TOURISM FLOWS AND THE DEMAND

FOR REGIONAL AND CITY THEATRES IN AUSTRIA

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Abstract

This paper investigates the impact of tourism flows on demand for large regional and city theatres in Austria over the period from 1972 to 2011 (39 years). The results are obtained by applying an aggregated theatre demand function for both residents and tourists. The elasticity of theatre attendance in response to tourism is estimated along with other standard demand variables such as ticket price and income. The quality factors and theatre-specific effects are also included. The total elasticity of attendance per capita in response to tourism is estimated between 15 to 20 per cent, indicating that increasing the number of arrivals by 2 tourists per resident in the relevant market would generate an increase in theatre attendance by 581 to 680 thousand visitors per year. The role of tourism flows is found to be particularly important for attendance at opera, operetta & musicals as opposed to attendance at drama performances. The analysis also reveals that foreign, non-German tourists have a positive impact on theatre attendance whereas domestic tourists do not contribute significantly to higher demand for Austrian theatres.

Keywords: cultural tourism, tourism flows, elasticity of theatre attendance in response to tourism, Austrian theatres

JEL Codes: Z11, L32, L83, H44

1. INTRODUCTION

This paper investigates the role of tourism in the consumption of cultural activities. In particular, we test a hypothesis that tourism can positively contribute to the demand for the performing arts in the region where a theatre company is located. The relationship between the tourism and demand for theatre is examined using a novel panel data set on 20 large theatres in Austria and on tourism flows over the period from 1972/1973 to 2010/2011.

The examination of the impact of tourists on demand for Austrian theatres is an interesting case study for several reasons. The examined theatres belong to the largest theatre group in the world. In some cases with over 700 seats, these theatres are mostly run as three-branch concerns with a variety of the performing arts forms at their disposal. The theatre landscape in Austria is similar in production and funding structure to the public theatres in Germany. However, Austrian theatres received relatively little attention in the economic literature on the performing arts in contrast to Germany (see Zieba 2009; O'Hagan and Zieba 2010) or other countries (see for example Laamanen 2013; Werck and Heyndels 2007; Withers 1980; Gapinski 1984, 1986, 1988). Theatre attendance also did not decline in Austria as happened in Germany. The total number of visitors decreased only slightly from 3.9 million in season 1969/1970 to 3.7 million visitors in 2010/2011 but in 1972/73 it was approximately at the same level as in 2010.

On the other hand, the number of tourists in Austria doubled from over 15 million in 1972 to about 33 million in 2010. The impact of tourism on domestic economy as a whole, is particularly important in Austria where both foreign and domestic tourists

(including the day visitors), spent 29.5 billion EUR in 2010.[1] The average tourist expenditure per capita in Austria has also been one of the highest in Europe. In 2011 it amounted to 1,672 EUR in contrast to an average of 502 EUR for the EU27 and only 319 EUR in Germany. It is also noteworthy that the tourist consumption expenditures for cultural and leisure activities accounted to 2.7 billion EUR in 2010 which equals 9.2% of total tourist expenditures for the same year. The greatest share of this amount accounts for cultural consumption such as visiting museums or theatres (19.2%), followed by other leisure activities such as sport and recreation.[2]

According to McKercher (2002) little research has been published examining the market for cultural tourism in general and its impact on the consumption of cultural activities. The empirical evidence of the positive influence of tourists on demand for the performing arts was confirmed by Gapinski (1988) in his study on the lively arts companies in London. Recently, Borowiecki and Castiglione (2014) estimated the effects of tourism flows on cultural participation in Italian provinces. Their results provide empirical support for the existence of a strong relationship between tourism flows and the number of visits to museums, theatre and concerts. This paper uses a similar approach to that applied in the two earlier studies. In particular, this study aims to estimate the elasticity of theatre attendance in response to tourism by applying an aggregated demand function for both residents and tourists. The primary dependent variable is the total number of theatre visitors normalised using per capita terms. The data on tourists refer to individuals traveling and staying at least one night in a region or a city that is not their usual environment. We also disentangle between foreign and domestic tourists and estimate the model using theatre attendance at different types of performances produced by the theatres.

[1] According to *Tourism - Satellite Account*, the tourist expenditures in Austria contributed overall to 7.5% of GDP in 2010.
[2] See Bundesministerium für Wirtschaft, Familie und Jugend (2012) for more details.

The paper is structured as follows. Section 2 discusses the role of tourism in cultural consumption and presents the relevant literature review. Section 3 provides a brief discussion of theatre and tourism sector in Austria. Section 4 discusses the variables used in the estimation of demand function for both residents and tourists, and it also presents the estimation strategy. While Section 5 presents the empirical results Section 6 concludes the paper.

2. LITERATURE REVIEW

In this paper we test a hypothesis that cultural tourism can positively contribute to the demand for the performing arts in the region where a performing arts organisation is located. In contrast to other sectors such as agriculture or production sector the tourism is not related to the consumption of a particular group of goods or to a single good. Thus, the goods consumed by tourists can broadly include accommodation, food and drink, local transportation, entertainment, shopping, sightseeing, participation in cultural activities and any other goods and services that facilitate the enjoyment of a trip. Essentially, once a tourist has decided to travel to a particular destination, a key issue is what factors influence the choice/purchase of various tourism goods and services (Divisekera and Deegan 2010).

An important feature of tourism consumption is that a large proportion of tourist expenditure is devoted to the consumption of non-traded goods and services which are not exportable in the traditional sense (Dritsakis 2012). The performing arts can also be classified in this category of services. The total demand for theatre is constrained by its local market such as geographical area, population size, income and consumer preferences of the local residents. Hence, tourist consumption represents an indirect form of exports of artistic performances and it can contribute to higher attendance

numbers. In fact, the important role of tourism in cultural consumption has been recognised by World Trade Organisation (WTO) which estimated that the cultural tourism accounts for 37 per cent of all tourist trips and that its demand is growing by 15 per cent per annum (Richards 1997).

It should also be noted that tourism literature has not yet settled on a single definition for the term "cultural tourism". Following this, many studies attempted to classify the different types of cultural tourists by type of the cultural attraction as well as by the tourist's individual preferences. For the purpose of this study, we use a more broad concept and define the cultural tourist as any individual who visits cultural institutions or places such as museums, archaeological and heritage sites, operas, theatres, festivals or architecture while away from home (for more discussion see Stylianou-Lambert 2011).

In the literature on cultural tourism we can also find two main hypotheses which can explain the factors that affect the cultural participation of tourists. According to a more traditional theory, tourists once away from home, will behave differently and will tend to consume other goods and services while on trip. The concept of everyday life often appears in opposition to behaviour that takes place away from home: 'Tourists are envisioned to adopt a tourist gaze as soon as they find themselves at a foreign destination' (see Stylianou-Lambert 2011, p. 407). According to this hypothesis, individuals will be more likely to visit an artistic performance while away from home. This may be to several reasons. First, tourists usually have more leisure time at their disposal than at home so their price of leisure, measured by the opportunity costs of time, may be zero.[3] Tourists also are more likely to organise their leisure time more actively or may be more willing, for example, to queue in order to

[3] See Zieba (2009) for an exact definition of price of leisure and its application to estimating the demand for German public theatre.

buy theatre ticket. Second, tourists may be more likely to visit an opera or musical performance, not only because they are regular theatre goers but because of the fact that a historical theatre can be one of the attractions in a region. We also postulate that tourists will be more likely to participate in cultural attractions abroad than in their home country as visiting a theatre may be a way to learn about the foreign culture. This might be a particularly deciding factor to visit the well-known theatres in Austria which are the subject of investigation in this study. In the case of art museums, there is indeed proof that tourists have an increase in desire to visit cultural attractions when abroad (see for example McIntyre 2007, Borowiecki and Castiglione 2014).

Many recent studies on cultural tourism recognised also the fact that tourists carry over their everyday life experiences to the tourism arena which results in a similar pattern of cultural consumption as at home and while on trip. Even in the cases where the main motivation for traveling was to leave one's everyday life behind, it was found that tourists still try to retain many of the routines of their own culture, or at least those that are close to their sense of identity (Stylianou-Lambert 2011). This supports the so-called spillover hypothesis that states that the individual preferences of tourists may be important factors in explaining their cultural participation.

To our knowledge, there has been until today relatively little research that could quantify the effects of tourism on the participation in the performing arts. Gapinski (1988) was perhaps one of the first works which tried to quantify how much of attendance at London's lively arts companies comes from tourism. Using the data for 13 London's arts companies over 12 years this study found an attendance elasticity with respect to the number of tourists of 0.645 indicating that a 10 per cent increase in London visitors increases lively arts attendance by almost 6.5 per cent. In the more recent study, Borowiecki and Castiglione (2014) used data on tourism flows over two

years in the Italian provinces. They identified positive effects of tourist arrivals and overnight stays on admission rates at theatrical activities, concerts, sports, dance and recitals, exhibitions and shows. Their findings also show that the demand for entertainment in general varies depending on the origin of the tourist. The admission to theatre-type activities increases as the number of domestic tourists rises, whereas admission to museums or concerts rises with an increase in foreign tourism. On the other hand, all tourists contribute significantly to admission rates at exhibitions, shows, dance and musical performances.

Much of the previous literature on cultural tourism also proves that there is a close linkage between tourists' socio-economic/socio-demographic status and their participation in cultural attractions. These studies provide an empirical evidence to support the spillover hypothesis discussed above. For example, Craik (1997) suggested that people with lower educational level are unlikely to consume cultural tourism. Furthermore, Hall and Zeppel (1990) revealed that tourists at art festivals tend to be mature professionals with high income who are willing to travel to attend major events. In particular, Kim, Cheng and O'Leary (2007) identified the effects of gender, age, income and education characteristics of domestic tourists on four clusters of cultural attractions in the U.S. market. They found that the level of income and education is positively related to participation in the cluster "festival and musical attractions" which includes among others the participation in theatre festivals, opera, ballet and dance performances, and also classical concerts.

In contrast to the studies which examine the behaviour of cultural tourists using their personal characteristics, this paper similarly to Gapinski (1988) and Borowiecki and Castiglione (2014) focuses on estimation of direct aggregated effects of tourism flows on attendance at Austrian theatres. Hence, this study is based rather in the

traditional theory discussed above which states that tourists may behave differently while away from home. Following this hypothesis, we distinguish the effects of tourism flows disentangled by the origin of tourists. In particular, we assume that foreign and domestic tourism flows can differ in their impact on demand for Austrian theatres.

3. THEATRE SECTOR AND TOURISM FLOWS IN AUSTRIA

3.1 Austrian theatres

The following study utilises panel data on 20 large theatres in Austria over 39 yearly theatre seasons from 1969/1970 until 2010/2011. These data are obtained from the annual *Theaterstatistik* (theatre statistics report) which has been published each year by the German Stage Association since 1965.[4] Appendix 1 lists the names of all theatres in the sample and their location in the relevant city or in the territorial unit. Among the examined group of theatres, 12 of them are located in Vienna. It is important to note that Vienna has been at the centre of Austrian theatre life for centuries. It is the owner of the four federal theatres (*Bundestheaters*) which constitutes the largest theatre group in the world. The Viennese *Staatsoper*, *Volksoper, Burgtheater* and *Akademietheater* which belong to the Federal Theatre Association, combined attracted 1.3 million visitors in 2010. Apart from these four state-run theatres, there are several large private theatres in Vienna, including such historical venues as the *Theater in der Josefstadt* (1788) or the *Theater an der Wien* (1801). The sample also includes 8 public regional theatres which are located in almost all regional capitals in Austria, such as *Landestheater* in Linz or *Landestheater* in Salzburg.

[4] Data on Austrian theatres were included for the first time in *Theaterstatistik 1969/70* and they are listed in this report the same way every year. This allows the comparison of data over time.

Although all Austrian theatres obtain their 'own revenues' on the market through tickets sales they can only meet a fraction of the production and running costs. For the federal theatres in Vienna and other state-run theatres, the government (state, regions and municipalities) has assumed legal responsibility. In contrast, private theatres in Austria operate under civil law but the budgetary support is also made available for the large private theatres under a highly differentiated system.[5] Based on the data available in *Theaterstatistik*, the level of public subsidies (adjusted using Consumer Price Index) accounted on average for 71 per cent of their total theatre budget over the examined period of time. In fact, the average budget deficit for Austrian theatres increased from 62 per cent in 1969/1970 to 72 per cent in 2010/2011.

The production structure of large regional and city theatres in Austria is very similar to that of German public theatres. Many regional Austrian theatres are known as three-branch or multi-branch companies meaning that they have drama performances (52%), opera (14%), operetta & musical performances (28%), but also ballet (2%) and concerts (2%) at their disposal. However, for some theatre companies such as the federal theatres in Vienna the branches tend to be separate (see Appendix 1). The examined theatres can also be described as repertory theatres. This implies that each production is re-run several times during the entire theatre season and the production program is prepared and published at the beginning of each season.[6]

Finally, all examined theatres in Austria have a permanently employed artistic ensemble consisting of solo artists, choir, ballet and theatre orchestra members whose employment rights are regulated by the Austrian Stage Association. All Austrian theatres employ an artistic director (*Intendant*) who decides the artistic production

[5] The public bodies provide support on a voluntary basis for these theatres but at the same time under the obligations arising from customary practice (Gruber and Köppl 1998).

[6] The theatre season usually lasts 12 months with 10 months of playing and 2 months of preparation for the new theatre season. Thus, it usually lasts from August/September until June/July of the following calendar year.

program, repertoire and ensemble in association with other artistic management such as dramaturges or stage managers.[7] Support staff, consisting of technicians, artistic-technical staff, administrative and house staff, is also employed.[8]

Figure 1 presents the trends in total aggregate attendance for all examined theatres in Austria. The average theatre attendance over the examined period of time accounts to about 3.74 million theatre visitors per yearly theatre season. It should be noted that the total number of visitors did not decline significantly over the examined period of time. Whereas there were around 3.9 million visits annually to theatre in Austria in 1969 the number of visitors accounted to 3.7 million in 2010. This trend is in opposite to theatre attendance in Germany where it has been steadily declining (see Zieba 2009). Figure 1 also presents the number of visitors at Austrian theatres split by the type of performances. It is noteworthy that whereas attendance at opera, operetta & musical performances is at approximately the same level today as in 1969 with about 1.82 million visitors, attendance at drama performances declined significantly from 1.67 million in 1969 to only 1.45 million visitors in 2010.[9]

3.2 Tourism flows in Austria

The detailed data on tourism flows are taken from the statistical data bank *STATcube* available at Federal Statistical Office in Austria (*Statistik Austria*).[10] This data bank provides the detailed time series data on accommodation statistics for both the whole

[7] In state-owned theatres, the management is usually appointed by the theatre's license holder. In the case of theatres with private ownership external governmental institutions are entitled to control them.
[8] All examined theatres also have their own venues which often consist of one large and several small auditoriums granted to them by the state, municipalities and federal regions in Austria.
[9] It should be noted that similar pattern of attendance can be observed in the data when attendance is normalized using the per capita terms. Therefore the figures for the normalized data are not presented.
[10] The exact data source name is *"STATcube - Statistische Datenbank der STATISTIK AUSTRIA"*

country and the regions.[11] The statistics includes yearly and monthly data on the number of tourist arrivals and overnight counts which can be grouped according to accommodation types and countries of origin. Figure 2 presents the total number of tourist arrivals and overnight stays in Austria, categorized by different categories of tourists, including domestic (Austrian) tourists, but also foreign and German visitors. As it can be seen, the total number of tourist arrivals increased over time from 15.4 million visitors in 1972 to 34.6 million in 2010. The total number of overnight counts also increased over time from 102 million nights in 1972 to 126 million in 2010.

Figure 2 also shows that international tourism is of primary importance in Austria where the number of foreign tourists outweighs almost three times the number of domestic visitors. However, the rate of increase in foreign tourist arrivals is slightly lower (about 100 per cent increase from 1972 until 2010) in contrast to the increase in arrivals of domestic tourists (about 185 percentage increase over the same time period). It is also interesting to note that the smallest increase in tourism flows (circa 63 per cent) can be found for the arrivals of German tourists.

Overall, the total trends in tourist arrivals and overnight stays indicate that in particular foreign, non-German tourists are more likely to contribute to higher visitor numbers at Austrian theatres. This trend is compatible with the ATLAS survey data on cultural tourism collected for 11 European countries (including Austria). According to this data source, the rise of cultural tourism in those countries closely parallels the increase in international tourism trips (see Richards 1996, pp.40-41).

The recent survey known as Travel Habits of Austrian Residents '*Reisegewohnheiten der österreichischen Bevölkerung*', collected during 2008-2009 also indicates that a much higher proportion of Austrian tourists choose cultural

[11] Approximately 1600 reporting municipalities (around two thirds of Austrian municipalities) submit data on monthly arrivals and overnight stays by guests from Austria and abroad who stay in around 75000 commercial and private accommodation establishments.

participation as their main motivation to travel abroad. Table 1 presents the data extracted from the survey. While only 8% of Austrian residents indicate that cultural participation was the most important motivation to travel to other regions in Austria for at least one of their trips, about 24% of Austrian tourists confirm that the main reason for travelling abroad were cultural attractions. This statistics is also consistent with data in other countries. A study of travel motivations of Japanese tourists shows a similar pattern with over 27% of respondents indicating that art galleries, museums, theatres and concerts were the most important reason for visiting another country. In Denmark it is estimated that 35% of foreign tourists visited museum during their stay. Similar to Austria, only about 5% of domestic tourists in the UK indicated that culture was the main purpose for their holiday trip (see Richards 1996 for further details). These trends indicate that the type of the trip (domestic or abroad) can be an important factor determining the cultural participation of tourists.

4. MODEL SPECIFICATION AND DATA SET

In this section we present a model of an aggregated demand function for Austrian theatres which distinguishes between residents and tourists. First, we define the dependent variable and a number of explanatory variables used to estimate the aggregated demand function for theatres. Second, we present an econometric model applied. Two data sources are used in this study. The dependent variable and the theatre-specific explanatory variables are constructed using *Theaterstatistik* for 20 theatres over the period 1969/1970-2010/2011. Data on tourism flows and other macroeconomic variables such as income and population are constructed using various sources available at the Central Statistical Office in Austria (*Statistik Austria)*. Both the data on arrivals and overnight stays of tourists are available in the statistical

data bank *STATcube* for 9 federal provinces in Austria, called NUTS2 level, and for 35 geographically smaller territorial units, called NUTS3 level.[12] As those data are available since 1972, the first three years of data for theatres are dropped from the analysis which gives a total of 591 observations for the full sample of theatres.

4.1 Variables used

In order to quantify the relationship between demand for theatre and tourism flows, we utilise a simple theoretical model discussed in Gapinski (1988) which is presented in Appendix 2. We assume that the quantity of cultural experiences demanded by a resident (y_r) will depend on theatre ticket price (P_r), price of substitutes (Ps_r) and his/her disposable income (Inc_r). Similarly, the quantity of cultural experiences demanded by a tourist (q_t) will also depend on theatre ticket price (P_t), the price of substitutes (Ps_t) and his/her expenditure (Exp_t) during the vacation. Hence, the total demand for cultural experiences (Y) will be equal to the total number of experiences demanded by all residents ($y_r \cdot R$) plus the total number of experiences demanded by tourists ($q_t \cdot T$). We also assume that the price coefficients (for theatre tickets and the substitutes) will be the same for both residents and tourists as they have similar response to the change in relative prices. Thus, the total number of cultural experiences per resident (y) would depend on the ticket price (P), price of substitutes (Ps), disposable income per resident (I), tourist expenditures per resident (E) and the shift variable of interest (TR) denoting the number of tourists per resident which we also call further the *tourist intensity rate* (see also Appendix 2).

[12] NUTS is an abbreviation for "Nomenclature des unités territoriales statistiques". This system divides the territory of the EU into territorial units on 3 levels, which normally consist of entire administrative units or groupings of such units: NUTS1 Regions of the European Communities, NUTS2 Basic administrative units, NUTS3 Subdivisions of the basic administrative units.

In the remaining part of this section, however, we are applying a number of modifications and extensions of this basic theoretical model in order to incorporate it into the aggregated demand function for the examined theatres in Austria. First, we define the theatre markets to properly match the tourist arrivals with the number of theatre visitors. Second, we apply alternative measures of the dependent variable. We also extend the basic demand model by introducing additional explanatory variables that are relevant to different extent for both residents and tourists.

4.1.1 Theatre markets

In order to examine the impact of the tourist arrivals and overnight stays on theatre attendance in Austria, the definition of the relevant theatre market is necessary. The market definition for Austrian theatres depends on their geographical location and it is based on the spatial weight matrix approach. This approach was firstly used by Werck and Heyndels (2007) for the Flemish theatres and was also applied for German theatres and orchestras by Zieba (2009) and Zieba and O'Hagan (2012).

Given the data availability for tourism flows, three spatial weight matrix specifications are considered and empirically tested. The first matrix specification is defined in the way that the market is limited to the NUTS3 province (district) in which theatre *j* is located. Each NUTS3 unit consists of merged municipalities and on average have an area of 3.2 km^2 and an average population of 239,294 persons. The spatial weight matrix associated with theatre *j* is denoted as M_j and is composed of $(m_{ik})_j$ elements – the NUTS3 units in (35 x 35) space. The elements $(m_{ik})_j$ equal one for NUTS3 unit *i* in which theatre *j* is located and 0 otherwise. It is very likely that the tourists may stay in the accommodation outside the city with the proximity to the town or city where a theatre is located. Hence, this theatre market specification seems

reasonable as the market for each theatre includes the relevant city or town in which theatre *j* is located and also the suburbs and the neighbouring municipalities.

In the second market specification, the elements of spatial weight matrix, M_j, take values $(m_{ik})_j$ equal to 1 not only in the NUTS3-region in which theatre *j* is located but also in the neighbouring regions and in the border-sharing regions of the neighbours. In addition, the rule is applied that the relevant market for each theatre depends on the geographical distance, defined as a circle with a radius of 45 - 50km from the theatre. Thus, we assume that both foreign and domestic tourists will not travel further than 50km away from their accommodation in order to visit an artistic performance. This specification of theatre market also controls for the day-visitors which may travel from one NUTS3-region to another neighbouring region in Austria (see discussion in Section 4.1.6).

The third market specification considers the geographical units at NUTS2 level which are the 9 federal provinces (regions) in Austria. Hence, the elements $(m_{ik})_j$ of the spatial weight matrix, M_j, equal 1 for the federal province in which theatre *j* is located and 0 otherwise. The main reason for using this additional specification is the fact that the data on tourism flows for the federal provinces are available not only on yearly but also on monthly basis. Monthly data allow for derivation of a more accurate flow of tourists which corresponds with yearly theatre seasons. Furthermore, the theatres in Austria are scattered geographically in the way that apart from region of Vienna each theatre is located generally in the centre of the federal region and the markets do not overlap.[13] Therefore, such definition of theatre markets seems also plausible.

[13] Most of the cities in which the theatres are located are the actual capitals of the federal provinces. The federal regions in Austria are geographically large units and they are also rather homogenous in their population and income structure. The only exception is the theatre in Baden ("Stadttheater

The size of theatre market which is defined using three different matrix specifications is measured using the number of residents (i.e. population). Population is not explicitly included in the empirical model but it is used to derive theatre attendance per capita, the disposable income per resident, and the shift variable of interest which is the tourist intensity rate. The annual population data for both NUTS2 and 3 levels were directly available at *Statistik Austria* for the whole period of time and they had only to be transformed into yearly theatres seasons equivalents. Thus, the population of market relevant for theatre j in season t can be defined as $RES_{jt} = M_j \cdot R_{it}$ where R_{it} is the number of inhabitants in the territorial unit under consideration and M_j is the spatial weight matrix associated with the market relevant for theatre j.

4.1.2 Theatre attendance

In line with the theoretical demand model of Gapinski (1988) discussed above, we define the demand for theatre in terms of cultural experiences per resident. Following this, we use as the primary dependent variable the total number of paying theatre visitors (Y_{jt}) divided by the total number of residents in the relevant theatre market (RES_{jt}) so that: $y_{jt} = Y_{jt}/RES_{jt}$. Total attendance at Austrian theatres, Y_{jt}, includes aggregated ticket sales at own location of theatre j in season t and it consists of visitors attending opera performances (17%), operetta and musicals (27%), drama performances (50%) but also ballet (3%) and classical concerts (2.6).[14]

We also assume that the type of the performance (art genre) can be a deciding factor for both residents and tourists in order to visit a particular theatre. Thus, in order to account for differences in demand with regard to the arts genre, we construct

Baden") which is located on the border between two federal regions and in this instance the market for the theatre may extend to the neighbouring districts such as Vienna. For this theatre both specifications were empirically tested but the results did not differ.

[14] It should be noted that this measure includes visitors attending performances staged by foreign ensembles but it does not include attendance at guest performances.

two alternative measures of the dependent variable. First, we use theatre attendance at operas, operettas and musicals. Second, we use attendance at drama performances only.[15] However, we do not use the category of ballet and concerts for our analysis as both these art genres are produced to much lesser extent at Austrian theatres than the first two categories.

4.1.3 Ticket Price

The ticket price variable, P_{jt}, is calculated similarly to Zieba (2009), Werck and Heyndels (2007), Gapinski (1986) and Withers (1980), and Toma and Meads (2007), by dividing operating revenues in a theatre obtained from tickets sales by the total number of visitors. As it was not possible to decompose the operating revenues by the different number of visitors, the aggregate average price is used for the estimations. As already noted above, we assume that the price coefficients will be the same for both residents and tourists. We also expect that the ticket price will have a negative effect on theatre attendance but the demand will be price-inelastic. One of the reasons for expecting a low price-elasticity may be the importance of quality factors. Both residents and tourists attend an artistic performance for aesthetic and artistic reasons and the ticket price itself may not outweigh other important factors which visitors take into account. Furthermore, as argued by Laamanen (2013) a low inelastic demand for performing arts may be due to the aggregated price measure.[16]

[15] The art genre "opera" was combined together with category "operettas & musicals" as they produced the same results with regard to all variables discussed.

[16] Laamanen (2013) estimated price elasticity for Finnish National Opera using the individual sales tickets for every performance and accordingly found that demand for theatre is unit-elastic in contrast to previous studies.

4.1.4 Capacity constraints

In order to control for the supply in a theatre and hence the capacity constraints which have an effect on theatre demand, we include the number of seats on offer in a theatre, S_{jt}, called according to O'Hagan and Zieba (2010) effective supply or capacity. This variable is obtained by multiplying the number of seats by the actual number of performances and it should control for the possible bias of the capacity constraints in a theatre that do change over time.[17]

4.1.5 Quality

We also introduce two variables which measure the objective quality characteristics of theatres following Werck and Heyndels (2007) and Zieba (2011). The first quality variable, A_{jt}, is constructed using the total number of artists in a theatre. The second variable is defined by the standard of décor and costumes (D_{jt}) which is obtained by dividing the total outlay on décor and costumes by the number of artists. In general, we would expect that both the number of artists and décor & costumes will have a positive effect on theatre attendance. In case of the first quality measure, we could expect that audiences would prefer larger staff complements, in terms of spectacle and variety (see also O'Hagan and Zieba 2010).

It should be, however, noted that whereas the objective quality characteristics of theatres might be important for residents, they may not be very relevant for tourists. In fact, tourists and residents can have different search capabilities (Gapinski 1988). While the residents can choose the theatre company and the particular performance (play, playright and actor) they would like to visit, tourists have only limited consumption opportunities. They must consume a performance at the particular

[17] The changes in the capacity constraints that do not change over time but are particular to each theatre, are controlled for in the model by using individual theatre dummies (see Section 4.2 below).

theatre company which is available at the destination at the time of their visit. Nevertheless, the location of theatre would be an important factor for tourists. In order to control for demand preferences of residents which are connected with unobserved characteristics of theatres, we introduce a dummy variable, X_j, taking value of 1 if a theatre company under examination is theatre *j* and 0 when it is not. It should be noted that the dummy variable for each individual theatre also controls at the same time for the location of theatre *j* which is relevant for tourists.[18]

4.1.6 Tourist intensity rate

Our main variable of interest is the tourist intensity rate, TR_{jt}, which is the number of tourists per resident. We define tourists as individuals travelling and staying at least one night (24 hours) in a region or a city that is not their usual environment (see also Bull 1995). To measure the number of tourists in the relevant market *i* for theatre *j* in period *t*, two alternative variables are applied. The first measure of TR_{jt} is derived using the number of tourist arrivals and is the primary variable of interest (Borowiecki and Castiglione 2014; Carey, Davidson and Sahli 2013). This number refers to all tourists staying at least one night in the market *i* relevant for theatre *j* in period *t*. The number of overnight stays of tourists at the main destination is an alternative measure for measuring TR_{jt}. We also account for the size of the relevant theatre market. Thus, the tourism intensity rate for theatre *j* and season *t* is defined as: $TR_{jt} = (M_j \cdot T_{it}) \big/ RES_{jt}$, where T_{it} is the total number of tourist arrivals or tourist

[18] Including separate dummy variables for the location of each theatre will be dropped from the model due to collinearity with the individual theatre dummies. However, we also estimate the model using the dummy variables for the location instead of dummy variables for theatres and we find similar results.

overnight stays in the relevant territorial unit *i* and RES_{jt} is the population (residents) of the market relevant for theatre *j* in season *t*.[19]

We assume that the tourist intensity rate will have a positive effect on theatre attendance and that the effect of tourism flows on demand for theatre may differ depending on the origin of tourist. Therefore, we disentangle the tourist arrivals and overnight stays into following three main groups: total number of tourists, domestic (Austrian) tourists and foreign tourists. We also split foreign tourists into German visitors and into visitors coming from rest of the world.

As noted in Borowiecki and Castiglione (2014), both measures of TR_{jt} discussed above, do not include day visitors that could have an important influence on theatre attendance. In fact, the definition of tourists formulated by the Tourism World Organisation (UNWTO) includes in its classification the visitors staying in a destination for less than 24 hours. These visitors are defined as excursionists or just one-day visitors. In our framework we attempt to take account of those daily tourists by using different territorial units and estimating the demand model using three alternative theatre markets specifications discussed earlier. As regards the first market specification, while it is possible that some tourists stay overnight outside the city where a theatre is located, it is less likely that they will stay outside the NUTS3 unit. As for the second market specification, although it is possible that some tourists may travel through Austria and they might visit a theatre during this journey, the distances across different NUTS3 units are too large enough to be covered within a day. For the third market specification the analysis is conducted at federal provinces level so that the distance to be covered by tourists would be even more extreme. Hence, using the

[19] As the data on both tourists arrivals and overnight stays were available for the first and second market specification on yearly basis and for the third market specification on monthly basis, they were transformed into yearly theatre seasons equivalents.

alternative market specifications we are able to check if there is any possible bias of not including day visitors in our model.

4.1.7 Income per capita

Our further variable of interest is the income of residents (I_{jt}) which is approximated using real GDP per capita.[20] Thus, the real GPD series for each territorial unit are used to calculate the income per resident in the market relevant for theatre *j* in season *t* using the formula: $I_{jt} = (M_j \cdot GDP_{it}) / RES_{jt}$ where RES_{jt} is the population of the relevant market for theatre *j* in season *t*. The income per capita is expected to have a positive effect on theatre attendance. We also would expect the income elasticity of demand to exceed one but the empirical evidence with regard to the effect of income on theatre attendance is mixed. However, the income effect can be an effect of two factors, a positive large full-income effect and the negative price of leisure time effect (see Zieba 2009; Zieba and O'Hagan 2013, Withers 1980).

4.1.8 Tourists expenditures

We would also expect that tourist expenditure per resident (E_{jt}) would have a positive effect on attendance at large theatres in Austria. In this study it was, however, impossible to measure the tourism expenditure in any reliable way.[21] We also believe that the tourists' expenditures may not be a deciding factor to consume performing arts. This can be explained using the assumption that the consumers' overall utility

[20] The data on total disposable income of households in Austria was not available for the required time period at NUTS-3 level. The data on Gross Domestic Product (GDP) were available for the period 2000-2011 for both federal regions (NUTS2) and the smaller territorial units (NUTS3) in Austria. For 1969-1999 the country level data were available and the values for NUTS2 and NUTS3 units were obtained using the average shares (calculated on the basis of data available for the later period).

[21] The data on tourism expenditures were available for the time period 2000-2010 and for the whole country only. Therefore, obtaining the robust estimates using the limited number of observations and variation in the data was not possible.

maximizing problem may be represented by a multi-stage budgeting process.[22] According to this hypothesis the tourist first divides the total holiday expenditures across the different groups (first stage) and then he or she divides the expenditure for any given group across the different items in that group (second stage). While the first stage requires information only on "group prices" (a price index for each group), the second stage requires information needed for making a decision for any given group (in this case a cultural good), i.e. the total expenditure allocated to that group in the first stage, plus the prices for each item in that group is needed. Due to the fact that in this study we analyse only one item within the group "cultural good", we are rather concerned with the second stage decision process. Hence, we can assume that the ticket price is the main determinant of the choice of consuming performing arts within the group. Furthermore, as found by Kim et al (2007), the tourists are characterised with higher income and wealth than the residents which would imply that not the available budget but the relative prices of different cultural goods are much more important for determining the tourist's consumption bundle.

4.1.9 Substitutes

In line with theoretical demand model, the price of substitutes (Ps_{jt}) should also have an effect on theatre attendance in Austria. As in many other studies on the consumption in the performing arts, the data on the price of substitutes are very difficult to obtain. As the robustness check, we included in the empirical model the cinema ticket price as a proxy variable for the price of substitutes, however, the

[22] This hypothesis requires the usual assumption about weakly separable consumer preferences (Divisekera and Deegan 2010).

coefficient of this variable was not significant, indicating that cinema is rather a poor substitute for both residents' and tourists' demand for theatre.[23]

4.2. Estimation strategy

Given the discussion of the dependent and independent variables we formulate an empirical demand function for Austrian theatres. The demand function is estimated using both the full sample of Austrian theatres where attendance at all performances is used as the dependent variable and for the reduced sample of theatres where attendance at different types of performances is considered. Expressing all variables in natural logs and including individual theatre dummies (X_j) which control for unobservable characteristics that are constant over time, the time trend C and an error term (u_{jt}), the empirical demand model is given by equation (1)[24]:

$$\ln y_{jt} = \alpha_r + \sum_{j=2}^{N} \alpha_j X_j + \alpha_p \ln P_{jt} + \alpha_s \ln S_{jt} + \alpha_a \ln A_{jt} + \alpha_d \ln D_{jt} \qquad (1)$$

$$\alpha_i \ln I_{jt} + \alpha_{tr} \ln TR_{jt} + \alpha_\gamma \gamma + u_{jt}$$

where the dependent variable is the theatre attendance per capita for theatre *j* and season *t*, P_{jt} is theatre ticket price for theatre *j* in season *t*, S_{jt} is the total capacity for theatre *j* and season *t* measured as the number of performances multiplied by the number of seats; and A_{jt} (number of artists) and D_{jt} (standard of décor and costumes) measure the objective quality for theatre *j* in period *t*. I_{jt} is the disposable income per resident in the marker relevant for theatre *j* in season *t*; TR_{jt} is the main variable of

[23] However, a valuable extension of this research would be including better proxy variables for the prices of other cultural goods that are relevant for both residents and tourists.

[24] The log-linear model was chosen since a substantially better statistical fit was obtained through the use of the logarithmic transformation of most of the variables as compared to a simple linear function. The logarithmic transformation has also the advantage as the estimates of determinants of demand can be interpreted as direct partial elasticities.

interest which shows the tourist intensity rate in the market of theatre *j* and season *t*, where coefficient α_{tr} measures the elasticity of attendance in response to tourism.

The model given by equation (1) is fitted to unbalanced panel data. As the data set represents a long-panel where the number of time periods (*T=39*) is large relative to the number of theatres (*N=20*), it is likely that the error term is first-order autoregressive.[25] For this reason, we use a more efficient FGLS (feasible general least squares) estimator and assume that the form of autocorrelation is common for all theatres. The statistical noise term, u_{jt} given in the equation (1) is adjusted according to the Markov first-order autoregressive scheme AR (1) so that:

$$u_{jt} = \rho \cdot u_{jt-1} + \varepsilon_{jt} \qquad (2)$$

where ρ is the first-order coefficient of autocorrelation at lag 1. Furthermore, in order to control for unobserved theatre-fixed effects that can be correlated with the error term, the individual theatre-dummies, as specified in equation (1), are included.

It should be noted that the introduction of theatre-specific dummies allows for consistent estimates of the coefficients of the time-varying regressors under a limited form of endogeneity. This means that the regressors in equation (1) may be correlated with individual effects but not with the error term. The endogeneity of theatre ticket price may come from the classical issue where demand and supply are simultaneously determined. However, many studies for the performing arts applied a single equation demand model in which they explicitly assumed that ticket price is exogenous given the recursive nature of theatrical productions (Moore 1968, Withers 1980, Gapinski 1980, Werck and Heyndels 2007). This assumption may also hold for Austrian large theatres where their supply does not respond to demand during the yearly theatre

[25] In the short-panel case it is possible to obtain cluster-robust standard errors that control for serial correlation in the error without explicitly stating the model for serial correlation. In the long-panel case where *T* is large relative to *N*, the cluster robust standard errors are no longer valid and it is necessary to specify a model for serial correlation in the error term.

season, as both theatre ticket and repertoire are decided in advance. The supply of Austrian theatres is also not determined by the ticket price itself given the fact that these theatres are heavily subsidised by the state and the share of total operating revenues from tickets sales accounts only to about 30 per cent on average (see Section 3). As for other variables such as capacity or quality factors, the issue of endogeneity could also apply but this was discussed and tested at length for German public theatre in O'Hagan and Zieba (2010) thereby rejecting the possibility of any serious endogeneity problems.[26]

5. EMPIRICAL RESULTS

5.1 Descriptive statistics

Table 2 presents the summary statistics for the dependent variable and for explanatory theatre-specific variables. Column (1) of Table 2 shows the summary statistics for the full sample of theatres where all art forms are included. The summary statistics for the reduced sample of theatres that produce opera, operetta & musicals, and for theatres that produce drama performances, are presented in columns (2) and (3), respectively. With regard to the dependent and independent variables, there is a considerable variation in their means. While total theatre attendance is about 247 thousand visitors on average, theatre attendance per resident equals 0.33. Furthermore, both total theatre attendance and attendance in per capita terms is higher on average at opera, operetta & musicals (column 2) than attendance at drama performances only (column 3). It should also be noted that theatres which produce opera, operetta & musicals charge on average higher ticket price in contrast to all theatres in the sample or to contrast to theatres that produce drama performances. The same applies to the number of artists

[26] O'Hagan and Zieba (2010) applied a dynamic difference GMM estimator in order to correct for possible endogeneity bias and the results varied little from those using the fixed-effects estimator.

and total capacity (number of seats on offer) which is higher for theatres producing this type genre. Furthermore, Table 2 also shows that the number of visitors is always lower than the number of seats on offer which indicates that on overage the capacity constraints are not an issue for Austrian theatres.

Table 3 shows the summary statistics for population, income per capita and tourism flows per resident using three different theatre market specifications. Whereas population increases with the extension of theatre markets (i.e. is the lowest for the 1st market specification and the highest for the 3rd market specification), the income per capita is similar across different definitions of theatre markets. Furthermore, the total tourist intensity rate (TR_{jt}) measured by the number of tourist arrivals per resident equals 2.17. This rate is also the lowest for the first market specification meaning that on average 2 tourists per resident visit the relevant region. Furthermore, tourist arrivals and tourist overnight counts per resident increase with the size of the relevant theatre market. Hence, the tourist intensity rate is the highest for the 3rd matrix specification and for all tourists it equals 2.98. It is also noteworthy that TR_{jt}, as measured by tourist arrivals, is higher for foreign tourists than for domestic or German tourists.

5.2 Model estimates

The results of the aggregated demand model for the full sample of Austrian theatres that produce all types of performances are presented in Table 4. Table 5 presents the results for theatre attendance at opera, operetta and musical performances only. In both Tables 4 and 5 the estimated elasticity of theatre attendance in response to tourism (measured by $\ln TR_{jt}$) is presented. The tourist intensity rate is, however, never significant or has the wrong sign when theatre attendance at drama performances is

used as the dependent variable.[27] Thus, our further analysis of results focuses on the discussion of the effects of tourist intensity rate on total theatre attendance or attendance at opera, operetta and musical performances only. The results are also disentangled for different categories of tourists depending on their country of origin. Whereas the first column of both Tables 4 and 5 presents the results for all tourists, columns (2) and (3) present the results for domestic and foreign tourists, respectively. Furthermore, columns (4) and (5) divide the foreign tourists into tourists coming from Germany and into visitors arriving from rest of the world.

All models presented in Tables 4 and 5 are estimated using the FGLS estimator that controls for a serial correlation which is common to all panels.[28] The F-test of the null hypothesis that the constant term is equal across individual theatres was rejected at the 1 per cent level indicating that there exist significant theatre-specific effects. In order to control for theatre-specific effects which may be correlated with quality variables or other variables that are omitted from the model, we include 19 theatre dummies. All individual dummy variables are not presented but they are also statistically significant.[29]

The definition of theatre markets was also important in order to properly estimate the impact of tourism flows on theatre attendance and to control for any bias arising from not including the day visitors. Accordingly, Tables 4 and 5 present the results for all three alternative specifications of the spatial weight matrix as defined in Section 4. The signs and the magnitude of the estimated coefficients are very consistent for all three matrices indicating that the presented demand model is robust to alternative

[27] These results are not presented as the estimates of all other remaining explanatory variables in the demand model for drama performances were very similar to those presented in the paper.
[28] Serial correlation of order 1 but not higher was confirmed by Wooldridge's (2002) test for linear panel data.
[29] The demand models presented in Tables 4 and 5 were also estimated using the standard fixed effects estimator without AR(1) component and in each case a Hausman specification test confirmed that the fixed-effects estimator is consistent but the random effects estimator is not.

theatre markets specifications and to the measurement of tourism flows. These results also neglect any estimation bias that would arise from not including the day-visitors in the measurement of tourist intensity rate (TR_{jt}).

With regard to the estimated coefficients of explanatory variables, the ticket price elasticity of attendance ($\ln P_{jt}$) is always highly significant and has the expected negative sign. The demand for large theatres in Austria is also found to be inelastic with regard to the ticket price. In Table 4 where theatre attendance at all performances in considered, it equals -0.41 for all three theatre market specifications. The elasticity is slightly higher when only attendance at opera, operetta & musicals is used as the dependent variable (Table 5) and it lies between -0.48 and -0.46. These results are consistent with previous results found for both Austrian and German theatres and indicate that doubling the ticket price will reduce theatre attendance by 41 to 48 per cent.

The income elasticity is estimated at around one varying between 0.81 and 1.2 in Table 4, confirming the hypothesis that performing arts are a normal good.[30] However, when attendance at opera, operetta & musicals only is used as the dependent variable, the income elasticity is well above one (see Table 5). These results would suggest that when high-brow artistic performances are taken into account, the demand is income-elastic and that opera performances can be considered a luxury good.

The number of seats on offer (S_{jt}) which controls for capacity and supply constraints in a theatre is always highly significant, equals 0.5 and is also robust across different market specifications. As for the quality variables, the cast size

[30] Nevertheless, as discussed in Section 4, the conventional income effect could be the net effect of two factors, a pure income effect and a leisure-price substitution effect. These effects were jointly estimated for German theatres in Zieba (2009) and German independent orchestra companies in Zieba and O'Hagan (2012).

measured using number of artists (A_{jt}) positively affects total theatre attendance but the overall standard of stage design and costumes (D_{jt}) has a positive and significant impact on attendance at opera, operetta & musicals only.[31]

The main variable of interest in the estimated demand model is the elasticity of theatre attendance in response to tourism. It is measured by the tourist intensity rate, TR_{jt}, which is the number of tourists arrivals divided by the number of residents in the relevant theatre market. The coefficient of TR_{jt} is significant and positive in column (1) of both Tables 4 and 5, and for all three alternative market specifications. When total theatre attendance at all performances is taken into account (Table 4), the elasticity of attendance in response to tourism is estimated between 0.15 and 0.18, depending on the relevant theatre market specification. This result indicates that an increase of tourist arrivals per resident by 10 per cent would increase theatre attendance per capita up to 2 per cent. The estimated tourist intensity rate is even higher when only attendance at opera, operetta & musicals is used as the dependent variable in Table 5 and it ranges from 0.43 to 0.68.

The variable, TR_{jt}, is however not significant when only the category of domestic tourists is considered (see column (2) of Tables 4 and 5). Thus, Austrian tourists do not contribute significantly to higher theatre attendance and while on business trip or vacation in other regions of Austria, they are looking for alternative local attractions. This result is compatible with the survey of travel habits of Austrian residents which indicates that higher proportion of Austrian tourists will participate in cultural attractions abroad than at home (see Section 3). This finding though is in contrast to the results found in Borowiecki and Castiglione (2014) for Italy where domestic

[31] The number of artists was in the end excluded from the demand models presented in Table 5 as it was never significant and highly correlated with décor & costumes variable. This might be due to the fact that this variable refers to all artistic staff in a theatre and not specifically to those playing at opera, operetta and musical performances.

tourists play a more important role in demand for theatre than foreign tourists. One of the explanations for our result might be the fact that as Austrian residents can consume the same type of cultural experiences at their home region or city, while on holiday they might focus on consuming other leisure activities such as visiting museums, heritage sites or sport/recreation activities.

It is also interesting to note that a similar finding can be found with regard to TR_{jt} variable estimated for German tourists only which is positive but not significant in Table 4. This might be due to the fact that theatres in Austria are very similar in structure to theatres in Germany. Thus, although language barriers do not apply to German tourists, they would rather choose other leisure activities than visiting an artistic performance. However, when only the attendance at opera, operetta & musicals is considered as the dependent variable in Table 5, the elasticity of demand in response to tourism is positive and significant for German tourists for the second and third theatre market specification. This result would suggest that German tourists would have preferences to consuming high-brow artistic performances, such as opera, while on vacation in Austria.

The most remarkable result perhaps is that the coefficient of TR_{jt} is always positive and highly significant for foreign tourists and in particular for tourists coming from other countries than Germany. This rate is presented in column (3) of Table 4 and it ranges between 0.15 and 0.17 and in column (5) it varies from 0.14 to 0.20. The coefficient is even higher in Table 5 and varies between 0.37 and 0.48 for all foreign tourists and between 0.35 and 0.39 for non-German tourists, depending on the market specification. The emerging results are consistent with previous discussion that mainly foreign tourists can contribute to higher visitor numbers at Austrian theatres.

In the case of opera, operetta & musicals, an increase in foreign tourism by 10 per cent would increase theatre attendance by about 4 to 5 per cent.

Furthermore, the total elasticity of attendance with respect to tourism flows is much higher and of greater magnitude when only attendance at opera, operetta and musical performances is considered as the dependent variable (see Table 5) but it was not significant when attendance at drama performances only was used. There are two explanations for this finding. First, due to the fact that the main theatre goers among tourists are foreign, mainly non-German tourists, they will rather choose not drama performances but other performances where the knowledge of language is not very important. Second, the results imply that the individual preferences and tastes among tourists matter. The visitors who decide to attend an artistic performance will consume "highbrow" arts performances such as opera or concerts. This result is consistent with that found in Borowiecki and Castiglione (2014) and with other empirical studies which confirm that tourists attending this group of performances are better educated with relatively higher incomes (Kim, Cheng and O'Leary 2007, Hall and Zeppel 1990).

5.3. Specification checks

Besides using three alternative theatre markets specifications, estimating the demand for different types of performances and disentangling tourism flows by their country of origin, we also ran a series of alternate models to examine the robustness of our primary model specification. First, we used theatre attendance not normalised in per capita terms as the dependent variable and found that the results are very consistent with our previous conclusions. Second, we also reestimated the models presented in Tables 4 and 5 using the number of performances or the number of seats, or excluding

the capacity variable (S_{jt}) to check for any endogeneity issues connected with this variable and the results did not change.

Furthermore, we also used the alternative specification of tourist intensity rate (TR_{jt}). Table 6 presents the summary of estimates of tourism elasticity when the number of overnight stays per resident is used as an alternative measure for TR_{jt}. The results are in general consistent with those presented in previous section. The number of overnight stays per resident will increase theatre attendance per resident but its effect is much greater and highly significant for attendance at opera, operetta & musicals only. Foreign tourism plays again the main role in its impact on theatre attendance. To examine if the impact between duration of stay and demand for theatre is non-linear, we included in line with Borowiecki and Castiglione (2014) the number of stays per residents as quadratic term but this variable was found not significant for most of the specifications. We also included both measures of tourist intensity rate into one model. Whereas the coefficient of the variable measuring tourist arrivals per resident was positive, the coefficient of the number of overnight stays per resident was negative indicating the existence of decreasing returns with regard to tourists' length of stay and its impact on theatre attendance.

6. CONCLUSIONS

This study provides further empirical insights into the effects of determinants of demand for theatre. In particular, it contributes to the literature on the economic impact of tourism on consumption of cultural activities. This is achieved by applying a detailed panel data set on both tourism flows and theatre attendance at large theatres in Austria. The results provide robust estimates of ticket price and income elasticities which are in line with previous studies on theatre demand. Whereas ticket price is

found to be inelastic, the income elasticity is found to be around one for all performances but above one for opera, operetta & musicals. Furthermore, quality variables and capacity constraints are also important factors of theatre demand in Austria.

The main variable of interest, the elasticity of theatre attendance per capita in response to tourism (TR_{jt}) is estimated between 0.15 to 0.20 indicating that increasing the number of arrivals by about 2 tourists per resident in the relevant theatre market would generate an increase in total theatre attendance by 581 to 680 thousand visitors per year. The estimate of this elasticity does not change considerably, depending on the theatre market specification chosen. Furthermore, the analysis reveals that foreign, in particular non-German tourists have a highly significant and positive impact on theatre attendance whereas domestic tourists do not contribute significantly to higher attendance numbers at Austrian theatres. This is consistent with previous results found in the literature indicating that foreign tourists might be more inclined to participate in cultural activities than domestic tourists.

The empirical results also indicate that the effect of tourism on theatre attendance is much greater when only attendance at opera, operetta performances and musicals for the theatres in question is considered. This would suggest that tourists tend to consume highbrow arts performances and that their cultural tastes are also important. Consequently, these results are consistent with findings of other empirical studies which confirm that cultural tourists are better educated with relatively higher incomes.

Overall, the results clearly indicate that the effect of tourism flows, although inelastic, is positive and important for demand for Austrian performing arts institutions. Given the growing role of international tourism the results may have useful policy implications. The tourist consumption of performing arts represents an

indirect form of exports of artistic performances and hence can contribute to higher attendance numbers. Thus, theatre managers could increase ticket revenues by addressing their theatres' supply in particular to foreign visitors. Furthermore, the positive impact of tourists on attendance at large theatres in Austria and the increasing role of foreign cultural tourists might also partly explain why theatre attendance did not decrease in Austria over the examined period of time. While the framework applied in this paper is constructed to specifically fit our application to the case of effects on tourism on large Austrian theatres it could also be applied to other cultural institutions such as museums or galleries, or even to other leisure activities.

REFERENCES

Borowiecki, K. J., & Castiglione, C. (2014). Cultural participation and tourism flows: an empirical investigation of Italian provinces. *Tourism Economics, 20*(2), 241-262.

Bull, A. (1995). *The Economics of Travel and Tourism*, Addison Wesley Longman Australia Pty Ltd, 2nd edition.

Bundesministerium für Wirtschaft, Familie und Jugend (2011): *Tourismus in Österreich 2011. Ein Überblick in Zahlen*. Can be downloaded at: http://www.bmwfj.gv.at/Tourismus/TourismusInOesterreich/Documents/Tourismus%20in%20O%CC%88sterreich%202011_HP.pdf

Carey, S., Davidson, L., & Sahli, M. (2013). Capital City Museums and Tourism Flows: an Empirical Study of the Museum of New Zealand Te Papa Tongarewa. *International Journal of Tourism Research, 15*, 554-569.

Craik, J. (1997). The culture of tourism, in: Rojek, C., & Urry, J. (eds.), *Touring cultures: Transformations of travel and theory*, London: Routledge: 114-136.

Divisekera, S., & Deegan, J. (2010). An analysis of consumption behaviour of foreign tourists in Ireland. *Applied Economics, 42*, 1681-1697.

Dritsakis, N. (2012). Tourism development and economic growth in seven Mediterranean countries: a panel data approach. *Tourism Economics, 18*(4), 801-816.

Gapinski, J. (1984). The Economics of Performing Shakespeare. *The American Economic Review, 74*(3), 458-466.

Gapinski, J. (1986). The Lively Arts as Substitutes for the Lively Arts. *The American Economic Review, 76* (2), 20-25.

Gapinski, J. (1988). Tourism contribution to the demand for London's lively arts. *Applied Economics*, 20, pp. 957-968.

Gruber, K., & Köppl, R. (1998). The Theatre System of Austria, in: Hans van Maanen and Steve Wilmer (ed.), *Theatre Worlds in Motion. Structures, Politics and Developments in the countries of Western Europe*, Amsterdam, 37-73.

Hall, M. & Zeppel, H. (1990). Cultural and heritage tourism: The new Grand Tour? *Historic Environment, 7*, 86-98.

Kim, H., Cheng, Ch.-K., & O'Leary, J.T. (2007). Understanding participation patterns and trends in tourism cultural attractions. *Tourism Management, 28*, 1366-1371.

Laamanen, J.-P. (2013). Estimating demand for opera using sales system data: the case of Finnish National Opera. *Journal of Cultural Economics*, *37*(4), 417–432.

McIntyre, C. (2007). Survival theory: Tourist consumption as a beneficial experiental process in a limited risk setting. *International Journal of Tourism Research*, *9*(2), 115–130.

McKercher, B. (2002). Towards a Classification of Cultural Tourists. *International Journal of Tourism Research, 4*, 29-38.

Moore, T. (1966). The Demand for Broadway Theatre Tickets. *The Review of Economics and Statistics, 48*(1), 79-87.

O'Hagan, J., & Zieba, M.(2010). Output Characteristics and Other Determinants of Theatre Attendance - An Econometric Analysis of German Data. *Applied Economics Quarterly*, *56*(2), 147-174.

Richards, G. (1996). The scope and significance of cultural tourism, in: Richards G (ed.), *Cultural Tourism in Europe*, CAB International: Wallingford: 19-46.

Seaman, B. (2006). Empirical Studies of Demand for the Performing Arts, in Ginsburgh V. and D. Throsby (editors), *Handbook of the Economics of Art and Culture*, Volume 1, Amsterdam: Elsevier, 416-472.

Stylianou-Lambert, T. (2011). Gazing from Home: Cultural tourism and Art Museums. *Annals of Tourism Research, 38*(2), 403–421.

Toma, M. & Meads, H. (2007). Recent Evidence on the Determinants of Concert Attendance for Mid-Size Symphonies. *Journal of Economics and Finance, 31*(3), 412-421.

Werck, K., & Heyndels, B. (2007): Programmatic Choices and the Demand for Theatre: the Case of Flemish Theatres. *Journal of Cultural Economics*, *31*(1), pp. 25-41.

Withers, G. (1980). Unbalanced Growth and the Demand for Performing Arts: An Econometric Analysis. *Southern Economic Journal, 46*(3), 735-742.

Wooldridge J. (2002). *Econometric Analysis of Cross Section and Panel Data*, London: The MIT Press.

Zieba, M. (2009): Full-income and price elasticities of demand for German public theatre, *Journal of Cultural Economics*, *33*(2), 85-108.

Zieba, M (2011): Determinants of Demand for Theatre Tickets in Austria and Switzerland. *Austrian Journal of Statistics*, *40*(3), 209–219.

Zieba, M., & O'Hagan, J. (2013): Demand for Live Orchestral Music – The Case of German Kulturorchester. *Jahrbücher für Nationalökonomie und Statistik*, *233*(2), 225-245.

APPENDICES

A.1: List of Austrian theatres and their location.

Location and Name of Theatre	City/town	NUTS3-region	NUTS2-federal region
Stadttheater Baden	Baden	Wiener Umland-Südteil	Lower Austria
Vorarlberger Landestheater	Bregenz	Rheintal-Bodenseegebiet	Voralberg
Vereinigte Bühnen Graz	Graz	Graz	Styria
Tiroler Landestheater	Innsbruck	Innsbruck	Tyrol
Stadttheater Klagenfurt	Klagenfurt	Klagenfurt-Villach	Carinthia
Landestheater Linz	Linz	Linz-Wels	Upper Austria
Landestheater Salzburg	Salzburg	Salzburg and surroundings	Region Salzburg
Theater der Landeshauptstadt	Sankt Pölten	Sankt Pölten	Lower Austria
Burgtheater	Vienna	Vienna	region Vienna
Inter Thalia Theater	Vienna	Vienna	region Vienna
Kammerspiele	Vienna	Vienna	region Vienna
Kleines Theater im Konzerthaus	Vienna	Vienna	region Vienna
Raimund Theater	Vienna	Vienna	region Vienna
Wiener Staatsoper	Vienna	Vienna	region Vienna
Theater an der Wien	Vienna	Vienna	region Vienna
Theater der Jugend	Vienna	Vienna	region Vienna
Theater in der Josefstadt	Vienna	Vienna	region Vienna
Vereinigte Bühnen Wien	Vienna	Vienna	region Vienna
Wiener Volksoper	Vienna	Vienna	region Vienna
Volkstheater	Vienna	Vienna	region Vienna

A.2 Aggregate theatre demand model for residents and tourists

Following Gapinski (1988) we assume that the quantity of cultural experiences demanded by a resident (y_r) depends on the ticket price (P), price of substitutes (Ps) and his/her disposable income (Inc_r), thus it is equal to: $y_r = \alpha_r + \alpha_{pr} P_r + \alpha_{sr} Ps_r + \alpha_I Inc_r$ and the quantity of cultural experiences demanded by a tourist (q_t) is equal to: $q_t = \alpha_t + \alpha_{pt} P_t + \alpha_{st} Ps_t + \alpha_e Exp_t$ where P, Ps are the ticket price and the prices of substitutes, and Exp_t is the tourist expenditure, respectively. Given R residents and T tourists, the total demand for cultural experiences must be equal to $Y_t = \sum_{r=1}^{r=R} y_r + \sum_{t=1}^{t=T} q_t$, or alternatively can be written as:

$$Y = \alpha_r \cdot R + \alpha_t \cdot T + \alpha_{pr} P \cdot R + \alpha_{pt} P \cdot T + \alpha_{sr} Ps \cdot R + \alpha_{st} Ps \cdot T + \alpha_y \sum_r Inc_r + \alpha_e \sum_t Exp_t \quad \text{(A.1)}$$

Furthermore, assuming that the price coefficients are the same for both residents and tourists (thus α_{pr}= α_{pt} and $\alpha_{sr} = \alpha_{st}$) and dividing the equation (1) by the number of residents (so that $y = Y / R$) we obtain the number of cultural experiences per capita/resident which is given by equation (2):

$$y = \alpha_r + \alpha_t \cdot TR + \alpha_p (1 + TR) P + \alpha_s (1 + TR) Ps + \alpha_i I + \alpha_e E \quad \text{(A. 2)}$$

Where I is the income per resident and E is the total tourist expenditures per resident and $TR=T/R$ is the ratio of tourists divided by the number of residents. The shifts coefficient of interest is α_t and denotes the impact of tourism on theatre attendance per resident.

TABLES AND FIGURES

Table 1: Participation rates in cultural activities of Austrian tourists by type of the trip

		Domestic trips	Foreign trips	Total
Participated	N	703	1,928	2,631
	%	8.0	24.1	15.7
Did not participate	N	8,085	6,081	14,166
	%	92.0	75.9	84.3
Total	N	8,788	8,009	16,797

Source: Travel Habits of Austrian Residents 2008-2009, *Statistik Austria*

Table 2: Summary statistics for theatre-specific variables*

	(1) All performances	(2) Opera, operetta and musicals	(3) Drama performances
Theatre attendance, Y_{jt}	247,119	169,702	132,732
	(166,286)	(167,503)	(128,462)
Theatre attendance per resident, y_{jt}:			
1st market specification	0.33	0.23	0.17
	(0.18)	(0.11)	(0.08)
2nd market specification	0.16	0.13	0.11
	(0.08)	(0.10)	(0.08)
3rdmarket specification	0.20	0.10	0.09
	(0.10)	(0.07)	(0.05)
Explanatory variables:			
Ticket price, P_{jt}	24.84	26.46	21.17
	(13.45)	(14.96)	(8.23)
Seats on offer, S_{jt}	324,262	311,522	266,905
	(199,757)	(201,970)	(166,235)
Cast size, A_{jt}	188	194	151
	(137)	(143)	(100)
Décor and costumes, D_{jt}	6,493	5,668	6,164
	(7,038)	(6,575)	(6,301)
No. theatres	20	15	16
No. observations	591	424	475

* Standard deviation in parentheses. Outlay on décor and costumes (D_{jt}) is presented in EUR for the year 2005.

Table 3: Summary statistics for tourism flows, income and population*

Market Specification	1st market specification	2nd market specification	3rd market specification
Population (*in 1,000 persons)*	957 (636)	1,260 (448)	1,702 (739)
Income per resident, (I_{jt})	29,554 (6,919)	25,790 (6,461)	27,069 (7,681)
Tourist arrivals per resident *(T_{jt})*			
Total	2.17 (1.63)	2.64 (2.74)	2.98 (2.96)
Domestic	0.53 (0.41)	0.63 (0.48)	0.71 (0.62)
Foreign total	1.63 (1.36)	2.00 (2.46)	2.27 (2.55)
Germany	0.59 (0.62)	1.02 (1.56)	1.13 (1.61)
Rest of the world	1.04 (0.81)	0.98 (0.96)	1.14 (1.03)
Tourist overnight counts per resident *(alternative measure for T_{jt})*			
Total	7.17 (7.54)	12.04 (16.50)	13.59 (17.66)
Domestic	1.58 (1.58)	2.48 (2.27)	2.77 (2.99)
Foreign total	5.59 (6.54)	9.56 (15.24)	10.83 (15.73)
Germany	2.81 (4.52)	5.92 (10.47)	6.67 (10.96)
Rest of the world	2.78 (2.39)	3.64 (5.08)	4.16 (5.16)

* Standard deviation in parentheses. The mean values are presented for the years from 1972 until 2011. The data on income are presented in EUR for the year 2005.

Table 4: Tourists arrivals and theatre attendance at all performances

Log attendance per capita (y_{jt})	(1) total	(2) domestic (total)	(3) foreign (total)	(4) Germany	(5) rest of world
1st market specification (NUTS3 - regions)					
Ticket price (P_{jt})	-0.410***	-0.407***	-0.412***	-0.404***	-0.407***
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Seats on offer (S_{jt})	0.529***	0.537**	0.523***	0.539***	0.525***
	(0.031)	(0.032)	(0.032)	(0.032)	(0.031)
Artists (A_{jt})	0.049**	0.041*	0.047*	0.044*	0.048**
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Décor & costumes (D_{jt})	0.012	0.009	0.011	0.010	0.012
	(0.010)	(0.010)	(0.009)	(0.010)	(0.010)
Income per resident (I_{jt})	0.927***	1.085***	0.879***	1.075***	0.810***
	(0.149)	(0.139)	(0.151)	(0.146)	(0.145)
Tourist intensity rate (TR_{jt})	0.155***	-0.036	0.158***	0.008	0.197***
	(0.057)	(0.050)	(0.047)	(0.045)	(0.040)
Time trend (γ)	-0.017***	-0.015***	-0.015***	-0.016***	-0.015***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Theatre fixed effects	yes	yes	yes	yes	yes
Model χ^2 (df=26)	6,598***	6,508***	6,634***	6,629***	7,122***
2nd market specification (NUTS3 – units including neighbouring units)					
Ticket price (P_{jt})	-0.412***	-0.407***	-0.412***	-0.412***	-0.409***
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Seats on offer (S_{jt})	0.529***	0.535***	0.529***	0.529***	0.532***
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Artists (A_{jt})	0.038*	0.038*	0.037	0.036	0.039
	(0.022)	(0.023)	(0.023)	(0.023)	(0.023)
Décor & costumes (D_{jt})	0.009	0.009	0.010	0.009	0.009
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Income per resident (I_{jt})	1.036***	1.225***	1.044***	1.127***	1.051***
	(0.169)	(0.155)	(0.172)	(0.169)	(0.171)
Tourist intensity rate (TR_{jt})	0.192***	0.032	0.147**	0.092	0.139**
	(0.069)	(0.058)	(0.060)	(0.059)	(0.058)
Time trend (γ)	-0.019***	-0.019***	-0.018***	-0.018***	-0.019***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Theatre fixed effects	yes	yes	yes	yes	yes
Model χ^2 (df=26)	7,941***	7,873***	7,862***	7,773***	7,933***
3rdmarket specification (NUTS2 - federal regions)					
Ticket price (P_{jt})	-0.407***	-0.411***	-0.406***	-0.408***	-0.405***
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Seats on offer (S_{jt})	0.533***	0.531***	0.531***	0.532***	0.528***
	(0.032)	(0.031)	(0.031)	(0.031)	(0.031)
Artists (A_{jt})	0.040*	0.036	0.041*	0.039*	0.043*
	(0.023)	(0.023)	(0.023)	(0.023)	(0.022)
Décor & costumes (D_{jt})	0.010	0.009	0.011	0.010	0.011
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Income per resident (I_{jt})	1.035***	1.201***	0.986***	1.123***	0.949***
	(0.157)	(0.146)	(0.158)	(0.153)	(0.155)
Tourist intensity rate (TR_{jt})	0.171**	-0.043	0.174***	0.072	0.201***
	(0.066)	(0.048)	(0.055)	(0.049)	(0.051)
Time trend (γ)	-0.018***	-0.017***	-0.018***	-0.018***	-0.019***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)
Theatre fixed effects	yes	yes	yes	yes	yes
Model χ^2 (df=26)	7,601***	7,303***	7,680***	7,400***	7,897***

Standard errors in parentheses. *** indicate significance at the 1 per cent level. ** and * indicate significance at the 5 and 10 per cent level respectively. Number of observations is 591 where the number of theatres (N) is 20 and the maximal number of time periods (T) is 39. All models include theatre-specific dummies. All independent variables are expressed in natural log hence they can be interpreted as direct partial elasticities.

Table 5: Tourists arrivals and theatre attendance at opera, operetta & musicals

Log attendance per capita (y_{jt})	(1) total	(2) domestic (total)	(3) foreign (total)	(4) Germany	(5) rest of world
	1st market specification (NUTS3 - regions)				
Ticket price (P_{jt})	-0.477***	-0.456***	-0.480***	-0.470***	-0.470***
	(0.066)	(0.066)	(0.066)	(0.067)	(0.066)
Seats on offer (S_{jt})	0.505***	0.546***	0.493***	0.521***	0.494***
	(0.083)	(0.083)	(0.083)	(0.083)	(0.082)
Décor & costumes (D_{jt})	0.047*	0.045*	0.045*	0.043*	0.046*
	(0.024)	(0.024)	(0.024)	(0.025)	(0.024)
Income per resident (I_{jt})	1.315***	1.718***	1.257***	1.603***	1.179***
	(0.393)	(0.365)	(0.401)	(0.393)	(0.386)
Tourist intensity rate (TR_{jt})	0.430***	0.203	0.369***	0.122	0.392***
	(0.138)	(0.136)	(0.114)	(0.108)	(0.097)
Time trend (γ)	-0.035***	-0.038***	-0.030***	-0.031***	-0.031***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)
Theatre fixed effects	yes	yes	yes	yes	yes
Model χ^2 (df=20)	1,789***	1,833***	1,744***	1,740***	1,891***
	2nd market specification (NUTS3 – units including neighbouring units)				
Ticket price (P_{jt})	-0.480***	-0.443***	-0.477***	-0.477***	-0.467***
	(0.066)	(0.066)	(0.067)	(0.066)	(0.066)
Seats on offer (S_{jt})	0.508***	0.562***	0.507***	0.513***	0.512***
	(0.081)	(0.081)	(0.082)	(0.082)	(0.082)
Décor & costumes (D_{jt})	0.042*	0.037	0.045*	0.042*	0.048**
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Income per resident (I_{jt})	1.273***	1.836***	1.367***	1.546***	1.530***
	(0.445)	(0.394)	(0.451)	(0.443)	(0.446)
Tourist intensity rate (TR_{jt})	0.687***	0.494***	0.485**	0.380***	0.347**
	(0.175)	(0.151)	(0.149)	(0.143)	(0.147)
Time trend (γ)	-0.039***	-0.049***	-0.035***	-0.034***	-0.038***
	(0.007)	(0.008)	(0.008)	(0.008)	(0.007)
Theatre fixed effects	yes	yes	yes	yes	yes
Model χ^2 (df=20)	2,293***	2,558***	2,167***	2,153***	2,161***
	3rdmarket specification (NUTS2 - federal regions)				
Ticket price (P_{jt})	-0.466***	-0.454***	-0.461***	-0.458***	-0.466***
	(0.066)	(0.067)	(0.065)	(0.066)	(0.066)
Seats on offer (S_{jt})	0.529***	0.547***	0.520***	0.540*	0.501***
	(0.081)	(0.083)	(0.081)	(0.082)	(0.082)
Décor & costumes (D_{jt})	0.042*	0.041*	0.046*	0.042*	0.050**
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Income per resident (I_{jt})	1.453***	2.023***	1.477***	1.724***	1.626***
	(0.412)	(0.388)	(0.415)	(0.410)	(0.423)
Tourist intensity rate (TR_{jt})	0.616***	0.194	0.472***	0.314**	0.346***
	(0.169)	(0.134)	(0.134)	(0.123)	(0.127)
Time trend (γ)	-0.039***	-0.043***	-0.036***	-0.036***	-0.039***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Theatre fixed effects	yes	yes	yes	yes	yes
Model χ^2 (df=20)	2,482***	2,379***	2,439***	2,382***	2,325***

Standard errors in parentheses. *** indicate significance at the 1 per cent level. ** and * indicate significance at the 5 and 10 per cent level respectively. Number of observations in the reduced sample is 424 where the number of theatres (N) is 15 and the maximal number of time periods (T) is 39. All models include theatre-specific dummies. All independent variables are expressed in natural log hence they can be interpreted as direct partial elasticities.

Table 6: Tourist overnight stays and theatre attendance

log attendance per capita ($\ln y_{jt}$)	(1) total	(2) domestic (total)	(3) foreign (total)	(4) Germany	(5) rest of world
Attendance at all performances (full sample)					
1st market specification	0.041	-0.084**	0.071*	-0.014	0.154***
	(0.048)	(0.042)	(0.041)	(0.035)	(0.043)
2nd market specification	0.145**	0.005	0.148***	0.087*	0.176***
	(0.057)	(0.062)	(0.049)	(0.046)	(0.058)
3rdmarket specification	0.056	-0.051	0.095**	0.034	0.152***
	(0.047)	(0.037)	(0.043)	(0.037)	(0.052)
Attendance at opera, operetta & musicals (reduced sample)					
1st market specification	0.313**	0.065	0.270***	0.117	0.366***
	(0.121)	(0.117)	(0.101)	(0.085)	(0.107)
2nd market specification	0.589***	0.310**	0.480***	0.388***	0.371***
	(0.137)	(0.153)	(0.116)	(0.110)	(0.145)
3rdmarket specification	0.358***	0.096	0.353***	0.253***	0.247*
	(0.119)	(0.101)	(0.103)	(0.091)	(0.129)

Standard errors in parentheses. *** indicate significance at the 1 per cent level. ** and * indicate significance at the 5 and 10 per cent level respectively. The coefficients of tourist intensity rate (TR_{jt}) are presented only. Other explanatory variables are not presented as their coefficients are very similar to those presented in Tables 4 and 5.

Figure 1: Total attendance at large regional and city theatres in Austria

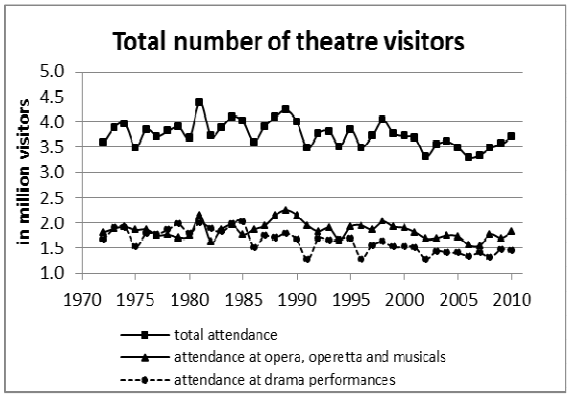

Figure 2: Tourist arrivals and tourist overnight stays by type of the trip in Austria