Assessing the impact of an increase in tourists' expenditure

Contents

Introduction

In a study published by the Austrian Institute for Economic Research in 2010 (SMERAL 2010) it is argued that under certain conditions there is a good chance that foreign tourists' expenditure might grow faster than in the recent past and assumed in the Base Case Scenario of the Austrian INFORUM model AEIOU II.

The findings and considerations of this study were taken as a starting point for carrying out two simulation exercises with the help of AEIOU II.

In a second part of the contribution the simulation results are confronted with the outcomes of two popular standard approaches to assess the impact of an increase in tourists' expenditure.

Simulations with AEIOU II

Short description of the model

Typical INFORUM model; demand side and price side solved simultaneously in an iterative process.

Macro variables are calculated in a bottom-up approach.

Emphasis laid on a disaggregated and consistent accounting framework and on a sound empirical foundation.

Consumption, capital formation, imports, employment and prices are endogenously determined.

Linked to the INFORUM Bilateral Trade Model (BTM) as a satellite.

Simulations with AEIOU II

Short description of the model - Accounting framework

Core: Austrian IO table for 2005 in the European standard classification.

Two exceptions:

CPA 40 Energy
- 40.1 Electricity
- 40.2 and 40.3 Gas, steam and hot water

CPA 70 Real estate services
- Real estate services - market
- Real estate services – owner occupied
- Real estate agency services

Simulations with AEIOU II

Short description of the model - Accounting framework

Final consumption expenditures
- Private consumption expenditure, Austrians in Austria
- Private consumption expenditure, Foreigners in Austria
- Final consumption expenditure by government
- Final consumption expenditure by NPISH

Gross capital formation - fifteen categories

Cultivated assets
Changes in valuables
Changes in inventories

Exports
- Merchandise goods
- Services

Simulations with AEIOU II

Short description of the model - Accounting framework

Value added

- Compensation of employees
- Other net taxes on production
- Consumption of fixed capital
- Operating surplus, net

Simple accountant for private households.

Most of time series cover the period 1976 to 2008.

The chain-weighted volume indices had to be transformed into series at constant prices 2005.

Simulations with AEIOU II

Short description of the model – Demand side

Consumer expenditure of Austrian private households is based on a set of behavioural equations in a breakdown by CPA.

Private consumption expenditure of foreigners in Austria, final consumption expenditure by government and final consumption expenditure by NPISH - treated exogenously.

Behavioural equations for 15 categories of gross capital formation.

Cultivated assets, changes in valuables and changes in inventories – treated exogenously.

Simulations with AEIOU II

Short description of the model – Demand side

Demand for Austrian exports taken from the BTM.

Product specific behavioural equations for describing the change in shares of imports in total demand.

The import matrix is updated every year in order to keep the import matrix (and the respective share matrices) consistent with estimated total imports.

Simulations with AEIOU II

Short description of the model – Price side

The price side is based on the traditional cost-push philosophy.

The process of arriving at unit labour costs per industry is done in two separate steps.

In the first step the persons employed per industry are estimated.

In a second stage the corresponding wage rates in nominal terms are derived to arrive at wage bills per industry.

The wage rate of an industry is seen as a simple, linear function of the overall wage rate.

Simulations with AEIOU II

Short description of the model – Price side

Depreciation by industry is estimated as a function of the depreciation level in this industry and the (lagged) investment level of the industry.

The shares of operating surplus in total output are treated exogenously, based on the average of these shares over the past decade.

Import prices (very relevant for a small open economy like Austria) are taken from the international system of interlinked INFORUM models.

Simulations with AEIOU II

Base Case – Assumptions

Foreign tourists' expenditure:
Hypothesis that the future development will correspond to the average development in real terms over the last 10 to 13 years, taking the pronounced product specific differences in growth into account.

CPA 55 Hotel and restaurant services:
The product group with the highest share in total foreign tourists' expenditure - no growth or decline for the entire period up to 2030.

CPA 23 Consumption of gasoline and diesel:
Assumption that the price relations between Austria, Germany and Italy remain more or less stable at the present level.

Simulations with AEIOU II

Alternative A – Assumptions

The two alternative Scenarios presented differ – compared to the Base Case Scenario – only with respect

- to the assumptions on total expenditures of foreign tourists in Austria,
- the structure of these expenditures and
- with respect to the input structure of industry NACE 55 Hotels and restaurants.

Simulations with AEIOU II

Alternative A – Assumptions

Foreign tourists' expenditure:
Somewhat higher growth than in the recent past; The small increase in expenditure for services of hotels and restaurants (+1% per annum in contrast to the zero growth in the Base Case) is almost sufficient to arrive at the growth rate of the base case of the SMERAL study.

In addition slightly higher growth of expenditure was assumed for:

38| 60 Land transport and transport via pipeline services
40| 62 Air transport services
41| 63 Supporting transport services, travel agency services
42| 64 Post and telecommunication services
55| 85 Health and social work services
58| 92 Recreational, cultural and sporting services

Simulations with AEIOU II

Alternative A – Assumptions

The additional growth compared to the Base Case Scenario is associated with a higher utilization of existing capacities, primarily in hotels and restaurants and an increase in quality of the services.

These two tendencies had to be translated into changes in the input structure of industry NACE 55 Hotels and restaurants.

Some of the inputs are relatively independent of the level of output. Better capacity utilization will lead to a decrease in the relevant input coefficients. Such a development was in particular assumed for:

46| 70AM Real estate services - market
52| 74 Other business services
57| 91 Membership organisation services n.e.c.

Simulations with AEIOU II

Alternative A – Assumptions

The tendency towards higher quality is reflected in small increases in the technical coefficients for the following product groups:

9| 17 Textiles
18| 26 Other non-metallic mineral products
28| 36 Furniture, other manufactured goods n.e.c.
33| 45 Construction work
42| 64 Post and telecommunication services
50| 72 Computer and related services
55| 85 Health and social work services
58| 92 Recreational, cultural and sporting services
59| 93 Other services

Simulations with AEIOU II

Table 1 Alternative A Macro variables at constant prices 2005			
Differences relative to the Base Case Scenario in %			
	2008	2015	2030
Private consumption expenditure, Austrians in Austria	0,00	0,23	0,86
Private consumption expenditure, Foreigners in Austria (Tourism)	0,00	4,30	12,67
Final consumption expenditure by government	0,00	0,00	0,00
Final consumption expenditure by NPISH	0,00	0,00	0,00
Gross fixed capital formation	0,00	0,15	0,71
Exports (excl. Tourism)	0,00	0,00	0,00
Imports (excl. Tourism)	0,00	0,11	0,37
GDP	0,00	0,29	0,84
Employees (in full time equivalent)	0,00	0,21	0,56

Simulations with AEIOU II

Table 2 Alternative A Output by products at constant prices 2005		Selected products	
Differences relative to the Base Case Scenario in %			
No CPA	2008	2015	2030
1| 01 Products of agriculture, hunting	0,00	0,34	0,92
7| 15 Food products and beverages	0,00	0,35	0,97
20| 28 Fabricated metal products	0,00	0,08	0,25
30| 40.1 Electricity	0,00	0,25	0,64
37| 55 Hotel and restaurant services	0,00	1,89	5,11
38| 60 Land transport and transport via pipeline services	0,00	0,39	0,85
39| 61 Water transport services	0,00	0,21	0,61
40| 62 Air transport services	0,00	1,40	3,06
41| 63 Supporting transport services, travel agency services	0,00	0,31	0,91
42| 64 Post and telecommunication services	0,00	0,31	1,13
58| 92 Recreational, cultural and sporting services	0,00	0,61	1,82
59| 93 Other services	0,00	0,43	1,38

Simulations with AEIOU II

Alternative B – Assumptions

Foreign tourists' expenditure:
An annual growth of 3% in real terms might be realized if Austria could become more attractive for tourists coming from countries with booming tourism expenditures of their residents.

For Alternative B the exogenous estimate of foreign tourists' expenditure had to be changed considerably.

The increase in nights spent in Austria (+2% per annum) according to the SMERAL study was augmented by a quality factor.

Simulations with AEIOU II

Alternative B – Assumptions

As in the case of Alternative A even higher growth of expenditure was assumed for:

38| 60 Land transport and transport via pipeline services
40| 62 Air transport services
41| 63 Supporting transport services, travel agency services
42| 64 Post and telecommunication services
55| 85 Health and social work services
58| 92 Recreational, cultural and sporting services

Simulations with AEIOU II

Alternative B – Assumptions

The remarkable additional growth compared to the Base Case Scenario is associated with a higher utilization of existing capacities, primarily in hotels and restaurants and a marked increase in quality of the services.

These two tendencies again had to be translated into changes in the input structure of industry NACE 55 Hotels and restaurants.

Simulations with AEIOU II

Table 3 Alternative B Macro variables at constant prices 2005			
Differences relative to the Base Case Scenario in %			
	2008	2015	2030
Private consumption expenditure, Austrians in Austria	0,00	0,69	2,53
Private consumption expenditure, Foreigners in Austria (Tourism)	0,00	13,96	40,52
Final consumption expenditure by government	0,00	0,00	0,00
Final consumption expenditure by NPISH	0,00	0,00	0,00
Gross fixed capital formation	0,00	0,56	2,31
Exports (excl. Tourism)	0,00	0,00	0,00
Imports (excl. Tourism)	0,00	0,43	1,32
GDP	0,00	0,88	2,53
Employees (in full time equivalent)	0,00	0,65	1,62

Simulations with AEIOU II

Table 4 Alternative B Output by products at constant prices 2005		Selected products	
Differences relative to the Base Case Scenario in %			
No CPA	2008	2015	2030
1| 01 Products of agriculture, hunting	0,00	1,29	3,38
7| 15 Food products and beverages	0,00	1,28	3,50
20| 28 Fabricated metal products	0,00	0,25	0,81
30| 40.1 Electricity	0,00	0,76	1,96
37| 55 Hotel and restaurant services	0,00	5,03	13,14
38| 60 Land transport and transport via pipeline services	0,00	1,49	3,21
39| 61 Water transport services	0,00	1,16	2,68
40| 62 Air transport services	0,00	3,91	8,03
41| 63 Supporting transport services, travel agency services	0,00	1,11	2,92
42| 64 Post and telecommunication services	0,00	1,40	3,96
58| 92 Recreational, cultural and sporting services	0,00	2,75	7,42
59| 93 Other services	0,00	2,05	6,14

Simulations with AEIOU II

Overview of results

Table 6 Output by products		Selected products	
Comparison of average annual growth rates(in %) at constant prices 2005; 2008 to 2030			
No CPA	Base	Alt A	Alt B
1| 01 Products of agriculture, hunting	0,07	0,11	0,23
7| 15 Food products and beverages	1,16	1,21	1,33
20| 28 Fabricated metal products	1,35	1,36	1,39
30| 40.1 Electricity	1,05	1,08	1,14
37| 55 Hotel and restaurant services	1,33	1,57	1,98
38| 60 Land transport and transport via pipeline services	2,53	2,57	2,69
39| 61 Water transport services	1,68	1,70	1,80
40| 62 Air transport services	2,91	3,05	3,30
41| 63 Supporting transport services, travel agency services	1,96	2,00	2,09
42| 64 Post and telecommunication services	2,69	2,75	2,88
58| 92 Recreational, cultural and sporting services	1,35	1,43	1,70
59| 93 Other services	1,32	1,39	1,62

Tourists' expenditure seen in an isolated way

The increase is demand is only seen in the direct effect on domestic production.

In the case of additional expenditure of foreign tourists only the part of demand which is directly met by imports needs to be subtracted.

The remaining "domestic part" of the additional demand can then be set in relation to total domestic production of the various products groups.

In this simple analysis the domestic production of the base year is taken as the reference solution and set equal to the Base Case Scenario.

The results therefore report the additional domestic production in base year 2005 if the expenditures of foreign tourists 2005 are replaced by the expenditures of foreign tourists 2030 under the assumptions of Scenario A (or Scenario B). All calculations are carried out at prices 2005.

Tourists' expenditure seen in an isolated way

Table 9 Direct effects on domestic production		
Differences relative to the Base Case Scenario in % (at 2005 prices)	**Selected products**	
No CPA	**Alt A**	**Alt B**
1| 01 Products of agriculture, hunting	0,00	0,00
7| 15 Food products and beverages	0,00	0,09
20| 28 Fabricated metal products	0,00	0,00
30| 40.1 Electricity	0,00	0,01
37| 55 Hotel and restaurant services	7,21	20,17
38| 60 Land transport and transport via pipeline services	0,93	3,93
39| 61 Water transport services	0,59	3,31
40| 62 Air transport services	5,15	13,71
41| 63 Supporting transport services, travel agency services	0,34	1,25
42| 64 Post and telecommunication services	0,72	2,68
58| 92 Recreational, cultural and sporting services	1,73	8,05

Taking the production effects of tourists' expenditure into account

In the absence of a dynamic multisectoral model it is quite usual to calculate at least the direct production effects of changes in one of the final demand categories with the help of the static open Leontief model.

The additional domestic production induced by a higher tourists' demand in Scenario A compared to the situation in the Base Case is then calculated simply by:

$$X^{\text{Scenario A}} = (I - B)^{-1} \cdot (FDD^{\text{Scenario A}} - FDD^{\text{Base Case}})$$

The additional domestic production induced by a higher tourists' demand in Scenario B compared to the situation in the Base Case can be calculated in an analogous way by replacing FDD for Scenario A by FDD for Scenario B.

Taking the production effects of tourists' expenditure into account

Table 10 Effects on domestic production 2030 taking the production chain into account		
Differences relative to the Base Case Scenario in % (at 2005 prices)	Selected products	
No CPA	Alt A	Alt B
1| 01 Products of agriculture, hunting	0,87	2,51
7| 15 Food products and beverages	0,86	2,51
20| 28 Fabricated metal products	0,10	0,33
30| 40.1 Electricity	0,41	1,34
37| 55 Hotel and restaurant services	7,32	20,50
38| 60 Land transport and transport via pipeline services	1,15	4,72
39| 61 Water transport services	0,74	3,79
40| 62 Air transport services	5,88	15,79
41| 63 Supporting transport services, travel agency services	0,98	3,23
42| 64 Post and telecommunication services	1,17	4,26
58| 92 Recreational, cultural and sporting services	1,94	8,92
59| 93 Other services	0,81	4,52

Comparing the results

An illegitimate comparison		Selected products	
Effects on domestic production relative to Base - 2030 (2005)			
No CPA	**Direct**	**Incl prodeff**	**AEIOU Var B**
1| 01 Products of agriculture, hunting	0,00	2,51	3,38
7| 15 Food products and beverages	0,09	2,51	3,50
20| 28 Fabricated metal products	0,00	0,33	0,81
30| 40.1 Electricity	0,01	1,34	1,96
37| 55 Hotel and restaurant services	20,17	20,50	13,14
38| 60 Land transport and transport via pipeline services	3,93	4,72	3,21
39| 61 Water transport services	3,31	3,79	2,68
40| 62 Air transport services	13,71	15,79	8,03
41| 63 Supporting transport services, travel agency services	1,25	3,23	2,92
42| 64 Post and telecommunication services	2,68	4,26	3,96
58| 92 Recreational, cultural and sporting services	8,05	8,92	7,42
59| 93 Other services	3,81	4,52	6,14

Comparing the results

The comparison presented is not only misleading, it is not legitimate:

In the simulations with AEIOU II the increase in foreign tourism affects the other major categories of final demand such as private consumer expenditure of resident households and capital formation via the income and production effects but also because of implications on prices.

In the simple calculations described above the other categories of final demand remain unchanged if foreign tourism is altered.

Comparing the results

In the simulations with AEIOU II the increase in foreign tourism affects prices and via prices the competitive position of Austria.

In particular price changes affect imports. In the simple calculations no such feedback effects are taken into account.

The simulations with AEIOU II for 2030 are based on an import matrix for 2030 which shows considerable higher import shares than in 2005, the matrix on which the simple calculations are based.

Comparing the results

In the calculations with AEIOU II the results of Scenarios A and B are compared to a situation 2030 in the Base Case, not to a situation of production in the base year 2005 as in the case of the simple calculations.

The simple standard approaches only provide ceteris paribus analyses “what would have been, if...”.

In the simulations with AEIOU II the analysis is carried out in a dynamic setting taking the major feedback effects into account.

The results relate to different situations in 2030; in addition the time-path leading to the final situations in 2030 are shown.

Concluding remarks

The analysis of an increase in tourists' expenditure needs to be based on a disaggregated approach.

To study the effects induced by a change in one final demand category with a very specific product structure asks for an input-output approach to trace the indirect production related effects on nearly all branches in the economy.

Simulations with the help of a model like AEIOU II cover all the direct effects and all the production effects.

In addition they offer insight in all the macro implications and detailed results for the effects on employment, wages and salaries, domestic prices, etc.

Thank you for your attention