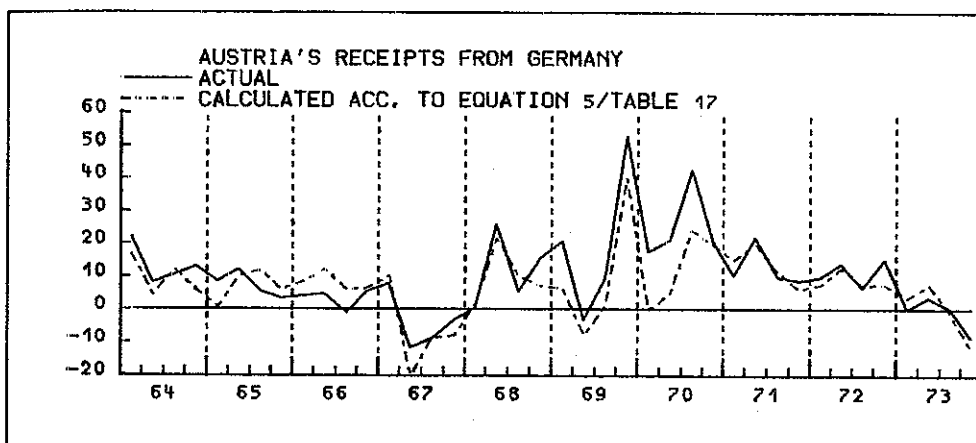
For lack of data only a few variables could be tested as determinants. Only, one, namely relative prices which is the most important variable, exhibited a statistically significant effect. When the price of a vacation in Austria goes up for tourists from the rest countries, Austria's nominal market share falls by around 0,9 %, its real share by about 1,4 %.

Three important observations are in place:

- The rest countries react to price changes only after about one year. This seems plausible when one considers that US-tourists plan their European vacations a long time ahead.
- Relative price changes play a larger role for tourists from these countries than for German tourists. This can be explained by a special German preference for Austria.

Figure 16

International Tourism in Austria
Direct Concept (Real)/Version 1

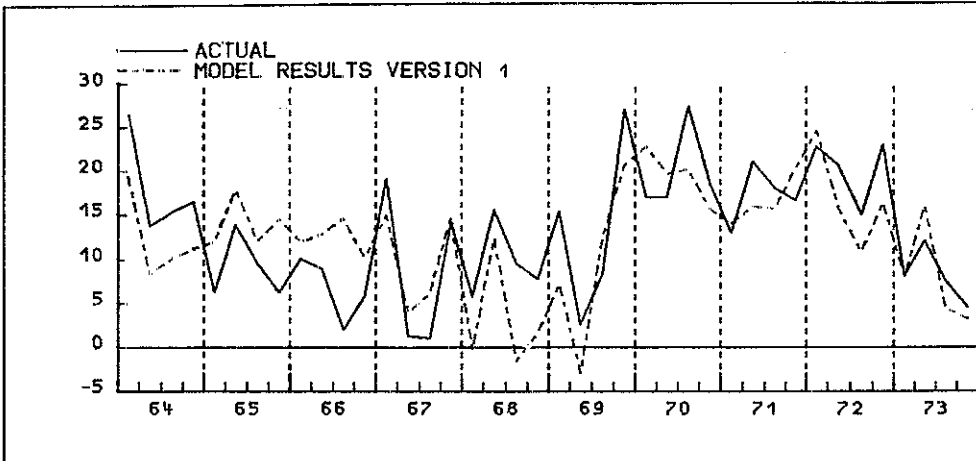


- The rest countries exhibit a significant trend towards vacations in Austria. In the long run the Austrian share increases. When total expenditures for tourism in these countries rise by 1 %, Austria's expenditures grow by 1,2 %. This is only true under ceteris paribus conditions, in the concrete example only when relative prices are held constant.

3.5.6 Austria's Total Receipts from International Tourism

Austria's total receipts from international tourism are by definition composed of the sum of the receipts from Germany and the rest countries. For this reason they can be calculated both by the market share concept and by the direct approach. The approaches differ from

Total Tourism in Austria (by Austrians and Foreigners)
Dependent Variable: Nominal Receipts



each other only for Germany, since for the rest countries always the same equation was used. Therefore the remarks made under point 3.5.4 3 apply also here.

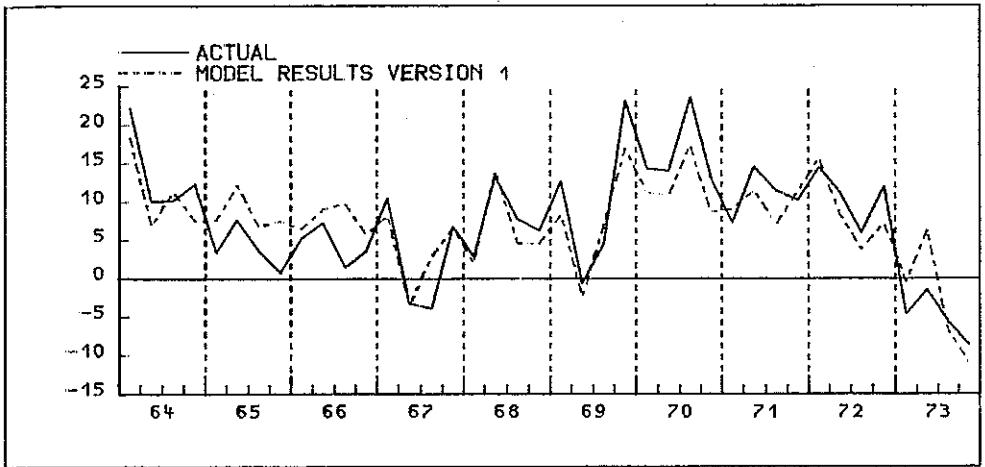
Figures 13 and 15 both show the results from the nominal and the real models in the lowest diagram. In both cases the market share approach was applied. Lack of data prevented a very thorough analysis for the rest countries, thus the fit of the equations for Austria's total exports is slightly inferior to that for its receipts from Germany alone.

3.6 Total Tourism in Austria: Domestic and International

3.6.1 Development 1964 to 1973

The marked trend towards foreign travel is also revealed by the diverse development of the two components of receipts from tourism in Austria. While receipts from domestic tourism increases by 8,2 % (nominal) and 2,8 % (real) per year during the period 1964 to 1973, Austria's receipts from foreign countries increased annually by 13,2 %, and 7,3 % respectively. Thus foreign currency receipts from tourists increased at the same pace as total exports: commodity exports (13,9 %) had also expanded clearly faster than Austrian GNP (9,9 %). Thus the share of receipts from tourism in total exports remained about the same (1964: 26,9 %, 1973: 25,4 %). In real terms foreign currency receipts from tourism grew less than commodity exports (because in Austria as in most other countries tourism prices

Total Tourism in Austria (by Austrians and Foreigners)
Dependent Variable: Real Receipts



had grown above average), but for balance of payments purposes only the nominal flows are of interest.

Austria's total receipts from tourism (from foreigners as well as from Austrian tourists) expanded by around 11,9 % per year in nominal terms and by 6,2 % in real terms. Their growth exceeded that of total final demand. Their share in GNP increased from 9,3 % to 10,9 % and thus held on to the first place among all developed industrial countries.

3.6.2 Econometric Results

Figures 17 and 18 show the model results for both the nominal and the real development of all tourism receipts of Austria. In both cases the fit of the estimated equations is satisfactory. In view of the very strong fluctuations relative to other macroeconomic variables it can even be called excellent. This allows the conclusion that the econometric model chosen contains the actual determinants of Austria's receipts from tourism, that their respective influence has been quantified satisfactorily and that their combined effects are reflected in the model structure. However, this statement is only true for the period under investigation.

In the following sections we want to examine to what extent the relations discovered also hold for the time since the "energy crisis" and whether they can also be used for forecasting purposes.

4. The Development of Tourism Since the "Energy Crisis" and Its Explanation by Means of Econometric Models

4.1 Overview

In this first part we attempt to illustrate the general tendencies of tourism in Western Europe and the specific case of Austria by means of a qualitative analysis. We set out by comparing the medium-term trend since 1973 with the development in the sixties and early seventies. Then we shall examine in more detail the developments since 1973 giving special consideration to the following problems:

- Tourism and the system of flexible exchange rates
- Tourism and economic expectations
- Tourism and the balance of payments.

In the second part we examine to what extent quarterly models of tourism can explain the time since the "energy crisis". For those demand components which exhibit shifts in their behavior patterns, new estimates are introduced. Furthermore new models of demand for tourism in Germany are developed. They attempt to quantify the relationship between tourism and expectations. This second part is organized according to the general system of types of demand for tourism. Thus it is similar to section 3. above.

4.1.1 Tourism in Western Europe Since the "Energy Crisis"

Table 3 shows the development of international tourism in the most important European countries of destination. At first the differences between the trend in the sixties and early seventies (column 1) and the development since the "energy crisis" (column 2) are investigated. During the first period nights spent by foreigners in Western Europe increased by 7,6 % per year, in the second period this rate fell to only 2,7 %: the growth rate fell to less than half its previous value. This rupture in the long-term development shows very clearly how much tourism depends on the general economic situation. The rates of growth of production and incomes also had fallen drastically since the "energy crisis".

This rupture in the expansion of tourism also shows up in the structure of the growth process. A very clear development pattern had emerged from the development of the sixties and early seventies:

- By far the fastest expansion took place in the relatively less developed countries of the Mediterranean area (Yugoslavia, Greece, Spain); Italy experienced a special development

Nights in International Tourism in Western Europe

	Ø 1961/ 1973	Ø 1973/ 1977	1974	1975	1976	1977
	Annual Growth Rates					
Austria	+ 7,6	- 0,1	- 5,0	+ 6,7	- 1,1	- 0,9
France	+ 5,6	+ 2,5	+ 0,4	+ 2,1	+ 3,1	+ 4,4
Germany	+ 3,1	+ 3,5	- 6,0	+ 5,5	+ 8,3	+ 6,8
Switzerland	+ 1,9	- 1,2	- 8,2	+ 1,4	- 3,7	+ 6,1
Great Britain	+ 8,2	+ 6,2	+ 1,0	+ 8,1	+ 4,7	+ 11,5
Greece	+ 15,5	+ 8,3	- 35,0	+ 44,8	+ 35,4	+ 7,9
Italy	+ 4,4	+ 2,6	- 4,1	+ 5,3	+ 1,8	+ 7,7
Spain	+ 14,4	+ 1,6	- 6,8	+ 8,8	- 16,2	+ 25,3
Yugoslavia	+ 17,7	- 2,4	- 7,2	+ 6,4	- 7,1	- 1,2
Total ¹⁾	+ 7,6	+ 2,7	- 4,8	+ 7,1	- 0,8	+ 9,4

1) The nine most important countries of destination listed above.

due to two reasons: on the one hand, Italy had already reached a higher level of economic activity than the other countries and on the other, labor conflicts and the press they received especially in the German speaking countries had slowed down the growth rates of tourism already since the late sixties.

- The expansion was slowest in the most highly developed countries of Central Europe (Switzerland, Germany, France): all these experienced severe drops in their market shares.
- Only in Great Britain and in Austria did foreign tourism expand at around average speed. Great Britain benefited on the one hand from the fast increase in visitors from the Commonwealth countries as well as from its attraction for language students; Austria profited from a series of structural effects which will be explained in detail further down.

This development pattern of the market shares in international tourism can be explained by two major reasons:

- Industrial countries became more expensive relative to the Mediterranean countries. This discrepancy goes back to the differing conditions of production between tourism services and industrial goods, but also to differences in the relative factor intensities between the countries. Since the production of tourism services is relatively labor intensive and since labor is abundant in relation to capital in the Mediterranean countries (this fact also accounts for the migration of workers from these countries to the industrialized nations where labor is relatively scarce), tourism services in the Mediterranean countries became cheaper relative to industrial goods. As a result these countries specialized more in the production of tourism, the more developed countries more in the production of industrial goods. It has been shown that this case represents a model case of the theory of comparative costs [67].
- Trend towards the Mediterranean countries. This can be explained by the specific socio-psychological determinants of tourism. The longing for "alternatives" as a negation to the working and living conditions of everyday life is projected especially to the Mediterranean countries, in climatic, cultural and also social respect.

Since the "energy crisis" not only the speed, but also the structure of the growth path of tourism has changed. Only three countries perpetuated their old market share development. Switzerland was again marked by below-average growth rates in the number of nights spent by foreigners, Greece and Great Britain repeated their above-average performance. All other countries of destination showed a reverse trend in the development of their market shares. These severe shifts can be explained by two reasons:

- Changes in the relative prices in international tourism
- Political events

As a result of the breakdown of the International Monetary System of Bretton Woods, i.e. of the system of fixed exchange rates, the conditions of price and competition in international tourism changed faster within a few years than during the whole after-war period before. This can be made clear by using the example of price shifts between 1972 and 1977. The year before the "energy crisis" is included, in order to account for the strong changes in exchange rates in 1973 which exerted some of their effects on the tourism flows only a year later. Using Austria as reference basis, the following hierarchy in tourist price levels results in 1972:

Switzerland	127,0	Italy	110,8
Germany	123,3	Austria	100,0
France	114,6	Spain	97,6
Great Britain	114,3	Yugoslavia	74,6

This hierarchy changed drastically in the course of a few years mainly because of the exchange rate fluctuations. Let us take for example the case of Austria and Italy. Generally speaking, changes in relative prices in the international economy (the "terms of trade") are determined by three components: the price developments in each of the two countries (in national currency) and the exchange rate. Thus in Italy prices for tourism services increased by 112,0% (in lira) between 1972 and 1977, in Austria only by 52,4% (in schillings). During the same period the lira lost 52,7% of its value with respect to the schilling, which was much more than could be explained by the difference in the rates of inflation between the two countries. Thus a vacation in Italy became cheaper relative to one in Austria, namely by 34,4% ($2,12 \times 0,47/1,52 = 0,656$).

Thus the combined effects of exchange rate changes and differing rates of domestic inflation resulted in the following hierarchy for tourism prices in 1977:

Switzerland	113,3	France	89,0
Germany	101,7	Great Britain	78,7
Austria	100,0	Italy	72,7
Spain	90,2	Yugoslavia	72,3

Austria had moved from the third—cheapest to the third most expensive country. Moreover, the difference to the countries with even higher prices (Germany and Switzerland) had narrowed, since the Austrian rate of inflation did not correspond to the hard currency policy pursued by the National Bank (or vice versa). In Austria tourism prices increased significantly faster than in the two other hard—currency countries Germany and Switzerland.

This shift in relative prices caused tourism to develop faster in Great Britain relative to its competitor countries than before the "energy crisis". The continuing loss of market shares for Switzerland also coincides with its position as the most expensive tourist country in Europe. The trend reversals in Austria's market share development (decreases since 1973) and in that of France and Italy (gains since 1973) also found their qualitative, but not quantitative correspondence in the relative price developments: judging by the extent of Austria's relative price increases her market shares would have had to fall considerably faster; on the other hand, one could have expected a faster increase in Italian tourism judging from its very sudden fall in tourism prices. Also in Spain, the relative price increase cannot entirely explain the whole extent of the trend reversal in market shares, i.e. its losses since the "energy crisis". In all these cases political events became effective at the same time, which often were related to the price changes. Such effects influenced very strongly the period following the energy crisis:

- In Portugal the unstable political situation as from 1974 (overthrow of the military dictatorship) caused a fall in the number of nights spent by foreigners by 23,8 % and in 1975 again by 23,3 %.
- The Cyprus events of 1974 caused the nights spent in Greece to fall by 35,0 %.
- In Spain the events before and after the death of Franco (during fall of 1975) are probably responsible for the heavy decrease in the number of nights spent by foreigners in the following year (– 16,2 %).
- In Italy the continuing political tensions up to the parliamentary elections of 1976 were responsible for slowing down foreign demand for vacations in Italy.

These political disturbance factors accounted for the fact that the changes in the price structure of tourism (Portugal and Greece had also devalued their currencies and thus become cheaper) was not fully visible in the development of tourism during the first years after 1973; these "backlog" effects benefited the politically more stable countries, such as Germany, Great Britain, France and especially those which at the same time were expected to lose market shares because of their relative price increases, like e.g. Austria.

The development in the various countries after these political factors corroborates the above hypotheses:

- In Portugal the number of nights spent by foreigners increased by 8,4 % in 1976 and by 67,8 % in 1977.
- Greece experienced far—above—average increases in 1975 and 1976: the number of nights grew by 44,8 %, respectively by 35,4 %. This expansion is not only due to political factors (it is very likely that the democratization of Greece after the end of 1974 had a positive effect on tourism), but also to a fashion trend in favor of Greece.
- In Spain foreign tourism in 1977 expanded faster than in all other important countries: the number of nights grew by 25,3 %.
- Italy also had a very good tourism year in 1977, but domestic political problems – e.g. terrorism – are still responsible for a muted interest in this country.
- The elimination of these "backlog" effects hurts Austria's market shares most: in 1977 her share in Western European tourist nights fell by 10 %; this effect will also cause the 1978 results to be below average.

The rupture in the long-term development of international travel becomes also apparent when annual tourism results are investigated. While in Western Europe the number of nights of foreigners had increased every year up to 1973, they fell twice in absolute terms since the "energy crisis". The amplitude of the fluctuations – measured in terms of growth rates – was higher between 1973 and 1977 than in the previous 15 years.

A combination of socio-political and economic factors is responsible for this development:

- Already in 1973 economic expectations had deteriorated in all important countries of origin: this was caused by the breakup of the world monetary system and the fall of the US-dollar. The latter had also gained symbolic importance for the superiority of the Western economic system. Already in 1973 international tourism expanded below-average, the number of foreigner-nights increased only by 3,7 %.
- The announcement of an oil embargo by the Arab states and the energy-conserving measures introduced in the belief that a veritable "quantity crisis" was imminent caused a socio-psychological shock for the private households in Western Europe. The negative psychological effects of these measures went far beyond the objective consequences of the short-lived gasoline conservation measures. These effects were directed towards the private automobile which in addition to its objective role as a mean of transportation also represents the most important symbol of general and personal economic success and thus stands for the superiority and stability of the Western economic system. This shattering of consumer confidence in the system led to a rapid increase in precautionary savings, which was to a large extent financed by reductions in foreign travel expenditures. Moreover, international tourism was slowed down by the political factors mentioned above. Thus the year 1974 saw the most severe setback in the development of tourism since the end of World War II. The number of nights of foreigners in Western Europe fell by 4,8 %. This reduction cannot be explained by the general economic development, since in 1974 and even more so in 1973 real incomes had still increased substantially.

The development of total tourism was a little better in 1974, since for the above reasons demand switched to domestic travel as it had never done before. This effect benefited countries with a large domestic market: thus the number of total nights in 1974 grew by 2 % in Germany and fell by 3,5 % in Austria, even though the number of nights of foreigners in Germany (- 0,6 %) had fallen more than in Austria (- 5,0 %). Domestic tourism had increased in both countries (Germany + 2,7 %, Austria + 1,5 %). In Austria, only 25 % of all nights spent are due to Austrians. The corresponding figure for Germany is more than 90 %.

- In the year 1975, which was marked by the severest recession since the end of the war, international tourism expanded quite rapidly:

The number of nights in Western Europe increased by 7,1 %. This can again be explained by fluctuations in consumer expectations: since the worst fears had not come true, expectations of private household increased significantly in 1975, even though the actual economic situation became worse and worse. This obverse development of subjective evaluation and objective economic indicators has been dubbed "compensation effect" [70]. Econometric models which do not contain empirical data on consumer expectations cannot account for this effect. Thus such models which might work well for "normal" years, cannot explain the development in 1975.

- Since 1976 the development of tourism has corresponded once again to the general behavior pattern, which is primarily influenced by economic factors. The typical tourism lag of one year showed up in 1976 in a delayed reaction to the events of 1975: the number of nights of foreigners in Western Europe fell by 0,8 %.
- The rapid increase in the number of nights in 1977 (+ 9,4 %) depicts the influence of the short-lived economic recovery in 1976 in the same fashion.

4.1.2 Tourism in Austria Since the "Energy Crisis"

Also in Austria the effects of the "energy crisis" and its socio-psychological and economic consequences for foreign tourism became apparent. While the number of nights of foreigners had grown by 7,6 % per year between 1961 and 1973, they stagnated during the four years since the crisis (– 0,1 %). When compared with total Western European tourism, Austria's development up to 1976 was quite good. For all countries together market shares were maintained, since losses in the German market were compensated by significant gains in the other countries (especially in the Benelux countries). This is quite remarkable in view of the following two reasons, why the consequences of the breakup of the world monetary system were expected to be especially negative for Austria:

- Between 1972 and 1977 a vacation in Austria became by 26,9 % more expensive than a vacation in the competitor countries.
- Austrian tourism is dominated by such social strata which are especially vulnerable to recession and unemployment ("social strata theory").

The good performance of Austria up to 1976 was the consequence of the positive (at least for Austria) "backlog" effects: as a result of the political problems described above in the Mediterranean countries, their relative cheapness could not take its full effect on the country distribution of the number of nights. In addition, the tendency towards the Mediterranean area, which had developed independently of the price developments, slowed down. When political stability was restored in 1976, these two "backlogged" factors finally reached

their full effect: in the Mediterranean countries tourism expanded especially fast, while it stagnated in Austria. For the same reason Austria is again losing market shares in the international tourism market in 1978

4.2 Econometric Models as an Instrument of Demand Analysis

This section compares the model results described above, and forecasts made on their basis (ex-post-forecasts) with actual observations. This leads to an investigation of the following problems:

- To what extent can models constructed on the basis of developments in the sixties and early seventies explain actual fluctuations in tourism since the "energy crisis"?
- Can large deviations between model results and actual developments be interpreted as random fluctuations, or do they offer clues towards special factors or additional determinants which were not specified in the model?
- Did these additional variables influence the demand pattern of tourists only in the short run, or can it reasonably be expected that a rupture in the economic structure took place which requires the estimation of new models?
- Can future actual developments be explained by the same combination of determinants, but with changes in the quantitative influence each individual of variables, which again would require new estimates?

Trying to answer these questions will lead to a deductive investigation of those hypotheses on the development of tourism since the "energy crisis" which were treated in an inductive qualitative analysis above. At the same time this investigation can uncover mis-specifications in the estimated models and thus require the inclusion of additional variables. In both cases it might well be possible that the estimates were optimal for the period under investigation, but that since then economic structures have shifted significantly. This is especially true when the combination of explanatory variables was specified correctly, but their quantitative influence – measured by the regression coefficients – has changed.

The method used in this analysis consists of a close comparison of calculated and actual development, in individual cases by means of new estimates for different periods. Statistical stability criteria were not applied, because on account of the special factors described above the pattern of tourism was so unstable (relative to long-term behavior) that it immediately after the "energy crisis" that it does not require statistical corroboration. Unfortunately the period after these disturbance factors were eliminated is not long enough

to determine whether the estimated pattern for the sixties and seventies has been re-established.

The econometric models are not only used for analysis of the development since the end of the period under investigation (by means of ex-post-forecasts), but also for the calculation of ex-ante-forecasts for the years to come. Estimates for 1978 and 1979 are already contained in the diagrams and will be discussed more closely in the next section.

Moreover models are used frequently to simulate specific policy decisions. With their aid one can examine the effects of a certain policy tool on a given behavior structure and institutional side-effects. With the help of tourism models we investigated only one such measure, which was the most important one, however: in [71] we estimated the effects of a devaluation of the Austrian schilling on the Austrian tourism balance. It could be shown that for Austrian tourism the dynamic Marshall-Lerner condition holds: the sum of import elasticities for tourism is more than one, the supply elasticities in tourism are practically infinite, due to the structural underutilization of capacities in tourism. Thus a devaluation of the schilling would increase the balance of the Austrian tourism account considerably.

4.3 Domestic Tourism in Austria

4.3.1 Development 1973 to 1977

Table 4 shows the development of domestic tourism and its main determinants since 1970. In order to allow a comparison between the periods before and after the "energy crisis" also the average growth rates between 1961 and 1973 and between 1973 and 1977 are recorded. For the two years following the "energy crisis" also quarterly developments are described.

A comparison of columns 1 and 4 shows that for Austria the shift towards domestic tourism was very strong after the "energy crisis". Between 1961 and 1973 the number of nights spent by Austrians abroad had expanded much fast (+ 5,9 % per year) than those spent within Austria (+ 1,3 %). Since 1973 domestic tourism increased faster than in the long-term average (+ 2,1 %), despite a reduced growth in real incomes, while the expansion of demand for foreign travel was out by half (+ 3,1 %). Since the rate of inflation (column 9) had nearly doubled since 1973, private consumption in nominal terms (column 8) increased slightly faster (+ 12,0 %) than between 1961 and 1973 (+ 8,9 %). At the same time the growth rates of production (column 5) and of real incomes (column 7) fell. All this leads to the conclusion that those models which contain nominal consumption as a determinant are not well suited for periods of high rates of inflation, since they tend to underestimate actual developments considerably. The shift towards domestic tourism which was caused by socio-psychological effects also seems to have interrupted the usual relationship with the development of relativ prices (column 12) since the "energy crisis". Since a

vacation in Austria became much more expensive than one abroad (columns 10 and 11), a shift towards foreign travel should have been expected.

Investigation of quarterly fluctuations in domestic tourism with respect to the distribution of school vacation days (column 14) and weather conditions (column 15) reveals that the quantitative connection from the earlier period has remained quite stable. The shift in the Easter vacation in 1975 resulted in an increase in the number of nights for the 1st quarter of 14,3%. A year earlier demand had expanded even more (+ 16,4%), but that had been due to the introduction of the so-called "energy vacation", whose total effect had not been captured by our variable indicating school vacation days. The very unfavorable weather conditions in the 2nd and 3rd quarters of 1974 caused similar fluctuations in the number of nights. The opposite conditions during the 1st quarter of 1975 indicate the stability of the estimated relationship.

4.3.2 Econometric Results

The upper diagram of figure 19 compares the results obtained from a model for the period 1961/1973 with actual developments in domestic tourism. With the exception of the 1st quarter of 1974 ("energy vacation") the model gives a good picture of the actual development up to the 2nd quarter of 1975. The estimates for the second half of 1975 and for the whole of 1977 are much too low, however. The main reason for this underestimation was the fast expansion of private consumption (in nominal terms) which was primarily due to inflation. Thus its effect on the number of nights (a "real" variable) was much weaker than during the sixties, when inflation was by far lower and therefore the difference between real and nominal consumption expenditures much less marked.

Since our quarterly models have been applied to short-term forecasting for nearly two years, it seemed reasonable to re-estimate the equations for domestic tourism and extend the period under investigation. It now includes the 4th quarter of 1977. Even though more than 40.000 different equations were tested, it was essentially the same combinations of determinants that yielded the best model results. One important difference was that real private consumption performed much better (in statistical terms) than nominal consumption. This, however, was to be expected due to the strong increase in the rate of inflation. Moreover, no significant relationship was found between the development of relativ tourist prices (Austria/abroad) and the number of nights spent by Austrians. Also this result had been expected as a consequence of specific changes in the growth pattern of tourism since the "energy crisis".

Thus, apart from these two relatively minor changes, all the results of section 3.2.2 also apply to the longer period.

Table 4

Demand for Tourism by Austrians and its Determinants in the Business Cycle

	Domestic Tourism	International Tourism		Business Cycle	Determinants of the Demand for Tourism			
	Number of Nights	Expenditures		Nights Spent Abroad	GNP	Wages and Pensions		Private Consumption
		(1)	Nominal (2)	Real (3)	(4)	Real (5)	Nominal (6)	Real (7)
Annual Growth Rates								
1970	+ 3,0	+ 6,2	- 2,5	+ 0,7	+ 7,8	+ 8,2	+ 4,1	+ 9,6
1971	+ 3,1	+ 10,7	+ 5,8	+ 4,7	+ 5,3	+ 14,6	+ 10,1	+ 10,6
1972	- 1,8	+ 23,7	+ 16,0	- 1,7	+ 6,4	+ 12,6	+ 6,2	+ 14,8
1973	+ 0,4	+ 7,9	+ 3,9	+ 11,7	+ 5,8	+ 16,5	+ 9,4	+ 10,9
Ø 1973/61	+ 1,3	+ 18,3	+ 13,5	+ 5,9	+ 4,9	+ 10,2	+ 6,0	+ 8,9
1974	+ 1,5	+ 24,2	+ 16,8	- 3,4	+ 4,1	+ 13,9	+ 4,1	+ 13,4
1st Qu.	+ 16,4	+ 48,9	+ 42,4		+ 7,6	+ 15,8	+ 6,8	+ 17,7
2nd Qu.	- 2,4	+ 30,2	+ 22,5		+ 4,5	+ 14,6	+ 5,1	+ 12,9
3rd Qu.	- 2,5	+ 8,6	+ 0,3		+ 4,2	+ 12,7	+ 2,2	+ 14,1
4th Qu.	- 0,5	+ 28,1	+ 23,7		+ 0,9	+ 12,8	+ 2,6	+ 10,4
1975	+ 2,5	+ 10,3	+ 6,1	+ 9,4	- 2,0	+ 16,0	+ 6,3	+ 10,8
1st Qu.	+ 14,3	+ 11,3	+ 9,5		- 2,4	+ 14,3	+ 4,3	+ 12,0
2nd Qu.	- 7,0	+ 7,4	+ 4,7		- 3,4	+ 16,2	+ 7,3	+ 8,9
3rd Qu.	+ 0,9	+ 16,4	+ 11,3		- 3,1	+ 16,6	+ 7,4	+ 11,0
4th Qu.	+ 3,2	+ 4,1	- 2,6		+ 0,7	+ 13,1	+ 6,2	+ 11,4
1976	- 0,3	+ 14,2	+ 11,2	+ 3,6	+ 5,2	+ 10,2	+ 2,9	+ 11,2
1977	+ 4,8	+ 21,0	+ 16,4	+ 3,4	+ 3,5	+ 8,6	+ 3,3	+ 12,7
Ø 1977/73	+ 2,1	+ 17,3	+ 12,5	+ 3,1	+ 2,7	+ 11,9	+ 4,1	+ 12,0

The lower diagram in figure 19 shows that the new model reflects better the actual development. This is especially true for the 1st quarter of 1974, the second half of 1975 and all of 1977. When the old model is compared with the new model, one can see that their results become more similar when inflation rates are declining. For 1979 there is hardly any difference in the model forecasts, since the rate of inflation had been assumed to fall to 3 %.

Demand for Tourism by Austrians and its Determinants in the Business Cycle

	Determinants of the Demand for Tourism						
	CPI	Tourism Prices			Expectations	Special Factors	
	(9)	in Austria (10)	Abroad (11)	Relative Austria/ Abroad (12)	Female Unemployment Rate (13)	School Vacation Days ¹⁾ (14)	Weather ¹⁾ (15)
Annual Growth Rates							
1970	+ 4,4	+ 3,1	+ 8,6	- 5,0	- 5,8	+ 1,0	- 1,2
1971	+ 4,7	+ 5,4	+ 4,9	+ 1,6	- 3,5	- 1,0	+ 5,0
1972	+ 6,4	+ 8,6	+ 6,3	+ 2,5	- 3,6	+ 3,0	- 83,7
1973	+ 7,5	+ 12,4	+ 4,6	+ 9,8	- 14,7	+ 1,0	+ 57,2
Ø 1973/61	+ 4,2	+ 4,9	+ 4,3	+ 0,7			
1974	+ 9,5	+ 11,0	+ 5,6	+ 4,3	- 9,1	+ 3,0	- 11,9
1st Qu.	+ 8,5	+ 11,7	+ 4,6	+ 6,5	+ 3,8	+ 4,0	+ 1,5
2nd Qu.	+ 9,9	+ 11,9	+ 6,3	+ 4,2	- 2,6	+ 0,0	- 20,6
3rd Qu.	+ 10,0	+ 11,1	+ 8,3	+ 0,9	- 21,7	+ 0,0	- 34,3
4th Qu.	+ 9,7	+ 9,4	+ 3,6	+ 5,8	- 18,5	- 1,0	+ 6,0
1975	+ 8,4	+ 6,4	+ 3,9	+ 1,9	+ 3,0	+ 1,0	+ 4,5
1st Qu.	+ 9,4	+ 7,6	+ 1,6	+ 6,1	- 18,2	+ 12,0	+ 30,0
2nd Qu.	+ 8,5	+ 6,5	+ 2,5	+ 3,1	- 0,0	- 9,5	- 5,2
3rd Qu.	+ 8,8	+ 6,8	+ 4,6	+ 1,2	+ 22,2	- 0,5	+ 30,4
4th Qu.	+ 7,1	+ 5,0	+ 6,9	- 2,5	+ 20,5	- 1,0	- 37,1
1976	+ 7,3	+ 6,2	+ 2,8	+ 4,6	- 5,6	+ 0,0	+ 11,8
1977	+ 5,5	+ 6,6	+ 3,7	+ 2,7	- 6,0	- 1,0	- 8,2
Ø 1977/73	+ 7,7	+ 7,5	+ 4,0	+ 3,4			

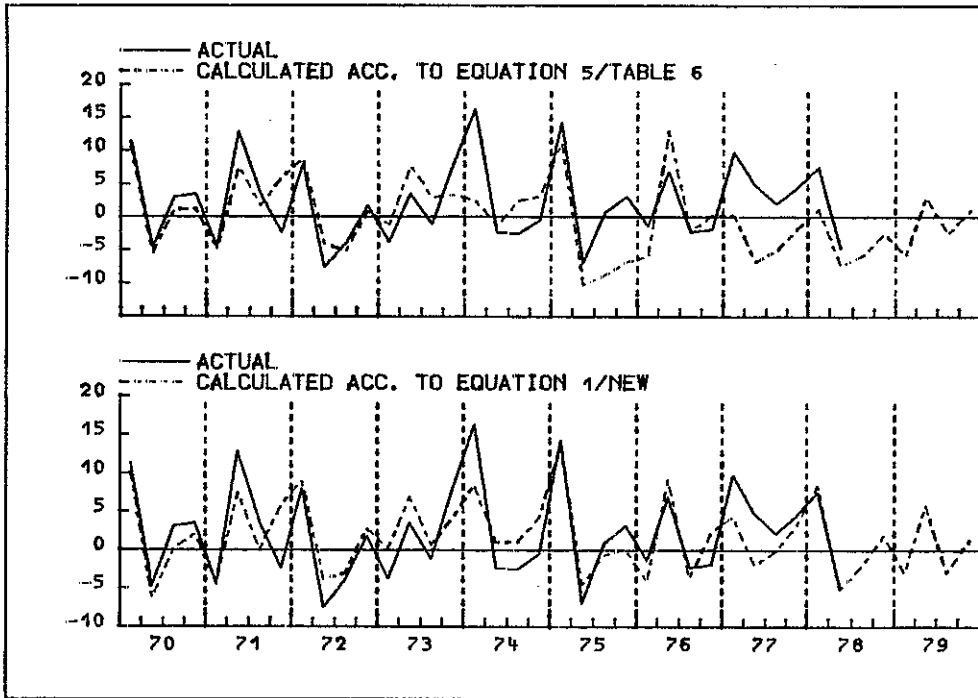
1) First order differences against the previous year.

4.4 Austria's Expenditures for International Tourism

4.4.1 Development 1973 to 1977

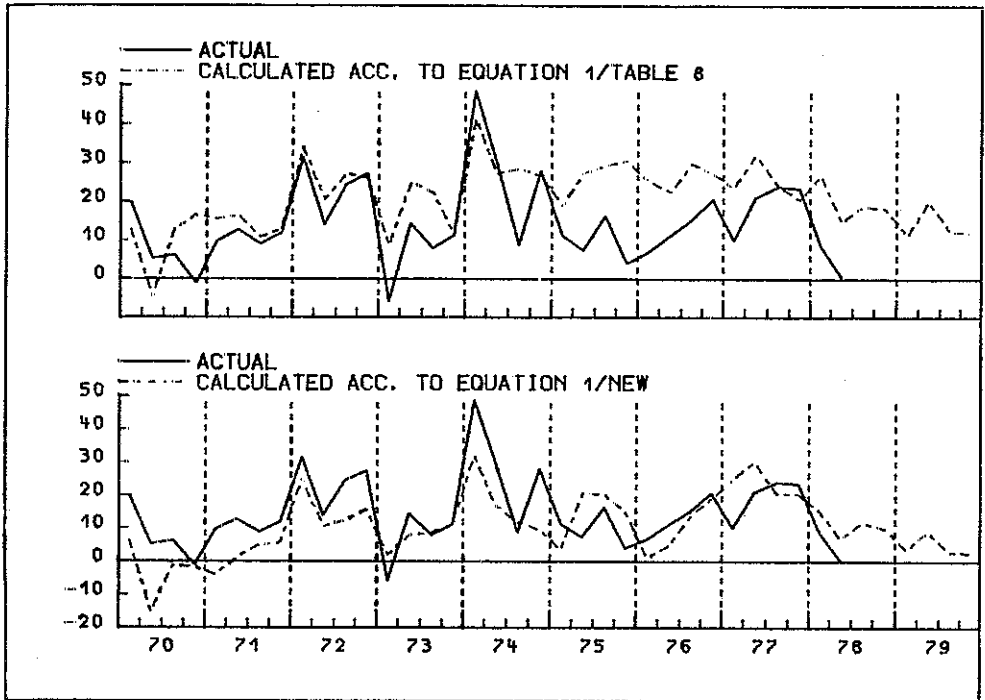
Table 4 shows the development of Austria's demand for foreign travel and its main determinants since the "energy crisis". When the number of nights spent by Austrians abroad is

Domestic Tourism in Austria
Dependent Variable: Nights



used as an indicator of the demand for tourism (column 4), one can see that foreign travel was heavily influenced by the "compensation effect": in 1974 the number of nights had fallen significantly ($-3,4\%$), but in the following year they grew above average ($+9,4\%$). In spite of the 1975 recession foreign travel expanded in 1976 and 1977, even though less than its long run average. One of the main reasons for this further expansion was the fact that the high wage contracts in the spring of 1975 effectively covered up the effect of the recession. Furthermore, vacations abroad had become continuously cheaper in relation to Austria. These devaluation effects had their main impact on commodity imports, however. On the basis of the development of the number of nights and of prices, specific tourism expenditures between 1973 and 1976 should have increased by only 7% per year. Total foreign currency outflows increased by $16,1\%$ per year, however, since direct imports of commodities had increased even faster.

International Tourism
Austria's Expenditures (Nominal)

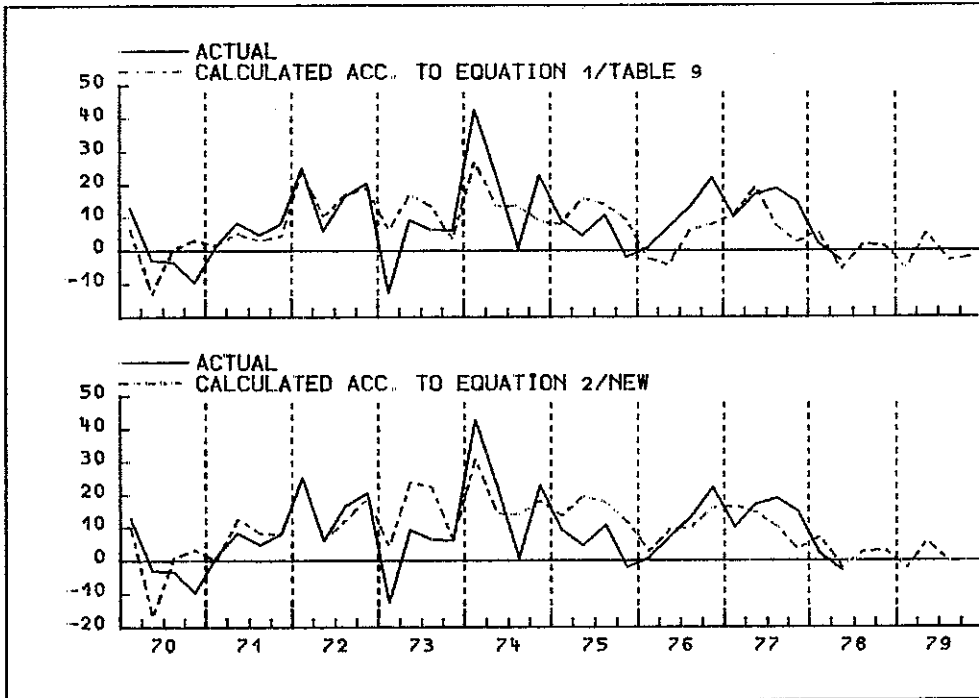


4.4.2 Econometric Results

The upper diagram in figure 20 shows the results of a simple model estimated on the basis of the developments up to 1973. According to that model expenditures for foreign travel and direct imports of goods should have increased in 1975 and 1976 even faster than they did, due to the high increases in nominal wage and pension income. These models were unable to account for the sudden increase in inflation, since inflation rates had been much lower in the sixties. Thus the equations for foreign travel were re-estimated (just like those for domestic tourism) using the period from the 1st quarter of 1964 to the 4th quarter of 1977. These new estimates yielded the following results:

- The income elasticity of demand for foreign travel by Austrians remained approximately stable.
- The dampening effect of increasing inflation became stronger. Every increase in consumer prices absorbs an additional part of household income, which therefore cannot flow into

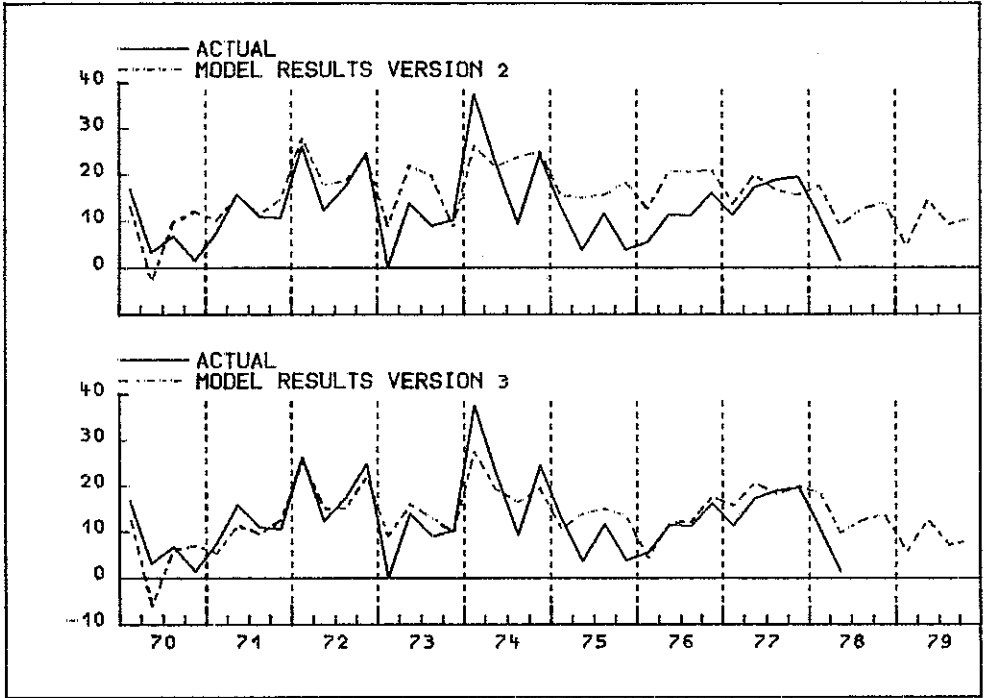
International Tourism
Austria's Expenditures (Real)



tourism. In general, consumers react very little to across the price increases, but it is quite easy to forego or reduce vacation expenditures or expenditures for directly imported commodities. In general an increase in consumer prices by 1 % leads to a decrease in (nominal) foreign currency outflows of 3,5 %, and in real outflows of 2 %.

- The coefficients of the price variables remained quite stable. Because of the much stronger fluctuation in exchange rates it became possible for the first time to isolate domestic price effects from exchange rate effects. It seems that consumers react quite strongly to changes in exchange rates, with a time lag of about two quarters. When a foreign country devaluates its currency, Austrian foreign travel expenditures tend to increase after a certain planning and reaction period. Price fluctuations in a country of destination, however, have a much smaller but immediate effect on demand. It seems that in times of generally high inflation rates differences between the rates of individual countries and corresponding exchange rate fluctuations, are realized by tourists only when they are already in that country.

Total Travel by Austrians in Austria and Abroad
 Dependent Variable: Nominal Expenditures



— The coefficients of the other variables remain stable, the same combination of determinants explains tourism imports best.

The lower diagram in figure 20 compares the results from a re-estimated model with the actual development. As expected, the explanatory value of this model is much higher.

Figure 21 compares old and new model results for the real demand for foreign travel and direct imports of commodities. Since the large differences between old and new models are caused by the effects of inflation rates, no such effect should result for the real models. Old and new models for real developments are quite similar in explaining the seventies.

4.5 Total Tourism of Austrians: Domestic and International

4.5.1 Development 1973 to 1977

Total tourism expenditures by Austrians — as defined by economic statistics — increased slightly faster since the “energy crisis” than before, due to the rapid expansion of direct commodity imports. Total expenditures increased in nominal terms by 14,4 % per year, in real terms by 8,9 % per year. Thus the difference in growth rates between total private consumption and tourism became even larger than in the years before 1973. This development cannot be explained by economic reasoning, however, since what is recorded under “foreign currency outflows” has become less and less homogeneous, not only with the increasing importance of direct commodity imports, but also because of foreign workers’ currency transfers and speculative monetary flows.

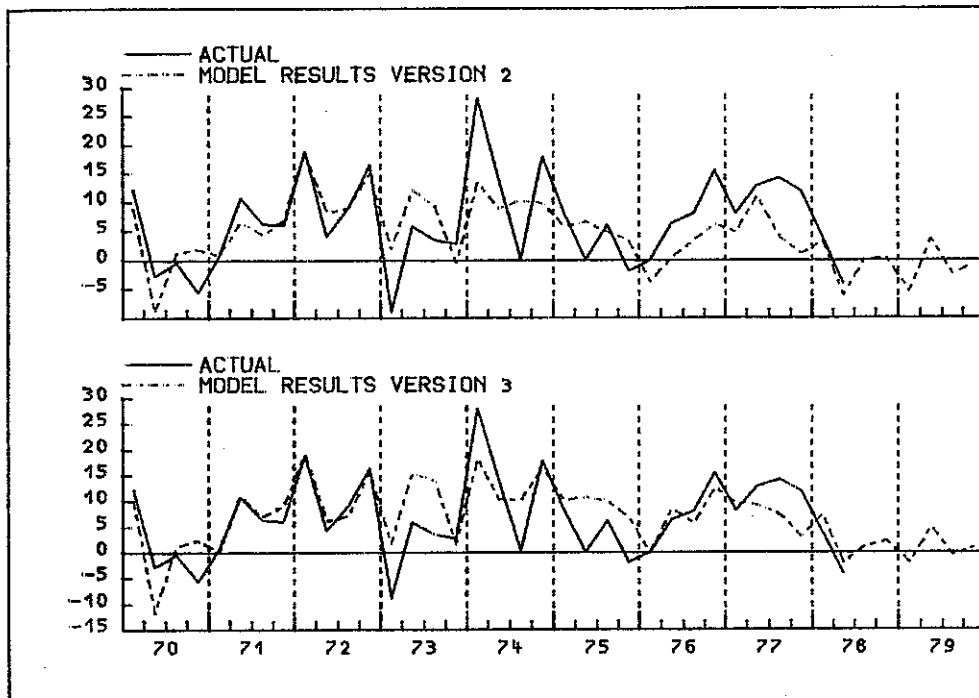
4.5.2 Econometric Results

The upper diagrams in figures 22 and 23 show the results of the models estimated for the period 1961/1973 (version 2). Underneath the results of the re-estimated models (version 3) are shown. From our previous considerations we know already that the largest differences are expected to occur for the nominal estimates, because in these models the fast increases in inflation since 1973 led to overestimates of foreign currency expenditures. When total tourism expenditures are estimated, however, this difference should be smaller, because the actual development of domestic tourism had been underestimated, especially for 1975 and 1977. This shows that the unsatisfactory forecasting performance of these models was also due to the strong shifts towards domestic tourism. It had been impossible to allow for a such shift in the old models, because it was primarily caused by the socio-psychological effects consequences of the “energy crisis”.

The re-estimated model (version 3) fits therefore the actual development much better, especially for the first years since the “energy crisis”. Since 1977 both model versions are very similar to each other. This shows that the original estimates are still good for “normal times” with average inflation and without major socio-psychological events.

Real expenditures for total tourism are estimated equally well by the old and the new models, since they are not influenced by the high increases in inflation.

Total Travel by Austrians in Austria and Abroad
Dependent Variable: Real Expenditures



4.6 Austria's Receipts from International Tourism

4.6.1 Development 1973 to 1977

The development of international tourism in Western Europe and Austria since the "energy crisis" was extensively described above. Thus in this section we discuss only the model variables contained in table 5.

After the "energy crisis", like before, demand for foreign tourism increased faster in Germany (column 1) than in other countries (column 4). The gap between Germany and the other countries became smaller, however. This, of course, also reduced the positive structural effect for Austria, which is heavily dependent on German tourists. Austria's receipts from the rest countries increased on average by 9,6 % per year, those from Germany by 6,3 %. Austria lost market shares in the German market (- 3,1 %), but gained in the rest countries (+ 1,0 %), since the fashion trend working in favor of Austria was stronger than

Table 5

Demand for Tourism by Foreigners and its Determinants in the Business Cycle (Nominal)

	Dependent Variable						
	Total Expenditures by Germans	Austria's Share in the German Market	Austria's Receipts from Germany	Total Expenditures of all Other Countries	Austria's Share in the Market of all Other Countries	Austria's Receipts from all Other Countries	Austria's Total Receipts
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Annual Growth Rates						
1970	+ 18,4	+ 4,7	+ 24,0	+ 15,6	- 0,6	+ 14,9	+ 26,6
1971	+ 20,1	- 2,3	+ 17,3	+ 10,3	+ 8,3	+ 19,5	+ 19,0
1972	+ 18,3	+ 0,1	+ 18,5	+ 10,5	+ 11,1	+ 22,8	+ 20,7
1973	+ 19,3	- 5,9	+ 12,3	+ 2,1	- 5,0	- 3,0	+ 7,7
Ø 1973/61	+ 13,6	+ 0,6	+ 14,4	+ 9,2	+ 5,0	+ 14,7	+ 15,3
1974	+ 5,1	- 6,8	- 2,1	+ 3,3	+ 5,4	+ 8,9	+ 0,2
1st Qu.	+ 15,6	- 16,1	- 3,0	+ 2,4	+ 1,1	+ 3,5	+ 0,5
2nd Qu.	- 1,6	- 11,0	- 12,4	- 5,1	+ 5,7	+ 0,3	- 8,2
3rd Qu.	+ 6,9	- 7,4	- 1,1	+ 5,9	+ 15,7	+ 22,5	+ 2,6
4th Qu.	+ 1,7	+ 9,7	+ 11,5	+ 11,7	- 9,8	+ 0,8	+ 4,9
1975	+ 14,8	- 1,3	+ 13,4	+ 9,3	+ 6,6	+ 16,5	+ 13,4
1st Qu.	+ 14,8	+ 18,8	+ 36,5	+ 4,0	+ 10,4	+ 14,8	+ 25,0
2nd Qu.	+ 14,0	- 0,7	+ 13,1	+ 1,2	+ 21,7	+ 23,2	+ 14,7
3rd Qu.	+ 14,5	- 7,4	+ 6,0	+ 15,3	- 4,8	+ 9,8	+ 6,9
4th Qu.	+ 16,7	- 4,6	+ 11,4	+ 13,0	+ 10,1	+ 24,5	+ 16,0
1976	+ 6,4	- 3,2	+ 3,0	+ 8,9	+ 1,0	+ 9,9	+ 5,9
1977	+ 12,6	- 0,9	+ 11,5	+ 12,6	- 8,2	+ 3,3	+ 8,2
Ø 1977/73	+ 9,7	- 3,1	+ 6,3	+ 8,5	+ 1,0	+ 9,6	+ 6,8

the negative effects resulting from Austria's becoming relatively more expensive (columns 11 and 13). For this reason, and also because of the "backlog effects" described above, Austria's total market share in tourism fell by only 1,3 % in nominal terms between 1973 and 1977. The real market share declined much more (- 3,1 %) due to the price effects. However, from the foreign trade point of view nominal monetary flows are more important than real developments.

Demand for Tourism by Foreigners and its Determinants in the Business Cycle (Nominal)

Determinants of the Demand for Tourism

	Net National Income, Germany	Expectations German Unemployment Rate	Relative Prices			
			Germany/ Abroad : for Germany	Austria/ Competitors for Germany	Germany/ Austria for Germany	Austria/ Competitors for Rest Countries
	(8)	(9)	(10)	(11)	(12)	(13)
Annual Growth Rates						
1970	+ 14,4	- 17,8	+ 6,7	- 1,6	+ 7,9	- 2,2
1971	+ 8,6	+ 25,3	+ 2,3	+ 1,0	+ 1,6	- 0,7
1972	+ 9,2	+ 30,8	+ 1,0	+ 2,1	- 0,5	+ 1,8
1973	+ 6,7	+ 11,8	+ 2,8	+ 12,9	- 5,3	+ 14,6
Ø 1973/61	+ 8,0		+ 0,4	+ 1,1	- 0,4	+ 1,4
1974	+ 5,3	+ 109,2	- 2,2	+ 4,5	- 5,0	+ 5,2
1st Qu.	+ 5,6	+ 79,5	+ 3,6	+ 11,1	- 3,5	+ 11,6
2nd Qu.	+ 3,5	+ 117,2	+ 1,3	+ 8,2	- 3,8	+ 10,1
3rd Qu.	+ 7,2	+ 130,0	- 8,0	- 2,2	- 6,7	- 1,5
4th Qu.	+ 5,1	+ 118,4	- 5,0	+ 1,8	- 6,2	+ 1,9
1975	+ 5,4	+ 78,6	- 5,4	- 1,5	- 4,5	- 1,8
1st Qu.	+ 3,2	+ 91,1	- 4,3	+ 3,3	- 6,4	+ 4,3
2nd Qu.	+ 6,0	+ 114,3	- 6,8	- 1,9	- 5,6	- 2,6
3rd Qu.	+ 4,8	+ 94,2	- 4,8	- 2,6	- 3,2	- 3,5
4th Qu.	+ 7,4	+ 38,3	- 5,8	- 4,8	- 2,6	- 5,3
1976	+ 7,1	- 2,6	+ 1,3	+ 4,7	- 1,7	+ 4,3
1977	+ 6,3	- 1,4	+ 0,5	+ 4,6	- 2,4	+ 4,0
Ø 1977/73	+ 6,0		- 1,5	+ 3,0	- 3,4	+ 2,9

When individual years are investigated the connections analyzed above are corroborated. Germany's tourism imports grew only by 5,1 % (in nominal terms) in 1974 – in real terms they fell by 4,7 % – and expanded quickly in the year of the worst economic recession since World War II (nominal + 14,8 %, real + 5,1 %). Only after 1976 the usual connection between tourism demand and the general economic situation was re-established. In the year before this relationship had been disturbed by the socio-psychological aspects of the "energy crisis". The following section shows econometric results corroborating this hypothesis.

4.6.2 Demand for Tourism and Household Expectations

Our analysis leads to the following hypothesis: in times of political and economic crises sudden fluctuations in the expectations of private households have very strong short-term effects on the demand for tourism. In extreme cases, such effects are even stronger than those of fluctuations in income. During "normal times" these connections are much weaker, since changes in "consumer sentiments" have a large random component. Thus it seems reasonable to use only such models during "crisis periods" which contain specific expectational variables, while for "normal" times rather economic-theory oriented models are more useful.

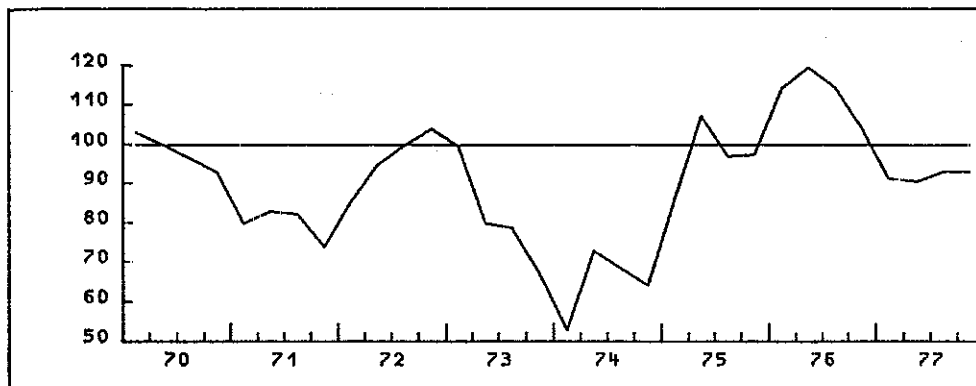
We shall test this hypothesis, using as a case study the development of German demand for tourism in the seventies. A similar study for Austria could not be carried out, due to the lack of sufficiently long series of data on "consumer sentiment". Furthermore, for Austria the data on foreign currency outflows are not a good indicator of the development of the demand for foreign travel. The reasons for this were mentioned above.

The indicator representing "consumer sentiment" is the household's evaluation of the general economic situation for the immediate future. The survey question was: "How do you think the general economic situation in this country will develop over the next 12 months?" Optimistic results were balanced against the pessimistic ones, and an index was formed whereby values over 100 described positive, values below 100 negative consumer expectations.

In addition, we also tested answers to questions on inflation and unemployment. The best model results were achieved by the more general question, however.

The development over time of consumer expectations in Germany shows the high importance of political and economic crises (figure 24). While the fluctuations in 1971 and 1972 were primarily caused by the domestic economic situation, the sudden deterioration in consumer expectations during the first half of 1973 was due to the international monetary crisis, and especially the first devaluation of the dollar: the index fell from 104 in the 4th quarter of 1972 to only 80 in the 2nd quarter of 1973. The "energy crisis" and especially the heavy-handed gasoline rationing measures (restrictions in the use of private automobiles) reinforced the prevailing pessimism: in the 1st quarter of 1974 the index fell to its lowest value of 53. Later on in 1974 expectations improved, but remained below the level of the previous year. At the same time unemployment increased significantly. Both variables moved parallel, as expected by socio-economic considerations: when unemployment rises, expectations become more pessimistic. This relationship did not hold any longer in 1975, however. Private households became more optimistic, even though unemployment still kept increasing. This divergent behavior can be explained by the fact that the worst expectations in the wake of the "energy crisis" had not come true. From 1976 on expect-

Economic Expectations of German Households
Neutral Judgement = 100



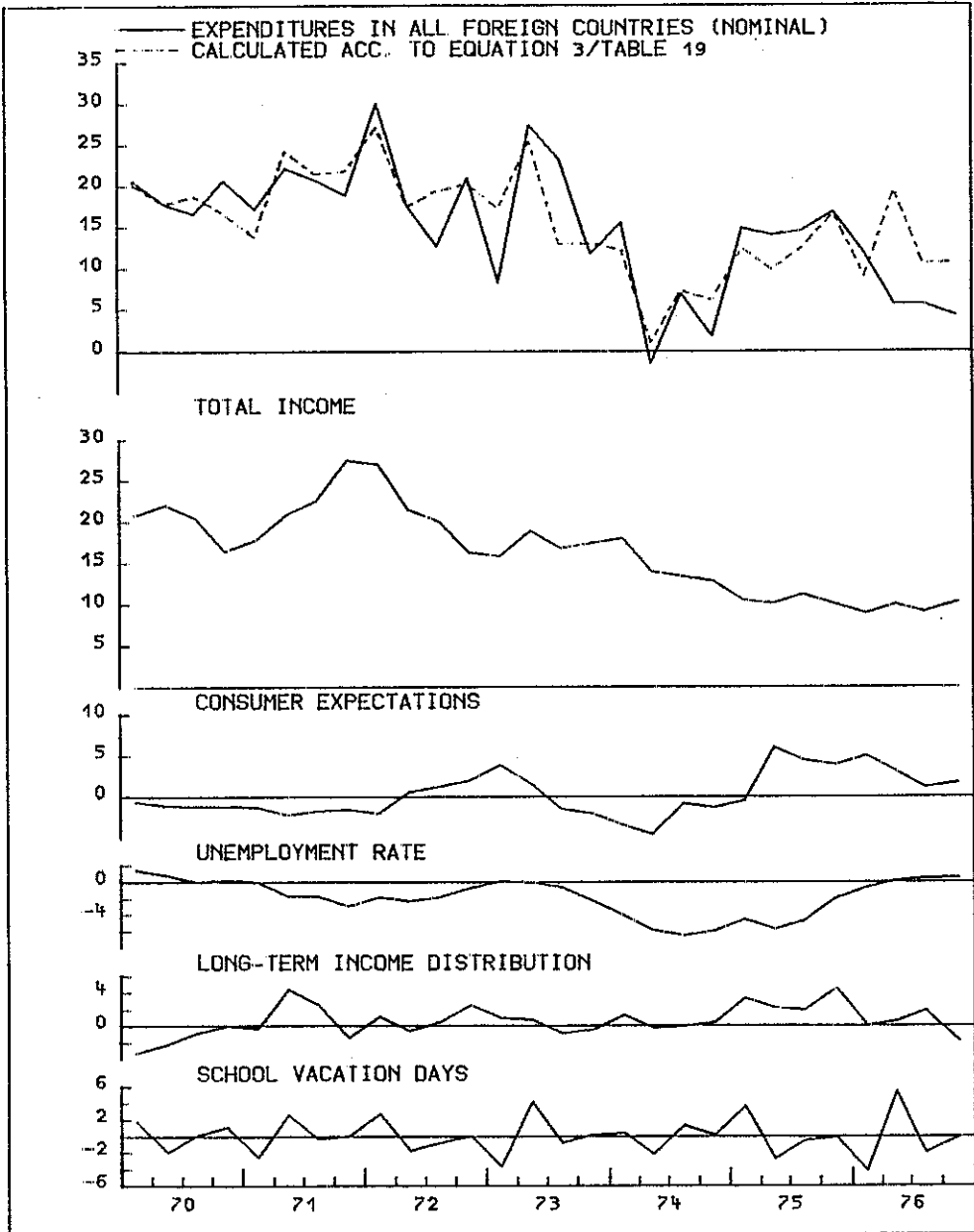
tations again went hand in hand with the general economic situation. They improved as a result of the economic recovery, but deteriorated again as a consequence of renewed recessionary tendencies in 1977.

The econometric estimates yielded the following results: next to income and the time distribution of school vacation days expectations exerted a strong and significant influence in all cases:

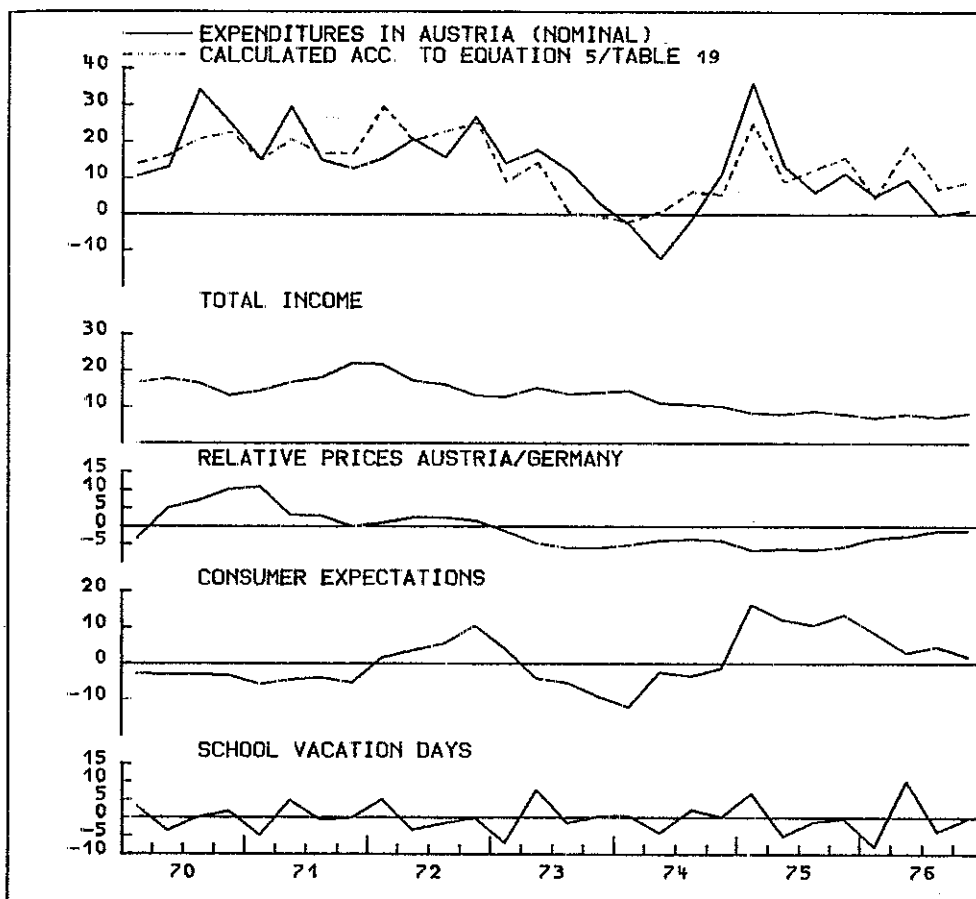
- When the expectation index rises by 10 %, German expenditures for tourism in all foreign countries increase by 1 %, and vice versa.
- Austria is affected twice as strongly by changes in German consumer sentiments. When the index changes by 10 %, Austria's receipts change by around 2 1/2 %. This result follows the "social strata theory", according to which the socially weaker strata are influenced more heavily by a deterioration in the economic situation and thus in expectations
- The number of nights spent by German visitors in Austria is influenced less by changes in consumer sentiments than are expenditures. When the index rises by 10 %, the number of nights increases by 1 1/2 %, and vice versa. It seems that German households react to insecurity not only by reducing their vacations, but also by cutting down on side expenses.

In specific cases the following variables also show a significant effect on German demand for tourism:

Consumer Expectations and Tourism
 Dependent Variable: Demand for Tourism by Germany

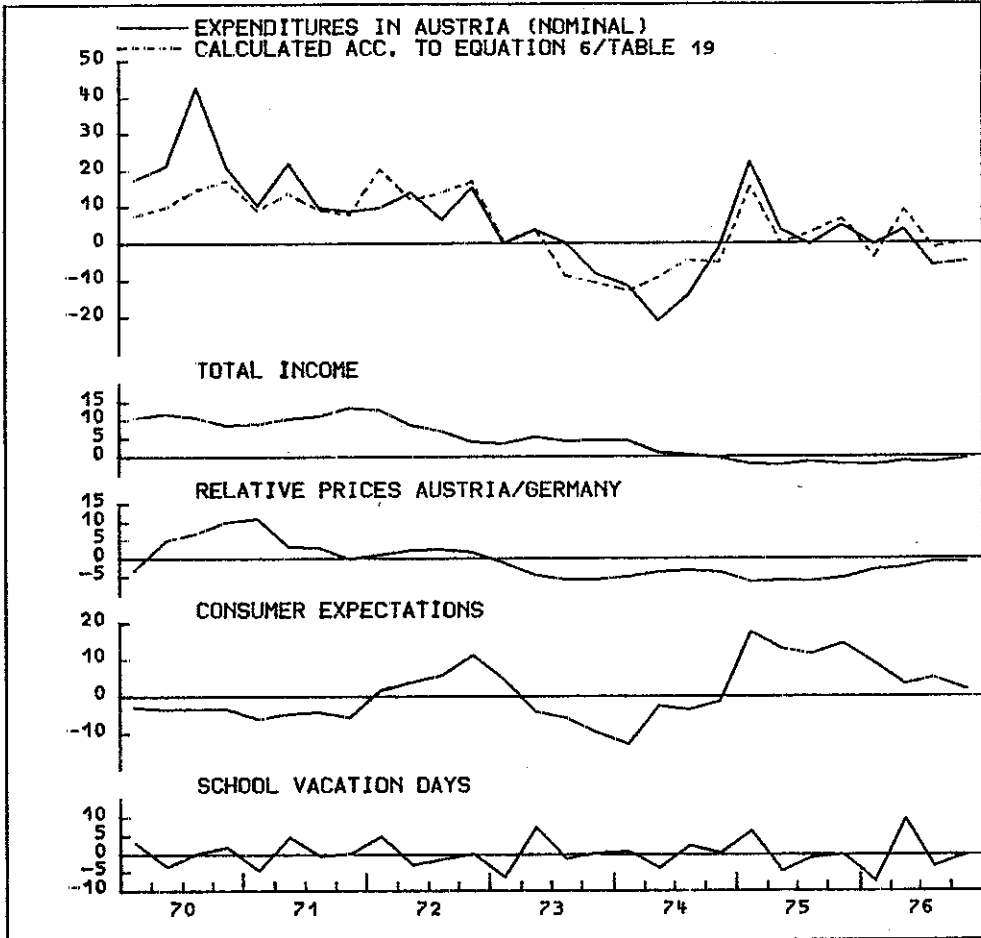


Consumer Expectations and Tourism
 Dependent Variable: Germany's Demand for Tourism



- Relative prices between Germany and Austria
- The functional distribution of income
- The German unemployment rate. This shows again that the incidence of unemployment was not a satisfactory indicator of economic expectations, especially in 1975. It seems that a strong increase in unemployment influences expectations already much less after one year (accustoming effect) By that time, expectations increasingly are influenced by other factors. This would explain, why the unemployment rate was a sufficient

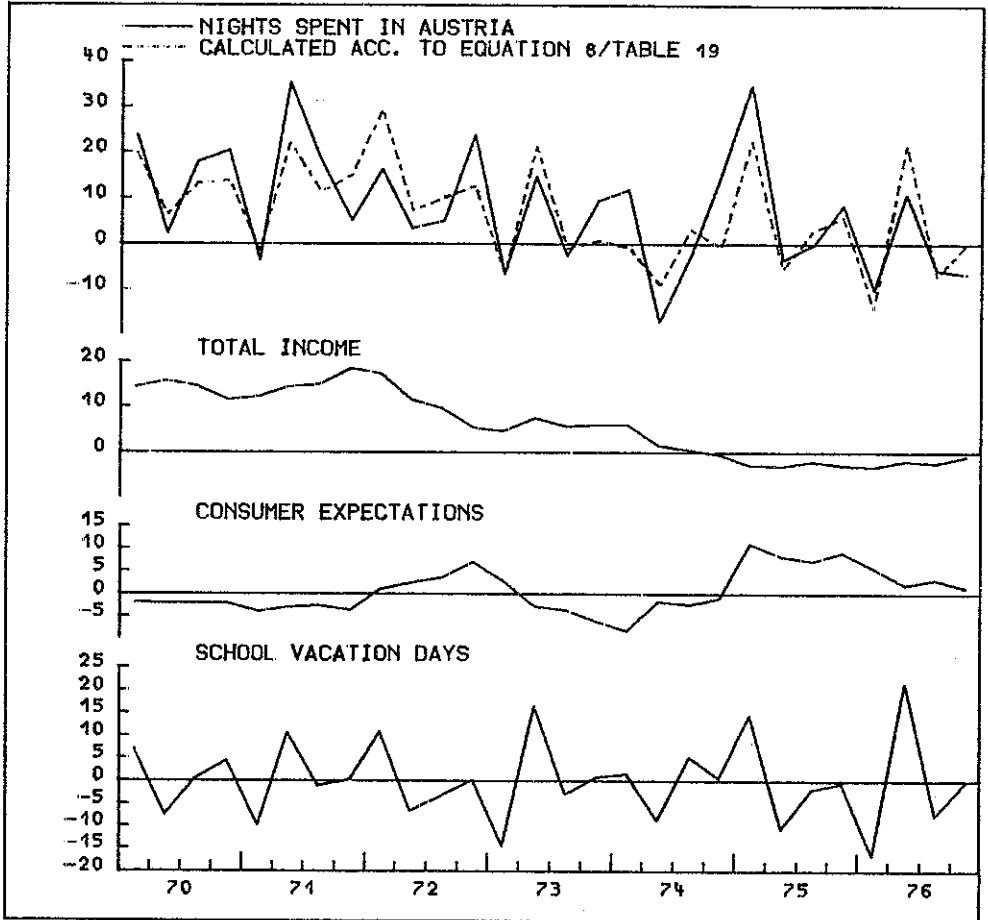
Consumer Expectations and Tourism
 Dependent Variable: Germany's Demand for Tourism



indicator of expectations for the period 1964 to 1973. During this period it never increased strongly for two years in a row: after a rise in 1967, it fell again during the following years.

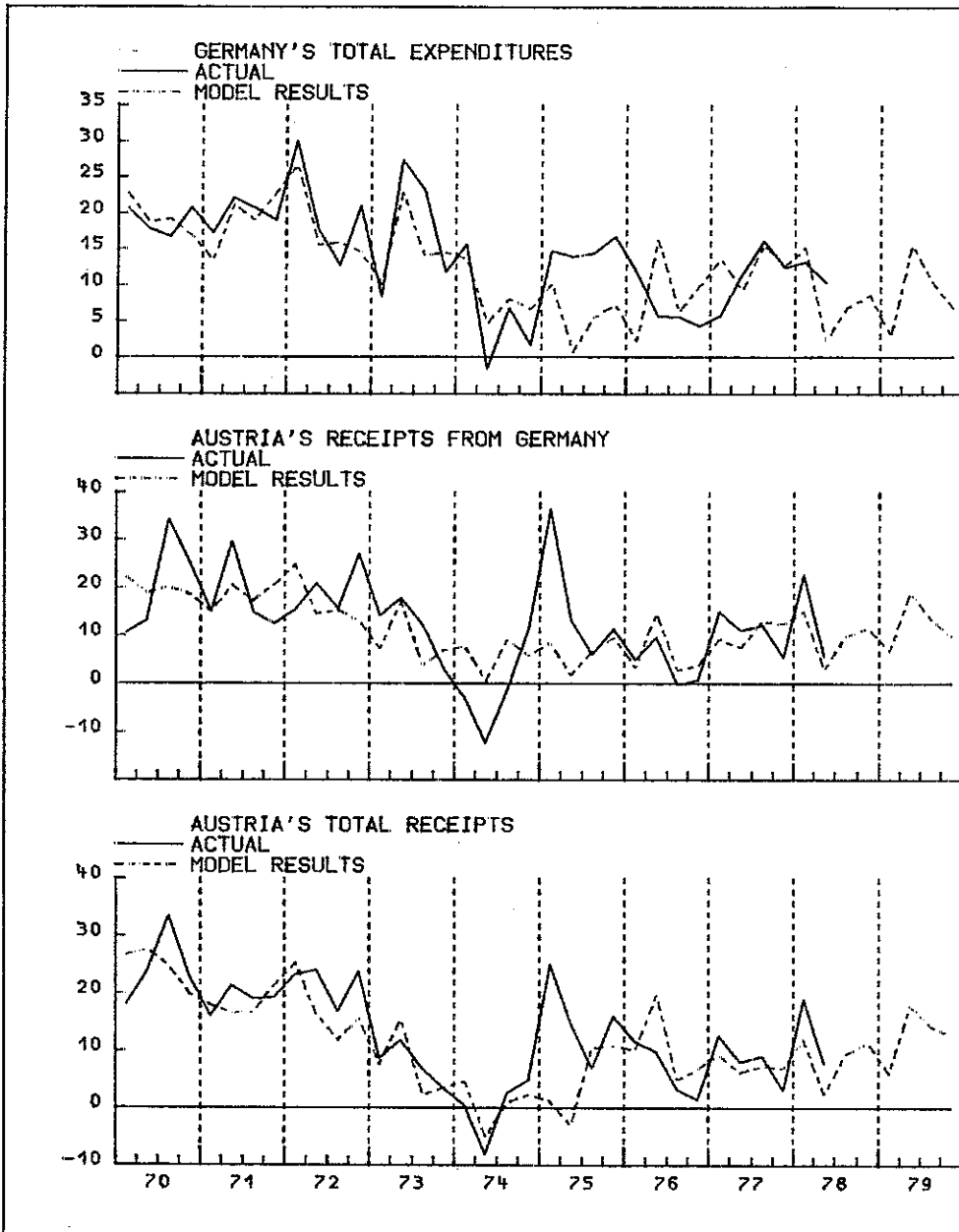
When the quantitative influence of the individual variables is compared with the old estimates one can see that with the exception of the special case of school vacation days, all elasticity coefficients remained nearly the same in spite of the strong difference between the two periods under investigation. This proves the high quality of the estimates and shows that touristic behavior patterns are quite stable, except for socio-psychological factors.

Consumer Expectations and Tourism
 Dependent Variable: Germany's Demand for Tourism



Figures 25 to 28 show these connections clearly. When compared with each other, the different influence of expectations on total German demand and on the demand for vacations in Austria becomes clear. While the strongest effect of expectations on total demand was only slightly more than 5 %, in the case of Austria it reached a high of 15 % in the 1st quarter of 1975. This shows one decisive advantage of using an expectational variable: the index captured the "compensation effect" of 1975 fully, while other models using only economic variables performed worst exactly in that period (figures 29 to 32).

International Tourism in Austria
Market Share Concept (Nominal)/Version 2

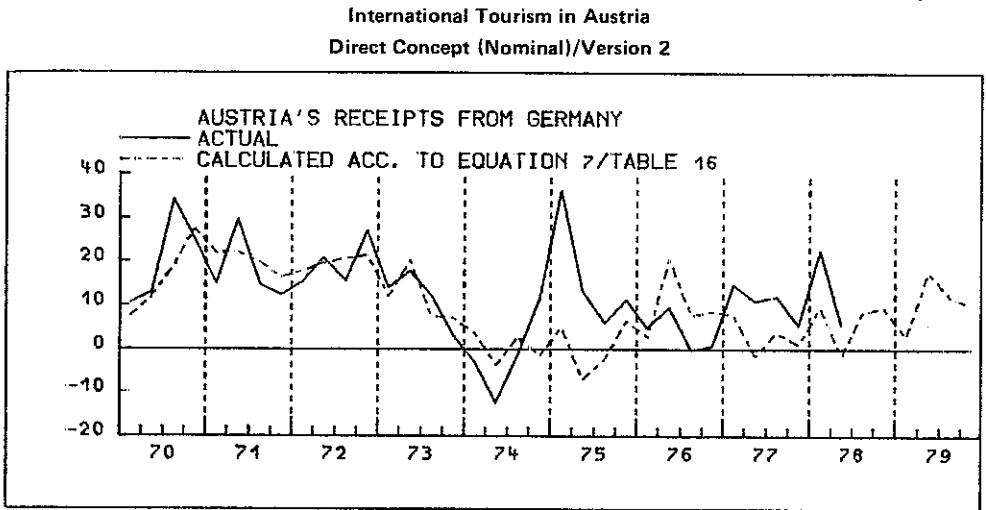


A comparison of figures 27 and 28 shows the differing influences of fluctuations in expectations on real expenditures and on the number of nights spent in Austria. In 1975 nearly 20% of the change in real expenditures was explained by consumer sentiment, but for the number of nights this explanatory effect was only 10%. Fluctuations in consumer expectations thus influence Austria's receipts in two ways: on the one hand via the number of nights spent by German visitors in Austria, on the other hand via their real expenditures per night.

4.6.3 Econometric Results

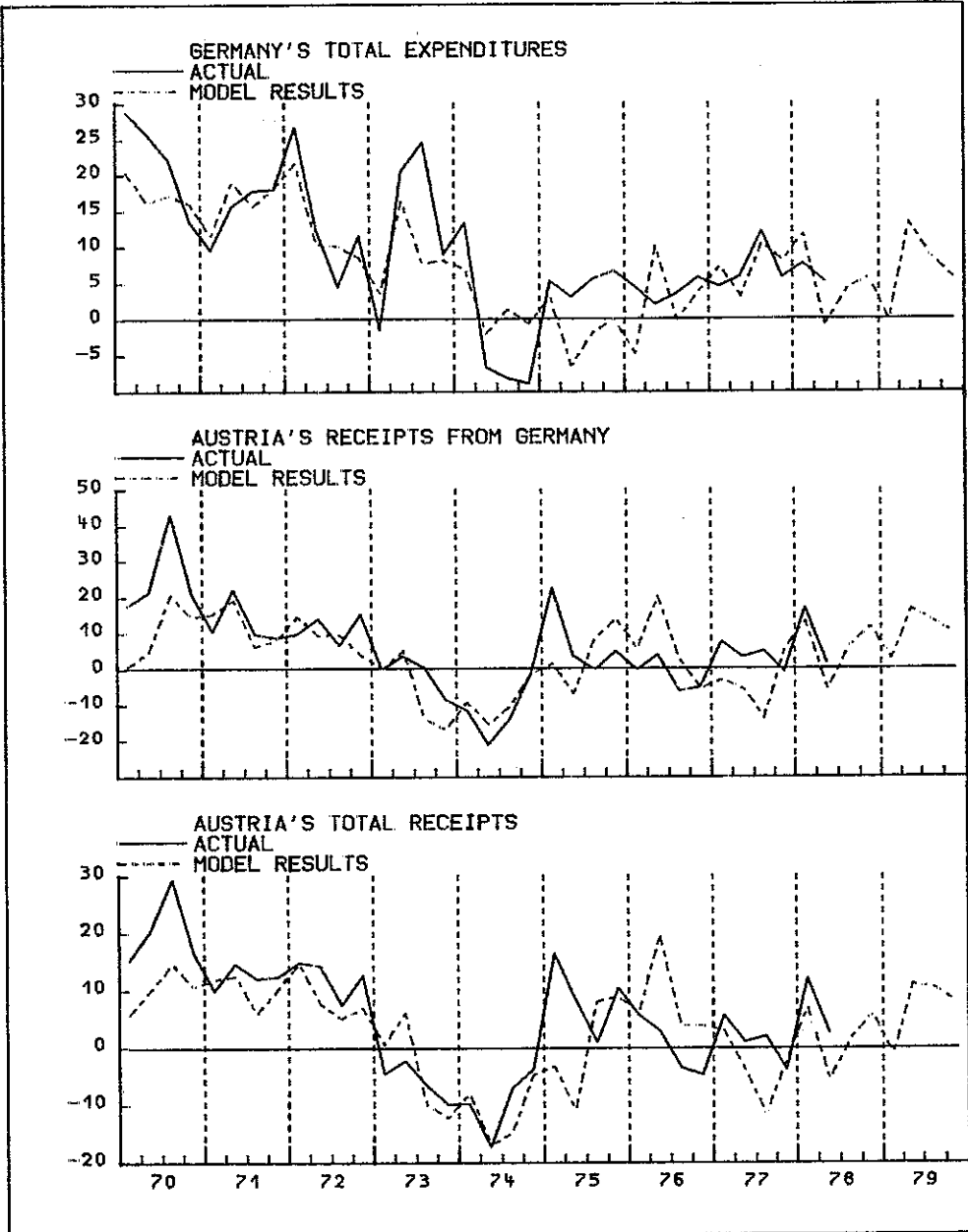
Figure 29 contains the calculations for nominal tourism exports in the seventies, on the basis of the market share approach. Even though the period under investigation includes

Figure 30



only the year 1973, the model explains well the reduction in international tourism following the "energy crisis". The rapid increase in unemployment captured entirely the deterioration in expectations. However, the model is not able to capture the "compensation effect". While in reality tourism expanded strongly in 1975, the model calculates a further decrease, since unemployment had risen further. This applies especially to Germany's total expenditures on tourism (top diagram), while Austria's receipts (middle diagram) were underestimated only in the first half of 1975. An additional factor explaining the extreme deviation in the 1st quarter can be found in the prolongation of Christmas vacations in Germany, an effect similar to that of the introduction of "energy vacations" in Austria. For the period after the summer of 1975 Austria's receipts from German tourists have been estimated surprisingly well. For this reason it was decided to apply the export

International Tourism in Austria
Market Share Concept (Real)/Version 1

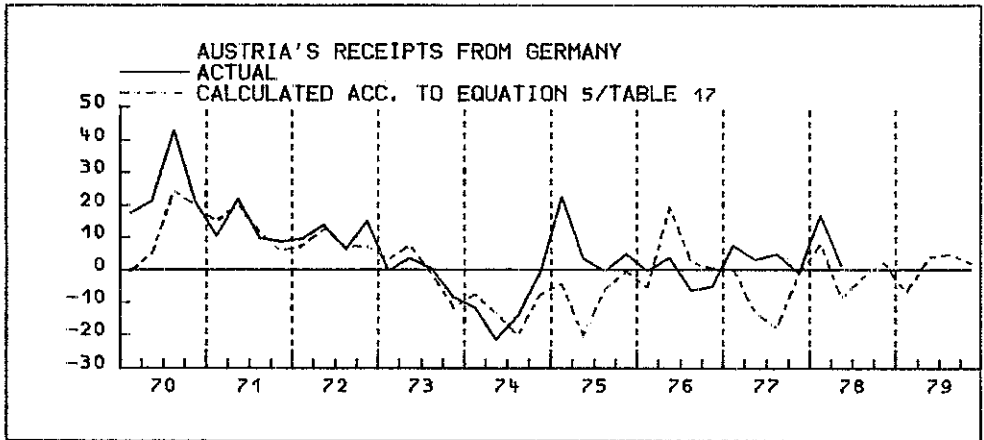


models estimated for the period 1964 to 1973 also to future forecasting periods. Extensive re-estimates will have to wait for a time when persistent and strong deviations between actual and estimated development may justify the assumption of a rupture in the model structure.

When figure 30 is compared with the middle diagram of figure 29, one can see that since 1973 the market share approach has yielded significantly better results than the direct approach. This can be explained by the very sizable devaluations following the breakdown of the monetary system. These devaluations caused relative prices between Austria and the rest countries to fluctuate very differently from those between Austria and Germany. The former do not contain price and exchange rate developments in Germany and are only important for the market share approach. With the exception of the year following

Figure 32.

International Tourism in Austria
Direct Concept (Real)/Version 1

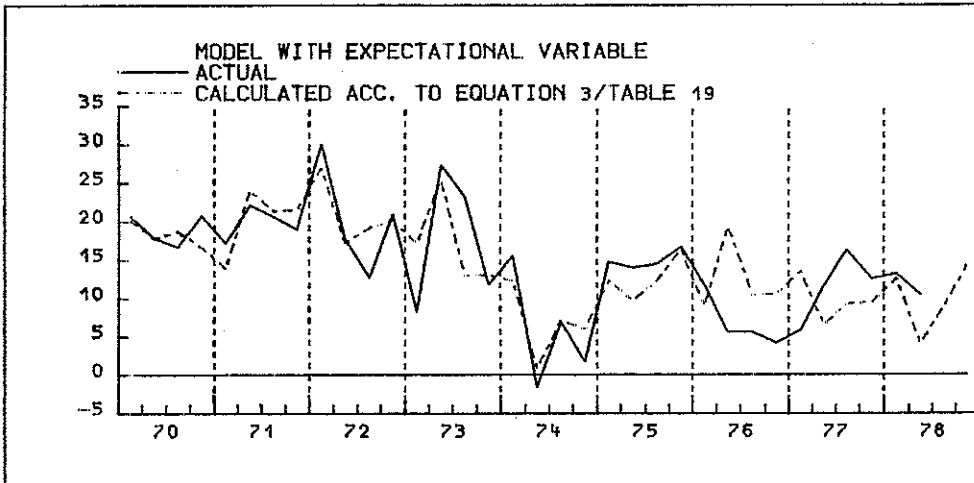


the "energy crisis", this has resulted in increasing competition for Austria in the last years. It seems that the preference for Austria on the part of German tourists holds only within a certain price relation to other countries. When this price relation rises above a certain threshold, other countries enter into German vacation decisions to an increasing extent.

Figures 31 and 32 compare the market share concept with the direct approach with respect to real tourism exports of Austria. Also in this case the ex-post-forecasts resulting from the market share model are superior. The reasons are the same as those for nominal exports.

A comparison between Austria's receipts from Germany and her total receipts (bottom diagram) shows that the reliability of the "total" forecasts is much lower. This is, because

International Tourism
 Dependent Variable: Germany's Expenditures (Nominal)



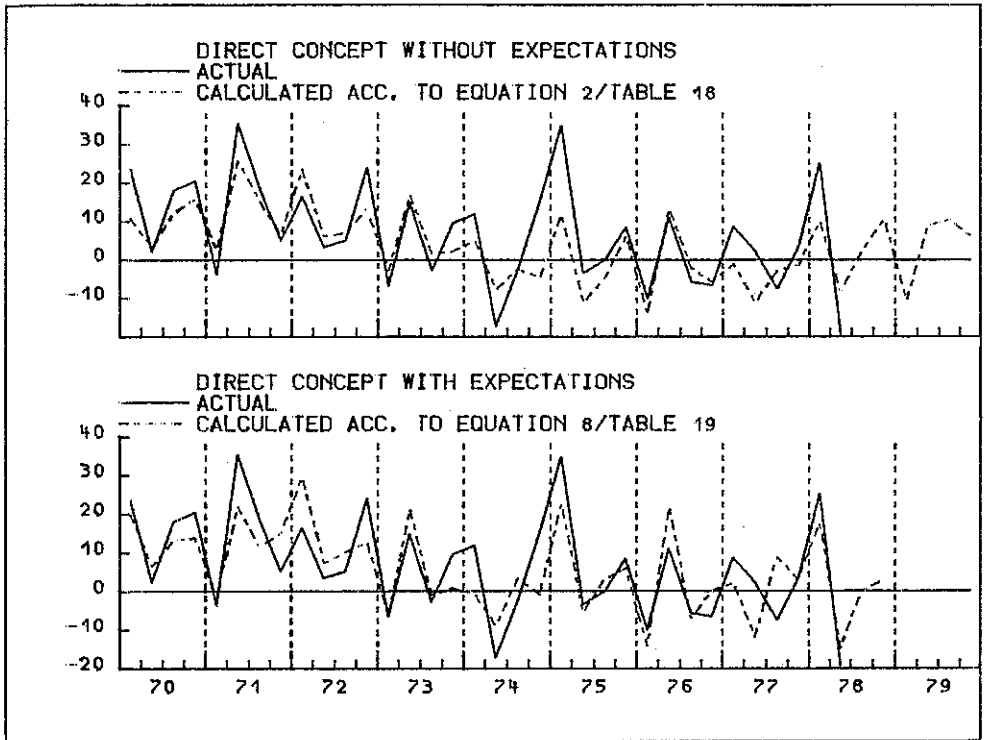
receipts from the rest countries are influenced by a much more complex economic structure, which for lack of data could not be included into our models. Thus model forecasts for Austria's total receipts are less reliable than those for Austria's receipts from Germany.

Finally, looking at figures 29 to 32 one realizes that the nominal estimates follow reality more closely than the real estimates. This corresponds to the hypothesis mentioned above, that in general vacation expenditures are planned in nominal terms; unexpected price increases therefore lead to adjustments in real expenditures

Figure 33 once more demonstrates the high explanatory power of models with expectational variables in times of "crises". At the same time it shows them to be less well suited for normal times, during which primarily economically determined models are superior. The equation estimating total nominal expenditures by Germany describes the development for 1974 and 1975 much better than the model in figure 29. The latter however, performs much better for the "normal" years 1976 and 1977. This leads to the conclusion that the choice of a certain model depends heavily on the period which the model is supposed to explain.

Figure 34 contains ex-post-forecasts for the number of nights spent by German visitors in Austria. Since these are less influenced by changes in expectations than the monetary flows, the model forecasts differ less. But here also the "expectational" model (lower dia-

International Tourism in Austria
Dependent Variable: Nights Spent by Germans



gram) yields better results for 1975, the "economic" model for 1977. Much more important is the fact that in both cases the number of nights for the period since 1973 is represented much better than the corresponding monetary flows. It seems that the behavior pattern of consumers with respect to vacations as such and their duration is more stable than the propensities to spend. For this reason more confidence should be put into the forecasts of nights than of monetary flows.

4.7 Total Tourism in Austria: Domestic and International

4.7.1 Development 1973 to 1977

In Austria the share of domestic tourism is much smaller than in most other countries. For this reason the growth rate of total receipts from tourism has slowed down in Austria after

Figure 35

Total Tourism in Austria by Austrians and Foreigners
 Dependent Variable: Receipts (Real)

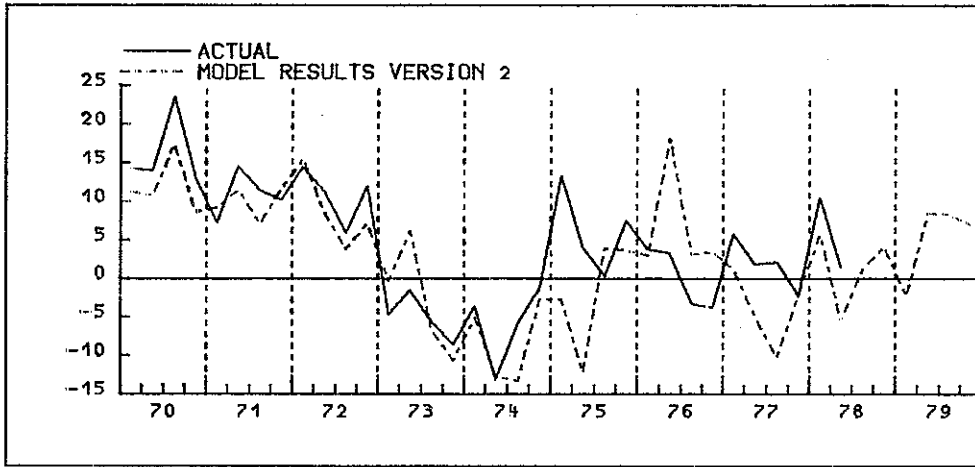
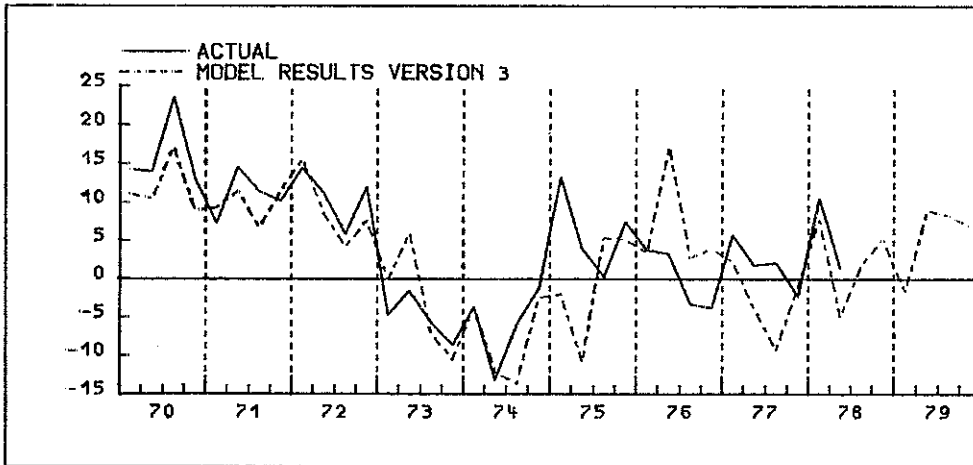


Figure 36

Total Tourism in Austria by Austrians and Foreigners
 Dependent Variable: Receipts (Real)



the "energy crisis" despite the satisfactory expansion of domestic travel. In nominal terms receipts increased by 7,4 % per year (1964/1973 + 10,8 %), in real terms they stagnated (- 0,1 %) after they had increased continuously and rapidly during the previous period (+ 6,2 %). Thus the rate of increase of tourism was slower than that of total final demand: the share of the demand for tourism in total GNP dropped from 10,9 % to 9,8 %.

4.7.2 Econometric Results

Finally we would like to present the ex-post-forecasts for Austria's total receipts from tourism. Figure 35 shows the calculations in nominal terms. As described above, the models of domestic travel and of tourism exports exhibit satisfactory closeness of fit for the period after the summer of 1975. Only for the 2nd quarter of 1976 did the models overestimate the actual results, due to an extreme shift in the number of school vacation days. The results for the model in real terms are presented in graphical form in figure 36. A comparison with figure 35 shows the superiority of the nominal estimates. This superiority has already been concluded on theoretical grounds and proven empirically for tourism exports.

5. Model Forecasts of Tourism for 1978 and 1979

5.1 Overview

In general the accuracy of econometric forecasts depends on two conditions:

- On the stability of the estimated economic structure. This means that the relationships between the exogenous and endogenous variables – in statistical terms the regression coefficients – remain stable in the future and thus do not violate the assumption of unchanged behavior patterns.
- On satisfactory knowledge of the future values of the exogenous variables.

In reality neither of these two conditions is ever fulfilled perfectly. Even in "normal" times additional variables which are not contained in the model, influence the demand pattern like strikes in the tourism or transport sector (e.g. the blockade of important roads by truck drivers in Austria in July (1978)). Such events are in general completely unforeseeable.

But even if both conditions were fulfilled, model forecasts could still be interpreted only as the most likely values. In general the results of econometric investigations can claim validity only within certain error margins.

All that model forecasts can show are the most likely future developments, derived from a systematic analysis of past behavior. Thus they must not be interpreted as statements of certainty about the future, as which they were regarded still a few years ago, when model results commanded the credibility of the Holy Bible. This understanding had of course partly been promoted by the way in which forecasters published their results. Moreover,

as the most recent versions of the models used and the values of the exogenous variables were in general not made available to the public, it was impossible to follow or reconstruct the forecasting process, which is indispensable for thorough evaluation. The present study attempts to avoid such mistakes.

In addition econometric forecasts of tourism must be interpreted with particular caution, because no other sub-sector of total demand fluctuates as widely as the demand for tourism. For this reason the Austrian Institute for Economic Research developed the following methods of forecasting of tourism:

- A model of nights in international tourism for Western Europe, cross-classified by countries of origin and destination. This model was constructed in 1975 for OECD and is documented in [67] [68]. It serves mainly the purpose of medium- and long-term forecasts
- Annual models of the demand for tourism were developed as a supplement to the quarterly functions and are published in [70].
- Quarterly models of the demand for tourism are the subject of the present study.
- A survey for seasonal forecasts of tourism in winter and summer. This survey is based on responses from tourism managers of Austrian communities and hotel owners. Its general design follows usual business tests for industry, but in our case we ask for quantitative information (i.e. for the rate of change expected for the following season). The answers are blown up according to a multi-layered stratified sample procedure [63].

Simultaneous application of several forecasting methods permits testing the accuracy of the individual forecasts which sometimes exhibit considerable differences depending on the period under investigation. This procedure also enables the forecaster to check, whether the implicit assumptions made in the forecasts are consistent with each other. This is done by splitting the results of the individual models into their components.

5.2 Forecasting Assumptions

The values of the exogenous variables were forecast up to the end of 1979 based on information available in the summer of 1978. For Austria it was assumed that the growth of incomes would slow down. Also the price level for tourism services is expected to increase less than in the previous years.

For Germany a relatively favorable growth performance was assumed on the hypothesis that the measures announced by the government to stimulate the economy will become fully effective in 1979.

For the price forecasts of each individual country the latest consumer price forecasts were used

Exchange rates were assumed to remain at the levels of June 1978. In view of the strong fluctuations in exchange rates this looks problematic, but we don't know of any superior alternative. At the time the forecasts were made this assumption seemed less critical, since most currencies relevant for the development of tourism had remained relatively stable for quite a while, with the notable exception of the US-dollar. Its value had continued to fall during the summer of 1978, but it was impossible to include this information into the forecasts. If the exchange rate as of August 1978 will not go up, or even continue to fall, the estimates of Austria's receipts from the rest countries for 1979 will have a slight upward bias.

5.3 Forecasting Tourism by Austrians in Austria and Abroad

As was already shown in figure 19, the newly estimated model represents quite well the development of domestic nights spent since the "energy crisis" (columns 1 and 2). Only in 1977 demand was actually higher than estimated. This may be due to the increased advertising efforts started in 1976. For the same reason the model forecasts might also be on the low side: for 1978 we calculated an increase in the number of nights spent by Austrians by 0,6 %, for 1979 a fall by - 0,7 %. When the forecasting results for the first half of 1978 are compared with actual development, a remarkable degree of accuracy is revealed. The model had calculated an increase by 2,5 %, the actual increase was 2,1 %. For the summer the models produce a reduction in domestic nights by 2,0 %, a result which seems to be in line with the information available up to the end of the summer 1978.

Direct imports of commodities will fall for various reasons not further explained in this context. As a result Austria's foreign currency outflow in 1978 will only be 6 % higher than a year ago; in real terms it will be slightly lower (- 0,8 %). The model had forecast a faster increase, but it did not contain provisions for this special effect. For 1979 the model forecasts seem more plausible. They project an increase in Austria's tourism imports of 10,9 % in nominal terms, and by 1,0 % in real terms. According to the model total Austrian demand for tourism will increase in 1979 by 8,7 % in nominal terms, and by 1,1 % in real terms.

5.4 Forecasting Tourism in Austria by Austrians and Foreigners

Austria's total receipts from international tourism as calculated by the models will increase by 8,8 % in nominal, and by 2,0 % in real terms (figure 7). Both results correspond to the recent actual development. During the first half of 1978 the actual increase was slightly

higher than that calculated by the model, but it seems that the 3rd quarter (summer season) will be slightly less favorable.

Receipts from Germany are calculated to grow slightly faster than Germany's total tourism expenditures. Thus Austria would gain market shares for the first time since 1972. Some special factors, however, like the bad weather in June and the first half of July, and the truck blockade in July render this development unlikely.

According to the model receipts from the rest countries (nominal + 5,1 %, real - 4,9 %) will grow less than those from Germany (nominal + 9,8 %, real + 6,0 %). This corresponds to the actual results for the first half of 1978

The number of nights spent by German visitors in Austria is expected to grow by 2,3 %. This seems quite plausible. Visits by Germans had grown faster during the first half (+ 3,0 %), but the summer season is likely to be worse than forecast. For 1979 the models calculate a marked increase in the rate of growth of receipts (nominal + 12,9 %, real + 7,5 %). Unlike for 1978 the model predicts receipts from Germany (+ 12,4 %) to grow less than those from the rest countries (+ 13,7 %). Two assumptions account for the latter:

- The combination of Austria becoming relatively cheaper together with the positive fashion trend in favor of Austria should result in Austria gaining market shares in the travel market of the rest countries.
- Total expenditures by the rest countries will increase from 6,5 % to 10,4 % (calculated in Austrian schillings).

While the first assumption seems to be quite plausible, the second one is more questionable because of the devaluation of the dollar. It should also be kept in mind that for the general methodological reasons mentioned above forecasts for the rest countries are less reliable than those for Germany.

The positive development of Austria's receipts from Germany originates from two factors:

- The model calculates total German expenditures for tourism to grow by 7,6 % in 1978 and by 9,5 % in 1979 (in nominal terms) as a consequence of the economic stimulus.
- Since in 1979 Austria will become cheaper relative to countries with high inflation rates, considerable gains are forecast in the German market.

According to the model the number of nights spent by Germans in Austria will increase by 4,9 %. This is mainly due to improvements in the German labor market situation which are taken into account by the model. Since this improvement is not yet certain, the forecast marks a certain upper limit of further actual development.

The forecast yields the following picture for Austria's total receipts from tourism: in nominal terms an increase of 7,9 % was calculated for 1978, which in real terms will amount to 1,3 %. Thus 1978 will be very similar to 1977, even though a certain shift in the demand from domestic to foreign travel becomes visible. This effect will increase in 1979. Total receipts will increase by 11,1 % in nominal, and by 5,8 % in real terms. The increase in tourism exports will be significantly above that for domestic travel.

6. Tourism and Economic Theory

Up to now no economic theory of tourism has been developed. The few major papers published recently have mainly empirical objectives; they attempt to investigate the features common to the various forms of tourism in an inductive way, and to confront them with similar phenomena of economic activity. Moreover, all basic tourism studies, ranging from "Allgemeine Fremdenverkehrslehre" (General Theory of Tourism) by Hunziker and Krapf [31] to "Die Stellung des Reiseverkehrs im Leistungssystem der Wirtschaft" (Tourism Within the General Economic Framework) by Bernecker [14] and "Die Fremdenverkehrslehre im Grundriß" (An Introduction to Tourism) by Kaspar [33] develop their own system of definition and analysis, which in general does not correspond to the general macro- and microeconomic frameworks. The same holds also for the most important Anglo-American studies, e.g. "Tourism – Principles, Practices, Philosophies" by McIntosh [47], "International Tourism" by Peters [54] and "International Travel – International Trade" by Gray [29]. The rôle of tourism within the System of National Accounts and thus within the concepts of macroeconomic theory is thoroughly investigated in [64], [65] and [72]. The two former studies are of entirely descriptive character.

Within the framework of this paper it is not possible to develop a general theory of tourism. In the following sections we attempted, however, to sketch the specific characteristics of tourism according to the principles of general economic theory and to describe the major causal relationships.

6.1 Economic Characteristics of Tourism

6.1.1 Tourism as a Specific Form of Demand

Tourism represents a special form of economic demand; it can be characterised by two features:

- Tourism stands for the demand of a specific bundle of commodities and services. The shares of the major types of expenditures differ by period and region, but are dependent

on each other qualitatively. They cannot be substituted for each other (the consumption of one night abroad is contingent on prior transportation). Thus in a way tourism can be called a form of complementary demand.

- Within this bundle of expenditures, the specific tourism services such as accomodation, food and transport play by far the most important role.

Being a form of complementary demand tourism expenditures can be subdivided not only into services and commodities, but also according to their production criteria into:

- Privately produced services and commodities .
- Public goods, whose generally free use benefits an indeterminate number of economic subjects in such a way that use by one subject does not exclude similar use by another.

These again can be subdivided into:

- Produced public goods: all existing infrastructure, especially transport facilities belong to this category.
- Non—produced public goods which represent the natural environment of a certain region, namely landscape in its various forms.

6.1.2 Tourism as a Specific Form of Supply

The complementary character of tourism as a form of demand affects a wide spread of economic activities. No economic sector produces exclusively for tourism. Therefore no production sector "tourism" exists in the strict sense of the word.

Within tourism demand the services for accomodation and catering play the largest role. According to economic criteria they are characterized by the fact that they cannot be stored, nor transported. This means that production, sale and consumption are identical. The specific problems of the hotel industry stem from this fact: its production is exclusively dependent on demand, thus capacity utilization fluctuates widely. For the same reason the largest part of costs is fixed — at least in the short run. Thus planning the time distribution of demand over time by means of marketing strategies plays an important role. This study does not investigate further the production of tourism supply, since it is primarily dependent on the development of demand.

6.1.3 Tourism as Private Consumption

Depending on the origin of the demand for tourism one can distinguish:

- ↓
- Tourism as private consumption (demand for tourism by private households).
- Tourism as public consumption (demand for tourism by public household: official business trips).
- Tourism as part of production (demand for tourism by enterprises: business trips)

The first two forms of tourism are part of final demand, whereas business trips are an intermediate input into production. By far the largest part of tourism stems from private households. For this reason the present study concentrates on this type of tourism.

6.1.4 Tourism as Part of International Trade

Insofar as demand for tourism is exerted by Austrians abroad and by foreigners within Austria, tourism is part of imports and exports in the wider sense. Tourism is thus closely related to foreign trade.

As an phenomenon of economics tourism can be analyzed only in connection with various areas of economic theory. In this paper its connection with private consumption, international trade and business cycle theory is emphasized.

6.2 Tourism and the Theory of Consumption

The short-term development of demand for tourism touches especially on two fields of consumption theory:

- Theory of the macroeconomic consumption function: here the cyclical variation of private consumption and especially the differences between short- and longer-term reactions to changes in income are investigated
- Engel-curves, hierarchies of needs and structure of consumption: insofar as income represents the most important determinant of the demand for tourism (as part of private consumption), the equations estimated in this paper can be considered specific Engel-curves. They differ from the more general form of Engel-curves insofar as they specifically take account of short-term cyclical aspects. For this reason they contain additional variables. Since tourism comprises only a small and at the same time very specific

part of total consumption, its analysis touches on the general problem of need hierarchies as a determinant for changes in the structure of consumption.

The analysis of the relationships between private consumption as a whole and changes in income lies at the core of macroeconomic consumption theory. Two hypotheses especially contributed to an extended discussion of this problem: the primarily theoretically deduced "fundamental psychological law" by Keynes [36], according to which consumption expands more slowly than income, and the diametrically opposite empirical finding by Kuznets [39], which maintains a long-term constancy of the share of consumption. According to Duesenberry's [24] relative income hypothesis the share of consumption is determined by the position of the household in the hierarchy of social strata, and thus specifically by the income distribution. Changes in distribution of income affect the share of consumption in the short run; in the long run it remains constant, however. The life-cycle hypothesis by Ando and Modigliani [2] and the permanent income hypothesis by Friedman [27] also attempt to prove the long run constancy of the share of consumption and its short run variability. Empirical studies have shown that the consumption share increases during recession and falls in boom years. Friedman elaborates a thought that was formulated already by Keynes: the distinction between permanent and transitory income. Only the customary permanent income which is considered safe determines the consumption of private households in a general quantifiable way, while unexpected (windfall) income increases are in general saved. When these hypotheses are confronted with the actual development of tourism, it can be seen that their results cannot be applied directly. Firstly, the demand for tourism in the long run rises much faster than income (the share of tourism in consumption increases); secondly, the marginal propensity to consume tourism services falls in recessions and rises in booms.

Katona [34, 35] offered an important contribution to the explanation of short-term fluctuations in private demand. He proved empirically that private consumption (especially of durable goods) is not only determined by objective economic variables, but in the short run also by subjective evaluations of the personal and general economic situation. Especially during periods of political crises these evaluations do not necessarily coincide with the actual situation. These findings also apply to the demand for tourism, because it occupies a similar position in the hierarchy of needs as durable consumer goods.

These observations show that the demand for tourism can be analyzed only in relation to other types of consumer spending. Therefore its analysis must be closely related to that of the consumption structure. Up to now no general theory of the consumption structure and its short- and long-term changes has been developed. Most studies in this field are empirical investigations and analyze long-term changes in the various types of consumption.

The most promising approach to the analysis of tourism seems to be the one developed by Stone [75] for changes in the consumption structure. For consumption in general as well as

for important types of consumption he distinguishes relatively fixed minimal outlays which have to be undertaken no matter what, and additional expenditures which are defined as the difference between planned total expenditures and the respective nominal minimum expenditures. This concept is related to those approaches to consumption theory which distinguish different types of consumption by the degree of their necessity. This approach results in a ranking of all types of consumption spending, starting with the absolute necessities (food, clothing, shelter), rising to less intensive needs (furniture, household equipment, automobile) and ending with the highest forms of luxury consumption (personal servants in the household, luxury cars, etc.) [77]. The latter very often also assume the function of storing value, or increasing value, e.g. jewellery, art collections, and thus contain an element of saving.

In the course of economic development specific "consumption waves" correspond to this hierarchy: after a certain category of needs has been satisfied sufficiently, expenditures for the next higher form of consumption increase above average; when a saturation point is approached, the next higher category takes over. In reality things are less clear-cut: especially because of unequal distribution of income and its fluctuations, these "waves" overlap and blur into each other.

Within this hierarchy tourism is classified with the types of higher consumption. In a very simple hierarchy structure it could be ranked approximately between the purchase of an automobile and a second apartment. Connecting all these considerations, a simple economic model results which permits an analysis of the relationships between income, expectations, total consumption and the demand for tourism:

In the long run total consumption is determined by fluctuations in that part of income which from past experience is judged to be safe, in the short run also by socio-psychological factors (economic expectations).

The higher up a type of consumption is, the smaller is its share in the necessary minimal budget (subsistence budget) of a household and the higher is its share in the surplus income. In the long as well as in the short run additional income or a rapid improvement in expectations increase the surplus budget more than total expenditures; within the surplus budget the structure shifts towards relatively high-grade consumption. Vice versa a reduction in income or a deterioration in the socio-psychological factors affect the surplus budget most, and within it they have their strongest effect on relatively high-rate types of consumption(1). The higher-rate one type of consumption, the higher is its income elasticity and the stronger it reacts to changes in expectations in the short run.

Since tourism is one form of high-rate consumption, its income elasticity is considerably higher than that of total private demand. For the same reason it is especially sensitive to

(1) This model deliberately modifies Stone's approach

changes in consumer expectations. When during periods of uncertainty planned savings by households increase, this has a relatively stronger effect on the high-rate types of consumption. Among those it is relatively simple to forego expenditures for tourism or to substitute a cheaper vacation for a more expensive one.

6.3 Tourism and the Theory of International Trade

International tourism exchanges services between countries just like international trade. From a general-economic viewpoint tourism differs from international trade in two respects:

- Since the demand for tourism is directed towards consumption of specific types of services abroad, the commodities are not (as in the case of imports) transported to their users inside the country, but rather the consumers are shipped to the services and commodities abroad. Object and direction of transport are thus directly opposite to those in international trade.
- International tourism is the only import, or respectively export undertaken directly by private households. For this reason the "Balance of Payments Manual" [32] by the International Monetary Fund (IMF) records all foreign purchases by private households as tourism expenditures, even if they have nothing at all to do with tourism.

These two specifics are of practical rather than theoretical importance. Both the analytical tools and the most important results of general trade theory [20] [58] can be applied directly to international tourism. In [67] it is shown that the relationship between the commodity and travel flows between the most highly industrialized countries and the less developed countries represents a textbook example of the theory of comparative costs.

The monetary theory of international trade can also be directly applied to tourism. Studies of this kind are still in their early stages [29]. This is especially true of the theories of exchange rates and of the current balance. On the basis of econometric estimates in [70] whose most important results are contained in the present study, these problems were discussed further in a separate investigation [71]. The calculated price elasticities of the demand for tourism show that the dynamic Marshall–Lerner condition holds for Austrian tourism: a devaluation of the schilling by 10 % would *ceteris paribus* not affect expenditures, but would increase receipts by around 11 % and thus lead to an improvement in Austria's tourism balance.

6.4 Tourism and Business Cycle Theory

Two groups of economic variables can be distinguished depending on their causal relationship with cyclical fluctuations. Those which cause fluctuations, and those which are primarily influenced by cyclical fluctuations. If one considers a closed economy without government activity, both groups are reduced to one variable each:

- Investment in the wider sense (changes in productive capital and inventories)
- Private consumption.

Economic theory explains cyclical fluctuations as essentially stemming from fluctuations in investment. These become reinforced by means of multiplier/accelerator relationships and influence consumption and thus total final demand

Tourism may be regarded as “trade cycle taker” in three respects without influencing economic activity autonomously itself:

- Demand for tourism is primarily part of private consumption
- The most important types of tourism expenditures are for services; thus by definition no inventory cycles are possible (which of course are less relevant for consumer goods in general).
- Investment expenditures of the hotel and restaurant industries fluctuate less than those of the manufacturing sector. Since in the accommodation sector the share of investment in buildings is far above average, the capital–output ratio and thus the length of the amortization period are extremely high. Moreover, average capacity utilization is very low. For these reasons investment expenditures are less determined by such short–term determinants as profit expectations and capacity utilization, but rather by longer–term considerations (especially marketing as demand management).

Only insofar as the propensity to consume tourism fluctuates pro–cyclically does tourism exert autonomous influence on the general trade cycle. The above considerations apply only to a closed economy. Since in reality part of the demand for tourism originates abroad, it has a direct influence on the trade cycle, just like exports in general (international cyclical transmission).

An investigation in which way qualitative and quantitative the fluctuations in production and income are transmitted to the demand for tourism must lie at the center of an analysis of tourism and the trade cycle. The effects of the business cycle on the changes in the structure of demand for tourism have already been analyzed [66]. The present study in-

investigates the time pattern of the transmission of the general cycle to the total demand for tourism. In this way the most important short-term determinants of the demand for tourism are analyzed.

7. An Economic Model of the Demand for Tourism

7.1 The Model Structure

The various forms of demand for tourism and their interconnections can best be expressed by the following general model:

Destination	$C_1 \dots C_j \dots C_n$
Origin	
C_1	$T_{11} \dots T_{1j} \dots T_{1n}$
\vdots	\vdots
C_i	$T_{i1} \dots T_{ij} \dots T_{in}$
\vdots	\vdots
C_n	$T_{n1} \dots T_{nj} \dots T_{nn}$

The elements of this matrix represent the demand for tourism by countries of origin and destination. T_{ij} is the demand of the i -th country (of origin) for the j -th country (of destination)

The row sums $\sum_j T_{ij}$ form the total demand for tourism of each country of origin, the column sums $\sum_i T_{ij}$ total demand in each country of destination. The elements of the main diagonal represent the domestic demand for tourism (T_{ij} for $i = j$).

Without the elements of the main diagonal the sum of the rows shows total tourism imports ($\sum_{i \neq j} T_{ij}$), the sum of the columns total exports ($\sum_{i \neq j} T_{ij}$) of each country.

Summation of all elements yields the total demand of all countries of origin, or, which is the same, in all countries of destination ($\sum_i \sum_j T_{ij}$).

This model structure mirrors flows of goods and services between countries. Thus all models of international trade are based on it (in that case the main diagonal contains only zero-elements).

Models of international tourism can be developed on the basis of various concepts [57]:

- "Bilateral approach": here the T_{ij} are estimated directly, their summation yields total imports, and exports respectively. Neither models for world trade nor for international tourism are exclusively based on this concept.
- "Structural approach": at first total Imports ($\sum_j T_{ij}$) of each country are explained. The analysis of market shares is at the core of this approach, thus in the following it will be called the market share approach. Depending on how far-reaching the investigation of the demand structure is, two approaches are possible:
 - Only the total market shares ($\sum_i T_{ij} / \sum_i \sum_j T_{ij}$) are analyzed; in conjunction with the imports of all countries total exports for each country result by definition. All world trade models up to the end of the sixties followed this approach. The OECD model of 1969 [1] is a good example. A tourism study by the IMF [10] is also based on this structure.
 - The shares in each partial market ($T_{ij} / \sum_j T_{ij}$) and thus the entire matrix of market shares is explained. Multiplied by the vector of total imports, total exports of each country result. Hitherto, the development of the matrix of market shares over time has been explained by three procedures up to now:
 - The most recent OECD world trade model [59] and that of the IMF [78] are based on the investigations by Armington [6], [7]. In these models partial elasticities are estimated for each market. These elasticities are assumed to be constant for all exporting countries (thus n price elasticities exist).
 - The most far-reaching version of the LINK model ("Maxi-LINK") initially assumes a constant structure of market shares and then develops a procedure to correct for the resulting errors in estimation [37].
 - When the development over time of each matrix element is estimated, $n-1$ price elasticities result. Since such an approach is too far-reaching for world trade models, it has only been applied to international tourism [67]. Because of the homogeneity of demand (nights) and the concentration of tourism on relatively few countries of origin and destination only 85 market share equations had to be estimated. A far

greater number would be necessary for a world trade model. Version 2A is a forecasting model and "explains" the market share matrix solely by means of a trend; version 2B also analyzes the additional effect of relative prices (price and exchange rate effects) for each market share. It turns out that one cannot assume constant price elasticities for each partial market (country of origin)

- "Mixed approach": a combination of direct and market share approach makes sense only when the data do not permit estimation of a market share model, when the share of exports explained by the direct approach is relatively large and when no closed model, but only total exports of one or a few countries are estimated [57]

All these conditions apply to our case. For Austria's tourism exports a market share model combined with the direct approach is developed (see section 3.5.1)

In contrast to trade models it makes a lot of sense to estimate total demand for tourism initially and then to split it between domestic and foreign. Since the only reliable indicators for domestic tourism are the number of nights and arrivals, and since only monetary quarterly data exist for tourism imports, Austria's demand for international and domestic tourism had to be estimated separately

7.2 Explanatory Variables

These empirical—inductive and theoretical—deductive considerations yield the following determinants as the most important endogenous variables of an economic model of tourism

- Variables explaining total demand for tourism:
 - Disposable income of private households
 - Total
 - Wages and salaries
 - Non—wage income
 - Gross National Product
 - It comprises not only incomes of private households, but also captures the influence of total production on official and private business trips
 - Private consumption
 - It is impossible to make a priori statements whether private consumption is connected positively (complement) or negatively (substitute) with demand for tourism. When the effects of expectations of private households are captured by other variables, a

substitution relationship can be assumed. The largest part of private consumption consists of goods and services ranking below tourism in the hierarchy of needs. Thus a short-term increase may well be at the expense of the more easily foregoable tourism expenditures: spending out of surplus income shifts to lower-rate consumption. For this reason not only total consumption plays a role in the demand for tourism, but also its components:

- Durable consumer goods
- Non-durables
- Services

- Prices of consumer goods
If there is a substitution relation between the consumption of durables in particular and the demand for tourism, negative cross-price elasticities can be expected.
- Tourism prices
- Transport costs
- Distribution of income
- Consumer expectations
 - Unemployment
 - Specific expectation indicators

- Short-term factors
 - Distribution of school vacation days
 - Changes in weather conditions

- Long-term factors
 - Degree of motorization of private households (stock of private automobiles)
 - Length of vacations
 - Population structure
 - By age group
 - By community size (degree of urbanization)

- Variables explaining differences between components of total demand for tourism:
 - Relative prices between domestic and foreign tourism
This variable influences the “distribution” of the demand for tourism of a certain country by international and domestic travel.
 - Relative prices between home country and a specific foreign country (direct approach)
 - Relative prices between various foreign areas of destination (market share approach)

7.3 A Survey of the Literature

Up to now fewer econometric studies have been written on the demand for tourism than for any other aggregate of final demand. This is true of special tourism studies as well as of the inclusion of tourism into national and international econometric models. Moreover, most existing studies use very simple approaches and relatively few explanatory variables. This situation is in sharp contrast to the growth of tourism which is much faster than that of total production and income all over the world. The following reasons might account for this lack of analysis:

- Up to now tourism has seldom been dealt with as a specific problem of economic theory or of empirical investigations. Most of the macroeconomic investigations of tourism treat it as a partial problem within the framework of foreign trade or the balance of payments. On the other hand, most tourism experts up to now concentrated primarily on management aspects of production in the hotel industry. Studies on tourism as a separate phenomenon are mostly sociological investigations.
- For the same reasons data on tourism are by far inferior to those on other economic sectors. In addition, no unifying data system exists, like e.g. the National Income Accounts. Thus data on tourism from various countries are difficult to compare.

The Austrian Institute for Economic Research succeeded in developing a systematic data collection and classification system for tourism [65]. At present the following time series are available:

- Monetary flows of the most important countries of origin and destination in international tourism.
- Nights in international tourism, cross-classified by countries of origin and destination (matrix of international travel flows over time).
- Price indices in international tourism for all important countries of origin and destination (they measure the prices of specific tourism goods and services)
- Indices of relative tourism prices (including exchange rate effects) between the most important countries of origin and destination and between competing countries of destination

The Austrian Institute for Economic Research thus possesses one of the largest economic data banks in the area of tourism which is continually being expanded. At present there are around 1.000 time series available.

Let us now summarize briefly the most important econometric studies on tourism.

The investigations by Archer [3] and Vanhove [79] and a paper by Edwards which was published by the World Tourism Organization (WTO) [80] contain a general survey on forecasting techniques for the demand for tourism

The most important studies on the problem of tourism and the trade cycle (and thus on determinants of short-term fluctuations in the demand for tourism) are surveyed for German-speaking countries by Schmidhauser [61], for the Anglo-American area by Archer [3] and Sauran [60] and for French literature by Lesceux [44]. The first econometric analyses of demand for tourism were limited to simple one-equation models, such as the investigations by Menges [48], [49] which use income as the only explanatory variable. Later improvements led to the inclusion of a larger number of variables, as for instance in the papers by Artus [9] and Kwack [10]. An increasing number of single equations for tourism appear in econometric models of various countries [26], [42].

From the beginning of the seventies on econometric investigations were improved by means of enlarged model structures. Models were developed which contained a larger number of equations. But only in rare cases did they follow the "market share approach" developed for international trade models [10]. In most cases the simpler direct approach was used (market share are not specified explicitly as endogenous variables). Frequently variables were included which were supposed to explain travel flows as resulting from the opposite forces of attraction (population as "mass") and repulsion (distance between regions). These so-called "gravity" models succeed only in explaining the regional distribution of tourism flows within a given period (cross-section analysis), but not their development over time, since the corresponding variables either do not change (distance between regions) or fluctuate only mildly over time (population). For the purpose of short-term analysis the gravity approach is inappropriate. Models of this type were developed by Crampon/Tan [22], Lesceux [44], [45], Armstrong [8], Laber [41] and Archer/Shea [4], [5].

Askari developed a model structure of his own to explain the flows of tourists within the USA [11] and to various European countries [12].

A separate model of short-term trends of tourism in Canada was developed by the Bureau of Management Consulting [17]. It calculates the distribution of tourism expenditures over time (months), by region (provinces, or sub-regions within provinces), and for those economic sectors being closest to tourism (especially accommodation sector). The model is not based on econometrically estimated relationships, but on definitions. The behavior pattern of tourists and thus total demand have to be predetermined exogenously. For that reason this model is not well suited for forecasts, but it offers a methodically clear overview on the time, spatial and sectoral interdependencies of tourism. In another study the effects of tourism on production, income and tax revenues in the individual sectors were analyzed by means of econometric investment equations and an input-output model [18].

The most important studies on the long-term behavior of tourism should also be mentioned. Edwards estimated the development up to 1985 by means of assumption which were qualitatively deduced from past trends. These were supplemented by simple single equations, which together do not form a closed model according to the market share approach [25]. The Bureau of Management Consulting developed a "growth scenario model" which was not estimated econometrically, but is based on exogenously determined and definitional relationships [19]. A good survey of the most important non-econometric studies is contained in [43].

Two types of models have been developed up to now at the Austrian Institute for Economic Research. The first type is highly demanding as far as the model structure is concerned. It conforms to the market share approach, but goes beyond the models hitherto estimated insofar as all elements of the market share matrix are endogenous. For this reason the model contains a large number of equations (95 behavioral equations), but only gross domestic product, tourism prices and exchange rates are exogenous variables. Its main objective is the forecasting and analysis of the long-term development of tourism. For this reason it is based on annual data. The model was used for a forecast of international tourism up to 1985 undertaken for OECD. Its most important results are contained in an English-language abbreviated version [68]. The second model type is somehow complementary to the first. It contains only a few equations, but a large number of explanatory variables. It is used for analysis and forecasting of tourism in the short run. It is described in [70] and also forms the basis of the present investigation.

For extremely short-term forecasting purposes a procedure was developed which corresponds to the usual business tests developed for the industrial sector. At the beginning of each season tourism managers and hotel owners of selected Austrian communities are surveyed on their expectations as to the coming winter or summer season. The expected rates of change are then blown up to yield representative results for all of Austria [63].

All three forecasting procedures described above are regularly utilized for tourism forecasts. Thus their practicability and applicability has already been tested thoroughly.

8. An Econometric Model of Short-Term Changes in the Demand for Tourism

8.1 General Remarks

All equations selected were estimated in annual growth rates (with the exception of: weather, school vacations and foreign workers). This transformation was chosen for economic and statistical reasons (item 3). Other estimates using different types of transformations (first-order differences, logarithms, etc.) yielded inferior results.

Nominal and real equations were estimated for each type of demand, using quarterly as well as annual data. In this study only quarterly data are analyzed, however

For most explanatory variables time lags of up to six quarters were tested, for the income variables of up to ten quarters

Income variables were tested not only by using base data, but also their average for the year preceding quarter:

$$Y_{t,J} = 1/4 \sum_{q=1}^4 Y_{t-q}$$

Two reasons make this transformation plausible:

-- Demand for tourism becomes effective at certain periodic intervals

Most households take vacations once a year. Thus in 1975 only 9,9 % of all Austrians made more than one vacation trip. Given a total travel intensity of 36,1 %, this is 27,4 % of all travellers [53]. Thus when a vacation is planned, not only the income of one quarter is taken into account but that of a whole year as the most frequent travel interval

-- This type of transformation can be interpreted to represent a simple form of "permanent income"

Artus [10] also used this type of transformation. In the present study this specification yielded results superior to other types of transformations. When the income variable is transformed in this way, it is symbolized by the letter "J" at the last but one digit of the variable code. The last digit shows whether nominal or real price basis is used.

Knowledge of the following notation is necessary for the understanding of the equations and variables:

MT_i Expenditures of the i -th country of origin in international tourism (tourism imports)

XT_j Receipts of the j -th country of destination in international tourism (tourism exports)

$PT_{i(j)}$ Tourism prices (level) in country $i(j)$ expressed in domestic currency

$WK_{i(j)}$ Exchange rate of country $i(j)$ expressed in terms of Austrian schillings

m_{ij} Share of country j (of destination) in the total tourism expenditures of country i (of origin) (market, respectively import share ij) in 1970

x_{ij} Share of country i (of origin) in the total tourism receipts of country j (of destination)

When an index was formed, this is symbolized by a bar. All indices are based on the year 1970

The influence of transportation costs was not tested separately, because they enter the tourism price indices with their respective weights.

The equations were estimated by means of the combinatory regression program UNIMAX. Least squares methods were used. This method also yields equations of the desired quality, for the export model, since it is completely recursive [46], [62]. The "Haavelmo bias" can be neglected, since domestic demand for tourism forms only a very small part of private consumption and of national income [76].

In nearly all cases the constant term was insignificant and close to zero. Thus it was suppressed in the estimates (homogenous regression). This raises the quality of the equations which are supposed to represent the short-term development of demand measured in terms of growth rates, since no unexplained trend is left over. In the few cases where the constant term showed plausible and statistically significant values, the equations were included for comparison

This publication summarizes the most important econometric results. The individual variables and the various model versions are defined; the selected equations are contained in tables and figures. The results are described and interpreted in the basic investigation [70].

8.2 The Countries Investigated

For the price variables the following countries of destination (competitors) were considered explicitly:

Austria	1	Switzerland	5
Germany	2	Italy	6
France	3	Yugoslavia	7
Great Britain	4	Spain	8

By far the largest part of demand in international tourism is directed towards these countries. In 1970, for instance, around 90 % of Austria's expenditures (exclusive of domestic

tourism) and 72 % of Germany's expenditures went to these countries. In addition tourism price indices could only be constructed for these countries.

The following countries of origin entered the price variables:

Austria	1	Netherlands	6
Germany	2	USA	7
France	3	Sweden	8
Great Britain	4	Switzerland	9
Belgium	5		

Lack of data does not permit to include Sweden and Switzerland into the market variable (index of total expenditures in international tourism of each country of origin weighted by Austrian export shares). These eight countries (without Austria) represent the most important areas of origin in European tourism: in 1970 they accounted for around 93 % (without Sweden and Switzerland: 85 %) of Austria's tourism exports (measured by receipts).

The countries other than Germany which account for 64 % of all receipts are called the "rest countries"

The estimated equations are shown in tables together with the most important statistics. The standard error as percent of the coefficient (reciprocal t -value) is given under each coefficient.

8.3 List of Variables

This section shows all variables in summary form. They are defined either verbally or by means of formulas. It would lead too far to describe in detail the method of construction of each variable. This holds particularly for the data system for the foreign currency statistics and the price indices. The interested reader is referred to [65]

8.3.1 Demand for Tourism by Austrians in Austria and Abroad

Dependent Variable

NCIÖ Nights by Austrians in Austria

ACIÖ Arrivals by Austrians in Austria

MTRN Austria's expenditures in international tourism, revised data, in nominal terms

- MTNN* Austria's expenditures in international tourism according to Austrian National Bank, nominal
- MTRR* Austria's expenditures in international tourism, revised data, in real terms

Explanatory Variable

Income (averaged over the whole previous year)

- ETJR* Total disposable personal income of private households, real
- EMJN* Wages, salaries and pensions, nominal
- EMJR* Wages, salaries and pensions, real

Consumption

- CPTN* Private consumption, nominal
- CPTR* Private consumption, real

Prices

- PIDT* Index of tourism prices in Austria; it comprises 85 types of expenditures weighted by the corresponding consumption structure.
- PIMT* Index of tourism prices abroad (in schillings) including of exchange rate effects

$$PIMT = \sum_{j=2}^8 m_{1j} \overline{PT}_j \overline{WK}_j$$

- PIDP* Index of tourism prices abroad in national currencies of the countries of destination, without exchange rate effects

$$PIDP = \sum_{j=2}^8 m_{1j} \overline{PT}_j$$

- PIWK* Index of exchange rates of foreign currencies

$$PIWK = \sum_{j=2}^8 m_{1j} \overline{WK}_j$$

- PRÖA* Index of relative tourism prices between Austria and abroad (including exchange rate effects)

$$PR\ddot{O}A = \sum m_{1j} \frac{PT_1}{PT_j WK_j}$$

PT_1/PT_j represents the travel money parity between Austria and the j -th country of destination

PVPI Consumer price index, Austria

PICD Implicit price deflator for durable consumer goods, Austria

Expectations

ALOW Female unemployment rate

Income Distribution

VELG Ratio of personal disposable nominal per-capital income of employed to that of self-employed (without agriculture)

Population Structure

BSTG Share of population living in communities with more than 10.000 inhabitants in total residential population

Special Factors

SCHÖ Number of school holidays and legal holidays outside of weekends, Austria

WETT Index of weather conditions in Austria (combined series of snowfall in winter and sunshine days in summer)

FAOE Number of foreigners employed in Austria

WISO Dummy variable for shift to winter season

DOLY Dummy variable for special effect of Olympic Games 1964 Innsbruck

DKRM Dummy variable for political crises

DSPM Dummy variable for speculative transactions connected to exchange rate variations

The results of the econometric estimates are given in tables 6 to 10.

8.3.2 Foreign Demand for Tourism in Austria

Dependent Variable

- MTDN* Germany's expenditures in international tourism, nominal
MTDR Germany's expenditures in international tourism, real
XDÖN Germany's expenditures for tourism in Austria, nominal
XDÖR Germany's expenditures for tourism in Austria, real
XNDÖ Number of nights spent by Germans in Austria
XRÖN Tourism expenditures by visitors from rest countries in Austria, nominal
XRÖR Tourism expenditures by visitors from rest countries in Austria, real
MADN Austria's share in the German travel market, nominal
MADR Austria's share in the German travel market, real
MARN Austria's share in the travel market of the rest countries, nominal

$$MARN = \overline{XRÖN} / \sum_{i=3}^7 x_{i1} \overline{MT}_i \overline{WK}_i$$

- MARR* Austria's share in the travel market of the rest countries, real

$$MARR = \overline{XRÖR} / \sum_{i=3}^7 x_{i1} \overline{MT}_i / \overline{PMT}_i$$

$$\overline{PMT}_i = \sum_{j=1} m_{ij} \overline{PT}_j \overline{WK}_j / \overline{WK}_i$$

Explanatory Variables

Income (averaged over the whole previous year)

- VDJN* Wage and non-wage income of private households in Germany, after taxes, nominal
VDJR Wage and non-wage income of private households in Germany, after taxes, real
LDJN Wage bill in Germany, after taxes, nominal
LDJR Wage bill in Germany, after taxes, real
GDJN Non-wage income in Germany, nominal
GDJR Non-wage income in Germany, real

Market Variable

- MRCN* Expenditures of the rest countries in international tourism, nominal

$$MRCN = \sum_{i=1}^7 x_{i1} \overline{MT}_i \overline{WK}_i$$

MRCR Expenditures of the rest countries in international tourism, real

$$MRCR = \sum_{i=1}^7 x_{i1} \overline{MT}_i \overline{PMT}_i$$

Prices

PDDT Index of tourism prices in Germany

PDMT Index of tourism prices abroad for Germany

$$PDMT = \sum_{j=1}^8 m_{2j} \overline{PT}_j \overline{WK}_j / \overline{WK}_1$$

PRDA Index of relative tourism prices between Germany and abroad

$$PRDA = PDDT / PDMT$$

PRDÖ Index of relative tourism prices between Germany and Austria

$$PRDÖ = PDDT / PIDT$$

PDÖK Index of relative tourism prices between Austria and competitor countries for Germany

$$PDÖK = \overline{PT}_1 / \sum_{j=3}^8 m_{2j} \overline{PT}_j \overline{WK}_j$$

PRÖK Index of relative tourism prices between Austria and the competitor countries for the rest countries

$$PRÖK = \sum_{i=3}^9 x_{i1} \overline{PT}_1 / \sum_{j=3}^8 m_{ij} \overline{PT}_j \overline{WK}_j$$

This index is a double-weighted index, just like those used in international trade estimates. For each country of origin the price ratio between Austria and foreign competition is calculated and weighted by Austria's export shares.

Expectations

- ALOD* Unemployment rate, Germany
WEPD Index of economic expectations by private households
NCID Number of domestic nights spent in Germany
BPDN German gross national product, nominal
BPDR German gross national product, real

Income Distribution

- VLGD* Ratio of net income of employed to self-employed, Germany

Special Factors

- SCHD* Weighted average of number of school vacation days in the individual German federal states. The weights are composed by the shares in total foreign travel and travel to Austria respectively in 1970
WETT Index of weather conditions in Austria
WISO Dummy variable for shift to winter season
DKRD Dummy variable for political crises
DKRR
DSPD Dummy variable for speculative transaction connected to variations in exchange rates
DSPR

The econometric results are presented in tables 11 to 19.

8.4 Composition of the Model Versions

The individual model versions contain the following structural equations:

- Total Tourism by Austrians in Austria and Abroad
 - Nominal
 - Version 1: equation 4/table 6
equation 4/table 8
 - Version 2: equation 5/table 6
equation 1/table 8
 - Version 3: equation 1/domestic tourism/table 10
equation 1/tourism imports/table 10
 - Real
 - Version 1: equation 4/table 6
equation 1/table 9

- Version 2: equation 5/table 6
equation 1/table 9
 - Version 3: equation 1/domestic tourism/table 10
equation 2/tourism imports/table 10
- Austria's Receipts from International Tourism
 - Nominal
 - Market share approach
 - Version 1: equation 6/table 11
equation 2/table 15
equation 8/table 15
 - Version 2: equation 2/table 11
equation 1/table 15
equation 8/table 15
 - Direct approach
 - Version 1: equation 6/table 16
equation 8/table 15
 - Version 2: equation 7/table 16
equation 8/table 15
 - Real
 - Market share approach
 - Version 1: equation 1/table 12
equation 6/table 15
equation 9/table 15
 - Direct approach
 - Version 1: equation 5/table 17
equation 9/table 15
- Total Tourism in Austria by Austrians and Foreigners
 - Nominal
 - Version 1: equation 4/table 6
market share approach/version 2
 - Version 2: equation 5/table 6
market share approach/version 2
 - Version 3: equation 1/domestic tourism/table 10
market share approach/version 2
 - Real
 - Version 1: equation 4/table 6
market share approach/version 1
 - Version 2: equation 5/table 6
market share approach/version 1
 - Version 3: equation 3/domestic tourism/table 10
market share approach/version 1

Quarterly Equations for Domestic Tourism

Estimation period: 1st quarter 1961 to 4th quarter 1973
 Dependent variable: nights by Austrians (NCIÖ)

Number of Equation	Income		Con- sump- tion	Prices	Distri- bution	Expecta- tions	Population Structure			Special Factors			R ²	D.W.
	ETJR	EMJR					CPTN ₋₁	PIDT	PRÖA ₋₂	VELG	ALOW	BSTG ₋₂		
1	1,37		-0,40	-0,29				5,26	0,55	0,02	2,01	3,05	0,806	1,835
	16		34	52				40	12	24	24	62		
2	1,38		-0,53		-0,15			4,03	0,53	0,02	1,95	2,92	0,805	1,742
	16		23		54			50	12	23	25	65		
3	1,16		-0,34	-0,52		-0,11		7,13	0,54	0,02	1,87	4,61	0,771	1,720
	20		44	34		52		40	13	32	29	45		
4	1,16		-0,41	-0,28		-0,21			0,51	0,02	1,65	3,46	0,771	1,671
	20		39	62		24			14	32	32	60		
5	1,23		-0,59		-0,26	-0,13	-0,16		0,47	0,03	1,65	3,21	0,774	1,556
	20		28		37	63	34		16	27	32	65		
6	1,28		-0,63		-0,20	-0,19		6,18	0,47	0,03	1,90	3,71	0,767	1,425
	20		27		48	43		38	16	20	28	58		

Table 7

Quarterly Equations for Domestic Tourism

Estimation period: 1st quarter 1961 to 4th quarter 1973

Dependent variable: arrivals by Austrians (ACIÖ)

Number of Equation	Income		Con-sump-tion		Prices		Distri-bution		Expecta-tions		Population Structure		Special Factors		R ²	D.W.
	ETJR	EMJR	CPTN ₋₁	PIDT	PRÖA ₋₂	VELG	ALOW	BSTG ₋₂	SCHÖ	WETT	WISO					
1	1,12		-0,51				-0,08		0,50		1,43		0,710		1,927	
	21		24				53		13		34					
2	1,13		-0,48						0,47	0,02	1,65		0,781		1,661	
	17		23						12	23	26					
3	1,14		-0,43	-0,16					0,49	0,02	1,67		0,795		1,820	
	17		28	81					12	24	25					
4	0,97		-0,42	-0,22	-0,15		-0,16		0,46	0,02	1,42		0,769		1,571	
	21		33	67	59		27		14	31	33					
5	0,96		-0,53						0,44	0,03	1,63		0,741		1,482	
	23		28						15	22	29					
6	1,04		-0,58		-0,11		-0,14		0,43	0,03	1,62		0,750		1,511	
	22		26		78		52		15	22	29					

Table 8

Quarterly Equations for International Tourism (Imports)

Estimation period: 1st quarter 1961 to 4th quarter 1973

Dependent variable: Austria's expenditures for international tourism, nominal

Number of Equation	Dependent Variable	Income		Con-	Prices			
		EMJN ₋₄	EMJN ₋₅	sumption	PVPI ₋₂	PICD ₋₂	PIMT ₋₁	PRÖA ₋₂
1	MTRN	1,90 6						
2	MTRN	2,35 10				-1,76 44		
3	MTRN	2,70 14		-0,87 46				
4	MTRN		2,37 8				-0,95 40	
5	MTRN		2,96 9		-1,67 34		-0,66 55	
6	MTRN		2,95 9		-2,40 25			0,58 53
7	MTNN	2,39 7					-1,02 38	
8	MTNN	2,72 10			-2,05 34			0,93 32
9	MTNN	2,66 11		-0,75 44				
10	MTNN	2,75 10			-1,08 60		-1,01 37	

Quarterly Equations for International Tourism (Imports)

Estimation period: 1st quarter 1961 to 4th quarter 1973

Dependent variable: Austria's expenditures for international tourism, nominal

Distribu- tion	Special Factors					R ²	D.W.
VELG ₋₂	FAOE ₋₁	SCHÖ	WETT	DKRM	DSPM		
		0,41 45	- 0,04 40	- 13,05 18	15,91 9	0,833	1,209
		0,35 51	- 0,04 33	- 12,61 18	15,25 9	0,850	1,449
- 0,33 52		0,40 44	- 0,04 40	- 12,52 18	16,14 9	0,853	1,536
		0,39 40	- 0,05 26	- 14,22 15	15,71 8	0,878	1,531
		0,37 39	- 0,05 25	- 13,96 14	15,49 7	0,898	1,628
		0,34 43	- 0,05 25	- 14,79 14	15,38 8	0,899	1,443
	0,19 32	0,39 37	- 0,04 29	- 12,92 15	14,86 8	0,901	2,277
	0,21 29	0,34 41	- 0,04 30	- 14,23 13	14,44 8	0,912	2,031
	0,18 34	0,30 49	- 0,04 34	- 13,00 15	14,62 8	0,897	1,946
	0,24 28	0,40 36	- 0,04 30	- 12,90 14	14,57 8	0,907	2,271

Quarterly Equations for International Tourism (Imports)

Estimation period: 1st quarter 1961 to 4th quarter 1973

Dependent variable: Austria's expenditures for international tourism, real

Number of Equation	Dependent Variable	Income		Prices				Special Factors				R ²	D.W.		
		EMJR ₋₄	EMJR ₋₅	PVPI ₋₂	PIMT ₋₁	PIWK ₋₁	PROA ₋₂	FAOE ₋₁	SCHÖ	WETT	DKRM			DSPM	
1	MTRR	3,68 14		-1,15 63	-0,96 47					0,44 42	-0,04 41	-13,28 18	15,08 10	0,834	1,487
2	MTRR	3,56 14		-2,22 34		-0,88 48				0,41 45	-0,04 44	-13,32 18	15,08 10	0,833	1,462
3	MTRR		3,83 12	-2,34 29			0,76 48			0,36 48	-0,04 34	-15,08 16	15,32 9	0,857	1,207
4	MTNR	3,25 9			-1,52 27			0,22 29		0,44 36	-0,04 36	-13,08 16	14,61 9	0,878	2,012
5	MTNR	3,29 15		-1,73 49		-0,85 45		0,18 42		0,39 44	-0,03 48	-12,60 18	14,72 9	0,862	1,530
6	MTNR	3,61 13		-2,25 36			1,17 29	0,22 33		0,37 44	-0,03 41	-14,60 15	14,26 9	0,880	1,524

Table 12

Quarterly Equations for International Tourism (Exports)

Estimation period: 1st quarter 1964 to 4th quarter 1973

Dependent variable: Germany's expenditures for international tourism, real (MTDR)

Number of Equation	Constant	Income		Prices		Expectations		Special Factors		R ²	D.W.	
		VDJR ₋₃	LDJR ₋₃	GDJR ₋₂	PDDT ₋₂	PRDA ₋₁	PRDA ₋₂	ALOD	NCID			SCHD
1	4,16 40	1,52 18					0,04 35		0,47 31	18,86 23	0,741	1,351
2	2,09 8	2,09 8					0,04 39		0,44 35	16,90 27	0,721	1,142
3	2,82 63	1,00 30			0,75 37		0,03 45	0,88 38		17,52 24	0,776	1,455
4	1,72 16	1,72 16		0,67 56			0,04 37		0,43 35	18,71 24	0,730	1,203
5	3,98 51	0,99 34	0,50 38				0,03 52		0,56 28	18,93 26	0,695	1,303
6	1,44 18	0,64 30	0,64 30				0,03 57		0,56 30	17,35 29	0,678	1,197
7	1,11 22	0,79 23	0,79 23	0,50 68					0,65 26	17,51 29	0,673	1,258
8	0,94 47	0,66 28	0,66 28	0,75 71			0,02 67		0,54 30	18,17 28	0,687	1,239

Table 10

Total Demand for Tourism by Austrians (in Austria and Abroad)

New estimate for the period 1st quarter 1964 to 4th quarter 1977

	Number of Equation	Dependent Variable	Income		Consumption	Prices	
			ETJR	EMJN ₋₅	CPTR ₋₁	PVPI ₋₂	PIWK ₋₂
Domestic	1	NCIÖ	0,82		-0,43		
			27		50		
	2	NCIÖ	0,71		-0,38		
			32		57		
							EMJN ₋₄
Expenditures for International Travel Nominal	1	MTRN	3,39			-4,06	-0,78
			12			20	47
	2	MTRN	3,35			-3,66	
			12			22	
							EMJR ₋₄
	3	MTRN		3,11		-3,46	-0,71
				13		24	59
							PIWK ₋₁
	4	MTRN		2,97		-3,20	-0,77
				13		24	49
							PIWK ₋₂
	5	MTRN		3,04		-3,33	-0,65
				12		22	58
Real	1	MTRR	3,40			-1,78	-1,16
			15			31	33
							PIMT
	2	MTRR	2,84				-0,91
			11				43
							PRÖA ₋₂
	3	MTRR	3,69			0,94	-1,86
			15			41	33
							PIDT ₋₂
	4	MTRR	2,68				-1,01
			15			48	39
							PIWK ₋₂

Total Demand for Tourism by Austrians (in Austria and Abroad)

New estimate for the period 1st quarter 1964 to 4th quarter 1977

Expectations	Distribution	Special Factors				R ²	D.W.
		SCHÖ	WETT	WISO	DOLY		
ALOW ₋₂	VELG ₋₃						
		0,54 15	0,02 33	2,60 22	3,86 61	0,706	1 758
- 0,08 68		0,55 14	0,02 34	2,70 22	4,54 53	0,719	1,798
				DKRM	DSPM		
	- 0,27 46	0,29 61	- 0,02 61		16,71 10	0,714	1,561
	- 0,32 40	0,32 58	- 0,02 64		17,25 10	0,682	1,558
		0,36 53	- 0,03 51		15,30 12	0,670	1,498
		0,36 52	- 0,03 54		15,32 11	0,680	1,335
	- 0,24 54	0,35 52	- 0,03 49		16,33 11	0,700	1 349
		0,32 57		- 10,06 57	15,86 11	0,701	1,538
		0,34 56		- 11,23 55	15,71 12	0,652	1,360
		0,34 55			15,95 12	0,656	1 682
		0,37 52		- 10,35 58	15,76 11	0,666	1,466

Table 11

Quarterly Equations for International Tourism (Exports)

Estimation period: 1st quarter 1964 to 4th quarter 1973

Dependent variable: Germany's expenditures for international tourism, nominal (MTDN)

Number of Equation	Constant	Income				Prices	
		VDJN ₋₃	LDJN ₋₃	GDJN ₋₂	PDDT ₋₂	PDMT ₋₂	PRDA ₋₂
1	3,14 52	1,43 13					
2		1,76 5					
3		1,72 5					
4	3,80 42	1,33 14					0,41 47
5		1,18 15			0,61 54		
6		1,75 4					0,41 42
7		1,50 12					
8	2,50 67		0,76 31	0,49 23	0,95 45	- 0,49 40	
9	2,53 66		0,95 19	0,50 24			0,48 40

Quarterly Equations for International Tourism (Exports)

Estimation period: 1st quarter 1964 to 4th quarter 1973

Dependent variable: Germany's expenditures for international tourism, nominal (MTDN)

Expectations		Distribu- tion	Special Factors			R ²	D.W
ALOD	NCID	VLGD ₋₂	SCHD	WISO	DSPD		
- 0,04 23			0,46 22		14,64 21	0,820	1,793
- 0,04 23			0,44 24		13,61 23	0,812	1,665
		- 0,42 23	0,39 28	1,59 58	16,17 19	0,809	1,347
- 0,04 23			0,50 20		15,01 19	0,842	1,917
- 0,03 28	0,70 47		0,29 45	1,40 58	12,99 23	0,868	1,989
- 0,03 29		- 0,34 26	0,42 21	1,33 57	14,51 18	0,881	1,784
- 0,03 34	0,59 56	- 0,23 44	0,25 48	1,33 59	12,75 22	0,872	1,834
- 0,03 30			0,60 16		14,62 20	0,862	2,398
- 0,03 29			0,59 16		14,38 21	0,855	2,257

Table 13

Quarterly Equations for International Tourism (Exports)

Estimation period: 1st quarter 1964 to 4th quarter 1973

Dependent variable: Austria's share in the travel market of Germany and the rest countries, nominal

Number of Equation	Dependent Variable	Constant	Prices		Expectations		Distribution	
			PDÖK	BPDN	ALOD	VLGD ₋₁	VLGD ₋₅	
1	MADN		-0,35 65		-0,03 58			
2	MADN		-0,32 69	0,38 54	-0,03 47		0,28 56	
3	MADN		-0,57 48					
4	MADN		-0,25 75			-0,59 20		
5	MADN		-0,25 72			-0,61 20		
6	MADN		-0,30 66			-0,64 20	0,25 49	
				PRÖK ₋₄	PRÖK ₋₅			
7	MARN	3,53 38	-0,80 61					
8	MARN	3,50 37		-1,05 46				

Quarterly Equations for International Tourism (Exports)

Estimation period: 1st quarter 1964 to 4th quarter 1973

Dependent variable: Austria's share in the travel market of Germany and the rest countries, nominal

Substitution	Special Factors			R ²	D.W.	
	NCID	WETT	DKRD			DSPD
			- 15,95 31	20,63 34	0,406	1,509
- 0,56 70			- 11,43	20,00 47	0,456 34	1,558
			- 17,26 29	14,93 48	0,394	1,636
			- 11,72 34	21,40 26	0,611	1,370
	0,04 75		- 11,38 35	21,94 26	0,630	1,455
	0,02 68			22,03 27	0,584	1,492
			DKRR	DSPR		
			- 10,45 57	19,50 44	0,265	1,665
			- 11,33 51	17,26 49	0,300	1,767

Table 14

Quarterly Equations for International Tourism (Exports)

Estimation period: 1st quarter 1964 to 4th quarter 1973

Dependent variable: Austria's share in the travel market of Germany and the rest countries, real

Number of Equation	Dependent Variable	Constant	Prices		Expectations		Distributions	
			PDÖK	BPDR	ALOD	VLGD ₋₁	VLGD ₋₆	
1	MADR		- 0,86 20				- 0,68 16	
2	MADR		- 0,86 20				- 0,71 16	
3	MADR		- 1,02 24	0,51 55				
4	MADR		- 1,04 21					0,36 39
5	MADR		- 0,94 23	0,40 67	- 0,03 60			0,42 32
6	MADR		- 0,78 26				- 0,64 21	0,32 40
7	MADR		- 0,88 18				- 0,64 17	0,24 42
				PRÖK ₋₄	PRÖK ₋₅			
8	MARR	4,42 31	- 1,07 47					
9	MARR	4,36 30			- 1,32 37			

Quarterly Equations for International Tourism (Exports)

Estimation period: 1st quarter 1964 to 4th quarter 1973

Dependent variable: Austria's share in the travel market of Germany and the rest countries, real

Substitution	Special Factors			R ²	D.W.	
	NCID	WETT	DKRD			DSPD
			- 10,91 34	21,56 24	0,739	1,517
		0,04 70	- 10,58 35	22,10 23	0,755	1,613
- 0,53 59			- 16,29 31	15,48 48	0,507	1 536
			- 13,38 37	17,59 39	0,538	1,416
- 0,48 59			- 13,79 33	16,21 42	0,635	2,151
					0,610	1,990
			- 9,75 36	20,62 24	0,781	1,673
			DKRR	DSPR		
			- 9,83 62	12,38 70	0,238	1,554
			- 11,06 53	9,65 88	0,285	1,723

Quarterly Equations for International Tourism

Estimation period: 1st quarter 1964 to 4th quarter 1973

Dependent variable: Austria's receipts from international tourism by Germany and the rest countries, nominal and real Market share approach

Number of Equation	Dependent Variable	Total Expenditures	Prices		Expectations		Distribution		Special Factors		R ²	D.W.
			PDÖK	ALOD	VLGD ₋₁	VLGD ₋₆	DKRD	DSPD				
1	XDÖN	MTDN 0,99 9	-0,50 58					-17,16 34	17,36 49	0,482	1,407	
2	XDÖN	1,02 7	-0,36 65		-0,64 22			-12,85 37	20,51 33	0,664	1,404	
3	XDÖN	0,99 8	-0,44 65	-0,03 64				-17,41 33	19,16 44	0,534	1,561	
4	XDÖR	MTDR 0,79 11	-1,01 27					-16,39 34	13,41 61	0,544	1,318	
5	XDÖR	0,85 8	-0,89 23		-0,71 17			-11,63 35	17,56 34	0,760	1,636	
6	XDÖR	0,87 7	-0,92 21		-0,67 18	0,25 47		-10,45 38	17,08 33	0,786	1,715	
7	XDÖR	0,78 11	-0,94 29	-0,03 58				-16,62 33	15,09 53	0,602	1,468	
8	XRÖN	MTRN 1,18 12	PRÖK ₋₄ -0,76 73					DKRR	DSPR	0,276	1,598	
9	XRÖR	1,17 19	-0,93 61					-12,60 57	23,37 41	0,382	1,343	

Table 16

Quarterly Equations for International Tourism (Exports)

Estimation period: 1st quarter 1964 to 4th quarter 1973
 Dependent variable: Germany's tourism expenditures in Austria, nominal (XDÖN)
 Direct approach

Number of Equation	Income		Prices		Expectations		Distribution			Special Factors			R ²	D.W.
	VDJN ₋₄	LDJN ₋₅	GDJN ₋₃	PRDÖ ₋₂	ALOD	VLGD ₋₁	VLGD ₋₆	SCHD	WETT	DKRD	DSPD			
1	1,53 9			0,93 39		-0,94 19		0,55 35	0,03 68		35,08 22	0,588 22	1,366	
2	1,59 10			0,53 62	-0,08 22		0,50 33	0,58 33			38,12 22	0,611 22	1,558	
3	1,70 8				-0,06 28	-0,56 30	0,36 43	0,47 36			34,09 22	0,648 22	1,470	
4	1,69 7			0,69 39	-0,06 25	-0,53 29	0,32 43	0,49 33		-8,06 48	35,89 19	0,742 19	1,267	
5	1,69 8			0,75 39	-0,06 30	-0,64 25		0,50 34		-8,44 49	32,40 22	0,699 22	1,258	
6		1,63 8		1,15 26	-0,07 23	-0,43 37		0,63 26	0,03 60		44,89 15	0,721 15	1,704	
7		1,65 8		1,02 28	-0,09 18			0,64 26		-9,00 44	45,06 15	0,709 15	1,346	
8		1,30 14	0,42 41	1,03 25	-0,07 25	-0,45 34		0,54 29		-9,95 38	36,86 19	0,761 19	1,523	

Quarterly Equations for International Tourism (Exports)

Estimation period: 1st quarter 1964 to 4th quarter 1973

Dependent variable: Germany's tourism expenditures in Austria, real (XDÖR)

Direct approach

Number of Equation	Income		Prices		Expectations		Distribution		Special Factors			R ²	D.W.
	VDJR ₋₄	LDJR ₋₅	GDJR ₋₃	PRDÖ ₋₂	ALOD	VLGD ₋₁	VLGD ₋₆	SCHD	WETT	DKRD	DSPD		
1	1,50 13			0,77 37	-0,05 35	-0,66 23		0,42 39		-9,42 42	31,87 21	0,740	1,395
2	1,51 13			0,96 32	-0,04 36	-0,76 21		0,39 41	0,02 63	-8,90 43	31,73 21	0,760	1,440
3	1,39 16			0,71 45	-0,08 23		0,44 35			-11,21 39	37,31 21	0,688	1,029
4	1,66 12				-0,06 28	-0,58 28	0,33 44			-7,56 53	32,06 22	0,699	1,105
5	1,54 12			0,89 33	-0,05 29	-0,66 24	0,28 47		0,38 40	-8,69 42	34,49 18	0,788	1,358
6		1,45 14		0,97 31	-0,08 20			0,55 32		-10,75 39	42,70 16	0,693	1,158
7		1,45 13		1,19 25	-0,07 25	-0,48 32		0,49 32	0,02 62	-8,29 46	42,80 15	0,765	1,408
8		1,14 19	0,45 39	0,99 26	-0,05 30	-0,55 27		0,44 35		-11,24 33	34,53 20	0,774	1,617

Table 18

Quarterly Equations for International Tourism

Estimation period: 1st quarter 1964 to 4th quarter 1973

Dependent variable: Number of nights spent by Germans in Austria (XNDÖ)

Direct approach

Number of Equation	Income			Prices			Expectations			Distribution			Special Factors		R ²	D.W.
	VDJR ₋₄	LDJR ₋₄	LDJR ₋₅	PDDT ₋₁	PRDÖ ₋₂	ALOD	VLGD ₋₂	VLGD ₋₆	SCHD	WETT						
1	1,43 14				0,50 67		-0,77 22		0,84 22	0,03 55			0,582	1,544		
2	1,48 14					-0,05 33	0,51 30		0,93 20				0,558	1,634		
3	0,69 52			1,17 42		-0,04 47			0,95 20				0,482	1,636		
4	1,46 16					-0,05 37			0,94 21				0,463	1,625		
5	1,50 14				0,52 64	-0,03 55	-0,57 31		0,83 22	0,03 48			0,596	1,473		
6	1,45 16				0,49 74	-0,06 33			1,00 20	0,03 67			0,511	1,497		
7	1,28 21	0,27 68				-0,05 37			0,97 20				0,472	1,649		
8	1,29 21	0,23 79			0,46 78	-0,05 36			0,98 20	0,02 77			0,518	1,597		
9	1,19 20	0,38 44			0,65 50	-0,03 64	-0,58 31		0,87 20	0,03 50			0,616	1,600		

Table 19

Consumer Expectations and Demand for Tourism in Germany

Estimation period: 1st quarter 1970 to 3rd quarter 1976

Number of Equation	Dependent Variable	Income				Consumer Expectations	
		VDJN ₋₃	VDJR ₋₃	LDJR ₋₃	GDJR ₋₂	WEPD	WEPD ₋₁
1	MTDN	1,85 5					0,10 34
2	MTDN	1,91 6					0,12 27
3	MTDN	1,90 5					0,10 34
4	MTDR			1,82 16	0,79 36		0,18 36
5	XDÖN	1,54 11					0,26 22
6	XDÖR		1,27 23			0,28 20	
7	XDÖR		1,15 29				0,19 35
8	XNDÖ		1,76 19			0,18 37	

Consumer Expectations and Demand for Tourism in Germany

Estimation period: 1st quarter 1970 to 3rd quarter 1976

Prices	Unemployment Rate	Distribution		School Vacation Days	R ²	D.W.
PRDÖ ₋₂	ALOD	VLGD ₋₂	VLGD ₋₆	SCHD		
		- 0,22 46		0,36 38	0,658	2,249
	- 0,04 46			0,42 31	0,669	2,326
	- 0,05 34		0,23 49	0,35 38	0,719	2,285
				0,41 50	0,652	1,366
0,99 30				0,65 35	0,611	1,567
0,97 32				0,62 36	0,684	1,526
1,09 33			0,40 52	0,66 41	0,598	1,632
				1,38 19	0,642	1,664

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