

The Economic and Developmental Impacts of Tourism in Petra

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Abstract

Objectives: This study aims to apply the shift-share analysis method to evaluate the economic impact of tourism in Petra between 2007 and 2017, including employment changes across the study area.

Methods: The shift-share model is designed to assess the growth of individual industries at the local level compared to the national level. This method demonstrates employment growth rates in the Petra region resulting from a favorable industry mix and additional job creation. The data used in this study were obtained from multiple governmental and private sources through structured and non-structured interviews. A questionnaire was developed to collect data on the personnel working at the businesses, the star ranking of the businesses, and the types of services provided in both 2007 and 2017.

Results: The results indicate growth in most tourism-related industries, as well as public administration and education possibly due to a population increase in the region.

Conclusions: Based on the results, we can conclude that the decline in tourism between 2007 and 2017 led to a slowdown in growth in other sectors, despite the presence of modest growth in those sectors due to natural economic expansion.

Keywords: Shift-Share, tourism economic impact, Petra, Jordan.

الأثر الاقتصادي والتنموي للسياحة في البتراء

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ملخص

الأهداف: تهدف هذه الدراسة إلى تطبيق طريقة تحليل حجم التحول Shift-Share لتقييم التأثير الاقتصادي للسياحة في البتراء بين عامي 2007 و 2017، بما في ذلك تغير التوظيف في جميع مناطق الدراسة.

المنهجية: صُمم نموذج توزيع التحول Shift-Share لتقييم نمو الصناعات الفردية على المستوى المحلي بالمقارنة مع المستوى الوطني، بحيث يدرس المنهج معدلات نمو التوظيف في منطقة البتراء الناتجة عن مزيج صناعي موافٍ وإنشاء وظائف إضافية. جرى استخدام البيانات المستخلصة في هذه الدراسة من مصادر حكومية وخاصة متعددة من خلال مقابلات ممنهجة وغير ممنهجة، كما جرى تطوير استبيان لجمع البيانات حول الموظفين العاملين في المشاريع، ونوع الخدمات المقدمة، وتصنيف النجوم للمشاريع.

النتائج: تظهر النتائج نموًا في معظم الصناعات المتعلقة بالسياحة، إضافة إلى الإدارة العامة والتعليم، وذلك على الأرجح بسبب زيادة عدد السكان في المنطقة.

الخلاصة: يمكننا أن نستنتج من النتائج أن تراجع السياحة بين عامي 2007 و 2017 أدى إلى تباطؤ النمو في قطاعات أخرى، على الرغم من وجود نمو بسيط في تلك القطاعات بسبب التوسع الاقتصادي الطبيعي.

الكلمات الدالة: تحليل توزيع التحول، تأثير السياحة الاقتصادي، البتراء، الأردن.



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1. INTRODUCTION:

Tourism is widely seen as an engine for economic growth in many countries, especially developing ones (Pratt, 2015; Hrubcova, Loster, & Obergruber, 2016; Erkuş-Öztürk & Terhorst, 2018), and the connection between the tourism industry and economic development has been investigated from different perspectives (Paolo-Romero & Molina, 2013; Tugcu, 2014; Dogru & Bulut, 2018). It is branded as a pro-poor industry because it has been found to be a suitable tool to enhance the gross domestic product (GDP) and reduce poverty within local communities through the creation of new income sources (Munjal, 2013; Giaoutzi & Nijkamp, 2016; Njoya & Seetaram, 2018). Thus, local governments are giving serious efforts to attract investments into this industry, which is based on natural and cultural resources.

The need to link tourism to the local economy by encouraging local ownership of tourism-related projects and building locals' capacity to penetrate the tourist market seems to be essential in enhancing the whole domestic economy (Mitchell & Li, 2017). The challenges that the tourism industry faces in developing countries (infrastructure, quality of tourism products, lack of strong marketing tools, need to strengthen linkages between industries, and shortage in the qualified human resources) should all be tackled by local governments to enhance the positive economic impacts of tourism on the local communities (Anderson, 2011; Abuamoud, Libbin, Green, Alrousan, 2014). In addition, investments in tourism lead to remarkable impacts on the local economy, thus, policies should encourage people to invest in industries connected to tourism (Munjal, 2013). It is important to mention that poor economic structures, especially in developing countries, are usually subject to high leakage, so they receive limited positive impacts from tourism (Kim & Kim, 1998; Hrubcova, 2016). Analyzing the economic impact of tourism in Jordan is relatively weak, especially using shift share approach. This study will be the only study that conducted in Jordan using Shift-Share model to analyse economic impact of tourism in Petra. This study reviews several previous studies during the last few years in different regions around the world and will try to introduce the shift-share model as a valid tool that can be applied in Jordan and to fill the gap in analyzing tourism impact on job creation and income.

At heritage sites, there are continuous debates and concerns related to the adverse impacts of tourism on the environment, cultural and social values, and the local identity of the region (Giaoutzi, & Nijkamp, 2016). There have also been connections made between the noticeable increase in the number of tourists interested in visiting heritage sites and the commodification of the cultures on display (Alrawadieh, 2013). Despite these negative effects, the implementation of the principles of sustainability in many tourist destinations around the world has significantly helped alleviate poverty among the local people, and in making them proud of their cultural heritage (Çela, Lankford & Knowles-Lankford, 2009). Table1, shows the fluctuation of the number of tourists to Petra between 2007 and 2017,

Table1 Total number of tourists to Petra between 2007-2017

Month	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
January	25,804	47444	40,322	55,395	63,140	39,523	41,212	36,275	24,736	16,609	30,658
February	28,809	51568	36,057	56,995	42,173	38,037	43,761	38,618	23,337	24,349	31,742
March	46,051	82488	70,390	96,850	65,753	56,552	69,201	59,757	39,805	46,500	56,899
April	80,794	96136	102,489	121,711	85,669	83,794	79,659	92,802	60,282	57,432	87,513
May	41,626	82321	68,977	93,168	45,085	53,137	54,717	61,129	45,314	40,071	57,056
June	29,131	49651	41,346	48,664	30,704	37,903	33,379	39,277	22,946	19,569	33,783
July	36,779	45416	45,680	49,924	38,167	34,116	26,019	25,355	24,738	33,751	32,498
August	64,647	55577	49,988	47,144	22,930	34,686	38,428	33,322	25,430	30,886	34,928
September	35,869	55450	60,622	65,852	42,062	40,217	34,630	32,501	27,104	47,546	52,573
October	70,844	99616	105,866	117,103	53,598	72,613	61,992	55,916	50,290	51,574	74,055
November	69,914	89474	86,933	101,120	67,407	63,276	55,363	47,047	36,584	55,933	75,383
December	50,877	58126	58,268	64,210	39,344	45,434	36,368	29,492	29,805	39,934	53,279
Total	581,145	813,267	766,938	918,136	596,032	599,288	574,729	551,491	410,371	464,154	620,367
Av\Month	48429	67772	63912	76,511	49,669	49,941	47,894	45,958	34,198	38,680	51,697

The objective of this study is to use a shift-share analysis approach to analyze the impact that including Petra as one of the Seven Wonders of the World in 2007 has had on the local economy. The use of shift-share analysis in examining the tourism industry of Petra is important because of the model's ability to highlight differences in growth between regional and national levels. This is the first and only study in Jordan using the shift-share model. The model will help us understand which industries are thriving in Petra and which industries should be expanded further. Through the analysis of Petra's regional growth in various industries, the researchers can begin to focus in on why these discrepancies occur, which could lead to the development of more sustainable practices in the region. The importance of the tourism industry in Petra to Jordan's economy highlights the need for comprehensive, accurate information about the growth of industry in Petra in order to make well-informed policy decisions. This research is significant to both policy makers within the Jordanian government as well as independent organizations in charge of the management of Petra.

Following an analysis of the impact of tourism on Petra's regional economy, the study wishes to address the following questions: What industries have seen growth at Petra? Has Petra seen growth over the last 10 years, despite a decline in tourism at the site? Does all industry in Petra rely on tourism for its success? How does Petra's growth compare to that of Jordan as a whole? What is the cause of industry growth in Petra? Understanding what about Petra is leading to its economic growth will be of utmost importance to those living in the region as well as those involved in the tourism industry in the rest of Jordan.

2. LITERATURE REVIEW:

Jordan currently stands as the third poorest country in the world in terms of water. Lack of participation in the economy as well as a lack of natural resources puts Jordan in an economically critical situation where most resources are not easily accessible to the people. The industrial sector represents about 24% of the GDP including the following: extraction of crude petroleum and natural gas, mining and quarrying, food and beverages, and services sector [CITATION Inv17 \l 1033]. Tourism is a growing industry all over the world and is largely known for its sustainable approach to the interactions between tourists and the local destination. Jordan is one of the few countries in the Middle East region with sustainable tourism options, and in fact has one of the most widely recognized historical sites in the world (Abuamoud, Alrousan, & Nader, 2015). Because Jordan is a destination for both outdoor enthusiasts and culturists interested in the Middle East, tourism has the potential to be a main economic driving point, especially among the local community because of their involvement in the businesses surrounding the industry.

Cultural and heritage resources have the potential to generate a wide range of economic benefits for local communities. These economic benefits come from the rehabilitation and adaptive reuse of heritage buildings and cultural characteristics embodied in the place (Mark, Mathews, Dai, Hayes, & Cave, 2007, Chen, 2001). The cooperation and participation of the local communities in the tourism development process is vital, because of the enclave characteristics of tourism. Local communities need be given the time to gain the experience, skills, and resources necessary to run tourism businesses (Mbaiwa, 2005, Hayes & MacLeod, 2007). The demand for tourism is influenced by the availability of services provided by the government, as well as the willingness and viability of the local community to cooperate in stimulating tourism to historical sites (Maskey, Brown, & Lin, 2009), (Lazrak, Nijkamp, & Rietveld, 2009). There have been improvements made to the region to fulfill the needs of tourists that often have the side effect of improving the local community's economic situation, which encourages people to stay in the area, rather than move away for work (Picard, 2008). Perhaps the greatest concern regarding the development of cultural heritage tourism is that an increasing number of arrivals leads to problems with maintaining the environment. Negative environmental impacts can occur if tourism is not well managed (Honey & Krantz, 2007), such as overcrowding and misuse of natural resources. If tourism is properly managed, it has the potential for maintaining or even enhancing the natural resource base. If the tourism industry is mismanaged, it has the capability of destroying the very resources upon which it is built. The impacts of tourism on local tourist destinations have been investigated from different perspectives (cultural, social, environmental, and economic). The focus of this research is to minimize the negative impacts on the local people and to maximize the positive ones. Special attention is to the economic

impact caused by the tourism industry, and to the linkages that should be strengthened between tourism and other industries to reduce the economic leakages from visitor expenditures, and to foster the multiplier impacts on the local economy (Dwyer, Forsyth, Madden, & Spurr, 2000). In this context, there are many endeavors to find and adopt the appropriate mechanisms for measuring the economic impacts. Such studies on the industry's impact at the regional level are considered crucial in planning and implementing appropriate public policies that aim to foster the most beneficial industries (or even events) for the community (Kottke, 1987; Torre & Scarborough, 2017). For this purpose, researchers use different models to shed the light on the economic effects of tourism. The most used models are: the Input-Output Model (Leontief, 1936; Fletcher, 1989; Archer & Fletcher, 1996; Miller & Blair, 2009; Munjal, 2013; Klijs, Peerlings, & Heijman, 2015), the Computable General Equilibrium Model (Zhou, Yanagida, Chakravorty, & Leung, 1997; Narayan, 2004; Dwyer, 2000; Pratt, 2014; Meng, 2014), Benefit-Cost Analysis (Kottke, 1987; Dwyer, Jago, & Forsyth, 2016; Torre & Scarborough, 2017), Inventory/Budget Method (Kottke, 1987), the Tourism Satellite Accounts (TSA) Model (Suich, 2002; Frent & Frechtling, 2015; Frechtling, 2010; Munjal, 2013), and Shift-Share Analysis (Creamer, 1943; Dunn, 1960; Esteban-Marquillas, 1972; Kalbacher, 1979; Patterson, 1991; Knudsen, 2000; Artige & Van Neuss, 2014; Khusaini, 2015; Dogru & Sirakaya-Turk, 2017; Danko III & Hanink, 2017; Sirakaya, Choi, & Var, 2002). It is worth mentioning that each of those models has certain limitations, and the results taken from them might vary due to the different approaches followed in estimating the economic components, structure, data demands, complexity level, and assumptions of the model in question. (Bonn & Harrington, 2008; Klijs, Heijman, Maris, & Bryon, 2012; Kumar & Hussain, 2014).

The Input-Output (I-O) Model was developed by Wassily Leontief in the 1930s to describe the interdependence of different economic sectors in each area (Miller & Blair, 2009). Leontief (1936) describes the economic transactions and the interdisciplinary nature of industries by asserting that revenues coming out from any industry should reappear as outlays somewhere else. The I-O model has been increasingly used in tracing the economic effects of tourism at the regional level (Fletcher, 1989; Kottke, 1987; Archer & Fletcher, 1996; Munjal, 2013; Klijs, 2015; Kumar & Hussain, 2014). These effects, resulting from linkages with other industries, are calculated by using output, employment, and income, to measure the impact of tourism on the overall economy (Wanhill, 1983; Munjal, 2013; Yang, Fik, & Altschuler, 2018). In his study, (Tohmo, 2018) examines the economic contribution of tourism in terms of regional output, creating job opportunities, income, and taxes taken from tourism activities in the Central Finland region. (Poudel, Munn, & Henderson, 2017) try to shed light on the economic effects of wildlife watching activities in the southern American states using I-O analysis. The model was also implemented by (Atan & Arslanturk, 2012) to analyze the role of tourism in the economic growth in Turkey, where the results indicated the significant impact of tourism-related sectors on the economy. In their study, (Çela, Lankford & Knowles-Lankford, 2009) conducts research on the economic contribution to the community in Silos and Smokestacks National Heritage Area using the IMPLAN (Impact Analysis for Planning) I-O Model to estimate the growth derived from the money injection attributed to the tourism industry. On the other hand, researchers may face some difficulties while using the I-O model to measure the economic impact of tourism. The main challenges that must be tackled when using the I-O model for investigating the economic effects of tourism are the lack of data on the tourism industry in general, the need for tables that describe the transactions of tourism-related activities, and the necessity of having accurate details on tourist expenditures (Jones & Munday, 2004). This challenge often derives from the general structure of I-O tables that overlook the nature of tourism as a separate industry (Munjal, 2013). Moreover, the I-O model, which has been adopted widely to measure the economic effects of the tourism industry, was found to be exaggerating in giving estimates to impacts (Dwyer, Jago, & Forsyth, 2016). According to Dwyer (2000), the I-O model doesn't consider the impact of the increase in tourism demand on creating a severely competitive environment with other industries on the available resources, (land, labor, and capital) which could make these industries that are suffering from the increased costs, less competitive in the market. The various limitations of the I-O model have been looked at by researchers in several ways (Klijs, 2015; Kumar & Hussain, 2014). According to Sun (2007), the I-O models need to be adjusted to suit tourism and other service industries in which the outputs and inputs are more significantly affected by capacity utilization. Thus, changes in the supply and demand levels, the nature of products in tourism in terms of perishability, and price fluctuation should all be considered. Jones &

Munday (2004) preferred to incorporate tourism satellite accounts (TSA) together with I-O tables to have a more holistic view of the benefits derived from tourism-related activities. Klijs (2015) analyzes the impact of tourism by using the Non-Linear Input-Output Model, in which input substitution and price changes are considered. This technique was adopted to overcome the limitations of the traditional I-O model, where prices are fixed (Zhou, 1997). Due to these limitations in the I-O model, some researchers find the Computable General Equilibrium (CGE) Model a good mechanism to measure the economic impact of tourism (Kumar & Hussain, 2014), because it gives more attention to the specific behaviors and reactions of all involved parties in the process of production and consumption, including the inter-sectoral resource flows. The model also sheds light on the linkages between industries as well as the role of tourism in crowding out other industries (Dwyer, 2000; Zhou, 1997). According to Klijs (2015), CGE takes into consideration the effects of changes in final demand on both price changes and input substitution. Pratt (2014) uses the CGE model to explore the consequences of currency devaluation in Fiji on both national tourism and exports. Meng (2014) incorporates I-O tables to build a CGE in order to examine the economic impact of tourism in Singapore. However, while the CGE model has been adopted to face the difficulties derived from the assumptions of the I-O model, the nature of the examined event or economic issue has a crucial role in determining which model to use (Jones, 2010; Kumar & Hussain, 2014). Another model is the Benefit-Cost Analysis (BCA) model, which is mostly used by governments to evaluate proposed projects to develop the region (Kottke, 1987). Thus, the BCA model deals more with the future impacts of projects, investments, or policies (or even sectors) on the economy, rather than examining their current performance (Wanhill, 1983). BCA was found as an appropriate tool to measure the social effects of holding an event, by comparing the costs to be paid (social and economic costs) with the expected gains (social and economic benefits). Thus, it helps the decision-makers to adopt the best policies in this regard. (Dwyer, 2016; Torre & Scarborough, 2017). Due to the complicated nature of the industry, the Tourism Satellite Accounts (TSA) Model has been adopted by some countries to measure the economic impact of tourism (Frechtling, 2010; Frent & Frechtling, 2015). While the concept itself is very old, the Recommended Methodological Framework of TSA was presented only in 2008 by World Tourism Organization (UNWTO) together with the United Nations Statistics Division (UNSD), the Statistical Office of the European Communities (EUROSTAT), and the Organization for Economic Co-operation and Development (OECD). It provides aggregates that highlight the contribution of tourism to the economy, information on the consumption patterns of visitors and their effects on the demand and supply, as well as other details on related issues, such as employment and linkages with other industries. Although the TSA model was built to meet the specific needs of the tourism industry and to deal with its complex nature, the model is descriptive and lacks the ability to analyze the indirect and induced impacts of visitor consumption on economy (TSA: RMF 2008). Therefore, relying on the TSA tables (10 tables based on the supply and use tables of the System of National Accounts 1993) is not enough when examining the contribution of tourism to economy, and there is a need to resort to other supportive tools (I-O Analysis, CGE, and other Models) to explore the economic effects of tourism (TSA: RMF 2008). In some countries, exploring the interlinkages of tourism with other sectors through TSA is a challenge because tourism doesn't occur in the I-O tables as separate industry (Munjal, 2013). Moreover, the TSA international standards have not been followed completely by some countries, leading to the lack of comparability in tools measuring economic impact. (Frent & Frechtling, 2015). This could be attributed to the process of building the 10 tables itself, as it requires a lot of information to be collected and categorized, which can be difficult for some countries. (Suich, 2002). To recap, the different models used in tracing the economic impact of tourism industry each have their own advantages and limitations. When using those models, some challenges will be faced, especially in measuring the multiplier effects. This study will use a more appropriate approach to the investigated context, namely, shift-share analysis.

Shift-share analysis was first used by Creamer (1943) and was later formalized by Dunn (1960) and then developed by Esteban-Marquillas (1972) to explore the regional economic growth or decline over a period of time, through examining some elements such as employment and income (Creamer, 1943; Kalbacher, 1979). It can be used to analyze the growth in specific industry on the regional level in comparison to other regions on the national level (Dunn, 1960). The model is widely employed in the planning, geography, and regional studies (Knudsen, 2000). The shift-share model is designed to

deal with scarcity and unreliability of data (Arcelus, 1984), and to avoid consuming time and money in collecting the primary data by instead using the available secondary data that is usually collected by different public bodies working on both the regional and national levels (Knudsen, 2000; Sirakaya, 2002; Dogru & Sirakaya-Turk, 2017). The main drive behind using this technique is to examine the sectoral distribution of employment growth between the regional and national level, to examine economic growth or decline on the regional level compared to the national level, and to determine if the growth rate of a specific sector on the regional level is higher or lower than the national one, and finally to find the leading sectors on the regional level in comparison to the national level (Artige & Van Neuss, 2014). The shift-share model was found useful in shedding light on the most competitive industries on the regional level in a way that can help policymakers adopt the right development strategies (Herath, Gebremedhin, & Maumbe, 2011). The model analyzes regional economic changes by categorizing them into three components: National Share (NS) which explores the change in total growth on the regional level that is attributed to the economic growth on the national level during a specific period of time; Industry Mix (IM) which analyzes the growth (or decline) rates in industrial sectors on the regional level in light of the growth rates of the individual industry sectors on the national level; and the Regional Shift (RS), or Competitive Effect (CE), which focuses on comparing the growth rates of the single industries on the regional level with growth rates of the same sectors on the national level, in other words, it shows the growth that is attributed to the regional effects (Dunn, 1960; Esteban-Marquillas, 1972; Danko III & Hanink, 2017). Since its creation, the shift-share model has been subject to some changes. Patterson (1991) presented the new shift-share regression method, which tries to give more explanation to the relationship between an industry and its development on both the regional and the national level. According to Dogru & Sirakaya-Turk (2017), this new method helps to shed the light on the economic changes (whether significant or not) in an industry, even forecasting the change's components. Moreover, a dynamic shift-share method has been used by Sirakaya (2002) to overcome criticisms related to the temporal nature of the traditional method, taking into consideration yearly changes and differences within the time period of the analysis. Knudsen (2000) has implemented a probabilistic form of shift-share analysis, which was found to be more advanced in examining changes in employment and the value added on the regional and sectoral level in comparison with the traditional method. The traditional shift-share method examines the economic changes by exploring some variables such as income, gross value added, and employment. In this study, employment as a tool of measurement will be considered.

3. METHODS:

The data used in this study were taken from multiple organizations as well as from data collection. Data were provided from the Petra Development and Tourism Regional Authority (PDTRA) about number of hotels and other related businesses in Pera. as well as by the Department of Statistics about the national contribution of each sector in the GDP to compare it with the regional contribution, another data from the Ministry of Labor and Ministry of Tourism about employment indicators of in the tourism sector in Jordan, the data collected from the Central Bank of Jordan was about the national contribution of tourism in Jordan for each governorate. In addition, the researchers also collected data from various restaurants and hotels in the Petra area. Two students from the University of Jordan were employed for six months to collect information in person from these businesses. A questionnaire was developed to gather the required data from the local hotels, restaurants, tour operators, and governmental agencies, the data collected about the personnel working at the business such as gender, nationality, place to live in Petra or outside Petra, star-ranking of the hotels and restaurants in Petra, and type of services provided between 2007 and 2017 to measure the growth of businesses in 10 years. This information was collected and cleaned up between June 2018 and January 2019. For the purpose of this study, the classic shift-share analysis was used to produce results that can measure the pattern of employment growth and generate shift-share analysis results for local employment growth compared with the nation in Petra and nationwide between 2007 and 2017, and no regression or correlation analysis used The classic shift-share method decomposes the change in employment as follows (e.g., Cochrane and Poot, 2008, p. 55): The classic shift-share analysis is $SS = NS + IM + RS$ which can be transformed as the following:

The classic shift-share analysis is $SS = NS + IM + RS$ which can be transformed as the following:

$$\Delta E_{ir}^t \equiv E_{ir}^t - E_{ir}^{t-1} \equiv NS_{ir}^t + IM_{ir}^t + RS_{ir}^t \quad (1)$$

Where:

$$\text{National Share: } NS_{ir}^t = g_{00}^t \times E_{ir}^{t-1} \quad (2)$$

$$\text{Industry Mix: } IM_{ir}^t = (g_{i0}^t - g_{00}^t) \times E_{ir}^{t-1} \quad (3)$$

$$\text{Regional Shift: } RS_{ir}^t = (g_{ir}^t - g_{i0}^t) \times E_{ir}^{t-1} \quad (4)$$

The terms in the above equations are defined as:

E_{ir}^{t-1} = Employment in the i^{th} industry in the r^{th} region at time $t-1$. (employment in tourism sector in Petra in 2007)

E_{ir}^t = Employment in the i^{th} industry in the r^{th} region at time t . (employment in tourism sector in Petra in 2017)

NS_{ir}^t = National Share effect on industry i in the r^{th} region between $(t-1)$ and t . (effect of change on employment in tourism sector in Jordan between 2007 and 2017)

IM_{ir}^t = Industry-Mix effect on industry i in the r^{th} region between $(t-1)$ and t . (effect of change in industry mix on tourism in petra between 2007 and 2017)

RS_{ir}^t = Regional Shift on industry i in the r^{th} region between $(t-1)$ and t . (effect of change in tourism sector in Petra between 2007 and 2017)

g_{ir}^t = Growth rate of employment in industry i and region r between $(t-1)$ and t . (growth rate in employment in tourism sector in Petra between 2007 and 2017)

g_{i0}^t = Growth rate of nationwide employment in industry i between $(t-1)$ and t . (growth rate in employment in tourism sector in Jordan between 2007 and 2017)

g_{00}^t = Growth rate in nationwide total employment between $(t-1)$ and t . (growth rate in employment in all sectors in Jordan between 2007 and 2017)

Using (1) to (4) if we aggregate employment in (Petra region) r over industries i (Tourism) and define g_{0r}^t as the growth rate of total employment in region r between times $(t-1)$ and t , (2007-2017) this growth rate can be decomposed into a national growth rate; (Jordan Level) a growth rate due to the industry-mix (in Petra region) and a residual that is referred to as the regional shift rate r_{0r}^t .

4. RESULTS:

Based on the data collected, the researchers have been able to compare the growth of industries in Petra to the growth of those same industries on the national level and industry mix in the study area to understand why certain industries in Petra have flourished while others have been in decline. Most industries' growth varied dramatically from that predicted by the National Share (NS) value for the industry. Of all the industries researched, the only one whose total change in employment actually mirrored its NS value was the finance and insurance industry. For many of these industries, the difference between the NS value and the total change in employment is likely due to the relatively small number of people employed in 2007. This makes any change seem much greater percentage-wise, due to the low value being used. For example, while Petra's food service industry's growth of 113% may seem large when compared to national growth of 50%, the total number of people employed in this industry in Petra is only 190. the natural population growth in the Petra region, which includes six population groups between 2007 and 2017 has led to an increase in the total demand on wholesale, transportation, and food services sectors. Shift share analysis can consider the percentage growth/decline in individual job creation in the regional and national level without taking in account the size of the economy. In another word, the effect of growth/decline in total number of job creation of 50% in the national level is greater than 113% in the regional level Figure 1&2 represents annualized total employment growth during 2007-2017 for 22 sectors. The greatest growth by percentage was observed in both wholesale and transportation, for the hotel, art, and entertainment industries employment growth was negative in Petra due to a decline in number of tourists between 2011 and 2016 caused by political developments in the region, figure1. In 2017 number of tourists

noticed an increase by 34%. which shows an increase of number of tourists by 40% in 2008 compared to 2007, then start declining between 2010 and 2015 by 55%, this decline forced ten of hotels in Petra to close down, which can explain the decline in employment in hotels in Petra by 9%, and then start to increase between 2015 and 2017 at 47% in total. The hotels started to re-open in 2018 that hasn't captured by the model by the end of 2017.



Figure 1: Number and Percentages of National and International Tourists to Petra 2007-2017 in thousands

The field with the largest number of people employed, public administration, saw a massive increase in employment, growing from 2391 people in 2007 to 4071 people in 2017, at 70% increase. Table2. Other industries, such as camel, horse, and donkey transportation, wholesale and retail trade, transportation, and warehousing also saw sizeable increases, with employment increases in the low hundreds. All these industries can attribute some of their growth to change on the national level, shown by their positive NS values, but all exceeded these values, with Region Shift (RC) values that were significantly higher. Table1 Increase in employment can be attributed to these industries catching up with the demands of tourists. As tourists come into the region, they bring with them their own demands for goods and services that otherwise may not be popular or available in the region. As these needs are more and more catered to, and as the population in the region grows, the wholesale and retail trade industries, which saw a 202% increase in employment between 2007 and 2017, will naturally need to expand to deal with these rising demands. The growth of the transportation and warehousing industry, which saw a 196% increase between 2007 and 2017, alongside the trade industry also makes sense. The increase of the camel, horse, and donkey transportation industry in Petra can also be attributed to tourists' demands that happened only in 2017. While the use of these animals for transportation is generally in decline in Jordan, they still remain popular in Petra for their novelty to tourists, meaning that the industry is still quite valuable around Petra. Thus, the industry saw a 38% increase, from 532 people employed in 2007 to 732 people in 2017. the increase in horse and camel sector is an informal business, where locals can start this business with no regulations, which could be increased because of decline of demand on skilled jobs from one side and because of demand created by tourists in 2017

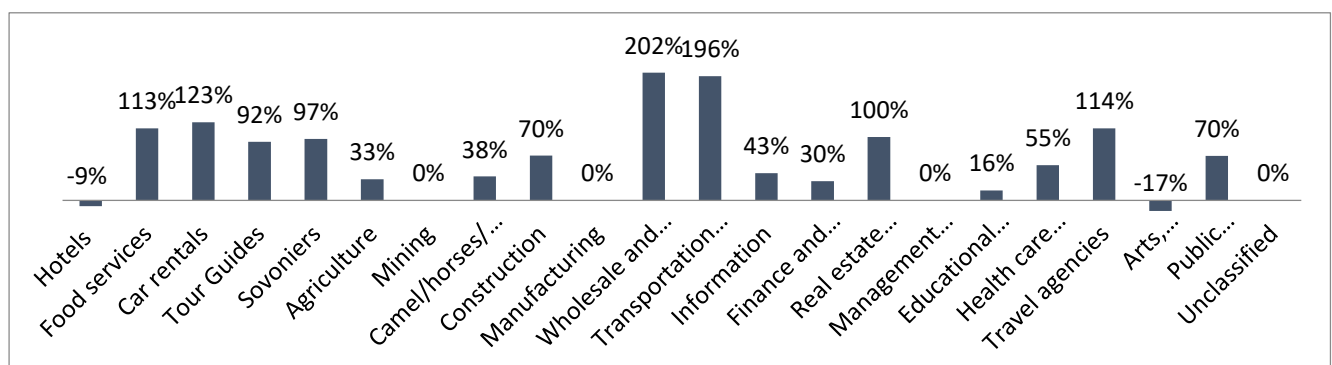


Figure 2: % change in employment in petra by sector 2007-2017

The growth in fields such as public administration, educational services, healthcare, and social assistance programs could be due to the increased population of the region because of normal growth and the influx of refugees. Since the start of the Syrian Civil War, there has been a 20% increase in the Jordanian population caused by Syrian refugees. It is likely that some of these refugees have settled in the region around Petra, increasing the need for these services.

Table 2 employment and percentage changes 2007-2017

Total Employment In the following sectors/Jordan							Total Employment In the following sectors/Petra									
Industry	2007 C1	2017 C2	Change C3	% Change C4	% of total 2007 C5	% of total 2017 C6	2007 C7	2017 C8	Change C9	% Change C10	% change 2007 C11	% change 2017 C12	NS C13	IM C14	RS C15	Total Change in Employment 2007-2017
Hotels & Accommodation	13193	20670	7477	57%	1%	2%	1083	984	-99	-9%	19%	11%	333	281	-713	-99
Food services	13472	20195	6723	50%	2%	2%	89	190	101	113%	2%	2%	27	17	57	101
Car rentals	1417	1755	338	24%	0%	0%	13	29	16	123%	0%	0%	4	-1	13	16
Tour Guides	686	1054	368	54%	0%	0%	65	125	60	92%	1%	1%	20	15	25	60
Souvenirs	637	848	211	33%	0%	0%	34	67	33	97%	1%	1%	10	1	22	33
Agriculture	64051	116275	52224	82%	7%	10%	3	4	3	300%	0%	0%	0	1	2	3
Mining	6067	8999	2932	48%	1%	1%	1	1	0	0%	0%	0%	0	0	0	0
Camel/horses transportation	613	413	-200	-33%	0%	0%	532	732	200	38%	9%	8%	163	-337	374	200
Construction	29992	38824	8832	29%	3%	3%	166	283	117	70%	3%	3%	51	-2	68	117
Manufacturing	172161	223869	51708	30%	19%	19%	1	1	0	0%	0%	0%	0	0	0	0
Wholesale and retail trade	195651	243711	48060	25%	22%	21%	105	317	212	202%	2%	4%	32	-6	186	212
Transportation	814	1047	233	29%	0%	0%	154	456	302	196%	3%	5%	47	-3	258	302
Information	1	1	0	0%	0%	0%	14	20	6	43%	0%	0%	4	-4	6	6
Finance and insurance	23062	37445	14383	62%	3%	3%	40	52	12	30%	1%	1%	12	13	-13	12
Real estate, rental , leasing	43913	6968	-36945	-84%	5%	1%	3	6	5	500%	0%	0%	0	-1	6	5
Management	1	1	0	0%	0%	0%	1	1	0	0%	0%	0%	0	0	0	0
Educational services	155640	213294	57654	37%	17%	18%	746	863	117	16%	13%	10%	229	47	-159	117
Health / social assistance	53337	74048	20711	39%	6%	6%	170	264	94	55%	3%	3%	52	14	28	94
Travel agencies	3408	4885	1477	43%	0%	0%	81	173	92	114%	1%	2%	25	10	57	92
Arts, entertainment, and recreation	2455	5583	3128	127%	0%	0%	12	10	-2	-17%	0%	0%	4	12	-17	-2
Public administration	87244	109487	22243	25%	10%	9%	2391	4071	1680	70%	42%	47%	734	-125	1070	1680
Unclassified	22770	34712	11942	52%	3%	3%	1	1	0	0%	0%	0%	0	0	-1	0
Industry total	890585	1164084	273499	730%	100%	100%	5701	8650	2949	20	100%	100%	1751	-70	1268	2949

However, the industry with the second-highest employment in the region, hotels and accommodation, saw a 9% drop in employment, despite the overall increase in employment in the industry at the national level. Despite relatively strong NS and IM values, the RS value is significantly negative. This decline in the hotel industry is due to an overall decrease in demand, caused by a decrease in tourism in the region during the period from 2010 to 2016. This decrease is likely due to fears from outside Jordan about violence in the MENA region, caused by the Arab Spring and other conflicts surrounding Jordan. While other industries were able to grow despite this, the hotel industry seems to be the one most directly affected by the number of tourists to the region Table2. After 2017, however, the number of tourists visiting Petra has begun to increase again. It is likely that if looked at employment in the hotel and accommodation industry in 2018, the number would represent this increase and be much higher.

5. CONCLUSION:

By applying shift-share analysis methods to Petra between the years 2007 and 2017, we have been able to get a more in-depth understanding of industries' growth in the region. In general, most industries seem to be succeeding in the region, especially those that are more directly affected by the tourism industry. In addition, an increase in population has helped industries such as the public administration, education, and healthcare industries. This increase can be partially attributed to jobs in the tourism industry causing people that would otherwise leave the region for work to stay. It is also likely that the influx of Syrian refugees coming into Jordan played a role in the increase in demand for these industries. While these changes do seem positive relative to the overall growth in Jordan, there is no anything else to directly compare them to, as no other shift-share analyses have been done in Petra or Jordan as a whole. Therefore, whether these numbers are "good" remains to be seen until more data are taken and more work with the shift-share model is done. However, the fact that most industries have seen substantial growth while tourism to the region was generally in decline bodes well for Petra. Even in times of relatively limited success, where incoming tourists dropped dramatically, the region was able to grow. From 2017

on, the number of tourists visiting Petra has been increasing for the first time since they fell in 2010, suggesting that industry in the region will be able to grow even more in the future. It is important to depend on numbers by the decision maker, such a study may contribute to clarifying the economic role of tourism for Petra compared to the role of tourism at the national level. The tourism sector in Jordan lacks economic studies, and therefore this is a rich field for researchers, as it is possible to apply more than one model to study the economic impact of tourism in Jordan such as Input-Output model, Tourism Satellite Account TSA, equilibrium (GE) model, Benefit Cost analysis (B/C), and other models

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