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# The Tourism Sector and U.S. Regional Macroeconomic Stability: A Network Approach

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**Abstract:** This study investigates how the structural mix of USA regional economies affects their volatility of economic growth. Four exogenous sectors are chosen for this investigation: Federal Government, construction, manufacturing, and tourism. Perhaps unsurprisingly, evidence suggests that a larger share of Federal Government employment in an economy reduces the variability of overall employment growth, while a larger share of construction activity elevates it. More telling is a finding that, recently, manufacturing has not contributed as much to such variability, and that a larger tourism presence increases it. The increasing integration of technology in tourism offers significant opportunities for a network approach and innovation in regional development.

**Keywords:** volatility; economic growth; variability; tourism; network approach

## 1. Introduction

Any regional economy is affected by its structural composition. That structural composition can affect both its rate of growth and the stability of that growth. The rate of economic growth is very important for any economy; however, often the stability of growth gets less attention. However, as in financial portfolio theory, in which the rate of return is considered a positive, but the variance of returns enters as a negative, economies with less volatile growth are likely to be preferred over ones with more volatile growth. Economic planning and forecasting are more certain in the former, and an economy with less volatile growth may even exhibit faster growth over the long haul because of its greater stability. Furthermore, the rapid growth of travel and tourism globally has demonstrated remarkable resilience even through shocks [1]. This paper does not deny that the rate of growth is important, but focuses on the volatility of growth.

Four key sectors of state economies in the USA are chosen for their key role in driving regional growth. These sectors are then compared in empirical analysis on the basis of how they influence the overall volatility of employment growth over a 28-year span, from 1991 through 2018. The results may surprise some, and as the industry-by-industry composition of employment changes over time, these outcomes may be useful in regional analysis and planning.

In their literature review analysis of tourism, Calero and Turner [2] contend that in the area of economic development, there is limited literature on regional economics and tourism. While the growth of international tourism extending beyond major ports and cities is acknowledged throughout tourism research, the contribution of tourism at a regional level for driving sound policies in regional policy making predominantly descriptive and limited in scope [3]. The tourism area life cycle (TALC),

proposed by Butler [4], has been a widely used model for tourism development in attempts to predict cyclical patterns and waves in relation to the dynamics of tourism and development. While the TALC model was proposed as an overarching conceptual model of tourism development that has been largely cited throughout the tourism literature for decades, Butler acknowledged that many of the costs of tourism are more highly evident at the community and regional levels and, if not strategically planned for at the community and regional level, the panacea of tourism development can quickly turn into a one-dimensional illness for the community itself [5]. Consideration of the structural nature of the economy of a region is an important factor from both endogenous and exogenous positions for the development of tourism and sustainability.

Regional development-focused studies did not traditionally include tourism due to the perceived intangibility of tourism, with manufacturing taking priority over services coupled with urban over rural areas of the economy. Additionally, previous research contained a general lack of recognition of tourism as a significant sector of economic development [2]. This is in addition to the heterogeneous nature of tourism from both demand and supply perspectives [5]. Therefore, the motivation of this research study is to address the research gap of tourism employment and volatility from a regionally focused perspective. The empirical cross-sectional investigation contributes to an understanding of the structural nature of the economy that is distinct from other research relative to cyclical influences found throughout the literature. Furthermore, historically, the nature of tourism is regarded as being highly human centric from a customer and employment dimension; therefore, the analysis of employment and volatility is highly relevant and applicable for research and policy decision making at a regional level. The purpose of this study is to explain the volatility of overall employment in state economies centered on the structural nature of the economy. To achieve this objective, the study will observe the existing literature regarding the structural composition of economic regions, development of tourism within a regional context, along with sustainable development in the context of employment and volatility to inform theory, and policy directives. To allow for an industry-by-industry cluster comparison of data among four employment categories over a period of 25 years, the establishment survey utilizing the North American Industrial Classification System (NAICS) was selected as the data source for the investigation.

## 2. Literature Review

There is literature that focuses on the structural composition of economic regions and the impacts that it has on economic growth, stability, and their response to exogenous shocks [6–8]. The papers mentioned below, and references cited within them, do provide a background for this study.

Blanchard et al. [9] address regional economic cycles in USA over a 40-year period. The model envisioned in the study states as producing different bundles of goods, all sold on the national market. One conclusion from the study is that regional employment volatility typically has permanent effects. Employment can return to the same growth rate, but on a permanently different path. The authors note that investigations in this area could have international implications for free trade areas such as the European Union as they solidify and evolve. Hill et al. [10] discuss regional economic resilience and responses to exogenous shocks such as 9/11 and Hurricane Katrina. These exogenous shocks can promote convergence of regional economies [11]. The authors attempt to define economic resilience, and address questions such as what explains economic resilience and the ability to recapture a previous growth path after being thrown off.

Garcia-Milà et al. [12] examines annual employment data for the U.S. with respect to trend rates of growth and variability from that trend and provides the background for the study. The authors present evidence that the industrial mix of an economy is at least one factor that explains differences in growth rates and volatility in growth across states. Kort [13] also notes that diversification of industries is one of the regional stability factors that impacts employment volatility yet varies among size of the area.

The economic importance of tourism has become increasingly recognized throughout the world. Research into tourism employment, however, remains an understudied area of analysis [14–19]. With

high rates of temporary and part-time work [20] along with typically high levels of seasonality [4,21] creates unique challenges in maintaining employment stability in specific areas of tourism. In addition, supporting the trend for remote destinations with unique “one of a kind” attributes, workforce development often faces further challenges in attracting and retaining employees [22]. Short-haul and long-distance air travel, for example, have increasingly contributed to the importance of niche cultural, sporting, and specialty themed entertainment events over mass-customized travel offers that are frequently losing further market share [23,24].

In considering urbanization externalities [25], industrial diversification contributes to growth over specialization or dominance of single sector industries [26]. Highly integrated into other sectors of the economy, tourism consists of a connected network from wider economic activities [27] and operating on a variety of scales [28]. Tourism is often considered by governments, but only in isolation of other activities and sectors of the economy [29]. Specific economic policies to attract volatile employment would result in neutral or negligible impacts on the growth of employment [30]. Tourism growth can be attributed to differences in productivity between tourism services and manufacturing along with structural differences in demand [23]. Furthermore, capital investment in manufacturing in terms of labor-saving advancements through technology, have traditionally been higher with fewer opportunities for the tourism industry [24]. According to Valeri and Baggio [31], the tourism industry is one of the economic sectors that could benefit greatly from technological innovation. One area of innovation and technology that has recently been examined and has not been widely adopted in the tourism and hospitality field which is a major contributor in integrating the different stakeholders to work cooperatively is that of blockchain systems [31,32]. The prevalence of lower-skilled labor, often associated with tourism, can offer less incentives for labor substitutes associated with large capital investment costs resulting in lower levels of advancements in productivity and innovation [24].

Considered an essential economic activity for many regions, tourism can also support weakening sectors with additional income and employment opportunities, especially when it is integrated with other creative sectors [27]. The notion of life-enriching experiences [33,34] poses the increasing need to provide novel experiences within tourism. This also provides further opportunities for innovation and unique network-based contributions to regional economies [35–38]. The quality of labor inputs impacts the service experience and the ability to adapt to change [39]. The personalization of experiences, fueled by technology, offers unique networks of exposure for tourism-related activities and innovations. Crowd sourcing and customer co-creation are examples that are driving new collaborative solutions that can reduce labor costs, increase speed to market, and present dynamic open-innovation opportunities [40]. Although, innovation often tends not to be incurred within tourism enterprises and the tourism sector itself, but rather through the supplying industries that contribute with spill-over and spill-back effects [41,42]. Brooker and Joppe [43] contend, however, that within tourism enterprises, innovation is contributing to unique growth opportunities with varying degrees of the size and scope of activities.

Highly collaborative special events at tourist destinations, for example, connect innovation networks in terms of the resilience to declines in the economy due to the nature of the activity and the participant as the stakeholder or crowd source. Participating or attending sporting events at tourist destinations are examples of special event tourism that are more resistant to economic fluctuations [44]. The implementation of sustainable tourism development into an area is another example where tourists are more resilient to economic declines as this type of tourism is considered a “win-win” for a destination [45] which provides benefits to the environment as well as economic growth for the residents of area [46]. These may attract new income from outside the area and can arguably provide substantial net effects of spending along with other benefits [47], providing significant economic and other benefits to regional communities [48].

Even in times of extreme crisis, well intentioned government subsidies and strategies for stabilizing employment can sometimes have adverse effects and employment volatility within the tourism sector itself and particularly in consideration of the movement of labor among the airline and accommodation

workforce [6,49]. When tourism is strategically planned and positioned, unique opportunities exist for further tangible and intangible benefits that may extend beyond employment and incomes relative to other sectors of a regional economy. Table 1 summarizes the related literature discussed in the paper.

**Table 1.** Related literature.

Authors	Article	Year
Kort, J.	Regional economic instability and industrial diversification	1981
Barro, R. J., Sala-i-Martin, X.	Convergence across states and regions	1991
Baum et al.	A review of tourism workforce	2016
Bellini et al.	Tourism and regional economic resilience	2017
Blanchard et al.	Regional economic evolutions	1992
Elmo et al.	Sustainability in tourism as innovation driver	2020
Garcia-Mila, T., McGuire, T.J.	Industrial mix as a factor in the growth and variability of states' economies	1993
Glaeser et al.	Economic growth in cities	1992
Hill et al.	Regional economic resilience	2008
Hjalager, A.M.	Economic Innovation patterns in sustainable tourism	1997
Holladay, P.J.	Destination resilience and sustainable tourism development	2018
Pallares, F.J., Adkisson, R.V.	Industrial diversification on employment growth across states	2017
Proenca, S., Soukiazis, E.	An economic growth factor of tourism	2008
Sirakaya et al.	The impact of tourism employment change in a region	2002
Smeral, E.	A structural view of tourism growth	2003
Solnet et al.	Locational factors for tourism employment	2014
Zhou et al.	Estimating economic impacts of tourism	1997

The potential significance of tourism from an international, national, and regional level cannot be understated as evident in the wide body of literature related to the economic impacts as well as the increasing recognition of tourism in its increasing capacity as an export engine. In the quest for economic growth yet stability from a regional perspective, employment volatility in the context of the structural nature of a regional economy has yet to be fully understood and appreciated from both theoretical and practitioner aspects. The North American Industrial Classification System (NAICS) employment data provide a more reliable and refined measure across industry sectors than other publicly available sources of data [50]. This study, therefore, will examine longitudinal employment data over a 25-year period generated from the NAICS establishment survey.

### 3. Methods

#### 3.1. Data Source

The data source used in this study is the establishment survey of non-farm payrolls by state, published by the USA Bureau of Labor Statistics (BLS). This is often referred to as the Current Employment Statistics (CES) survey and differs from the other major labor survey published by BLS, the household survey or Current Population Survey (CPS). The establishment survey comprises workplaces and the household survey consists of individuals. Thus, the establishment and household surveys measure two different things. Unemployment rates are calculated from the household survey, but the establishment survey allows a breakdown of employment by industry and is taken from a much larger sample. The establishment survey also counts multiple job holdings in many service-oriented economies, even though it may undercount self-employed while not counting agricultural jobs.

The establishment survey is one of the best data sources for investigations, as it allows an industry-by-industry decomposition. Although it does not distinguish between higher paying and lower paying positions, the units are the same and are thus comparable. There is also no need to adjust dollar measures of economic activity for inflation [51]. The establishment survey now uses the North American Industrial Classification System (NAICS), the first version of which was released in 1997. NAICS replaced the earlier Standard Industrial Classification (SIC) system. Even though the SIC system is used in government agencies, the NAICS breakdown is available in time series data [51]. A

major NAICS innovation was enhanced coverage of service sectors, reflecting an ongoing transition in the U.S. economy toward service-oriented jobs. Prior to the introduction of NAICS, it was not possible to accurately measure the contribution of the tourism industry. The introduction of a Leisure and Hospitality jobs category provides a further breakdown of the Arts, Entertainment, and Recreation categories along with the Accommodation and Food Services category.

For the current study, four sectors of the NAICS survey were selected. These sectors were not chosen for their relative size, but rather for their role in serving as regional export industries that play an instrumental role in driving the rest of the economy. Regional economy depends upon certain sectors to serve as growth engines for the more endogenous sectors [52]. Therefore, the four chosen employment categories were Federal Government, construction, manufacturing, and tourism.

### 3.2. Data Categories

The four chosen categories are considered as proxies for external injection into a state economy. The more endogenous sectors contain jobs that depend upon them, and are not associated directly with the original source of their economic strength. By using the latest NAISC classification system, a mixed-sector cluster employment data analysis can provide a validated approach for comparison among primary, secondary, and tertiary industries, along with industrial strength within a regional economy [52]. Represented as a newer form of spatial organization, cluster analysis offers practitioners of economic development advantages of efficiency, flexibility, and effectiveness within a representative geographic region [53]. McCann [54] additionally asserts that regional employment and industry impact including regional growth relative to national growth can also be garnered through NAICS industry clustered data. Based on factor analysis Feser and Bergman [55] proposed cluster templates for statistical applications at both the regional and national levels of analysis.

The first chosen job category is the Federal Government (FG). This is an exogenous influence in any state economy, even though the number of such jobs vary from state to state. The jobs are often civilian positions associated with defense spending, or other federal agencies located in a particular state. An alternative might have been to choose total government jobs, including state and local government because the entire public sector often tends to be more insulated and exogenous than the private sector. However, state and local government employment is dependent upon respective state and local budgets, which need to be balanced over certain time frame. That is, state and local authorities do not have the authority of running chronic budgets deficits that can run for decades without balancing at the Federal level. However, the assumption would be that a higher proportion of Federal Government jobs in any state economy should make it less volatile.

The second chosen category is construction jobs (C). This sector has some endogenous elements, depending on the size of the state. The construction industry is normally financed from external sources, driven by external factors such as interest rates and monetary policy [12]. Due to its highly cyclical nature, construction employment is one of the most volatile of categories in the entire survey, and the ultimate goal of this analysis is to explain volatility of overall employment in state economies.

The third category is manufacturing employment (M). The demand for most manufactured goods is externally driven from the nation or international countries. Manufacturing economies naturally are known to be more volatile than more service-oriented economies [2,13]. Manufacturing industries typically hold large inventories and these inventories are financed, leading to vulnerability attached to externally determined interest rates. The size of inventories is an important cyclical indicator since manufacturing employment does not begin to pick up again after a recession until those inventories are worked down. The U.S. economy has become less dependent on manufacturing jobs in recent decades, as the jobs have migrated to cheaper, lower-paying international labor locations. This is often listed as one aspect that has contributed to a less volatile U.S. economic cycle [27,30].

The fourth category is tourism (T). Whether the sector adds to or subtracts from overall economic volatility has been debatable [27]. Tourism is a service industry, implying that it is less subject to the natural volatility of sectors such as construction or manufacturing [2]. Tourism is cyclically sensitive

because households decide on vacations out of highly discretionary income. Expensive trips can easily be eliminated or curtailed as economic times and they can be restored when positive economic times return. There are states that are highly dependent on tourism, such as Hawaii and Nevada.

### 3.3. Data Analysis

The empirical specification investigated in the study is cross-sectional. This approach was taken in order to abstract from cyclical influences and focus on the structural nature of the economy. The dependent variable in all cross-sectional regressions reported in Table 2 is specified as the variance of annual percentage growth rates in non-farm employment for individual U.S. states from 1991 through 2018. A separate set of regressions was run using standard deviations rather than variances as the dependent variable. Results were similar, but analyses using variance to measure volatility are reported because statistical variance is merely standard deviation squared, and thus the former measure yields a broader range of volatility. The basic source for BLS establishment survey data was [economagic.com](http://economagic.com), available on subscription, which quotes data from 1990 through the most recently available year at the time of this investigation, which was 2018. Calculation of percentage rates of change in the data results in the loss of the 1990 observation year.

**Table 2.** Influence of four exogenous sectors on USA employment volatility; 1991–2018.

Model #; # of Observations		Intercept	FG	C	M	T	R <sup>2</sup> (AIC)
(1) 51 observations; All 50 states + D.C.	<i>B</i>	−4.428	0.051	0.474	0.101	0.414	0.513 *** (42.679)
	<i>SE</i>	2.017	0.074	0.270	0.069	0.084	
	<i>t</i>	−2.195	0.681	1.756	1.467	4.943	
	<i>p</i>	0.033	0.499	0.086	0.149	0.000	
(2) 46 observations; Excluding 5 states with gaps in data	<i>B</i>	−2.172	−0.719	0.759	0.006	0.339	0.624 *** (31.640)
	<i>SE</i>	2.052	0.231	0.264	0.074	0.081	
	<i>t</i>	−1.059	−3.110	2.875	0.080	4.167	
	<i>p</i>	0.296	0.003	0.006	0.936	0.000	
(3) 36 observations; Substituting only Durable Goods Manufacturing for states reporting it separately	<i>B</i>	−2.442	−0.654	0.817	−0.006	0.352	0.659 *** (27.357)
	<i>SE</i>	2.249	0.431	0.369	0.084	0.107	
	<i>t</i>	−1.086	−1.519	2.214	−0.077	3.307	
	<i>p</i>	0.286	0.139	0.034	0.939	0.002	
(4) 46 observations; Dropping Tourism and running regression with Total Manufacturing	<i>B</i>	0.741	−0.984	1.222	−0.096		0.465 *** (45.887)
	<i>SE</i>	2.274	0.262	0.282	0.083		
	<i>t</i>	0.333	−0.544	4.329	−1.163		
	<i>p</i>	0.746	0.001	0.000	0.251		

\*\*\* significant at 1% level, all using a two-tailed test for *t*-statistics. *B* (regression coefficient); *SE* (standard error); *t* (*t*-statistic value); *p* (probability value), AIC (Akaike Information Criterion).

The four independent variables were specified as the average percentage of the chosen category of employment to total non-farm employment over that same 1991–2018 interval. The specification abstracts from cyclical, seasonal, or trend influences on the raw data.

$$\sigma^2 = \alpha \pm \beta_1 \times FG \pm \beta_2 \times C \pm \beta_3 \times M \pm \beta_4 \times T \pm \varepsilon$$

Symbolically: where  $\sigma^2$  = Variance of annual percentage rates in total non-farm employment growth by state, FG = Average percent of Federal Government employment in total non-farm employment by state, C = Average percent of construction employment in total non-farm employment by state, M = Average percent of manufacturing employment in total non-farm jobs by state, T = Average percent of leisure and hospitality employment in total non-farm jobs by state,  $\beta'_s$  = Estimated coefficients,  $\alpha$  = Intercept, and  $\varepsilon$  = Error term.

## 4. Results

A number of cross-sectional regressions were run to investigate causal relationships involved, but four sectors are chosen for presentation in Table 2. Model (1) includes all 50 U.S. states plus the District

of Columbia, but a few states included in this analysis had gaps in the data that required approximation. Alabama, Delaware, and the District of Columbia do not report manufacturing employment separately, so those numbers were approximated from neighboring or similarly structured states. For Kansas, Federal Government employment is only reported from 2000 forward, and an average was calculated for those years only. Mississippi does not report Federal Government employment, so that state's Federal Government average was calculated by subtracting state and local government from total government number.

Model (1) results demonstrate the Federal Government and manufacturing to be not significant in influencing overall employment volatility. This was the best showing that manufacturing demonstrated in any of the regressions run. The construction sector is significant with the expected sign at the 10% level. The tourism sector showed by far the most robust outcome, significant at the 1% level. The coefficient indicates that a one percent increase in the tourism jobs share results in little less than a half percent increase in overall non-farm job variance across the sample of states. However, the independent variable measures are only proxies for economic activity in the chosen sectors, so that should be taken into account in the interpretation of the exact value of computed coefficients.

The approximation of data for the five states noted above is somewhat ad hoc and was undertaken only to report results for all states. Model (2) eliminates those five states from the sample, and slightly different outcomes can be observed. Federal Government employment is significant with the expected sign, and it is quite significant in explanatory power. Construction also rises to a much higher level of significance, but manufacturing drops out.

Tourism, however, remains strongest in explanatory power, and its estimated coefficient does not change. The weaker showing for manufacturing is somewhat puzzling given conventional assumptions that goods-producing economies are more volatile. Usually, durable goods manufacturing accumulates the tangible inventories that cause more volatility, and consumption of durables usually suffers more than non-durables in cyclical downturns. To test for this, Model (3) was analyzed, substituting only durable goods manufacturing employment for total manufacturing jobs. Unfortunately, the cause was not discovered. Federal Government and durable goods manufacturing are less than statistically acceptable ranges in that analysis. Construction and tourism remain to fill the gap in explanatory power.

Finally, given the tendency of tourism to dominate outcomes in other analyses, Model (4) was run, dropping the tourism variable, to see if other variables would rise in explanatory power in its absence. Durable goods manufacturing was not significant in Model (3), thereby Model (4) was run reverting to the total manufacturing measure. Both Federal Government and construction did rise markedly in significance over Model (3), but manufacturing did not get increased. In all cases, adjusted  $R^2$  was significant at the 1% level according to computed F-statistics.

Federal Government and construction were not strong in all models, but both do make a strong showing in Models (2) and (4) to lend support to causal influences on state economic volatility. Federal Government tends to reduce state economic volatility, and a higher average role for construction in a state economy tends to raise it, as expected. However, more striking is the fact that manufacturing makes the weakest showing in the U.S. and tourism makes the most powerful showing.

This analysis was undertaken as a cross-sectional study, but such a cross-sectional approach can mask some trends over time in the two decades examined. This can be seen clearly from charts at the national level on the two sectors. Figure 1 shows the demise of the U.S. manufacturing as international locations with lower labor costs have encroached for the U.S. economy. Likewise, as leisure time has increased within the U.S. and standards of living have risen internationally, tourism has grown substantially, as demonstrated in Figure 2. A review of Figures 1 and 2 can partially explain outcomes drawn in the study for these two sectors, and the trends are highly likely to continue.

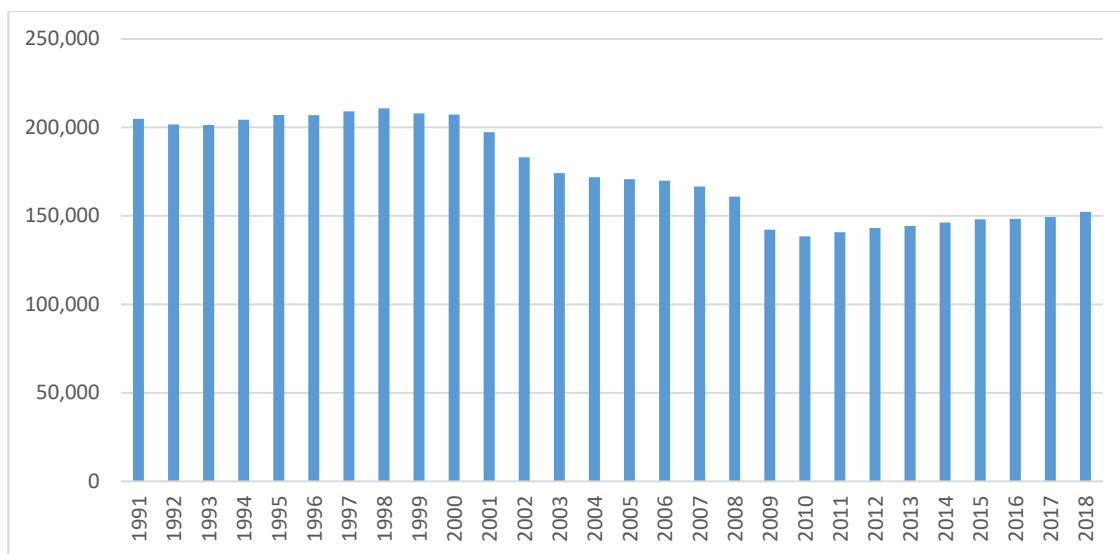


Figure 1. USA manufacturing jobs (000s): 1991–2018.

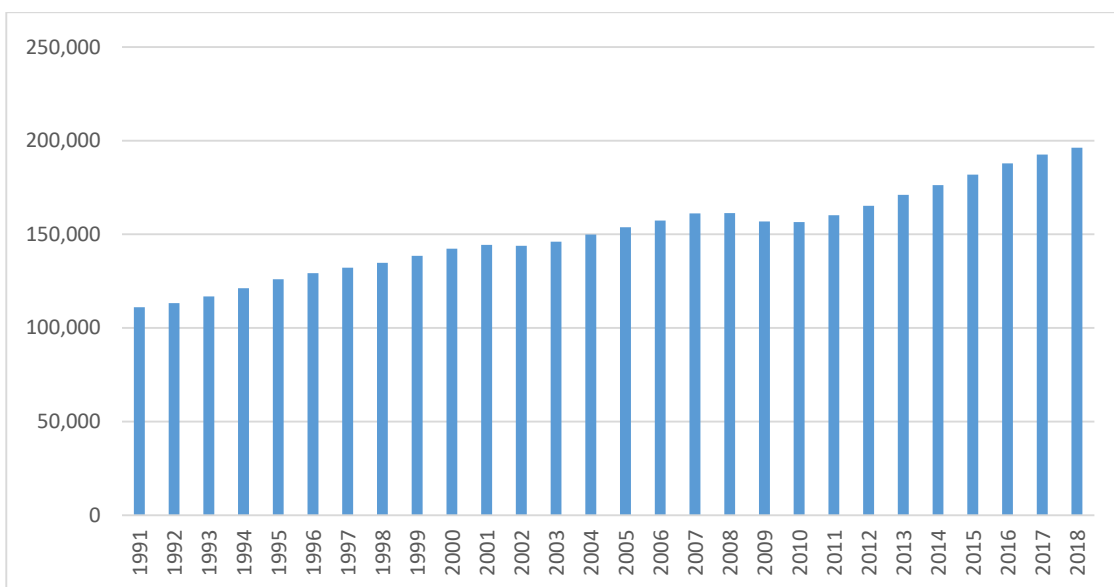


Figure 2. USA Leisure and Hospitality jobs (000s): 1991–2018.

### 5. Discussion and Conclusions

The main objective of the study was to explain the volatility of employment focusing on the structural nature of the economy among four sectors (Federal Government, construction, manufacturing, and tourism) of the NAICS survey. Tourism remains the strongest in explanatory power in influencing employment volatility among the identified sectors. It should also be recognized that tourism can contribute to the volatility of regional economic cycles. Tourism is by its nature, a service industry, and service-oriented economies are usually less volatile than goods-producing ones [27,30]. Therefore, the findings of this research paper supports the notation that tourism can add to regional volatility. However, among the four selected export drivers investigated in this study, tourism adds to regional job volatility most significantly.

Regional economies ultimately are driven by what they export to other regions or international countries. Often those export drivers are underestimated, but it would be difficult to highlight a better export engine than tourism [56]. When properly managed, tourism can serve to enhance and preserve local traditions, history, culture, and promote diplomacy among diverse groups [57]. Tourism can also



emerge in destinations that are less known or be used to promote unique locations resulting in the creation of jobs. It has been observed in this study that tourism has been displacing other sectors such as manufacturing in many regional economies in the U.S. On balance, that may be positive, due to the net externalities tourism can be attributed with (less polluting, labor intensive, creating jobs that often cannot be outsourced) than many of the sectors it is displacing [56]. Unlike some stereotypes of the tourism industry, employment opportunities in the tourism sector can create higher-paying positions as well as lower-paying jobs. With the rapid development of the leisure society coupled with changing demographics, the structural nature of a regional economy relative to levels of time and income along with consideration of the voluntary and involuntary aspects of leisure time with wide-varying levels of employment or unemployment. From the nature of the tourism industry itself to the cyclical effects of an industry susceptible to government policy and planning, pandemics, exports, along with other supply and demand functions of the economy accompanied by push and pull factors requires increasingly complex considerations.

Tourism is funded in most households by highly discretionary income [56]. When such income declines in a recession, that discretionary income can suffer and so can tourism. When better times return, tourism can flourish again. There are many forms of tourism, and certain types of tourism are less volatile than others. Economic forecasters in economies highly dependent on tourism are more aware than most of how important it is to analyze trends in other economies to gain insight into what that portends for their local economy. Tourism is, by its nature, complex that comprises organizations engaged in accommodations, food service, transportation, attractions and entertainment, and among other related support services. The network approach to tourism development may help to minimize fluctuations with unique forecasting, adaptation to change, and dynamic sources of collaborative inputs. The unique opportunities for stakeholder participation as part of the service experience may not exist to this degree in other sectors of the economy such as manufacturing and the often-transactional nature of other sectors in the regional economy. Tourism should be recognized for having the potential to increase the volatility of regional economic cycles. Service-oriented economies are usually considered less volatile than economies that are based on large manufacturing or goods-producing ones. However, a major result from this study determined that tourism does produce a large number of employment positions with service jobs being produced that most often cannot be outsourced to possibly result in increased volatility in regional economies. For tourism to demonstrate true resilience even through shocks, government and local agencies should realize the importance of tourism to the regional economy and provide a range of support and assistance for tourism businesses.

#### *Limitations and Future Studies*

The study adds a contribution to the area of research but has several limitations. The study attempted to measure how the structural mix of regional economies affect volatility of economic growth, but the current methodology may not fully capture the dynamic trends on the time series data. Therefore, future studies can split the time periods according to major events or policy changes during the data period and employ more dynamic approaches, such as a GARCH model. Future studies can also analyze spatial structure of regional economic volatility and provide a map to visualize the differences across states. Additionally, as the current study employed a mixture of cross-sectional and temporal case data and placed heavy emphasis on regional development from an economic and employment perspective, it may be beneficial for future research to investigate the trends in more comprehensive and multi-dimensional aspects such as cultural, social, and government policy factors for additional measures as well as other aspects of supply and demand in examining tourism impacts at the regional level of development. Last but not least, future research can possibly expand the study to include other regional economies that integrate sustainability into the four exogenous sectors that were investigated in the study to see if there are any significant differences that may occur in other regional economies.

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