

**The Chichester Festival Theatre  
Economic Impact Study 2010  
Final Report**



***Commissioned by Chichester Festival Theatre***

***From the Centre for Local and Regional Economic Analysis at the University of Portsmouth***

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### **CLREA:**

The Centre for Local and Regional Economic Analysis is located within the Department of Economics at the University of Portsmouth. It was established in the mid 1970s as a specialised unit researching local economies and developing appropriate economic modelling techniques to assess the impact of change on sub-regional areas, primarily in South East England. Since then it has expanded its geographical coverage, client base and research interests. Its members have a wide range of expertise in local and regional economic analysis, ranging from econometric modelling, questionnaire design and surveying, through to labour market analysis, locational and sectoral economic impact analysis as well as economic profiling, SWOT analysis and the formation of local economic development strategies.

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*Any errors or omissions are the sole responsibility of the authors and not of Chichester Festival Theatre.*





## Executive Summary

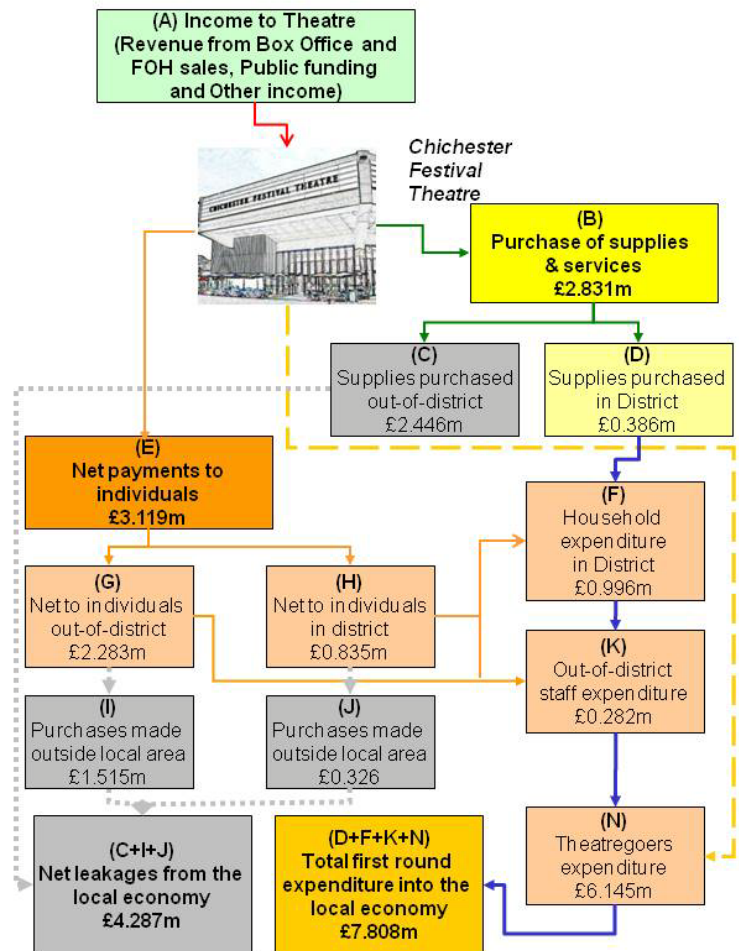
### Introduction

This report has been compiled for Chichester Festival Theatre by the Centre for Local and Regional Economic Analysis (CLREA) at the University of Portsmouth.

### What the study seeks to achieve

The aim of the study is to determine the economic impact of the Festival Theatre upon the economy of Chichester District in both monetary and employment terms. The study calculates the value of three primary streams of expenditure:

- First, the goods and services bought by the Theatre, including its associated food and drink outlets, and their employees from other businesses within the local economy.
- Secondly, the additional income spent in the local economy by theatregoers visiting Chichester from outside of the District.
- Thirdly, the substantial number of actors, musicians, creative and technical crew who stay in Chichester for the duration of the shows with which they are associated and spend a proportion of their salaries within the District.



Finally, this injection of spending benefits other businesses, not directly associated with the Theatre, as demand for their goods and services increases. Those businesses, in turn, need to re-stock and, possibly, take on additional staff to cope with increased demand. This is so-called multiplier effect is estimated.

## **The main findings**

By using detailed analysis of the Theatre's accounts and payroll, as well as recent evidence of the amount that typical theatregoers spend in the Chichester District, it is possible to derive accurate estimates of the overall economic impact of the Theatre. The study reveals the following main findings:

- Audience figures indicate that the Spring 2010 season was the best on record, with a significant boost provided by the 'Calendar Girls' production. The Festival Season for 2010 was also highly successful, with total attendance exceeding 202,000; an increase of over 20% on audience figures for the 2009 Festival Season. Approximately 40% of the patrons to the Theatre during the period from 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010 were from within Chichester District.
- It is estimated that the Theatre (including its associated food and drink outlets), its staff and theatregoers directly spent £7.8million in the local economy between 1<sup>st</sup> September 2009 and 31<sup>st</sup> August 2010. Most of this is as a result of spending by theatregoers into the Retail and Hotels and catering sectors of the local economy. There has been a significant decrease in expenditure by the Theatre on goods and services, although the proportion of this expenditure which occurs within the local economy has increased.
- The Theatre provides jobs for over 440 people, 155 of whom live within the District. In addition, more than 180 visiting actors and crew, as well as a substantial number of people supplying artistic services such as directors and designers, spend a proportion of their time working and living in the Chichester District.
- When the multiplier effect of the direct spending is taken into account, the estimated value of the Festival Theatre to the Chichester local economy for the period from 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010 was £12.5million. In terms of employment, the Theatre was directly and indirectly responsible for around 356 local full-time equivalent jobs.
- Finally, although impossible to measure in monetary terms, the Theatre's critical success and the impression it leaves in visitors' minds raises the profile of the District, and the wider county of West Sussex, on both the national and international stage, providing a clear boost to the District and County's tourism offer.

## **1. Introduction**

### **1.1 - Aim of the study**

The main aim of the study is to determine the economic impact of the Festival Theatre, including its associated food and drink outlets, upon the economy of Chichester District for the period from 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010<sup>1</sup>. In order to achieve this, the study has to estimate the value of three primary streams of expenditure:

- The first is the goods and services bought by the Theatre, attached on-site activities (such as the restaurant,) and its employees, from other businesses within the local economy.
- Secondly, theatregoers visiting Chichester from outside of the District spend money at other establishments in the city as well as at the Theatre. For the day visitor this might be refreshments, those staying longer may make use of hotels and guest houses, local transport and retail shopping.
- Thirdly, a substantial number of actors, musicians and stage technicians stay in Chichester for the duration of the shows with which they are associated and spend a proportion of their salaries in the District. In addition, they require accommodation for the period of their stay, providing a significant direct input to the District's hotel, guesthouse and accommodation sector.

The primary expenditure initially benefits local businesses through direct purchases by the Theatre and from the purchase of locally produced goods and services by those directly employed by the Theatre. However, an estimate of the overall economic impact of the Theatre must take into account the multiplier effect, in which this initial expenditure by the Theatre increases demand for labour and other inputs amongst other local firms within the Theatre's supply chain.

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<sup>1</sup> Throughout this study the Chichester District and District Economy refers to the spatial area covered by Chichester District Council. See Appendix 1 for details.

## **1.2 - The methodology**

The study was split into a number of phases:

### **Phase 1.**

Interviews were conducted with the management of the Festival Theatre and other on-site associated activities. Annual reports, business plans and published balance sheets from the Festival Theatre were also scrutinised.

### **Phase 2.**

Detailed statistical examinations were made of the Theatre's accounts to determine the precise value of the direct inputs made by the Theatre and its activities in the local economy.

1. The Theatre's finance department was asked to conduct a detailed examination of the management accounts for the year from 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010 in order that exact details of local expenditure could be determined.
2. Staffing levels and costs were calculated for the year 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010. These were differentiated to show the aggregated net incomes of those who live in the district and those who live outside it and their likely expenditure patterns in the local economy.
3. Spending survey data for staff and theatregoers from 2004 were updated to reflect movement in the different sub-sectors of the Consumer Price Index (CPI).
4. All expenditure data was separated into industrial sectors, in order to identify detailed first round expenditure impacts.

### **Phase 3.**

A bespoke input-output model of the local economy was created, updating previous models and using the most recent available data. Input expenditures were run through the model. This allowed the multiplier effect of the Festival Theatre's activities to be calculated across the different sectors of the local economy.

### **Phase 4.**

The findings were reported.

## **2. Overview of Chichester Festival Theatre**

This section of the report provides a general overview of the Chichester Festival Theatre including; location and company structure, main expenditure flows, direct employment, Theatre attendance, audience dispersion, and historic turnover levels.

### **2.1 - Location and company structure**

The Chichester Festival Theatre is situated to the north of Chichester City Centre in Oaklands Park. It comprises the main Chichester Festival Theatre with a capacity of 1206 and the smaller Minerva Theatre, which is able to accommodate 283. The Minerva building also houses a cafe and 'The Brasserie in the Park' restaurant.<sup>2</sup>

The Chichester Festival Theatre is a company limited by guarantee and a registered charity. The company's principal object is to encourage the promotion and advancement of the aesthetic education, cultivation and improvement of public taste in drama and other forms of art. It aims to provide, present, produce, organise, manage and conduct performances of plays, opera, ballet, films, concerts, educational and other similar events of cultural value to the community. It does this by presenting professional productions at the Chichester Festival and the Minerva Theatres and through an educational outreach programme across West Sussex. Chichester Festival Theatre itself is a production theatre with an ensemble in repertoire producing a world-class summer programme and also hosting performances and touring shows during the autumn and Christmas periods.

### **2.2 - Funding streams**

The Theatre receives financial support from a number of public bodies including Chichester District Council, West Sussex County Council and the Arts Council. In addition, it also receives income from the private sector in the form of corporate sponsorship, income from "Friends" and individuals, trusts, foundations, legacies and bequests.

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<sup>2</sup> Although the café and restaurant are located on-site they are run as separate commercial businesses under contract to the Theatre.

### 2.3 – Attendance figures and Box Office Receipts

The importance of the Festival Theatre to the local economy derives from its role as a generator of local jobs and income. The most important source of income for the Theatre is its box office receipts taken from ticket sales. Information from CFT box office accounts shows that in the period from 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010, the total value of receipts was just in excess of £6.4m (see Table 1). This figure comprises over £5.4m (85%) of ticket sales at the Festival Theatre and just over £960,000 (15%) of box office receipts at the Minerva Theatre. This figure represents an increase of over £850,000 in box office receipts compared to the period from 1<sup>st</sup> September 2008 to 31<sup>st</sup> August 2009 at the Festival Theatre, but a decline of over £100,000 in receipts at the Minerva Theatre. Thus overall takings have increased by over £700,000 compared to the previous year.

A diversified and extended programme has continued the increase in attendance numbers, with just fewer than 315,000 attending the two theatres between 1<sup>st</sup> September 2009 and 31<sup>st</sup> August 2010. A slightly higher proportion of the tickets sales at the Minerva Theatre were to patrons resident within Chichester District (42.0%) compared to those sold at the Festival Theatre (37.6%). This overall growth in ticket sales, combined with a slight increase in the average box office taking per theatregoer to £20.39, has led to the overall increase in total box office takings noted earlier.

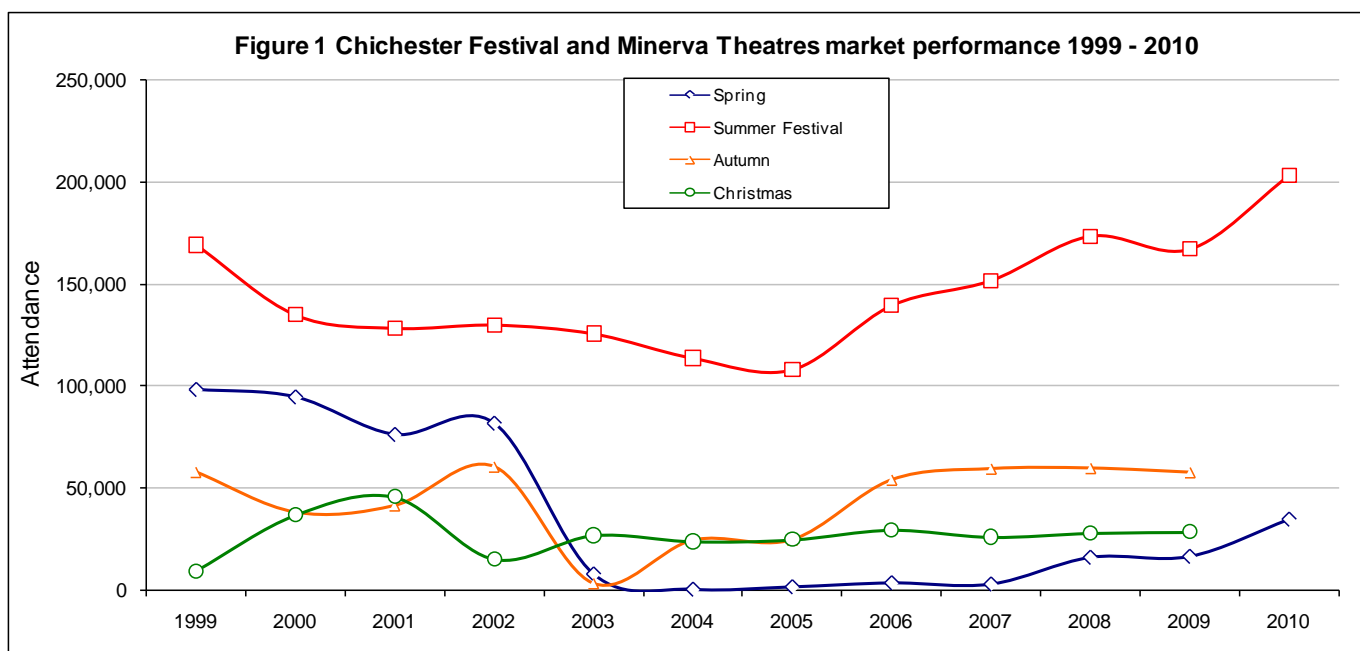
**Table 1 – CFT Ticket Sales by Origin of Patron (1<sup>st</sup> Sept 2009 – 31<sup>st</sup> Aug 2010)**

	Number of tickets sold	Proportion sold inside Chichester District	Value of ticket sales (£)	Proportion sold inside Chichester District
Chichester Festival Theatre	262,563	37.6%	5,449,772	36.3%
Minerva Theatre	52,031	42.0%	963,931	39.0%
Grand Total	314,594	38.3%	6,413,703	36.7%

Source: CFT Box Office Accounts

Figure 1 shows the trends in attendance at the two theatres combined, broken down by season since 1999. The graph shows that the audiences grew for the Summer Festival seasons of 2006-2008, before a slight drop in attendance for the Festival Season of 2009. The audience figures for the Festival Season of 2010 show that attendances reached in excess of 202,000, representing an increase of over 20% on the recorded attendances for the 2009 Festival Season.

This follows on from a highly successful Spring 2010, in which audience figures reached over 34,000, representing a 113% increase on attendance in Spring 2009. This increase was driven largely by the success of the ‘Calendar Girls’ production, which attracted 15,850 visitors to the Festival Theatre. Attendances at the Autumn and Christmas seasons have been stable over the 3 years up to 2009 attracting approximately 60,000 and 30,000 patrons respectively per annum. The expansion of the ‘out of season’ programme has seen the total number of people attending out of season shows increase from just 37,000 in 2003 to 103,000 by 2008. Although this figure fell slightly to 101,000 in 2009, the out of season programme ensures that the Theatre continues to provide benefits to the local economy throughout the year.

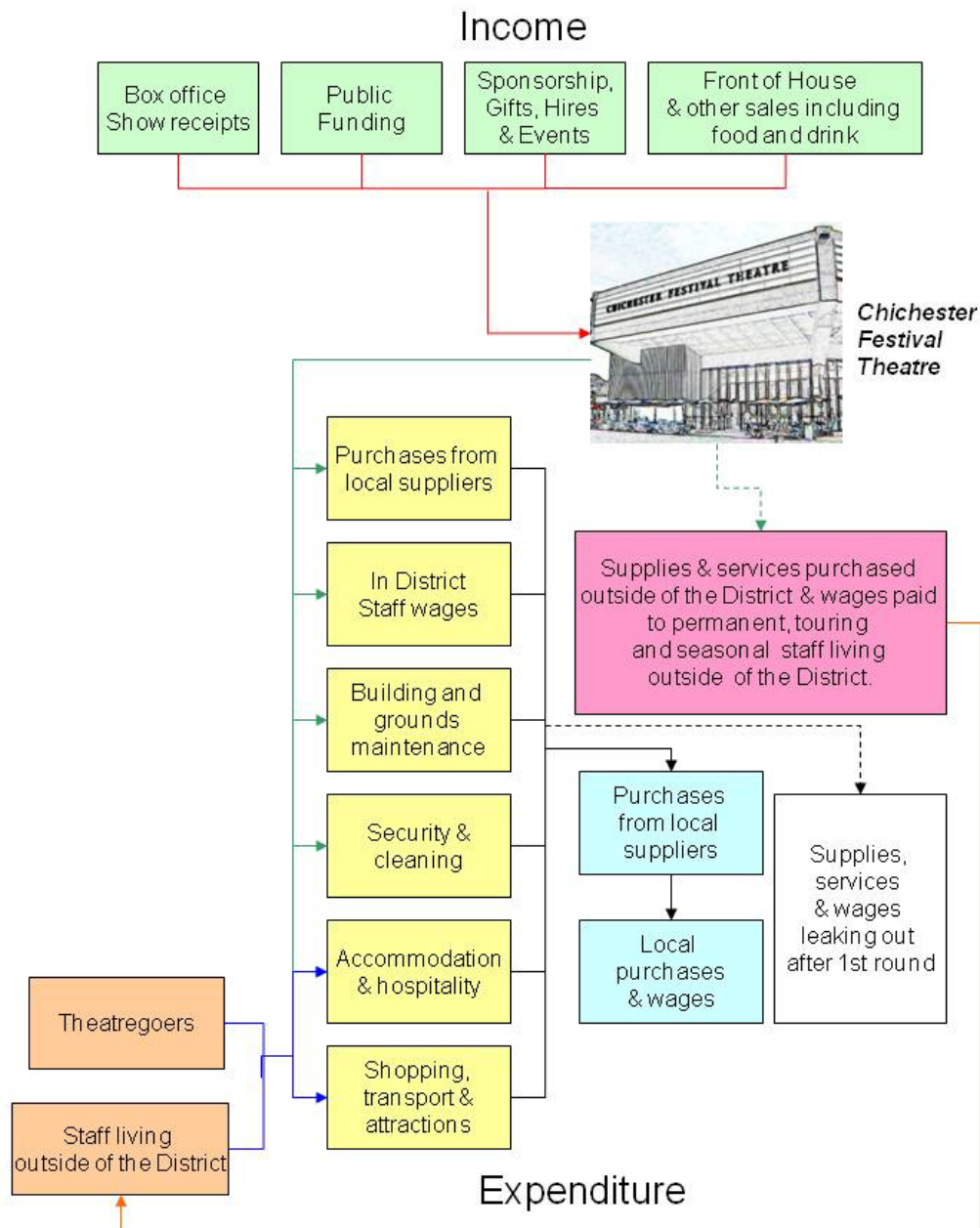


Source: CFT Box Office Accounts

## 2.4 - Main expenditure flows

In order to assess the impact of the Theatre on the local economy, it is necessary to update the findings of the analysis of the Theatre’s accounts which was conducted for the previous study at the end of 2008. As shown in Figure 2, the Theatre continues to derive most of its income from ticket sales, sponsorship, grants and gifts, public funding and sales through the “Front of House” activities.

**Figure 2 Indicative income and expenditure flows – Chichester Festival Theatre**



Theatre related expenditure splits into two main streams. The first stream (lines coloured solid green) relates to expenditures made directly by the Theatre inside the local economy. This includes items such as supplies and services from local businesses, building and grounds maintenance, accommodation and hospitality (mainly related to acting, creative and technical staff involved in productions), cleaning and the wages of security staff, permanent staff and payments to individuals.



Although expenditure not directly made by the Theatre, there are a further two sub-streams of income to the local economy which results from the presence of the Theatre in Chichester (coloured solid blue). These are expenditures made by theatregoers and theatre staff who, although they live outside of the District, spend part of their income in the District whilst at work or visiting the Theatre. In both cases these expenditures are made into a relatively small number of commercial sectors, such as Retail and wholesale and Hotel and catering.

The other major stream of expenditure is to suppliers of goods and services from businesses located outside of the District, and permanent, seasonal and touring staff who have their main residence outside of the District (coloured hatched green). This in turn, creates a sub-stream of expenditure when staff who live “out-of-district” make local purchases whilst at their place of work (coloured solid orange).

The primary flows resulting from the Theatre's location in Chichester are the first-round effects upon the local economy. However, this is only the start, because in turn recipients of primary expenditure will also purchase goods and services and pay wages and salaries to staff, a proportion of which will also be spent locally.

## **2.5 - Direct employment**

Calculating the number of people employed by the Theatre is challenging because many of those employed work non-standard hours, some are only employed for part of the year and others are only employed for a relatively short period (e.g. during the “summer season or for particular shows”). As with the previous study, pay data has been analysed making the estimations more robust in terms of the impact on the local economy. Table 2 shows employment in four categories. The first is on-site employees, who range from permanent full-time administrative staff to part-time employees in the two theatres. The second category are the front-of-house staff who sell programmes, tickets, sundries etc. and act as ushers for shows, almost all of whom work on a casual basis. The third category contains actors, musicians, stage management/crew and technical staff contracted for the specific shows mainly as part of the summer season. The fourth category is employees at the food and drink outlets affiliated to the Theatre.

**Table 2 – Employment at Chichester Festival Theatre (1<sup>st</sup> Sept 2009- 31<sup>st</sup> Aug 2010)**

	Live within Chichester	Live outside Chichester	Total	FTEs
Permanent staff including part-time	29	42	71	51
Front-of-house staff including casuals	41	20	61	20
Seasonal and touring actors and crew	17	187	204	67
Restaurant staff	68	38	106	30
Grand Total	155	287	442	168

Source: Chichester Festival Theatre

Note: FTE = Full Time Equivalent job

Overall the Theatre provided 442 jobs between 1<sup>st</sup> September 2009 and 31<sup>st</sup> August 2010. In order to avoid double counting, this figure excludes 12 positions held by people who were already employed by the Theatre on a part-time or full-time basis. Out of the total number of jobs, 155 (35%) were held by people who lived within Chichester. The largest group is made up of actors and crew who account for over 46% of the total, most of these (around 92%) live outside of the District.

Table 2 does not fully capture the number of people supplying artistic services to the Theatre. Touring actors and musicians and crew spend short periods of time at the Theatre, usually outside of the main Festival Season. They often live locally for a few days but their employment cost appears as supplies and services provided by people domiciled outside of the District, rather than on the payroll.

## 2.6 - Theatre attendance and audience origin

As noted in Section 2.3, the value of box office receipts between 1<sup>st</sup> September 2009 and 31<sup>st</sup> August 2010 was just over £6.4m. In order to estimate the economic impact of these receipts, and any other associated expenditure, upon the District economy it is necessary to differentiate between those theatregoers that live within the District and those that visit from outside. Information on ticket purchases supplied by the theatre box office includes the postcode of the purchaser. Using this information it is possible to differentiate between 'in district' and 'out of district' theatregoers.

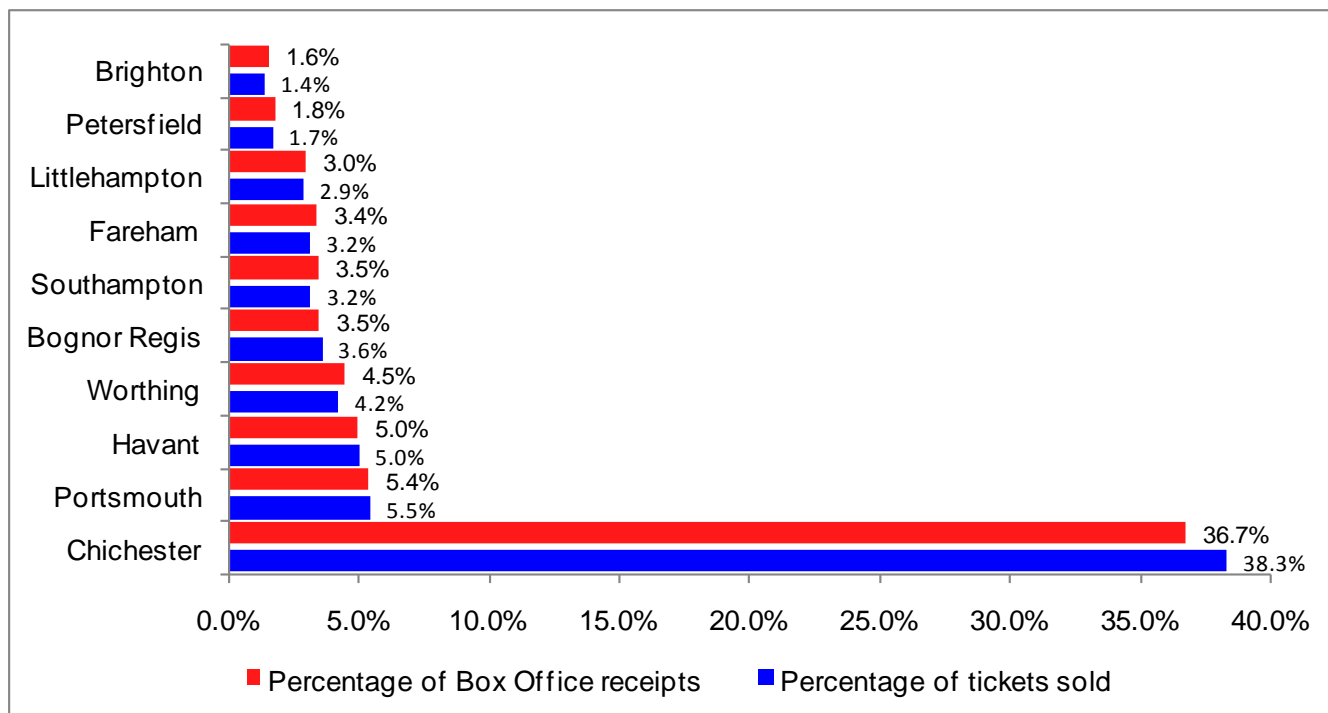
Analysing the information on theatregoers' area of origin, postcode information reveals that 38.3% of all ticket sales and 36.7% of all receipts were generated by theatregoers who were resident within the Chichester District. Both of these figures represent notable

increases in the contribution that local theatregoers make to the Chichester Festival Theatre compared to the figures for 2008, when 26.5% of all tickets were sold to local residents, generating 25.2% of the total revenue to the Chichester Festival Theatre.

Using the postcode information it is possible to look more closely at which areas (towns and cities) are the most important markets for the Theatre in terms of the revenue generated and the number of tickets sold. Figure 3 below show the ranking of the ten most important local areas in terms of ticket sales and box office receipts for the period from 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010 for the Chichester Festival Theatre.

The Chichester area generates most of the revenue and ticket sales for the Chichester Festival Theatre. In comparison to the previous analysis of theatregoers at CFT in 2008, it appears that this dependence upon the local economy has become more pronounced. When considering the two theatres, the Minerva also exhibits a higher dependence upon the local economy. The graph indicates that after Chichester, the neighbouring areas of Portsmouth, Havant and Worthing are the most important markets for the theatre. Between them, these four local areas accounted for 47.1% of the total value of box office takings between 1<sup>st</sup> September 2009 and 31<sup>st</sup> August 2010.

**Figure 3: Main Markets to Chichester Festival Theatre by Revenue and Tickets Sold (1<sup>st</sup> September 2009 – 31<sup>st</sup> August 2010)**

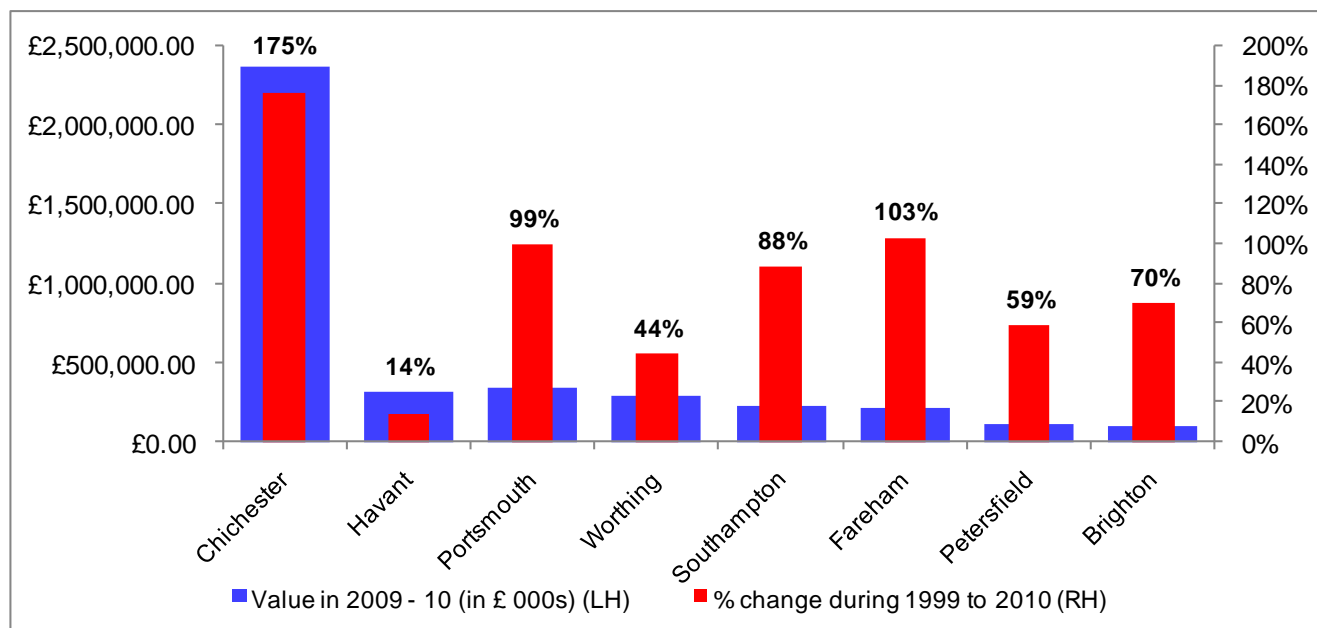


Source: CFT Box Office Accounts

The information provided on ticket sales and box office receipts also allows us to analyse if and how the importance of different local markets has changed over time. Figure 4 shows both the value of box office takings by local authority area (left hand axis) and the percentage change in the value of takings between 1999 and the latest data for the period between 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010 (right hand axis)<sup>3</sup>. The analysis shows that overall the value of box office receipts increased by 68.5% between 1999 and the current period. In the eight areas shown in Figure 4, the increases varied considerably, ranging from 14% in Havant to 175% in Chichester. However, the data suggests that the value of box office receipts for Bognor Regis and Littlehampton have declined by 11% and 10% respectively. Overall the box office data highlights the fact that over the ten year period for which information was provided, the Theatre’s catchment area has remained fairly stable. Whilst for the period between 1<sup>st</sup> September 2009 and 31<sup>st</sup> August 2010 the ten neighbouring authorities shown in Figures 3 and 4 accounted for 68.4% of all box office receipts, the comparable figure for 1999 was 66.7%, showing that little has changed in terms of market penetration in the intervening ten years.

<sup>3</sup> Please note that the data for 1999 to 2008 is for the 12 month period between January and December of each year, whereas the data for 2009/10 is for the 12 month period between 1<sup>st</sup> September 2009 and 31<sup>st</sup> August 2010.

**Figure 4: Growth in Main Local Authority Area Markets (1999 – 2009/10)**



Source: CFT Box Office Accounts

## 2.7 - Theatre Income

The analysis to determine the impact of the Chichester Festival Theatre upon the local economy relies substantially on the published and management accounts of the Theatre. Chichester Festival Theatre accounts show that over 61% of total income to the Theatre is due to Box Office sales. A further 22.8% of the Theatre’s £10.2m of total income comes from various sources of Public Funding (including the Arts Council of England, Chichester District Council and West Sussex County Council). The remaining 16.0% comes from other income sources, such as “front of house” sales, Events, Hires and voucher sales, education, fundraising and commercial sponsorship, interest and royalties.

**Table 3 – Estimated income of Chichester Festival Theatre (1<sup>st</sup> September 2009-31<sup>st</sup> August 2010)**

Funding Source	(%)
Box office	61.3
Public funding	22.8
All other income	16.0
Total £million	£10.2

Source: Chichester Festival Theatre accounts

Note: This table includes income to the Theatre only which incorporates the commission paid by the management of the on-site restaurant to the Theatre. Turnover accrued at the on-site restaurant is not included in these figures.

### **3. Direct Expenditure into the Local Economy**

Estimates based on the purchase ledgers of the Theatre and the on-site restaurant suggest that total expenditure on supplies and services during the period from 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010 by both enterprises amounted to £3.3m (including payments to individuals). This figure is somewhat lower than those reported in the previous study conducted in 2008 of just under £6.5m, although much of this additional spending leaked out of the local economy<sup>4</sup>. A significant proportion (37.5%) of the payments were made to firms within the culture, recreation and sport category, amounting to a total spend within this category of £1.2m. Many of these are specialised, small companies or individuals working on aspects of artistic production.

The Theatre itself purchased approximately 9.6% of its supplies and services in the local economy, whereas the on-site restaurant, whose purchases are less specialised, sourced 31.1% of its supplies and services locally. Overall, approximately 12.8% of the total spending by the Theatre and its restaurant on supplies and services occurred within the local economy. This represents an increase on the proportion (7%) spent in the local economy reported in the 2008 study. Nonetheless, almost 90% of expenditure by the Theatre on supplies and services leaks out of the District, being spent on highly specialised items or payments to national suppliers such as banks and energy companies, or to individuals and companies in the arts and cultural sectors. It is, however, clear from the accounts that a significant proportion of this external expenditure was retained within West Sussex. The overall impact of the Theatre upon the local economy would increase dramatically were it able to source more of its supplies and services locally, and presents a clear opportunity to local suppliers if they were able to deliver the right products and services at competitive prices.

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<sup>4</sup> This figure of £6.5m did not include spending on supplies and services by the on-site restaurant. Expenditure was particularly high during 2008 due to a substantial amount of building work being completed at the time.

**Table 4 - Major recipient sectors of direct expenditures by the Festival Theatre on goods and services (1<sup>st</sup> Sept 2009 - 31<sup>st</sup> Aug 2010)**

Sectors	Total purchases £m	Percentage of total	Percentage purchased locally
Primary products	0.001	0.0	0.0
Manufacturing and utilities	0.564	17.2	24.6
Construction	0.008	0.2	11.3
Private motor vehicle transportation	0.000	0.0	100.0
Wholesale distribution	0.000	0.0	0.0
Retail distribution	0.258	7.9	19.6
Hotels and catering	0.113	3.4	34.5
Transport services	0.029	0.9	44.9
Postal and telecommunications	0.071	2.2	0.0
Banking and finance	0.117	3.5	9.4
Property letting and sales	0.003	0.1	100.0
Business services	0.366	11.1	11.6
Public administration and defence	0.020	0.6	100.0
Education and health	0.018	0.5	85.1
Culture, recreation and sport	1.232	37.5	2.9
Other services	0.031	1.0	51.5
Individuals	0.454	13.8	7.4
Total	3.286		12.8

Source: Chichester Festival Theatre unpublished management accounts

#### 4. Expenditures by Households

The main source of income for household's expenditure is from wages and salaries.

There are also a small number of payments made to individuals living locally and outside of the District for services provided to the Theatre. Our estimates suggest that the Chichester Festival Theatre generated £3.12m of net household income<sup>5</sup>, almost all of which (£2.66m) was paid via payroll to employees residing both inside and outside of the District. In line with the previous study, net rather than gross pay figures are used when calculating household expenditure within the District. Furthermore, it is *assumed* that:

- Only directly employed staff who live within the District, spend all their income in the District, although it is recognised that those living outside will spend a proportion of their income in the District (see the following section).
- Actors, artists and theatre management “crew” associated with productions spend 60% of their net income locally during the period in which they are employed. This is distributed according to an adjusted household spending vector and takes into account data received from Chichester Festival Theatre that spending on rented accommodation by touring staff during the 2010 Festival Season amounted to more than £207,000.

As reported in earlier studies, there are a number of reasons why household expenditure figures fluctuate. The cost of artistic services (production, directors and designers etc.) can be a direct employment cost or can be accounted for as supplies and services. As shown in the previous section, the figure for Cultural and recreational services alone is in excess of £1.2m (mainly paid to people and agents residing outside of the District). An indeterminate proportion of this may be spent in the District during the period whilst these people are in residence but the actual amount can only be established via a detailed survey of spending habits. It is assumed that all wages and other income to individuals residing in the Chichester District are spent within the District.

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<sup>5</sup> Almost £800,000 was paid out in tax and national insurance giving a gross total of almost £3.2million.



Taking account of the assumptions above it is estimated that £1.56 million of net household income is potentially available to be spent as a result of payments to individuals living (or temporarily residing) within Chichester District. In order to estimate the amount actually spent in the local economy it is necessary to take account of consumer expenditure patterns<sup>6</sup>. In a typical economy 23% of all potential expenditure is lost to national imports and expenditure taxes. Further, some sectors do not exist in the local economy and it is assumed that this portion of consumption expenditure leaks out into surrounding areas. Applying the estimates of consumer expenditure patterns and taking account of the structure of the local economy, it is estimated that out of the £1.56 million potentially available to be spent in the district, an estimated £0.567 million (36%) leaks out. This means that an estimated total of £0.996 million is actually spent by households in the district as a result of the direct presence of the Festival Theatre.

The distribution of this expenditure is relatively uneven. Our estimates suggest that the largest portions 36.8% go into Retail and Property letting and sales which includes rents and mortgage payments. Retail distribution accounts for 16.6% of the total, whilst Manufacturing and utilities account for approximately 8.8%. Hotel and catering (6.6%), and Banking and finance (5.6%) are the largest service sectors, with all other sectors accounting for 5% or under (see Table 5).

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<sup>6</sup> The estimated consumer expenditure patterns in UK Input-Output Tables show proportionate expenditure spread throughout 123 industry sectors. This average expenditure pattern is assumed to exist in the Chichester District providing the sector into which that expenditure is likely to be made exists in the local economy; if not it is assumed to leak out to another area.

**Table 5 - Estimated distribution of household expenditure into the Chichester District economy (1<sup>st</sup> September 2009 – 31<sup>st</sup> August 2010)**

Sectors	Household expenditure (£)	% of total
Primary products	17,026	1.7
Manufacturing and utilities	87,183	8.8
Construction	8,922	0.9
Private motor vehicle transportation	40,575	4.1
Wholesale distribution	47,484	4.8
Retail distribution	165,491	16.6
Hotels and catering	66,055	6.6
Other transport services	17,806	1.8
Postal and telecommunications	3,665	0.4
Banking and finance	55,988	5.6
Property letting and sales	365,317	36.7
Business services	17,374	1.7
Public administration and defence	2,790	0.3
Education and health	44,211	4.4
Culture, recreation and sport	37,392	3.8
Other services	18,776	1.9
Total	996,055	

Source: CLREA, based on the Chichester Festival Theatre unpublished management accounts 2010 and assumptions above.

## 5. Expenditure by Theatregoers and Out-of-District Staff

In addition to the direct expenditures by the Festival Theatre and household expenditures by people dependent on the Theatre for their employment/ income, there is a further stream of spending generated as a result of the Theatre's presence in the local economy. This element of expenditure is generated from two sources. First it is recognised that theatregoers do not just spend their money at the Theatre itself, but also within the wider economy. Many reports<sup>7</sup> refer to this spending as additional visitor spending (AVS). Second, permanent staff employed at the Theatre, but living outside the district, will tend to spend a proportion of their income in the city because it is their place of employment.

<sup>7</sup> See for instance Shellard, D, (2004), Economic Impact of UK Theatres, Study for the Arts Council

### **5.1 – Theatregoers and out-of-district staff expenditure**

The assumptions regarding average expenditure by patrons of the Theatre is based upon data from the 2004 CLREA survey of theatregoers. In this survey, it was found that those visiting the Theatre spent an average of £22 in the local economy (excluding spending at the Theatre and the on-site restaurant). Visitors from outside of the District spent an average of £24, compared to an average expenditure of almost £7 by local theatregoers.

In order to obtain the most accurate picture of current expenditure in the District by visitors to the Theatre, it would be preferable to collect further primary data through conducting a new survey of visitors. Without this, it seems most appropriate to base the estimates for 2009/10, on the 2004 figures, updated to take into account consumer price inflation in the various expenditure categories. The CPI indices used to update the spending figures were; All goods, Hotels, cafes and restaurants, Transport, Cultural services and Other services<sup>8</sup>. The primary data suggests that the average spend per theatregoer at the Theatre's bars and restaurant is £4.24. This figure has also been taken into account when updating the 2004 theatregoer spending figures.

The overall effect has been to increase the additional visitor spending (AVS) figure to £29.20, with residents of Chichester spending an average of £12.03, and visitors from outside of the District spending an average of £31.67. These figures are in line with those which emerged from the 2008 survey of AVS at Pallant House Gallery (Chichester)<sup>9</sup> which found that on average people spent around £29 each, with local residents spending around £13 compared with those from Guildford and Brighton postcode areas who spent around £30 per person. Of this total £23.70 was spent with other businesses excluding the gallery shop and restaurant.

Scaling up the average expenditures to reflect the potential spending patterns of all theatregoers suggests that they contributed approximately £7.6 million to the Chichester District economy during the period of the study. The most significant proportion of this was into the Hotel and catering sector (£5.1 million) with a further £2.2 million spent in the Retail sector (see Table 6). Approximately 81% of this expenditure originates from people who live outside the District and the remaining 19% can be viewed as income that

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<sup>8</sup> See CPI indices D7C6, D7C2, D7C4, D7C7 and D7BT.

<sup>9</sup> CLREA, 2008, Pallant House Gallery Economic Impact Study 2008

might have migrated outside of the District had local residents decided to travel elsewhere to attend the Theatre.

In addition to the expenditure by theatregoers, out-of-district permanent staff will also spend a proportion of their income in the local economy. According to the 2004 staff expenditure survey, the volume of expenditure varies considerably, but the sectors into which that money is spent are fairly consistent. The current study utilises the expenditure patterns from the 2004 survey and updates average expenditure to take into account the rate of inflation as defined by the Consumer Price Index (CPI) in each expenditure category.

To calculate expenditure by out-of-district staff working at the on-site restaurant a number of additional assumptions were made. The calendar year for the restaurant was broken down into three distinct periods – the ‘peak’ season (18 weeks), the ‘mid’ season (22 weeks) and the ‘low’ season (12 weeks). For each of these periods, information was provided regarding the shift patterns of the hourly paid staff (who constitute over 96% of the employees at the restaurant). From these shift patterns it was possible to derive a figure for FTE employment at the restaurant for each of the three periods. It was assumed that proportion of these FTE employees residing outside of the District was equal to the proportion of out-of-district staff at the restaurant. It was further assumed that the spending patterns of out-of-district staff at the restaurant would be similar to those of out-of-district staff working at the Theatre itself. Thus the out-of-district staff expenditure was calculated for each of the three seasons as the average weekly spend per staff member multiplied by the number of out-of-district FTE staff, multiplied by the length of the period in weeks. The totals for each of the three seasons were summed to produce the total out-of-district staff expenditure figure for the restaurant.

It is estimated that the out-of-district staff working at both the theatre and the restaurant were estimated to have spent a total of approximately £282,000 in Chichester during the period of the study. This money was spent primarily in the Retail, Private motor vehicle transportation, Hotel and catering, and Culture, recreation and sport sectors, with Retail receiving more than 45% of the expenditure.

As in the previous study, the distribution of expenditure by theatregoers and out-of-district staff remains extremely unevenly spread throughout the economy. Our estimates suggest that approximately 95% was spent in just two sectors, Hotel and catering, and Retail. The levels are relatively small in other areas, although theatregoers will spend some of the money at other local cultural and leisure attractions.

**Table 6 - Distribution of theatregoers and out-of-district staff expenditure (1<sup>st</sup> September 2009 – 31<sup>st</sup> August 2010)**

Sector	Out of District Staff	Out-of-district Theatregoers	Local Theatregoers	Total £m
Private motor vehicle transportation	23.5%	0.0%	0.0%	0.066
Retail distribution	45.5%	29.8%	26.3%	2.340
Hotels and catering	15.9%	66.1%	71.1%	5.140
Public administration and defence	0.0%	0.7%	0.2%	0.049
Culture, recreation and sport	15.0%	2.4%	1.8%	0.215
Other services	0.0%	1.0%	0.5%	0.068
Total £m	0.282	6.145	1.451	7.877

Source: CLREA 2010; based on up-rated evidence from theatregoer and staff surveys.

Notes: 1. Expenditure in Public administration relates to car parking charges.

2. Local Theatregoers expenditure is not included in the cumulative totals because it is already included in the model elsewhere.

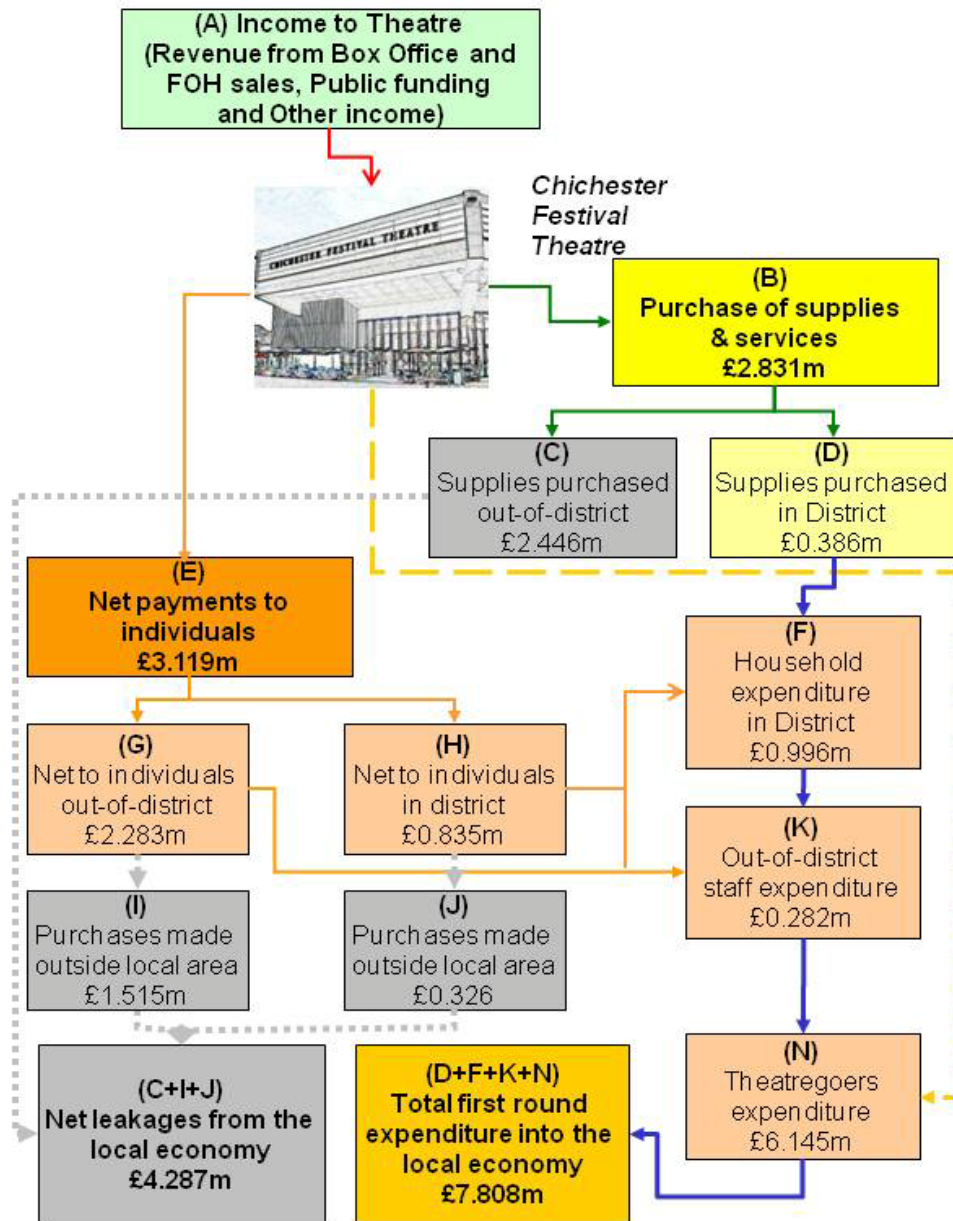
## 6. Cumulative First Round Expenditures into the Local Economy

It is estimated that in the period from 1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010, the activities of the Chichester Festival Theatre and its attraction of theatregoers generated around £12.1m of expenditure. This expenditure is made up of payments to companies and individuals, and spending by theatregoers. It is estimated that over the period upon which this study is focussed, the value of the first round expenditures (direct and indirect) into the Chichester District economy as a result of the presence of the Theatre was £7.81million. This figure is slightly higher than the figure of £7.69m reported in 2008, due to the inclusion of the expenditure of the food and drink outlets at the Theatre. This increase in the overall direct impact of the Theatre has occurred despite a significant reduction in expenditure on supplies and services by the Theatre relative to 2008.

Around £4.3 million leaks out to surrounding districts and the national economy. Approximately 57% of this leakage is due to supplies and services being bought outside of the local area, whilst the remainder is accounted for by wages and payments made to individuals residing outside of the District which is spent elsewhere. Tax and national insurance payments also leak out of the local economy, but a proportion returns as government spending and social welfare payments. For the purpose of this study these payments have been netted out before attempting to model the multiplier effects.

Table 7 shows that the sectors of the local economy which benefit most from the presence of the Festival Theatre are Hotels and catering and Retail, with a total income of £4.2 million and £2.2 million respectively. Locally, the sectors which experienced the lowest levels of direct benefit are Post and telecommunications, Primary products (which includes agriculture) and Construction, which each received less than £20,000.

**Figure 5 - Direct and indirect income and expenditure attributed to the activities of Chichester Festival Theatre 2010**



Source: CLREA 2010

**Table 7 - Estimated cumulative first round expenditure within the Chichester local economy resultant from the activities of the Chichester Festival Theatre (1<sup>st</sup> September 2009 – 31<sup>st</sup> August 2010)**

<b>Sectors receiving expenditure</b>	<b>Total direct expenditure in the District</b>	<b>Value of household expenditures in the District</b>	<b>Theatre-goers and OOD direct employees expenditure in the District</b>	<b>Total expenditure generated by the Theatre and its patrons</b>
Primary products	-	17,026	-	17,026
Manufacturing and utilities	138,895	87,183	-	226,078
Construction	*	8,922	-	9,813
Private motor vehicle transportation	*	40,575	66,306	107,040
Wholesale distribution	-	47,484	-	47,484
Retail distribution	50,642	165,491	1,957,718	2,173,850
Hotels and catering	38,835	66,055	4,108,562	4,213,453
Other transport services	13,146	17,806	-	30,952
Postal and telecommunications	-	*	-	*
Banking and finance	10,954	55,988	-	66,942
Property letting and sales	*	365,317	-	368,372
Business services	42,380	17,374	-	59,754
Public administration and defence	19,999	2,790	45,136	67,924
Education and health	15,084	44,211	-	59,294
Culture, recreation and sport	35,374	37,392	188,902	261,669
Other services	16,096	18,776	60,082	94,953
<b>Total (£)</b>	<b>385,509</b>	<b>996,055</b>	<b>6,426,706</b>	<b>7,808,270</b>
<i>Total (2008) (£)</i>	<i>438,000</i>	<i>907,000</i>	<i>6,349,000</i>	<i>7,694,000</i>

Source: CLREA 2010

Notes: - Indicates no expenditure.  
\* Sectors receiving < £5,000.

These figures clearly show that the Festival Theatre is a significant generator of economic activity, in terms of the direct jobs it provides and the indirect jobs that are dependent on direct expenditure by the Theatre and the spending power of theatre-goers and staff directly and indirectly employed by the Theatre. However, these figures are likely to increase once the effect of the multiplier is taken into account and it is this process to which we turn in the next section.



## 7. Total Impact of the Festival Theatre on the Local Economy

So far the report has mainly concentrated on the direct impact of the Chichester Festival Theatre upon local employment and income. We now turn to the cumulative or “multiplier” effects as the impact of the Theatre’s initial expenditure ripples out across the economy of Chichester.

### 7.1 - Explanation of indirect effects

The indirect effect can be broken down into two types – the indirect multiplier effect and the induced effect. These will be explained in turn. The *indirect multiplier effect* occurs when direct demand for products and services used by the Theatre leads to “knock on” benefits for other local firms who are not directly in the Theatre’s supply chain. These multiplier effects are caused when firms that are in the supply chain also purchase goods and services from other firms inside and outside of the District to replenish the stocks that have been purchased by the Theatre. The overall size of the local multiplier effect will depend upon the structure of the local economy and its ability to meet the supply needs of local firms. The smaller the local economy, the more likely it is that some industry sectors will either be absent or under-represented in the area. If this happens supplies and services will have to be imported from outside the area. This inability to supply from local sources is termed a “leakage”. The larger the leakage, the smaller will be the value of the multiplier effect.

The *induced effect* is associated with household and visitor spending. As shown above, the Theatre is a substantial direct employer in the District and it is also responsible for the employment of a number of people on a temporary basis. More importantly, a large percentage of these workers live in the area (at least during the period of their employment). This means that the Theatre provides a significant boost to local household income. This derived household income, will in turn be spent by its recipients within the District on various goods and services, many of which may be obtained locally. This spending will then be further re-circulated as local people are employed in shops and businesses to cope with the demand, and in the firms that supply the goods to local shops and services. Once again, a multiplier effect is created; the value of which will be dependent upon the ability of local firms to supply the needs of local consumers.

## **7.2 – The value of the multiplier**

Having recognised the importance of measuring these indirect effects, the next problem is to decide exactly how this can be achieved. It is generally agreed by economists that the most accurate method of tracing the various multiplier effects through an economy is by means of input-output analysis. This method has been used extensively to identify the impact of commercial, strategic and cultural assets<sup>10</sup>. The model used in this study was specifically constructed to provide an accurate simulation of the structure of, and interactions within, the Chichester District economy (see Appendices 2 and 3). Using the latest ABI, APS and DASA data, updated for productivity effects and primary local knowledge, the national input-output tables have been rolled forward and weighted so that they reflect the latest information of the structure of the District economy which relates to 2008. The input-output model thus derived allows us to trace the path of various multiplier effects through the economy, and thus enable a complete picture of the impact of the Theatre to be provided.

In order to set the value of the Theatre in context, it is desirable to quantify the level and structure of output and employment in the Chichester District. The latest output and employment data relates to 2008. The output figures in £m (see Table 8) relate to all transactions between firms, enterprises and individuals located within the Chichester District, this includes the purchase of inputs as well as the value added within the local economy. The FTE jobs relate to the employment structure of the District. It should be noted that the table shows the estimated number of jobs and output by firms that are located in Chichester. This is not necessarily the same as the number of people who live in Chichester that have jobs or the amount that they might spend locally.

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<sup>10</sup> Local examples include the Chichester Festival Theatre studies (various years), Rolls Royce Economic Impact Study and the Selsey Economic Impact Study

**Table 8 – Total estimated output and employment in the Chichester District economy 2008**

	<b>Output £m @2008 prices</b>	<b>Jobs (FTE equivalents)</b>
Primary products	£125.9	2,239
Manufacturing and utilities	£628.1	5,266
Construction	£401.6	4,127
Private motor vehicle transportation	£113.5	1,174
Wholesale distribution	£143.5	1,562
Retail distribution	£217.2	4,823
Hotels and catering	£202.1	3,520
Other transport services	£137.3	1,387
Postal and telecommunications	£24.0	357
Banking and finance	£245.0	1,522
Property letting and sales	£581.3	1,379
Business services	£524.0	7,006
Public administration and defence	£283.6	3,403
Education and health	£587.9	10,416
Culture, recreation and sport	£126.8	1,873
Other services	£74.4	1,820
<b>Total</b>	<b>£4,416.2</b>	<b>51,875</b>

Source: CLREA, 2010.

The model estimates that the total output within the Chichester District area was over £4.4bn in 2008. The largest sectors by value are Manufacturing and utilities, Education and health, Property letting and sales, and Business services. In terms of FTE jobs the largest sectors are; Education and Health, Business services, Manufacturing and utilities, Retail and Construction.

### **7.3 - Total output and employment resultant from Chichester Festival Theatre**

Table 9 shows the estimated direct expenditure by the Theatre and the value of the multiplier effect (indirect + induced), which combine to provide an estimate of the Theatre's total monetary impact upon the local economy. In terms of employment, direct employment is shown as well as the impact of direct expenditure and the multiplier effect as it works its way through the local economy. For both output and employment the Theatre's activities are benchmarked against the total output and employment figures for the District for 2008.

From direct expenditure of just over £7.8m, the Theatre generates a total estimated output of over £12.5million throughout the Chichester economy. The major beneficiary is the Hotel and catering sector with output valued at approximately £4.3million; significant income also accrues to the following sectors - Retail (£2.2million), Business Services

(£1.1million) and Manufacturing and utilities (£1.0million). It is evident that the activities of the Theatre ripple through the District economy touching almost all sectors. The output multiplier is calculated at 1.60, indicating that for every £1 of direct expenditure into the local economy by the Theatre and its patrons, an additional 60p of expenditure is generated elsewhere in the local economy. Table 9 also shows that the Theatre supports 168 direct FTE jobs locally, whilst the spending by the Theatre and its visitors (£7.8m) supports a further 136 FTE jobs and the multiplier effect (£4.7m) a further 52 FTE jobs.

Table 9 also shows that the Theatre supports an estimated 356 FTE jobs either directly or indirectly. The majority of these jobs are outside the Theatre itself. For every person directly employed at the Theatre, there are 1.12 additional jobs elsewhere in the economy that are dependent on the money spent by the Theatre, its staff and visitors. The largest proportion of all the jobs attributable either directly or indirectly to the Theatre are in Culture, recreation and sport mainly because this is the sector that includes all the Theatre's direct jobs. Other sectors which receive a large employment benefit from the presence of the Theatre include Hotel and catering and Retail. The Theatre supports jobs across the whole economy, and is directly or indirectly responsible for just over 0.7% of all jobs within the District.

Across the whole economy the Theatre's impact is less significant supporting around 0.28% of total output in the Chichester District (a similar amount to that found by the previous reports). However, as noted in previous reports, it should not necessarily be viewed as an entity in isolation. Part of the economic strength of Chichester is that it has a cluster of cultural assets, which when combined give it a unique selling point in the cultural tourism marketplace. Our estimates suggest that the Culture, recreation and sport sector in Chichester was worth £126.8m per annum in 2008. The Theatre provides a significant contribution in both monetary and cultural terms to the cultural tourism offer of Chichester, giving it a competitive edge over that of other rivals.

**Table 9 – Overall impact of Chichester Festival Theatre (1<sup>st</sup> September 2009 to 31<sup>st</sup> August 2010)**

	Total Chichester Economy <sup>1</sup>		Theatre Related Output			Theatre Related Employment <sup>2</sup>			
	Local Output (£m)	Local FTE Employment	Direct Expenditure	Multiplier Effect	Total Impact	Direct Employment	Direct spending impact	Multiplier effect	Total Employment
Primary products	£125.9	2,239	£0.017	£0.280	£0.297	0	0	5	5
Manufacturing and utilities	£628.1	5,266	£0.226	£0.816	£1.043	0	2	7	9
Construction	£401.6	4,127	£0.010	£0.317	£0.327	0	0	3	3
Private motor vehicle transportation	£113.5	1,174	£0.107	£0.146	£0.253	0	1	2	3
Wholesale distribution	£143.5	1,562	£0.047	£0.152	£0.199	0	1	2	2
Retail distribution	£217.2	4,823	£2.174	£0.001	£2.175	0	48	0	48
Hotels and catering	£202.1	3,520	£4.213	£0.082	£4.296	30	73	1	105
Other transport services	£137.3	1,387	£0.031	£0.409	£0.440	0	0	4	5
Postal and telecommunications	£24.0	357	£0.004	£0.075	£0.079	0	0	1	1
Banking and finance	£245.0	1,522	£0.067	£0.392	£0.459	0	0	2	3
Property letting and sales	£581.3	1,379	£0.368	£0.441	£0.809	0	0	2	3
Business services	£524.0	7,006	£0.060	£1.049	£1.109	0	1	14	15
Public administration and defence	£283.6	3,403	£0.068	£0.049	£0.116	0	1	1	1
Education and health	£587.9	10,416	£0.059	£0.254	£0.313	0	1	4	5
Culture, recreation and sport	£126.8	1,873	£0.262	£0.160	£0.422	138	4	2	145
Other services	£74.4	1,820	£0.095	£0.048	£0.142	0	3	1	4
<b>Total</b>	<b>£4,416.2</b>	<b>51,875</b>	<b>£7.808</b>	<b>£4.670</b>	<b>£12.478</b>	<b>168</b>	<b>136</b>	<b>52</b>	<b>356</b>
			<b>Output Multiplier</b>		<b>1.60</b>	<b>Employment Multiplier</b>		<b>1.39</b>	

Source: CLREA, 2010

Note: <sup>1</sup> The model is based upon the latest information regarding the structure of the Chichester Economy which relates to employment and output in 2008

<sup>2</sup> Employment totals have been rounded and consequently may not sum



## **8. Conclusions**

Although the current study uses the same methodology as previous studies conducted by CLREA into the economic impact of Chichester Festival Theatre, it should be noted that it is not directly comparable with the study produced in February 2009. This is because the current study treats the Theatre's food and drink outlets as integral to the Theatre, whilst the previous study treated these as part of the wider District economy. Furthermore, it should be borne in mind that any examination of the economic impact of the Theatre (or any other economic entity) at a given point in time almost inevitably produces different results. This is because of the changing nature of so many different variables, such as the expenditure patterns of the Theatre itself and the evolving consumption patterns of households, as well as changes to the scale and scope of the artistic programme. However, what is clear is that the Festival Theatre has a significant impact on the economy of Chichester, as summarised below.

Expenditure on supplies and services by the Theatre has declined significantly to £2.8m for the period between 1<sup>st</sup> September 2009 and 31<sup>st</sup> August 2010 compared to spending of £6.5m in 2008, which was reported in the last study. However, the proportion of this spending which occurred within the local economy increased from 6.9% to 9.6%. This in part mitigates the impact of the reduced expenditure overall, alongside the inclusion of a further £0.5m of spending on supplies and services by the theatre's restaurant, over 31% of which occurred within the local economy. Whilst many of the Theatre's supplies and services are highly specialised and may not be available locally, it is clear that a policy to source as much as possible of its supplies locally would dramatically increase the Theatre's impact upon the local economy.

Expenditure within the District by theatregoers and staff who reside outside of the District has increased to £6.4m, whilst the value of household expenditure within the District due to employment provided by the Theatre has increased to just under £1m. Thus the direct, or first-round, impact of the Theatre upon the Chichester economy is estimated to be £7.8million.

The Theatre provides approximately 168 full-time equivalent (FTE) jobs, and supports a further 136 FTE jobs within the local economy through its own, its employees and its patrons direct expenditure within Chichester. Through the multiplier effect, the Theatre indirectly supports a further 52 FTE jobs within the wider economy.

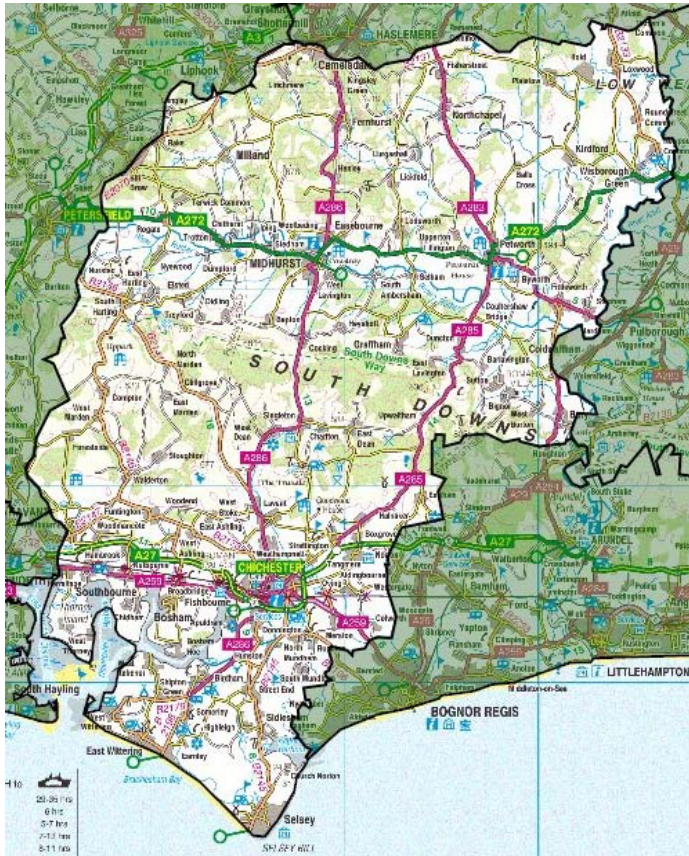
On the expenditure side, a further £4.7m of output is generated as the £7.8m of direct spending by the Theatre filters through the local economy. Thus, for every £1 spent directly by the Theatre, its employees or theatregoers in the local economy, a further 60p of output is generated via the multiplier process.

**Overall the Theatre is found to support an estimated 356 FTE jobs and to pump almost £12.5million into the local economy.** In addition to this monetary impact, the Theatre provides a number of additional benefits both to Chichester District and to the county of West Sussex. Not only does its educational outreach programme raise awareness of the arts amongst local young people, but the Theatre complements other cultural assets of the District and makes Chichester a more attractive destination for visitors.



## Appendix 1 Definition of Chichester District

**Figure A1 Map of Chichester District Council Area**



### Chichester District Postcodes

GU28 0 - Chichester	PO19 1 - Chichester	PO20 1 - Chichester
GU28 9 - Chichester	PO19 2 - Chichester	PO20 2 - Chichester
GU29 0 - Chichester	PO19 3 - Chichester	PO20 3 - Chichester
GU29 9 - Chichester	PO19 4 - Chichester	PO20 6 - Chichester
GU31 5 - Chichester	PO19 5 - Chichester	PO20 7 - Chichester
PO10 8 - Chichester	PO19 6 - Chichester	PO20 8 - Chichester
PO18 0 - Chichester	PO19 7 - Chichester	PO20 9 - Chichester
PO18 8 - Chichester	PO19 8 - Chichester	RH14 0 - Chichester
PO18 9 - Chichester	PO20 0 - Chichester	

## Appendix 2

### Basic construct of the local input-output model

Figure A2 Schematic diagram of input-output methodology

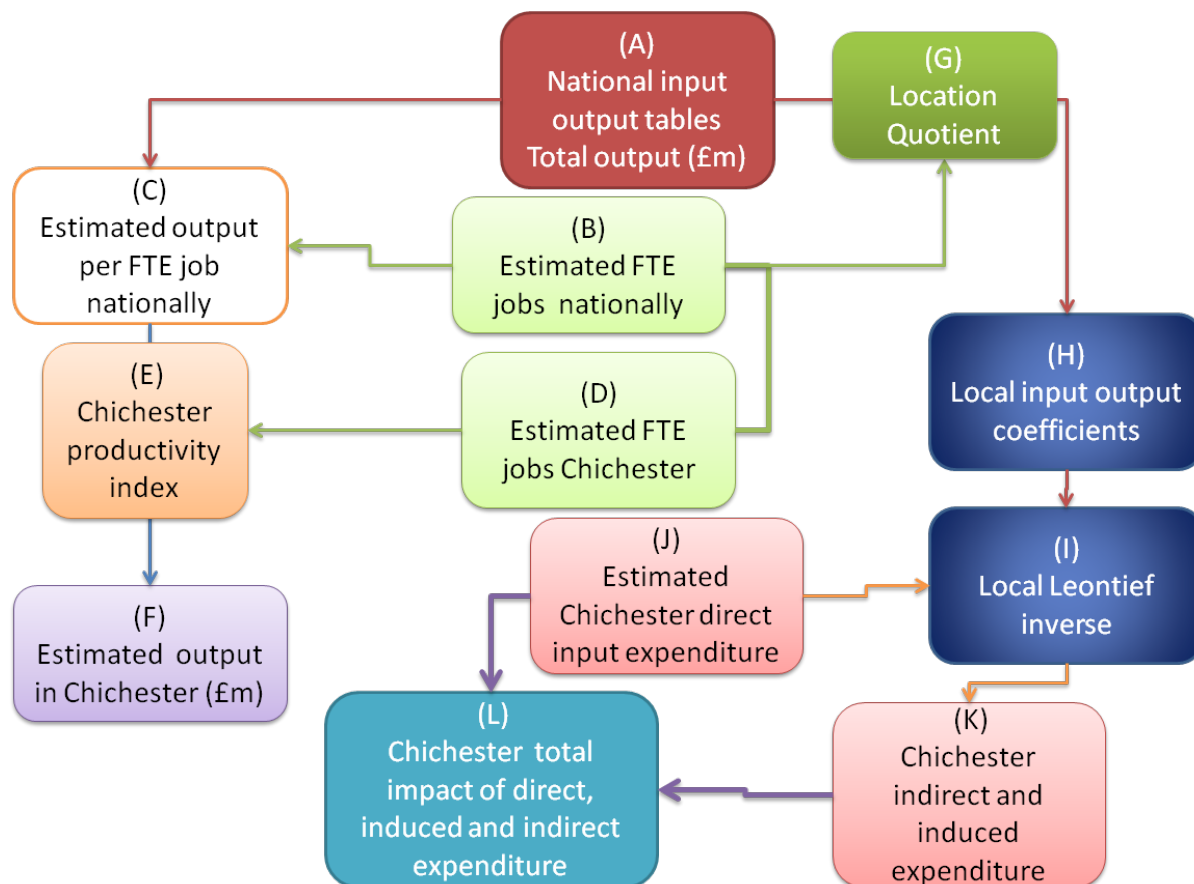


Figure A2 illustrates the basic construct of the input-output model used to quantify the direct, indirect and induced economic effects that the Theatre has on the local economy of Chichester. The national input-output tables, published by ONS, divide the economy into 123 industrial sectors, showing national output in £millions for each sector (A in Figure A2). The numbers of FTE (full time equivalent) jobs in each sector can be estimated using data from ABI, APS and DASA (B in Figure A2); these can then be used to obtain estimated output per FTE job nationally in each of the 123 sectors (C in Figure A2). Output for each of the sectors in Chichester (F in Figure A2) can be estimated by multiplying the national output per FTE job figures by a Chichester productivity index (E in Figure A2) which is based upon the number of local jobs in each of the 123 sectors (D in figure A2), weighted by a wage productivity scalar.

The employment structure within Chichester can be compared to the national employment structure to obtain a local 'Location Quotient'<sup>11</sup> (G in Figure A2) which scales the national input-output tables, to derive local input-output coefficients (H in Figure A2). This produces a matrix, which can be manipulated to obtain the local Leontief inverse, which provides a simulation of the interactions within the Chichester economy (I in Figure A2).

Primary data on direct spending by the Theatre, visitor and household expenditure (J in Figure A2) can then be fed into the model to produce estimates for any resultant indirect and induced expenditure in the local economy (K in Figure A2). These are then combined with the direct economic effects to assess the overall impact of the Theatre on the local economy (L in Figure A2), both in terms of output and jobs.

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<sup>11</sup> The local Location Quotient (LQ) expresses the relationship between the proportion of employment within a particular industrial sector in Chichester, and the proportion seen in the same sector at a national level. For example, an LQ of 0.5 for a particular sector would indicate that Chichester has half the proportion of employment in that sector than is seen at a national level. Any sector in Chichester which experiences a higher proportion of employment than the national average is given an LQ of 1.

### Appendix 3

#### Calibration of the local Input Output Model

In the economic model two pieces of information are used to calibrate the base year local accounts used in the model.

- i. A measure of sectoral specialisation. This is achieved using employment by sector – in the UK this information is available from the Annual Business Inquiry (ABI) at a detailed spatial level, e.g. ward, district, region, and Travel to Work Area. This information may of course be modified in the light of more detailed local information, e.g. a local survey and aggregated to create new geographic areas.
- ii. Information on national expenditures from the National Income and Expenditure Accounts and Input Output Tables.<sup>12</sup> These double entry accounts show the allocation of final demand expenditures to sectors and the associated detailed intermediate requirements allocated to sectors. This is the critical building block for analysing interdependency. The non-survey based assumption would be that the technological basis for production and employment for a sector in the local area would be broadly the same as for the national area.

The basic model is one where in region  $r$  the inputs from the  $i^{\text{th}}$  industry per unit of gross output of the  $j^{\text{th}}$  sector,  $a_{ij}^r$ , are determined by the national coefficient, i.e.

$$a_{ij}^r = k_i^r (a_{ij})$$

In the Location Quotient approach the determining relationship is assumed to be proportional with  $k_i$ , and is thus interpretable as a constant,

$$a_{ij}^r = k_i^r a_{ij} \quad 0 \leq k_i^r \leq 1$$

In the model the value of  $k_i^r$  is set equal to  $LQ_i^r$  if less than or equal to one; otherwise it is set equal to one, thus

$$LQ_i^r = (E_{ir}/E_r) * (E_n/E_{in})$$

Then,

$$k_i^r = LQ_i^r \quad 0 \leq LQ_i^r \leq 1$$

$$k_i^r = 1 \quad LQ_i^r > 1$$

Thus, for the  $k_i^r < 1$  cases, the model allocates the source of intermediate output to external flows in the regional import account.

<sup>12</sup> See a) CSO, **Input-output supply and use tables for the United Kingdom 2004-2006**, [http://www.statistics.gov.uk/about/methodology\\_by\\_theme/inputoutput/latestdata.asp](http://www.statistics.gov.uk/about/methodology_by_theme/inputoutput/latestdata.asp)

Defining **A** as the use matrix  $\{a_{ij}^r\}$ , allows the normal analysis of the basic input output relationship for the region as:

$$\mathbf{q}^r = \mathbf{A}^r \cdot \mathbf{q}^r + \mathbf{f}^r$$

where  $\mathbf{q}^r$  is the vector of regional gross outputs,  $\mathbf{f}^r$  is the vector of final demands and  $\mathbf{A}^r$  is the regional use matrix.

This shows the allocation of domestic output to intermediate demand,  $\mathbf{A} \cdot \mathbf{q}^r$ , and final demand. Assuming  $\mathbf{A}^r$  is fixed gives the Leontief solution for the regional impact of a given final demand:

$$\mathbf{q}^r = (\mathbf{I} - \mathbf{A}^r)^{-1} \cdot \mathbf{f}^r$$

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