Measuring the Economic Impact of Tourism and Special Events: Lessons from Mississippi

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This paper provides a way to estimate the economic impact of tourism in Mississippi's 82 counties. This approach uses a model to evaluate various tourism-related activities and events in a county or region. The model is referred to as the tourism impact model, or TIM. The analysis is based on a three-step process that uses estimates of the number of visitors and amount of visitor spending, local lodging supply data, and economic multipliers[1] derived from the IMPLAN Pro 2.0 input-output model to estimate the economic impact of a particular event.

Tourism can produce employment, income, sales, and tax revenues. These economic impacts are important to tourism directors, chambers of commerce, economic developers, and government officials. However, few tourism analysts or recreation managers have formal training in economics; they need help in assessing the impact of local tourism.

Tourism impacts start with expenditures by visitors in the local area (Horvath & Frechtling, 1999). In 2006, out of every dollar spent by Mississippi tourists[2], about $.31 was spent on gasoline; $.16 on gaming; $.10 on quick-stop, specialty foods, and groceries; and $.09 in restaurants. These sectors accounted for more than 80 percent of total tourism spending in Mississippi during this period. The remainder was spent on other goods and services in the state. The amount of economic activity that stays in the local area depends on four factors: the amount of tourist spending, the length of their stay in the area, the percentage of goods and services produced locally, and the pattern of expenditures by tourist.

Because tourism and special events may be time consuming and expensive to arrange and promote, event organizers and local officials need to know whether an event's benefits outweigh its costs. If the event is not having the intended effect, the county should channel its energy and funds into more profitable efforts (Mark Brunson, 2002).

Representative Counties and Economic Multipliers

The economic multipliers in the study are based on a stratified random selection of representative counties in Mississippi. The state's 82 counties were divided into nine groups based on population in the 2000 Census of Population. The groups were as follows: 0-9,999; 10,000-19,999; 20,000-29,999; 30,000-39,999; 40,000-49,999; 50,000-59,999; 60,000-69,999; 70,000-79,999; and 80,000+.

Next, a model was developed to derive random estimates of each population group. The generic model for drawing each population group estimate was:

$$PG_i = INT(PGUR_i + RAND()*(PGUR_i - PGLR_i))$$

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[1] These are average multipliers of each representative county in the study.

Where
PG_i = Population of group$_i$
$PGUR_i$ = Population group$_i$ upper range
$PGLR_i$ = Population group$_i$ lower range
RAND = An Excel Spreadsheet function that generates a random number between 0 and 1
INT = An Excel Spreadsheet function that rounds numbers down to the next whole number

The model was simulated 500 times for each group of counties. Random estimates from these simulations were converted to actual values because future changes in the model would cause it to recompute or simulate another set of values. From these values, the median was calculated and served as the population for that particular population group. Similar procedures were used to derive median population estimates for the remaining eight groups of counties in Mississippi.

Once we determined the median estimate of each population group, the county whose actual population was closest to the estimated random population was deemed the representative county for that group. Economic multipliers for each representative county served as the multipliers for all counties in that group. Thus, when a county was selected for analysis, the TIM Model determined which population group the county belong and assigned the appropriate multipliers for analysis.

Methodology

With the procedures established for matching county population with economic multipliers, a statewide spreadsheet model was built by Mississippi State University Extension Specialists to illustrate the impact of tourism in Mississippi counties. The model allows economic, community, and tourism development professionals to estimate the economic impact of various activities and special events in the county.

Visitor spending is estimated in 10 categories (Table 10) based on the number and type of visitors attracted to the county. In 2006, these sectors accounted for more than 70 percent of the expenditures by a typical visitor to Mississippi. Expenditure parameters in the TIM model are based on recent surveys of two tourism conferences in 2008 and spending profiles from the 2006 and 2007 statewide tourism impact reports in Mississippi. Using these parameters and a set of generic multipliers, the model may be tailored to a specific tourism activity or event to estimate the level of direct spending in the area.

Income and employment impacts are estimated by applying employment to sales and income ratios to total sales in the county (Daniel J. Stynes, 1999). The employment to sales ratio indicates the number of jobs required to produce a specific amount of sales, typically stated in jobs per million dollars of sales. Using secondary data from the Mississippi Department of employment Security Commission, Mississippi State Tax Commission, and Woods and Poole Projections to 2025, the model can accurately estimate this ratio by county in the state.

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[2] An estimated 20.8 million people visited Mississippi in fiscal year 2006.

The income-to-sales ratio is the total income per dollar of total sales in the county. The ratio indicates the amount of income required to produce a specific amount of sales and is also stated as income per million dollars of sales. Expenditures, employment, and income are then linked to IMPLAN Pro 2.0 multipliers to estimate direct and indirect impacts for income, employment, sales, and taxes in the county.

State and local revenues are based on general and special sales tax rates only. The spreadsheet model applies sales tax rates to visitor spending in the county. However, some counties levy a special bed and breakfast tax on lodging and restaurants sales as well as the statewide 7 percent general sales tax in Mississippi. The model recognizes these purchases and applies appropriate tax rates to those items.

Tourism Impact Model

Exhibit 1 (in the Appendix) provides a schematic diagram of the Tourism Impact Model (TIM). The model uses an Excel spreadsheet to calculate visitor spending and tax receipts and IMPLAN input-output multipliers to estimate the spin-off effects of the direct spending in the community. The TIM model is a computer-based spreadsheet model that may easily be used to evaluate various tourism-related activities (such as agricultural tourism, heritage tourism, nature-based tourism, or athletic events) and other special events in a given county. Because the model uses a standard approach to measuring the impact of tourism, it offers the potential to compare and contrast counties in Mississippi.

The generic form of the model is:

$$TE_{ij} = f(TED_{ij}, SSTxR, TTxR_j, M_j, SSP_k, OTED_j) * I_{ij}^{2}$$

Where
TE_{ij} = Tourism event i in county j,
TED_{ij} = Tourism expenditure data for event i and county j
SSTxR= State sales tax rate
$TTxR_j$ = Tourism tax rate in county j,
M_j= Local multiplier based on county population,
SSP_k= Statewide spending in sector k,
$OTED_j$= Other tourism event data in county j
$I_{ij=}$ Index of tourism employment in county$_j$

The tourism model uses local and state data, including local supply data on accommodations, statewide occupancy rates, employment, income, population, retail sales, number of visitors, length of stay, origin of visitors, and statewide spending profiles. The model applies this information to statewide tourism expenditures and to expenditures derived from regional tourism surveys to estimate the impacts.

The accuracy of these estimates will depend on detailed reliable local information to supplement state data sources. In cases where such data are available, local variations in tourism expenditures may be explicitly included in the model.

Model Operation

The model requires the user to provide basic information about tourism and special events in the community. This information is combined with research-based information and input from knowledgeable economic and tourism developers in the area. The TIM model is not a "black box" but a transparent and flexible tool. All calculations are visible in the spreadsheet, and if the user wants to change or add other economic development goals, he or she may do so.

Exhibit 2 (in the Appendix) shows some of the baseline information needed to perform the calculations in the model.   After entering the required information found in Exhibit 2, the user may move to the "Select Input" sheet in the model. Here the model contains two dropdown menus: one allowing the user to select a particular county and the other allowing the user to select a particular activity to analyze. This sets in motion the impact analysis process.

Measuring Impact

The economic impact of tourism and special events is based largely on the expenditures of visitors from outside the county. The model assumes that most of the spending by local residents would probably occur within the county in any case. Expenditures by outside visitors have both direct and indirect impacts on the county's economy.

To estimate the impact of these relationships in the county, the model uses county multipliers based on the population size of the local economy. The multipliers are based on representative counties in Mississippi and show how attracting new visitors into an area may stimulate economic growth in the state. Multipliers may also show how a decline in visitor spending results in decreased local economic activity (e.g., income, employment, income, and tax revenues).

The model also gives the user the ability to simulate the impact of more visitors to the area.
To do this, the user simply enters a number into a selected cell in the "Input Select" section of the model and sees how it affects tourism in the county. The model estimates separate impacts of visitors and simulated visitors for income, employment, sales, and taxes in the county. By building a spreadsheet program and linking "what-if" scenarios to the process, the user gains more insight into the impact of visitors in an area.

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[2] $I_{ij} = (TorE_j \div TotE_s) \div (TotE_j \div TotE_s)$

Where: $TorE_j$ and $TorE_s$ respectively equal tourism employment in county$_j$ and tourism employment in the state
$TotE_j$ and $TotE_s$ respectively equals total employment in county$_j$ and total employment in the state

Results

Computations of the direct and total effects are shown in the Appendix section, Tables 1- 5. These tables provide summaries of the economic impacts and key statistics from tourism held in the county in 2007. The user may proceed directly to these tables, where the overall economic impacts are summarized.

Table 1 provides estimates of key statistics based on statewide tourism trends and county tourism trends for a specific event in a chosen county. Selected statistics of note include county population, days in the event, length of overnight stay, percent of visitors from outside area, and the percent of visitors who stay overnight.

Table 2 gives the economic impact of the event for employment, income, sales, and tax revenues. These impacts are divided into direct, indirect, and total impact in the county.

Table 3 shows the impact of county visitors on local government finances. The revenue impacts are lodging receipts, restaurant receipts, and general sales receipts.

Table 4 is similar to Table 3, except the results reflect the impact on local government finances of attracting more visitors to the county. The table also includes an estimate of the demand for new lodging rooms if there were no facilities in the county or if more visitors were drawn to the area.

Table 5 provides tourism statistics from selected statewide tourism impact studies in Mississippi. Several years' worth of data are provided to give tourism directors and local government officials an understanding of how tourism has affected their county.

Model Benefits

The TIM model may help local officials to better provide financial support to tourism in the county. The model may also help decision makers focus their efforts on tourism activities that meet their long-term objectives of attracting more visitors and spending to the county. The user may conduct sensitivity analysis by changing key variables in the model. Variables such as duration of events, mean stay of overnight visitors, number of participants, number of spectators, percent of participants and spectators from outside the local area, and percent of participants and spectators staying overnight impact tourists expenditures in the county.

A final benefit of the model is that it gives the user the ability to assess other counties hosting similar tourism events. That assessment can help developers and policymakers develop realistic decisions about the community's chances of attracting visitors to the area. Most local officials and developers know about each other's town, economy, schools, or tourism activities. Comparisons of neighboring counties would be fairly simple to conduct.

Policy Response

Developing a spreadsheet-based model like TIM may have implications for decision making and policy analysis in the Mississippi tourism industry. First, the TIM model may help local officials to determine whether to invest public funds in tourism development based on the direct and indirect benefits that might accrue in the community. The model may help local officials better perform their role of providing financial support to tourism in the county. Second, the TIM model may help local decision makers determine reasonable levels of financial assistance for their convention and visitor bureau. Third, the ability to analyze local tourism and array the economic impacts from highest to lowest offers tourism directors and local decision makers some basis for prioritizing tourism funds and projects in the county. However, local governments should use caution when promoting tourism as a viable economic development strategy. Adequate infrastructure, such as lodging facilities, restaurants, retail shopping facilities, transportation, cultural and heritage attractions, is critical to supporting the tourism industry in an area.

Finally, information about the impact of public assistance in tourism development may also help local officials better target their efforts and resources and determine if local assistance in tourism promotes economic growth in the county.

Summary

With the use of this dynamic spreadsheet model, tourism managers can gain valuable insight into tourism and special events. This insight can help them plan future events or evaluate whether the costs of producing these events are justified by the benefits. Visitor spending from outside the county creates direct sales in the local economy. Each dollar of direct sales adds indirect and induced spending in the county. Besides these impacts, visitor spending produces labor income and jobs for residents in the county.

Conclusions

Economic impact analysis involves terms that are sometimes abused, confused, misused, and misinterpreted by individuals in some professions. Development experts and policy makers are no different. However, confusion among these individuals may be costly for the community.
The model should be used as a tool and not an absolute determinant of a community's tourism impacts. It is a valuable tool because it allows the user to evaluate and decide with confidence how much financial assistance to request or allow.

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Appendix

Table 1. Activity & Event Summary Report

County:	BOLIVAR
Population	**38,208**
Activity/event	*Football*
Duration (days)	2
Average stay of out-of- town visitors	1
Percent participants & spectators from outside host area	0.4762
Percent participants & spectators from inside host area	0.52381
Percent of overnighter (outside of local area)	0.5807
Hotel/motel rooms in county	460
Demand for lodging rooms	
Actual room demand	460
Estimated room demand (If lodging were available in county)	4,291
Available rooms (deficit/surplus)	3,831
Increase in room demand from additional visitors to area	10
Total room demand	4,300
Number of teams	2
Teams from local area	1
Teams from outside local area	1
Average size of team	131
Total number of participants (players, students, etc)	262
Average size of travel party	2.9
Total/average attendance	45,000
Total/average attendance (new)	**45,100**
Participants & spectators from local area	23,571
Participants & spectators from local area (new)	**23,624**
Participants & spectators from outside local area	21,429
Simulated increase # of Visitors to Community	100
Participants & spectators from outside local area (new)	**21,476**
Economic capture (estimated)	0.5348

Note: Key statistics about the county and tourism activity/event. Numbers may add exactly to totals due to expensive rounding.

Table 2. Economic Impact of Visitor Spending: Direct and Secondary Effects

County:	BOLIVAR
Activity/Event	**Football**
Economic:	**Value**
Output	
Direct expenditures/sales	$1,500,128
Indirect expenditures/sales	403,534
Total output	1,903,663
Income	
Direct income	$3,470
Indirect income	996
Total income	4,465
Employment	
Direct employment	0.12
Indirect employment	0.03
Total employment	0.15

Notes: The model adjusts direct sales (to reflect the portion of revenues that would flow to the state) before calculating the total economic impact.

                County wide impacts are derived by applying the changes in spending to a set of generic multipliers (employment, income, and output) based on population of representative counties.

Table 3. Impact of Visitors' Spending on Local Tax Receipts

County:	BOLIVAR
Activity/Event	**Football**
Fiscal/Sales taxes	
Lodging (special)	$993
Restaurant (special)	20,880
General tax (7%)	24,512
Total sales taxes	46,386

Note: Tax receipts are computed on direct sales using the tax rates for general retail sales and special tourism activities.

Table 4. Impact of Additional Visitors' Spending on Local Tax Receipts

County:	BOLIVAR
Activity/Event	**Football**
Additional visitors (simulated)	100
Simulated increase in room demand(projected)	$10
Lodging (special)	62
Restaurant (special)	46
General tax (7%)	95
Total sales taxes	204

Note: Tax receipts are computed on direct sales using the tax rates for general retail sales and special tourism activities.

Table 5. Bolivar County Tourism Profile

	2002	2003	2004	2005	2006
Tourism revenues	22,475,718	21,575,956	22,486,795	24,807,878	24,868,555
Tourism capital investment	-	-	2,183,954	1,647,961	896,086
Direct tourism employment	382	375	425	465	465
Percent of total employment	2.9	2.8	3.3	3.8	3.8
Number of lodging rooms	373	425	440	476	440
Number visitors (estimated)	28,058	51,190	49,368	54,213	34,858

Source: Mississippi Development Authority: Economic Impact of Tourism in Mississippi for selected years. Plus means data is combined with Forrest County's data.

Exhibit 1. Tourism Impact Model (TIM)
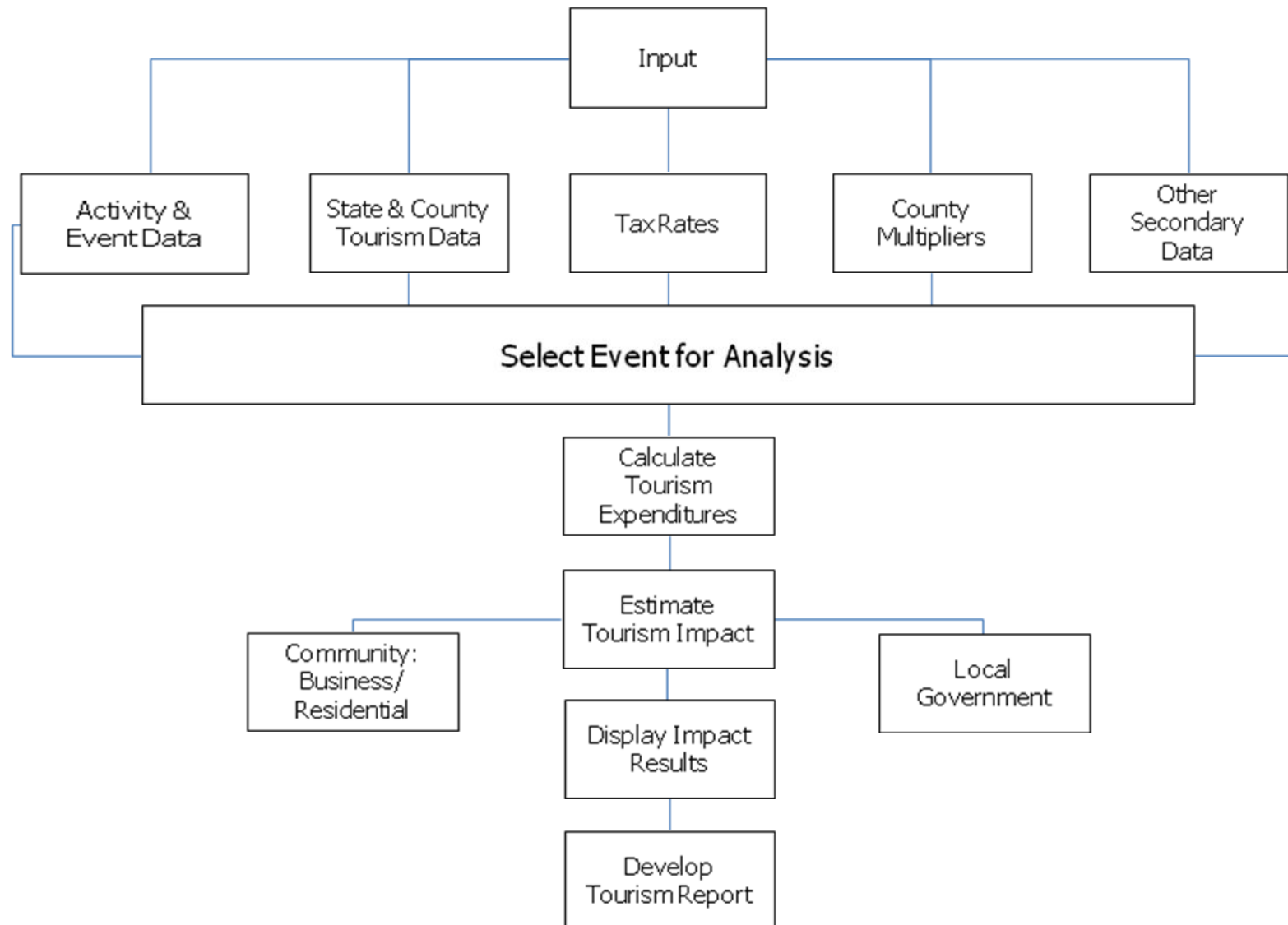
Tourism Impact Model (TIM)

Exhibit 2. Selected Data for Tourism Impact Model

Event Name	Duration (# Days) of Event #	Mean Stay Out-of-Town Visitors #	# of Teams (# of Partici-pants) #	Average Size of Team + Coaches #	# of Individual Participants #	Teams Inside the City #	Teams Inside the City %	Teams Outside the City #	Teams Outside the City %	Attn #	Participants & Spectators Inside the City #	Participants & Spectators Inside the City %	Participants & Spectators Outside the City #	Participants & Spectators Outside the City %	% of Over-night %
Swim Meet	5	2	24	45	1,080	2	0.083	22	0.917	3,132	398	0.127	2,735	0.87333333	0.5807
Boys Soccer Tournament	3	2	68	15	1,020	5	0.074	63	0.926	2,958	349	0.07047619	2,609	0.88190476	0.5807
Girls Soccer Tournament	3	2	70	15	1,050	0		70	1	3,045	146		2,900	0.95238095	0.5807
Girls Fast Pitch Invitational Tournament	3	2	69	12	828	15	0.217	54	0.783	2,401	612	0.20666667	1,791	0.74571429	0.5807
Girls U-14 Regional Softball Tournament	3	2	16	13	208	0	0	16	1	603			574	0.95238095	0.5807
Invitational Youth Soccer Tournament	4	3	146	15	2,190	20	0.137	126	0.863	6,351	1,130	0.13047619	5,220	0.82190476	0.5807
Softball Tournament	3	2	55	12	660	3	0.057	50	0.909	1,914	199	0.05610236	1,712	0.89468504	0.5807
College Athletes															
Football	2	1	2	131	262	1	0.5	1	0.5	45,000	23,571	0.52380952	21,429	0.47619048	0.5807
Basketball (men)	1		2	21	42	1	0.5	1	0.5	6,500	3,406	0.56	2,860	0.44	0.5807
Basketball (women)	1		2	19	38	1	0.5	1	0.5	2,500	1,310	0.71	725	0.29	0.5807
Baseball (men)	1		2	52		1	0.5	1	0.5	6,500	3,406	0.5242	3,095	0.47619048	0.5807
Baseball (women softball)	1		2	23		1	0.5	1	0.5	1,200	629	0.947	64	0.053	0.5807
Open Golf Tournament	4	3								1,259	577	0.458	682	0.542	0.5807
Arts Festival	1									1,765	1,184	0.669	581	0.329	0.5807
Music festival (country and jazz)	2	1								10,000	9,160	0.916	840	0.084	0.5807
Cultural/International Festivals (European, African-American, Italian, German, Hispanic, Mexican, etc.)	2.5	1.5								10,000	9,160	0.916	840	0.084	0.5807
Community/Special Celebrations (July 4th, Memorial day, Labor day, etc.)	1	1.7								15,000	13,905	0.927	1,095	0.073	0.5807
Car Shows & Bike Rallies	3	1			5,500					30,000	10,740	0.358	19,260	0.642	0.5807
College & University Graduations	2	1			3,000					8,700	1,935	0.222397	6,765	0.7776	0.360455
Conferences and meetings	3	2			2,500					7,250	1,612	0.222397	5,638	0.7776	0.360455
AgriTourism activities (see list below)										-	-	0.222397	-	0.7776	0.360455
Heritage tourism										-	0	0.222397	-	0.7776	0.360455