Engines of tourism's growth: An examination of efficacy of shift-share regression analysis in South Carolina

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HIGHLIGHTS

- The classical SSA and the Shift-share regression models yield contradictory results.
- Contradictory results are due the methodological problems exist in the classical SSA.
- The classical SSA cannot explain whether changes in employment are significant.
- Shift-share regression offers statistical basis for decomposing the regional growth.
- The efficacy of a probabilistic form of a shift-share model is illustrated.

ARTICLE INFO

ABSTRACT

This study investigates the efficacy of the shift-share regression analysis in examining the tourism industry's performance in a region. Tourism employment figures in the state of South Carolina are used to model and compute the change of employment in SC using shift-share regression and classical shift-share analysis (SSA). These methods yield significantly different results challenging the reliability of the non-statistical methods used in much of the relevant literature. The results from the shift-share regression analysis illustrate that the contribution of the tourism industry in SC to the tourism industry in the U.S. and to overall U.S. economy has decreased over the years. Contrary to the expectations, SC as tourism dependent State is not specialized in the tourism industry and demonstrate competitive disadvantage. While other industries appear to contribute more to the SC economy than the State's tourism industry, proper development policies and strategies could help capitalize on State's tourism potential.

1. Introduction

Policy-makers need to make effective decisions by pinpointing problematic issues and recommending strategies and policies to enhance socio-economic development of their communities. In general, a region's socio-economic development is compared with the nation or another region(s) to assess the relative degree of socio-economic development of a particular region against the nation or another region(s) (Blien, Eigenhüller, Promberger, & Schanne, 2014; Dogru & Sirakaya-Turk, 2016; Hoover & Giarratani, 1971; Perloff, Dunn Jr., Lampard, & Keith, 1960). Tourism contributes to the socio-economic development of communities

through increases in employment, real per capita income, tax revenues, access to tourism and recreational resources and so on. Travel and Tourism accounts for 2.7% of the United States economy in terms of gross domestic product supporting over 8 million jobs in 2015 (Bureau of Economic Analysis, 2016). From policy-makers' perspective, tourism development means the number of jobs created; however, the impacts are not limited solely to job creation. More jobs are expected to bring greater socio-economic benefits: lower unemployment, greater property value, higher wages, income and profits for local businesses, more tax revenues for the state, and of course possible re-election for the politician who can take credit for these changes (Bartik, 1991; Cheng, 2011). Policy-makers could capitalize on tourism development in their regions, but they first need information about the strength, composition, and performance of their local tourism economy relative to the economy of an area taken to be the norm (usually the average

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national tourism economy) to introduce new tourism activities, or to expand the existing tourism base of a region (Sirakaya, Uysal, & Toepper, 1995).

Traditionally, development of the tourism industry in a particular region is assessed in relative terms. While tourism development of a specific region could be gauged historically, the assessment might be more useful from a macroeconomic point of view if it is assessed in comparison with other regions or the national average. Shift-Share-Analysis (SSA) is widely used to analyze competitiveness of a region's various industries relative to a nation's general level of economic development since the 1960s. A relatively simple technique, SSA is used to describe regional economic growth, measure policy effects, and forecast future growth of a region (Sirakaya et al., 1995). One of the benefits of using this method is that it reduces the need for primary data collection (e.g., surveying businesses), which is a costly and time-consuming activity. SSA is conducted based on secondary data that are usually mandated by law and collected by various governmental organizations such as the U.S. Department of Labor or U.S. Department of Commerce or office of national statistics in the United Kingdom. Although local decision makers can easily obtain the required data, they may lack the theoretical and statistical expertise to conduct an extensive analysis, such as time series analysis, computable general equilibrium models or econometrics methods, to determine the economic impacts of tourism in their region. The shift-share technique is suggested as an alternative modus operandi for policy makers, who need a quick and inexpensive analytical tool to evaluate the performance and composition of their local tourism economy. SSA can help evaluate the change in a region's performance relative to the nation over a given period of time (Andrikopoulos, Brox, & Carvalho, 1990; Doeringer, Terkla, & Topakian, 1987; Kurre & Weller, 1989; Leigh & Blakely, 2013; Shi & Yang, 2008).

Since its original formulation by Dunn in early 1960s, variations of the shift share technique have found useful applications in the fields of regional economics and geography. Specifically, SSA has been especially popular in the fields of spatial economics (Barff & Knight III, 1988; Brown, 1969; Curtis, 1972), political economy (Glickman & Glasmeier, 1989), marketing (Huff & Sherr, 1967), geography (Plane, 1987), urban studies (Stilwell, 1969) and with scant applications in tourism (Sirakaya, Choi, & Var, 2002) for decades. Its popularity stems mainly from the fact that it requires data that is relatively easy and inexpensive to obtain, usually employment and income figures will suffice, yet it provides researchers and/or policy-makers useful information regarding the likely reasons for differential growth rates among different regions (Beck & Herr, 1990).

While the classical SSA allows the comparison of an industry's development in relative terms, it does not provide a statistical measurement that shows the relationships between the industry and national economic development; and between the industry and regional economic development. Put simply, the classical SSA is an exploratory accounting tool that provides relative figures to policy-makers. However, it cannot answer the puzzling question of whether there are significant changes in a particular industry's employment. One effective method that can void this gap is the shift-share regression analysis (Andrikopoulos et al., 1990; Patterson, 1991). The shift-share regression analysis is an assessment method that analyze whether changes in a particular industry's employment are statistically significant. In other words, shift-share regression analysis is a powerful explanatory tool that analyzes competitiveness and strength of an industry compared to national and regional economic development from an econometrics perspective. This method provides decision makers a probabilistic measurement of growth in the tourism industry. Originally developed by Patterson (1991), the shift-share regression method analyzes econometrically an industry's development in a particular region relative to that of national and regional economy. In its basic form, the shift-share regression method estimates the industry's effect, the period effect, and the location effect of a region using dummy variables (Patterson, 1991) that allow a researcher to avoid a perfect multicollinearity problem. Blien and Wolf (2002) and Kowalewski (2011) apply a version of the initial shift-share regression model that incorporates a weighting methodology (which is explained in detail later in this paper) to estimate the regional industrial structure effect on employment without using dummy variables. Although tourism researchers have applied the classical SSA to investigate strengths and weaknesses of the tourism and hospitality industry (see e.g., Sirakaya et al., 2002, 1995; Sobral, Peci, & Souza, 2007; Toh, Khan, & Lim, 2004; Vu & Turner, 2006; Yasin, Alavi, Sobral, & Lisboa, 2005), the shift-share regression method has yet to be applied in a tourism context.

The purpose of this study is to illustrate the efficacy of the shift-share regression analysis in examining the engines of growth/decline in tourism industry in South Carolina, in the Southeastern region of the USA. The state of South Carolina is chosen to examine the engines of growth/decline in tourism industry for several reasons. First, SC is known as a tourism dependent state because tourism generates more than $19 billion in income a year and accounts for more than 10% of the total state's employment (B. Smith, 2016). Second, SC has built a new airport in Columbia (its capital city) and improved the access and the capacity of its Greenville airport, which required substantial capital investments. These investments highlight the importance given by government officials to the tourism industry in overall SC economy. Third, Charleston, a city in the east cost of SC is one of the most popular tourist destinations in the U.S. that attracts millions of tourists each year. These attributes of SC provide a unique setting to examine the engines of growth/decline in tourism industry.

2. The shift-share model

Employment statistics are the most commonly used data for measuring the economic growth of a nation or a region, as these statistics are easy to obtain and suitable for the SSA (Bendavid-Val, 1991). While there are variants of the shift-share model, the fundamental accounting characteristics and computations are similar across models. Primarily, SSA decomposes the change of employment in tourism in a particular region, in our case the state of SC, into three components: the national growth effect (NGE), the industrial mix effect (IME), and the competitive share effect (CSE).

The national growth effect attempts to measure job growth or decline in a region that would have occurred in the region if employment had grown at precisely the same rate as the national average (Tervo & Okko, 1983) Hence, if the region grows at the same rate as the national average, the region does not possess any comparative advantage in terms of its resource endowments (such as tourist attractions) or human capital (such as trained hospitality labor force) thus nation's dynamic growth will positively influence the region's jobs-growth. According to the model used by Sirakaya et al. (1995), the NGE is computed by multiplying the regional base-year employment in each sector by the average national employment growth rate and then summing the products. The resulting figures illustrate the quantity of newly created jobs that are attributable to the national economic trends and nothing else.

The second of the three components, the industrial mix effect, associates the differential growth rate in tourism employment between the region in question and the nation with overall strengths and weaknesses of the tourism sector. Ideally, it is expected that a large proportion of the region's employment should be