Sun, Services and Development: Tourism and Household Welfare in Jamaica (Working Paper)

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Abstract

The industries in which a nation chooses to specialize can have important implications for structural change and economic development. A major service sector industry for which there are still significant questions to be answered regarding its impacts on local populations, is the global tourism sector. In this paper, I characterize the effects of tourism in the context of Jamaica. My question is: Are increases in the size of a nation's tourism industry welfare-improving for a nation's citizens? I employ a repeated cross-section of households between 2001 and 2021, tourist exit surveys, and administrative shapefiles. I analyze tourism spending and household welfare across hundreds of Jamaican development areas. I contribute by adding to the still-emerging literature on tourism and tradable services more broadly. I also contribute by conducting this research in Jamaica, where tourism is a cornerstone of the development strategy. In order to account for the likely endogeneity of development area tourism expenditures, I use a "Bartik-Style" shift-share instrumental variable (SSIV) identification strategy. Increases in tourist accommodation spending within a development area are associated with increases in per-capita household expenditures,but only for Urban households not working in the tourism industry. Increases in accommodation expenditures are also associated with decreases in the likelihood of urban households falling into poverty. There are only slight effects for rural households in the highest decile. Overall, I find that tourism can be welfare improving for some households and that there is evidence of sectoral spillovers, but that it can also exacerbate existing inequalities between urban and rural populations. I consider the implications of these findings for specialization in tourism, and services more generally.

Introduction

The growth of service sector industries has become a defining feature of structural change in modern developing economies. Tourism has been one of the most important sources of growth within global services (UNWTO 2023), and this has been especially true for lower and middle income countries(LMICs) (Nayyar et al. 2021).

Despite the undeniable growth in tourism services, there remain significant questions about it's ability to generate economic growth that raises real consumption across a broad cross-section of the population. It is also still unclear the scope for tourism to raise generate positive spillovers to other sectors of the economy through forward and backward linkages, and the extent to which linkages are possible across different contexts. I help to fill this gap in the literature by investigating the relationship between tourism and household consumption in the context of Jamaica, an upper middle-income country which has made tourism a pillar of its development framework[1].

In recent years, while manufacturing has remained largely stagnant in many developing economies (UNCTAD 2024) , between 1995 and 2019 services accounted for 66% percent of the world's growth in output and 57% of employment growth (UNWTO 2023). At the same time global travel and tourism has grown to become a US$10.9 trillion dollar industry representing 10% of the global economy [2], with a number of LMICs other than Jamaica choosing to develop master plans and frameworks for their development that feature tourism prominently such as Indonesia[3], Botswana[4], and India [5].

I answer the questions: 1. Do increases in tourist expenditures in municipalities Jamaica increase real per-capita consumption expenditures on average for households in that municipality? 2. Conditional on observing increases in per-capita consumption, to what extent are these consumption increases observed among households below or near the poverty line?

I contribute to the existing literature in several ways. The first way is in the rich household and tourism data that I employ to answer my questions. On the household side I use nearly 2 decades of the Jamaica Survey of Living Conditions (JSLC), a nationally representative survey of households covering a wide range of topics including consumption expenditures, poverty status, employment and other aspects of welfare. This dataset provides me with a repeated cross-section of roughly 30,000 households between the years of 2000 and 2021. My data on tourism comes from exit surveys conducted every year by the Jamaican Ministry of Tourism on a representative sample of tourists leaving the country. The surveys ask tourists detailed questions regarding their stay in Jamaica including, where they stay, how much they spent and on what, and demographics such as their income and country of origin.

From these two datasets I obtain a comprehensive picture of the changes in absolute and relative expenditure levels across the country over the period from 2000 to 2021. In order to account for the likely en-

[1]Source: (*Medium Term Socio-Economic Policy Framework 2024-2027* 2025)
[2]Source: (*International Tourism Highlights, 2024 Edition* 2024)
[3]Source: (*Environmental And Social Management Framework* 2018)
[4]Source: (*Kasane - Kazungula Tourism Development Master Plan 2022-2032* 2021)
[5]Source: (*National Strategy For Sustainable Tourism* 2022)

dogeneity of tourism levels in a particular part of the country to my outcome variables of interest, I use a shift-share instrumental variable strategy, exploiting variation across tourists from different regions of origin in where they go in Jamaica and how much they spend.

Armed with these plausibly exogenous shocks to tourism levels over a 20 year period, I use two stage least squares(2SLS) to estimate a linear instrumental variable regression model. In order to be able to better understand heterogeneity in the impacts of these shocks I also estimate an instrumental variable quantile regression(IVQR) I find that an increase of in tourism expenditure levels is associated with an increase of in real per-capita household expenditures of urban households, with no effects on average observed for rural households.

Tourism, Economic Development, and Welfare

This paper fits most directly within the literature studying the relationship between tourism, economic development and the welfare of households. One segment of this literature attempts to quantify the impacts of tourism specialization via wages, sectoral spillovers and agglomeration economies.

In their paper studying tourism and economic development in Mexico, Faber and Gaubert (2019) develop a quantitative spatial equilibrium model to explain the long-run effects of specialization in tourism services both locally and nationally. They find that tourism specializing municipalities experience significant gains relative to regions that do not specialize in tourism, with backward linkags to manufacturing serving as a key mechanism They also find that because of agglomeration economies, the gains in touristic regions are largely offset by losses in less touristic areas of the country, with long run gains instead resulting from market integration effects. The authors Wattanakuljarus and Coxhead (2006) use a general equilibrium approach to specifically investigate the degree to which tourism growth benefited the poorest segments of Thai society. In their paper they found that growth in tourism raised aggregate income but worsened inequality, which they attribute to the the lack of labor intensity in Thai tourism as well as the fact that general equilibrium effects of tourism shocks harmed the agricultural sector which is a major employer of the poor. Other works in the literature have found that tourism produces short-run gains but that these do not extend over the long term (Caliendo et al. 2017).

My study complements these existing works along several dimensions. Whereas Faber and Gaubert (2019) and Caliendo et al. (2017) focus on long run municipality-level and national- level outcomes, I exploit the temporal and demographic granularity of my data to quantify the heterogeneous short-run effects of tourism sector growth. The richness of my data further enables me to evaluate the general equilibrium channels that Faber and Gaubert (2019) and Wattanakuljarus and Coxhead (2006) model. Another contribution of my work relative to these studies is that my analysis takes place in a country where tourism is overwhelmingly an exported good, with over 90% of Jamaican tourism revenue coming from international visitors in 2023 (STATIN 2019) as opposed to about 60% in Poland in 2024 and approximately 20% in Mexico (Faber and Gaubert 2019). To the extent that the export-share of these industries is associated with different levels of

productivity growth, different skill requirements of workers, and sectoral vulnerability to external shocks these differences could imply meaningful differences in the the impacts of tourism specialization between these countries, and may be of great importance for countries hoping to pursue tourism lead growth.

An emerging strand of the tourism literature has focused on using urban spatial equilibrium models to quantify the short-run welfare impacts of tourism in modern cities. In Allen et al. (2021) the authors study the short-run welfare impacts of tourism shocks in Barcelona. In their paper they combine reduced form analysis with general equilibrium modeling to answer the question of whether or not tourism is good for locals, with the welfare outcome a contest between tourism induced cost of living increases, or tourism driven wage growth dominate. They account for the endogeneity of heterogeneous tourism intensity by using variation in tourist countries of origin and heterogeneous neighborhood preferences to construct a shift-share instrumental variable. I adapt this identification strategy to my own question and context. In Amsterdam, Almagro and Domínguez-Iino (2024) similarly consider the interplay between local resident welfare outcomes and increases in tourism. The authors specifically detail how growth in short-term-rental tourism impacts the development of residential amenities, and further describe how the welfare impacts of these changes are a function of distributional and demographic characteristics. Certain demographics of residents with similar amenity preferences to tourists experience welfare increases from positive tourist shocks, while and older, wealthier residents with different amenity preferences experience welfare losses.

My paper similarly investigates how the effects of tourism are mediated through demographic and socioeconomic characteristics of locals, as well as through the potential effects of tourism spending on local prices, but the lion share of touristic activity in Jamaica is far less integrated with the Jamaican economy than in the cases of Barcelona and Amsterdam. A major reason for this is the dominance of the All-Inclusive resort model of tourism in much of the country's touristic areas as is the case in many tourism dependent developing economies (Tavares 2015). This resort model is characterized by accommodations that provide a comprehensive package of accommodations, dining, and activities, primarily restricted to the resort premises (Issa and Jayawardena 2003). As a result tourists often spend considerably less in the communities in which the resorts are located than when staying in other types of accommodations (Çiftçi et al. 2007). These differences in spending patterns and the structure of tourism may very well result in very different welfare outcomes even from shocks of comparable magnitudes, which further supports the value of my study.

Service Lead Structural Transformation, Trade and The Geography of Economic Activity

This study is also related to the expansive literature that works at the intersection of service lead structural transformation, trade and economic development. Canonical models such as the Dual Sector or Lewis Model (Lewis 1954), postulate that transition of surplus labor out of agriculture, and into high productivity manufacturing provides enable gains in productivity that generate economic growth and raise the living standards of a population. The dual role of manufacturing as a destination for surplus labor, and as a source of pro-

ductivity gains lies at the heart of the model. This subset of the literature is particularly concerned with the implication of numerous countries progressing straight from agriculture into services, without ever industrializing. Tourism growth has been one of the biggest components this new service-lead structural transformation (Nayyar et al. 2021).The uncertainty about whether or not services such as tourism can produce comparable gains in productivity while also being inclusive is of first-order importance. If there is potential for large multiplier effects from growth in tourism such as Faber and Gaubert (2019) found in Mexico, this would support tourism activities holding a prominent place in national development plans as it does in Jamaica and other emerging economies.

If tourism either fundamentally or within the specific context of a country does not exhibit either or both the inclusiveness of manufacturing or its capacity for growth through innovations and connections to other sectors, specialization may not yield the returns that are sometimes hoped for by policymakers. The 2021 World Bank Report on Services (Nayyar et al. 2021),classifies the tourism related activities of Accommodations Services, Wholesale Retail, and Transportation Services as low-skill tradable services. Importantly; they show that the twin benefits of inclusive labor absorption and productivity growth are not present in any single service category. Low-skill tradable activities like tourism are very inclusive, bringing in large numbers of unskilled workers and women. The authors specifically point to the Wholesale and Transportation subsectors as having a moderate level of capital intensity, and the potential to exploit linkages to other sectors

At the same time they note that increases in productivity have largely been driven by the mechanical transition of labor away from agriculture, but not by all-important within-sector productivity growth. It is well known that the complexity of the goods in which a country specializes has a strongly positive relationship with incomes (Hausmann et al. 2006). The trend of the reduction in the relative share of manufacturing in many economies is also discussed by Rodrik (2016). In the

The potential effects of de-industrialization are intimately tied to the geographic aspects of structural transformation; namely the patterns of rural-urban migration resulting from the growth of sectors that are based in cities. Works such as those by Gollin et al. (2016), Venables (2017), discuss how gains from urbanization depend on whether or not the industries in an urban area have capacity for growth and productivity. They also point out that urbanization that draws large numbers of people into lower productivity non-tradable services could in fact be a drag on longer term gains. In this way such a type of urbanization could contribute to effects consistent with the “Dutch-Disease" framework of Corden and Neary (1982)

India is shown by Fan et al. (2023) to have achieved great gains from service sector specialization in large part because of increasing productivity in urban consumer services that benefited wealthier urban dwellers.They find that productivity growth in consumer services from 1987 until now has accounted for approximately 1/3 of the increase in economic well-being that Indias citizens have experienced in the previous several decades. They also show show that the gains generate unequal welfare effects across the population, with affluent, urban households experiencing the most notable rise in living standards, while rural households did not experience comparable benefits. My work also relates to studies the impacts of local shocks to certain sectors and

attempts to characterize how those shocks propagate through the local economy (Moretti 2010; Aragón and Rud 2013; Bonilla Mejía 2020).

While there has not been extensive work done on internal migration within Jamaica, based on my discussions with numerous Ministry of Tourism officials have revealed how the continued tourism boom has drawn Jamaicans from rural areas to the coasts. Many of these poor workers have clustered in informal settlements. I contribute to this literature by providing in depth reduced form analysis of how changes in tourism yield changes in real consumption for households in many of the countries growing urban tourism regions and hinterregions.

Shift-Share Instrumental Variable Techniques

My study also joins an extensive set of research employing shift-share instrumental variable(SSIV) identification strategies to correct for endogeneity. Since having been first introduced in Bartik (1991) in a study of the growth rate of employment of specific sectors, SSIVs have proven extremely versatile in a diverse array of areas including trade and labor (Autor et al. 2013; Hummels et al. 2014), health (Miguel and Kremer 2004), migration and labor market outcomes (Card 2009), and the welfare impacts of location sorting (Diamond 2016). In one of the most influential application SSIV strategies, Autor et al. (2013) study the effects of increases in import-competition by Chinese firms on local U.S. labor markets during the period 1980-2007. They instrument for U.S. imports by using changes in imports from China in 8 other countries, combined with the share of employment in different U.S. tradable sectors. As is evident from this sample of works using SSIV, these instruments are particularly effective for identifying the the true effect of shocks such as those to an industry or region on outcome variables like employment, and this helps motivate my own SSIV identification strategy.

In constructing and evaluating my SSIV I follow the literature regarding best-practices for achieving accurate inference from this instrumental variable stategy. I adapt the SSIV strategy of Allen et al. (2021), in my study, exploiting variation across the period of my study in where tourists of from certain origin regions choose to stay in Jamaica, and how much they spend. My estimation strategy follows the exogenous shock-based framework put proposed by Borusyak et al. (2022), as opposed to the exogenous shock based approach of (Goldsmith-Pinkham et al. 2020). The papers Borusyak et al. (2022), and Borusyak et al. (2024b), provide a detailed guidelines to ensure accurate shift-share inference in the presence of exogenous shocks, and specifically for my case a panel of exogenous shocks. Regarding accurate calculation of standard errors in SSIV designs, Borusyak et al. (2024b) and Adão et al. (2019) develop techniques for calculating standard errors that account for correlation in the residuals of units exposed to similar shocks. In their paper Adão et al. (2019) demonstrate that failure to account for residual correlations can lead to over-rejection of the null hypothesis. In use the approach of (Adão et al. 2019) in my analysis.

1 Context and Background

1.1 Global Tourism Industry

Rapid growth in the global tourism industry has been a consistent feature over the last two decades, during which the UN World Tourism Organization estimates that the number of global travelers has increased from roughly 700 million 25 years ago to 1.3 billion in 2024 (*International Tourism Highlights, 2024 Edition* 2024). According to the World Travel and Tourism Council, tourism made up roughly 10% of global GDP in 2019, accounting for 25% of all new jobs created worldwide (UNWTO 2023). Following the COVID-19 pandemic which saw the collapse of the industry, the global tourism sector rebounded to 80% of pre-pandemic levels in the first quarter of 2023, with roughly 235 million people traveling internationally; more than double the number during the same period in 2022 (UNWTO 2023).

Tourism has a number of qualities that make it an attractive sector in which to specialize for a developing country. It is an excellent source of foreign exchange, and as a labor-intensive sector it is capable of absorbing large numbers of unskilled workers (Nayyar et al. 2021). The 2021 World Bank Report on Services (Nayyar et al. 2021), divides the incredibly broad category of service sector industries into 4 distinct categories which exhibit large levels of heterogeneity in their scope to absorb low-skilled labor, generate spillovers to other sectors of the economy via linkages, and the ability to generate productivity gains that contribute to long run economic growth.

Despite its strengths tourism also exhibits some weaknesses relative to sectors such as manufacturing, namely, the level of its linkages to other sectors and its scope for productivity growth.

1.2 Jamaican and Tourism

Jamaica is an island nation in the Caribbean sea with a population of 2.8 million people. An upper middle-income country, Jamaica;s economy is heavily based upon tourism, which accounts for over 10% of GDP directly, and over 30% when accounting for spillovers (Mooney 2020). The tourism sector also comprises about 30% of the labor force when considering direct and indirect employment (Mooney 2020). Other Caribbean countries have comparable levels of specialization in tourism services, with the tourism comprising an average of 25% of Caribbean GDP between 2015 and 2019 according to the OECD (<**empty citation**>).

Table 1: **Global, Regional, and Jamaican Tourism Statistics**

Indicator	Value
Panel A: Global & Caribbean Region Tourism Statistics	
International Tourist Arrivals (2023)	1.3 billion USD (UNWTO)
International Tourism Export Revenues (2023)	1.8 trillion USD (UNWTO)
Global Tourism GDP Share (2023)	3% (UNWTO)
Share of Global Trade in Services	23% (UNWTO)
Average Growth in International Arrivals (2000–2023)	4.1% annually (UNWTO)
Caribbean Tourism Arrivals (2024)	34.2 million (CHTA)
Tourism Average Share of Caribbean GDP (2015–2019)	25.4% (OECD)
Panel B: Jamaican & Caribbean Tourism	
Poverty Rate	4.15 million (MOT)
Agricultural Share of Employment	2.9 million (MOT)
Manufacturing Share of Employment	1.25 million (MOT)
Service Share of Employment	*n.a.*
Tourism-Related Services Share of Employment	*n.a.*
Total Roomnights Sold in Jamaica (2024)	5.75 million (MOT)
Jamaica Total Tourism Earnings (2024)	4.2 billion USD (MOT)
Panel C: Jamaican Tourism Sector Capital Stock & Infrastructure	
Jamaica Hotel Room Capacity (2024)	26,427 rooms (MOT)
Average Growth in Hotel Room Stock (2000–2024)	2.6% (MOT)
Total Number of Hotels (2024)	210 properties (MOT)
Total Workers in Accommodation & Restaurant Services (2024)	43,913 (MOT)
2025/2026 Ministry of Tourism Budget	95.5 million USD (MOT)

Source: United Nations: World Tourism Organization,Caribbean Hotel & Tourism Association, Jamaican Ministry of Tourism(MOT).

Jamaica welcomed over 4.3 million tourists in 2024, earning over 4.2 billion in foreign exchange as shown in table 1. The Caribbean overall welcomed 34 million tourists in the same year. Jamaica is also heavily specialized in services, with the service sector comprising some $_{o}ftheeconomy.Othersectorsincludemanufacturing,miningandagriculture.$

Following independence in 1962 the Jamaican government worked to build out the country's tourism and mining sectors, exploiting the natural resources of "Beaches and Bauxite" as described by **king_evolution_2001**. The government created the Ministry of Tourism and instituted various laws such as The Tourist Board Act(), and the Hotel Incentives Act (Jamaican Ministry of Tourism 2020) were instituted to support the development of the new sector. Considerable investments were made in infrastructure, with the geographic base of the industry being the northern and western coasts of the country where the industry.

Out of the over 4.2 million visitor arrivals in 2024, roughly 2.7 million were "stop-over" visitors; those that spend at least 24 hours in the country according to the MOT (*Annual Travel Statistics 2024* 2025). The remaining 1.6 million are cruise visitors, who typically do not spend more than 24 hours in the country. While stop-over visitors made up about 56% of total arrivals to Jamaica, their spending made up over 95% of total visitor expenditure as can be seen in the MOT Annual Statistics publication for 2019 (Jamaican Ministry of Tourism 2020). Therefore, in order to best understand the impact of tourism on economic development, it is reasonable to devote the greatest amount of attention to the stop-over segment of the population of visitor arrivals.

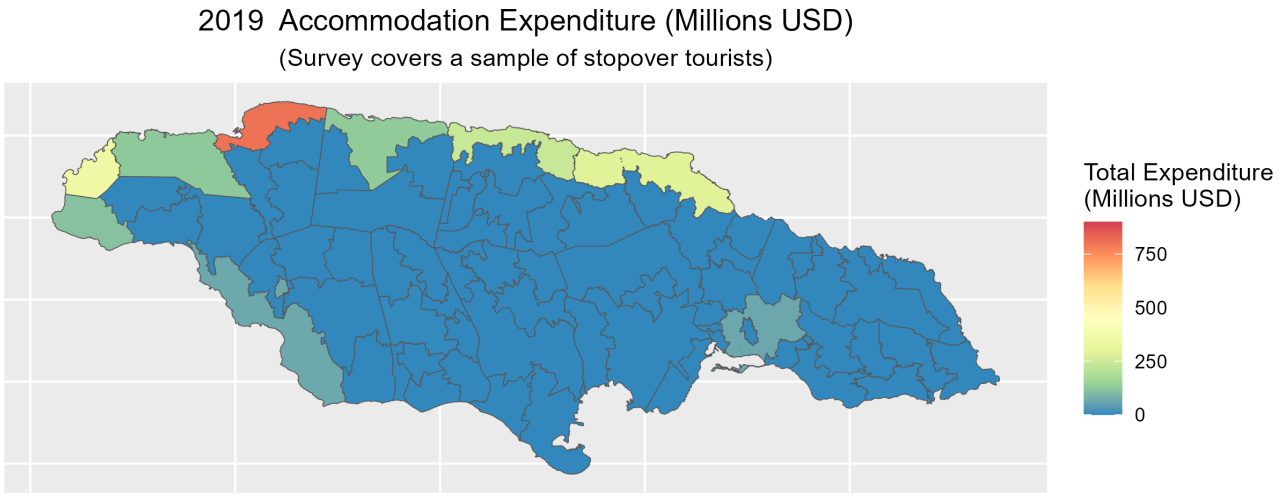

Figure 1: **Tourism Accommodation Expenditures Across The Island**

Table 2: **Tourist Summary Statistics**

	(1)		
	Mean	Standard Deviation	Median
Avg. Accom Price per Person	590.03	495.58	520.69
Number of People in Party	1.95	0.96	2.00
Total Cost of Trip	2706.91	1845.23	2350.90
Length of Stay	7.47	5.88	7.00
Visit for Vacation	0.74	0.44	1.00
Return Visitor	0.47	0.50	0.00
Summer Visitor	0.57	0.49	1.00
Income Over US60,000	0.50	0.50	0.00
Observations	78774		

Source: Author's own calculations based on Ministry of Tourism Exit Surveys (2000–2023).

The Jamaican tourism industry is a spatially concentrated sector. In 2019, over 75% of visitors stayed at accommodations located in either Saint James, Trelawny, Saint Ann, Saint Mary, Westmoreland or Hanover. Said another way, the vast majority of tourism activity occurs on the north and west coasts of the island. The MOT divides the country into 6 'Resort Areas' based on a combination of location and types of amenities offered.

As is to be expected, the tourism industry is a major employer. According the IADB, the tourism sector employed approximately 250,000 Jamaicans in 2019 either directly or indirectly (Mooney 2020). This was a roughly a quarter of the labor force at the time. Given spatial variation in the the intensity of touristic activity, and temporal variation in this intensity, there exists the opportunity to causally identify the impacts of tourism on Jamaican households.

The tourism sector has grown considerably over the last 60 years, and since 2000, arrivals have grown on average 5% per year and the average room stock has grown by an average of 2.6%. However this consistent growth has not translated into larger growth in the economy. Over the same period of time growth rates of real GDP per capita has oscillated betwen 1 and -1 percent. Value added per-worker has also not changed significantly, even as the tourism share of the labor force has continued to increase and the sector has continued to be seen as a means of generating long run growth improving living standards. This motivates my analysis of the relationship between tourism earnings and household welfare.

2 Jamaican Economy Background

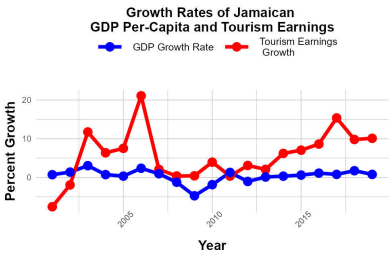

Figure 2: Tourism GDP Growth
Source: World Bank

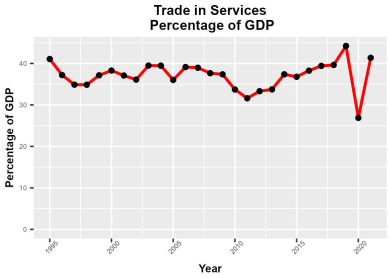

Figure 3: Services Sector Share
Source: World Bank

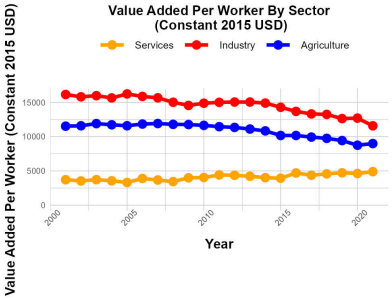

Figure 4: Multi-Sector Value Added
Source: World Bank

2.1 Household and Labor Force Heterogeneity

Despite Jamaica's small size, there is great variation in consumption levels across different areas of the country. While average real per-capita consumption expenditure is 3021 USD for households during my study period, average real per-capita consumption expenditures are 34 percent higher in urban areas compared to rural areas as is shown in panel b of table 3. There are also statistically significant differences in the non-food share of expenditures which is 4 percentage points higher in urban areas relative to rural areas. Regarding education, the average years of schooling is 12.15, years indicating completion of high school. Rural household heads have on average .89 less years of schooling than urban household heads.

The tourism labor force enjoys higher per-capita consumption expenditures when adjusting for regional differences in prices as can be seen in table 4. The largest shares of the labor force is concentrated in the service sector and agriculture, with agricultural households having the lowest per-capita expenditures as is to be expected given the previous results on rural-urban differences.

Table 4: **Characteristics of Labor Across Major Sections**

	Agriculture		Consumer_Services		Manufacturing		Not_Specified		Services		Tourism_Services	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Per-Capita Consumption	2299.49	1778.82	2974.77	2743.23	3069.62	2379.43	3045.99	2634.53	3607.18	3150.94	3548.34	3046.32
Per-Capita Total Expenditure	2430.71	2047.122	3183.94	3158.568	3364.19	3018.163	3221.06	3002.343	4181.99	4303.265	3915.44	3878.217
Per-Capita Food Expenditure	1227.72	975.184	1443.98	1612.628	1460.12	1043.184	1457.88	1208.271	1598.78	1324.342	1655.67	1295.775
Per-Capita Non-Food Expenditure	1072.06	1024.351	1530.79	1704.339	1609.49	1640.466	1591.01	1790.108	2008.50	2261.944	1893.32	2194.854
Per Capita Non Consumption Expenditure.(USD 2019)	193.65	631.751	290.84	857.966	371.54	1122.027	286.52	897.275	708.36	1841.048	449.24	1523.801
Non-Food Share of Consumption Expenditure	0.45	0.132	0.50	0.132	0.50	0.132	0.49	0.154	0.52	0.140	0.51	0.136
Non-Food Share of Tot. Expenditure	0.44	0.129	0.47	0.129	0.48	0.128	0.47	0.150	0.47	0.130	0.48	0.132
Consumption Share of Tot. Expenditure	0.97	0.068	0.96	0.075	0.95	0.086	0.97	0.070	0.92	0.117	0.95	0.091
Years of Schooling	10.51	3.514	12.28	3.998	12.44	2.716	11.87	4.916	13.47	4.108	12.86	4.432
Household Decile	4.28	2.617	5.31	2.737	5.52	2.727	5.17	2.930	5.92	2.871	6.04	2.680
Observations	6620		6719		1330		7006		5029		2862	

Source: Author's own calculations based on the J SLC.

Panel A: Full Sample Summary Statistics

Table 3: Household Characteristics: Full Sample and Urban–Rural Comparison

	Mean	Median	SD
Per-Capita Consumption	3020.99	2326.76	2682.68
Per-Capita Total Expenditure	3294.84	2415.31	3307.689
Per-Capita Food Expenditure	1450.57	1162.94	1307.787
Per-Capita Non-Food Expenditure	1571.12	1087.53	1803.881
Per Capita Non Consumption Expenditure.(USD 2019)	380.11	49.67	1217.168
Non-Food Share of Consumption Expenditure	0.49	0.49	0.140
Non-Food Share of Tot. Expenditure	0.47	0.46	0.135
Consumption Share of Tot. Expenditure	0.96	0.99	0.086
Years of Schooling	12.15	12.00	4.307
Household Decile	5.26	5.00	2.833
Male HH Head	0.51	1.00	0.500
Female HH Head	0.41	0.00	0.491
Single Male	0.06	0.00	0.241
Single Female	0.02	0.00	0.144
Observations	29566		

Panel B: Urban vs Rural Comparison

	Urban Households		Rural Households		Comparison
	Mean	SD	Mean	SD	T-Statistic
Per-Capita Consumption	3602.86	3161.80	2682.49	2292.67	25.35***
Per-Capita Total Expenditure	3990.83	3983.195	2889.95	2762.260	24.26***
Per-Capita Food Expenditure	1613.62	1289.520	1355.71	1308.996	14.04***
Per-Capita Non-Food Expenditure	1990.36	2319.748	1327.30	1362.054	26.84***
Per Capita Non Consumption Expenditure.(USD 2019)	523.55	1487.020	292.83	1008.639	11.60***
Non-Food Share of Consumption Expenditure	0.52	0.145	0.48	0.135	24.67***
Non-Food Share of Tot. Expenditure	0.48	0.139	0.46	0.131	19.51***
Consumption Share of Tot. Expenditure	0.95	0.095	0.96	0.080	-12.44***
Years of Schooling	12.65	3.926	11.76	4.538	12.28***
Household Decile	6.02	2.806	4.81	2.752	32.65***
Male HH Head	0.47	0.499	0.53	0.499	-7.84***
Female HH Head	0.44	0.497	0.39	0.487	9.41***
Single Male	0.06	0.234	0.06	0.245	-5.88***
Single Female	0.03	0.159	0.02	0.135	6.58***
Observations	11196		18370		29567

Notes: All statistics are weighted by household size. Panel A reports means, medians, and standard deviations for the full sample. Panel B compares urban and rural households using t-tests with unequal variances. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

3 Conceptual Framework

I will now describe a high-level conceptual framework adapted from Moretti (2010), in his analysis of the effects of a shock to the tradable sector for a local labor market. My approach is also influenced by Aragón and Rud (2013) who applied the Moretti (2010) framework to studying the Yanacocha Gold Mine in Peru. Additionally, I also draw insights from Allen et al. (2021) and Almagro and Domínguez-Iino (2025) in their investigations of the relationship between urban tourism and local welfare.

In the simpler framework of Moretti (2010) there is a nontradable sector and a nationally traded sector that are both competitive and that both use labor in production. Labor supply is upward sloping and is determined by workers' preferences over locations. Housing supply is determined by local geography and policy. I adapt this framework to Jamaica. I consider each development area or municipality as a single economy. Nontraded goods will have locally determined prices. This category will included housing and local services.

Assume that there are a collection of municipalities/ m in Jamaica, which is a small open economy. Each municipality is a competitive economy that produces a vector of internationally and domestically tradable goods and a vector of local goods. The internationally tradable goods are given by $x_1, x_2, x_3, ..., x_n$ and their prices are determined globally, while the nontradable goods $g_1, g_2, g_3, ..., g_J$, whose prices are determined locally. Each of these goods are produced using labor, which can be either high skilled or low-skilled, with high-skilled workers having a relatively higher level of productivity than low-skilled labor. Labor is mobile across sectors in a municipality so wages and marginal product are equal. Local labor supply for each type is upward sloping and depends on geographic mobility and the distribution of tastes for leisure.

Let us consider the case of a positive shock to tourism in locality m resulting from the arrival of a new resort. The opening of the new property increases the room stock of the area, and thousands of additional tourists now visit. There a permanent labor demand shock in municipality m for tourism sector x_1, that generates an increase in employment in that industry. The effect of this shock on the welfare of households in the local area will depend on 3 channels.

The first channel is that of wages and the implied effects on consumption expenditures. There is a direct effect on wages in the local tourism sector, along with the effect of the shock on wages in sectors that provide inputs to tourism. There may also be a change in the wages of other sectors owing to the increased labor demand from tourism, as well as potential general equilibrium effects from either increasing tourism incomes or an increased number of workers in the tourism sector living in the municipality.

The extent to which the there is a change in wages paid in the sector will depend on both the type of labor demanded, labor supply elasticity for said type of labor, and the labor intensity of the production technology. In so far as the labor technology is near constant returns to scale, and labor supply is relatively elastic, then we would expect there to be an increase in tourism employment without a major adjustment in wages earned by tourism workers. In other words, if the number of workers per tourist necessary for T arrivals as for cT arrivals, for some constant $c \geq 1$, and there is a large supply of labor, then real wages should remain

Panel A: Agriculture vs Tourism Sector

Table 6: Agriculture vs. Tourism Services Comparison

	Agriculture		Tourism Services		Difference
	Mean	SD	Mean	SD	T-Stat
Per-Capita Consumption	2965.58	2372.50	3548.34	3046.32	-19.48***
Per-Capita Total Expenditure	3186.53	2767.628	3915.44	3878.217	-18.82***
Per-Capita Food Expenditure	1646.33	1346.511	1655.67	1295.775	-13.87***
Per-Capita Non-Food Expenditure	1319.75	1346.134	1893.32	2194.854	-18.72***
Per Capita Non Consumption Expenditure	341.91	897.240	449.24	1523.801	-8.50***
Non-Food Share of Consumption Expenditure	0.43	0.143	0.51	0.136	-22.66***
Non-Food Share of Tot. Expenditure	0.42	0.140	0.48	0.132	-17.70***
Consumption Share of Tot. Expenditure	0.96	0.083	0.95	0.091	11.81***
Years of Schooling	10.27	3.765	12.86	4.432	-17.95***
Household Decile	5.25	2.818	6.04	2.680	-27.06***
Male HH Head	0.54	0.499	0.61	0.488	0.23
Female HH Head	0.15	0.352	0.34	0.474	-15.37***
Single Male	0.30	0.458	0.04	0.196	18.22***
Single Female	0.02	0.141	0.01	0.096	-3.39***
Observations	6621		2862		9483

Panel B: Manufacturing Vs. Tourism

Table 7: Manufacturing vs. Tourism Services Comparison

	Manufacturing		Tourism Services		Difference
	Mean	SD	Mean	SD	T-Stat
Per-Capita Consumption	3940.06	3235.83	3548.34	3046.32	-5.54***
Per-Capita Total Expenditure	4422.46	4229.719	3915.44	3878.217	-5.01***
Per-Capita Food Expenditure	1902.13	1430.458	1655.67	1295.775	-5.07***
Per-Capita Non-Food Expenditure	2037.93	2244.189	1893.32	2194.854	-4.71***
Per Capita Non Consumption Expenditure	627.78	1744.541	449.24	1523.801	-1.48
Non-Food Share of Consumption Expenditure	0.50	0.143	0.51	0.136	-2.40*
Non-Food Share of Tot. Expenditure	0.46	0.138	0.48	0.132	-1.94
Consumption Share of Tot. Expenditure	0.94	0.100	0.95	0.091	1.25
Years of Schooling	12.35	2.790	12.86	4.432	-2.69**
Household Decile	6.43	2.732	6.04	2.680	-5.27***
Male HH Head	0.52	0.500	0.61	0.488	-0.80
Female HH Head	0.25	0.433	0.34	0.474	-2.83**
Single Male	0.20	0.403	0.04	0.196	4.91***
Single Female	0.02	0.156	0.01	0.096	-1.55
Observations	1330		2862		4192

Notes: All statistics are weighted by household size. Panel A reports means, medians, and standard deviations for the full sample. Panel B compares urban and rural households using t-tests with unequal variances. *** p<0.01, ** p<0.05, * p<0.1.

the same. We can expect the same factors to influence wages in the other sectors of the local economy. The stronger the linkages between tourism and other sectors in the same locality,the larger the expected increase in either employment or wages in those sectors, depending on their labor intensity. The magnitude of the increase will also depend on whether much of the labor demanded is low-skilled or high-skilled, and the degree to which they are substitutable, as they may have different supply elasticities.

The increase in total wages paid may then be offset by increases in the cost of local nontradables. The increase in the cost of housing will depend on the local housing supply elasticity as well as the amount by which the population increases from the shock. Whether there is an increase in demand for local services will be determined by magnitude of the increases in either average wages or the total number of wage earners living in the municipality, as well as their preferences for nontradables. The skill-types of these workers will also influence the outcome, as higher-skilled workers will generally command higher salaries because of their relatively higher productivity levels. If there is a tightening of the labor market for one or both types of labor resulting from the tourism demand shock, the costs of producing local services increases and their supply decreases, further increasing their prices.

The second channel is non-accommodation tourist spending in the locality. Tourists may spend on goods, entertainment, food and other offerings within a community. The strength of this channel depends on how integrated the tourist experience is with that of locals. If tourists spend considerable time in the communities where they are staying, there may be greater demand for the services offered by local businesses thus increasing total dollars spent in the community. As Faber and Gaubert (2019),Allen et al. (2021), and Almagro and Domínguez-Iino (2025), there may also be positive effects on local amenities. However, this may also result in local services becoming more expensive and at least partially offsetting the benefits of the tourist presence to local incomes. A more segregated structure of the tourist experience will imply less spending on activities in the local community, and likely less tourist facing amenities, but may also insulate communities from the crowding out effects discussed in other studies.

Whether or not local households benefit from the tourism shock therefore depends on whether the increases in earnings and the improvements in amenities outweigh the price increases in the local nontradable sector.

My descriptive statistics suggest that the Jamaican tourism model is characterized by a low amount of integration between tourism activities and those of locals, as I described in the previous section. Labor in the Jamaican tourism sector is largely low-skilled, in line with the analysis of Nayyar et al. (2021) in their categorization of tourism services as a low skilled tradable service. My evidence also suggests that the workforce in Jamaica is relatively mobile between development areas, as conversations with the Ministry of Tourism have indicated that the tourism labor force attracts workers from poorer and rural communities to the coastline for work. For much of my study period, high unemployment was a persistent challenge for the Jamaican government. This suggests there was a sizable supply of low-skilled labor available for tourism shocks. This has resulted in shanty-towns developing in and around some resort areas due to migrants being unable to afford

local housing. Given these characteristics of the Jamaican setting, we can generate 5 testable predictions from this framework based on Moretti (2010).

1. There will be an increase in real per-capita consumption among households in areas exposed to positive tourism shocks relative to areas farther from these shocks. This increase will be determined by the low-skilled labor supply elasticity, and its mobility both within and outside Jamaica.
2. The tourism sector experiences an increase in its total wage bill through larger employment, but there will be little to no increase in real per-capita expenditures because of a highly elastic low-skilled labor supply with significant mobility.
3. The increase in real per-capita consumption will be highest among households working in local non-tradable sectors. To the extent that worker skill correlates with ownership and work in local nontradable services, this tourism shock will increase real consumption among the most affluent.
4. There are increases in the prices of local nontradable goods, particularly in areas with less or no all-inclusive tourism such as Kingston, Jamaica. The increase in prices owing to spending from tourists will be relatively less in tourism areas specializing in all-inclusive tourism. The extent of this increase will depend on the size of the tourism shock, and the labor supply elasticity.
5. The likelihood of a household being in poverty will decrease. This occurs as a result of households moving from lower paying sectors into tourism and because of households in local non-tradables earning higher wages. The extent of this reduction in poverty will depend on the labor supply elasticity, the size of the tourism demand shock, and the degree of price increases resulting from tourism spending.

4 Data

In order to carry out my analysis I combine household datasets, tourist expenditure surveys, and administrative shapefiles.

My primary source for data on households comes from the Jamaica Survey of Living Conditions(JSLC). The JSLC is an annual Living Standards and Measurement(LSMS)-style survey conducted on a representative sample of the Jamaican population. It is administered by the Statistical Institute of Jamaica(STATIN). The JSLC uses a two-stage stratified random sampling design. The modules cover a wide range of topics related to household well-being, such as expenditure across different types of consumption, education levels, health, and labor force participation. In most years there are around 2000 households surveyed, which results in around 6000 individuals being included in the sample, or about 0.3% of the Jamaican population. I construct a repeated cross-section of 30680 households, representing 98883 individuals. My data covers the years 2001-2004,2006,2008-2011,2013-2014,2016-2019 and 2021.

Tourism Exit Surveys

My data on tourism levels comes in part from the Ministry of Tourism (MOT) exit surveys. The MOT administers the survey each month to visitors leaving through either of Jamaica's two main international airports. While this survey only covers stop-over arrivals, as mentioned in the previous section, stopover arrivals account for the overwhelming share of Jamaica's tourism revenue. Thus, this survey captures the vast majority of tourist expenditure on the island. For my study period I construct a repeated cross-section with roughly 80,000 travel parties and 150,000 individuals.

The survey asks detailed questions about visitor characteristics, where in Jamaica they stayed, and how much they spent across categories such as accommodations, entertainment, transportation and food. Crucially the survey also asks visitors staying in hotel or hotel-like accommodations for the name of the establishment, as well as their country or state of origin. I can therefore estimate what share of tourists choose to stay in particular areas of the country, the amount of spending on accommodations within these localities, and the relative contribution to local tourism revenues by tourists from different regions of origin. Because the number of parties interviewed varies across years in my survey, and because the number of tourists interviewed does not always scale with the exact number of arrivals, I scale my estimates of local tourist accommodation expenditures by publicly available aggregate tourism statistics published by the Ministry of Tourism.

I make use of administrative shapefiles for the 2001 and 2011 censuses purchased from the Geographic Services Unit (GSU) of STATIN to link touristic activity and households across space. The shapefiles provides me with the boundaries of 86 'development areas' and 5776 enumeration districts into which STATIN divided the country for data collection and analysis. The boundaries for each census are maintained for the following decade until the following census. While for the 2001 census I do not observe development areas, I still observe household enumeration districts. For data before 2011, I overlay 2011 development area boundaries over 2001 enumeration district boundaries in order to obtain consistent spatial units. If an enumeration district is not wholly contained within a particular development area,I assign the households in that district to the development area where the largest share of the district is located. For the purposes of my analysis, I aggregate some neighboring development areas into one.

My final analysis has 65 development areas.Development area boundaries are designed to encompass municipalities with similar economic and social characteristics. Therefore, they represent a useful level at which to estimate variation in tourism activity. They are large enough to contain both urban and rural households as well, as can be seen in figure 11, showing the Greater Montego Bay development area and its urban and rural components.

5 Empirical Approach

The structural equation describing the relationship that I wish to estimate is given below. In this equation, y_{it} represents per-capita expenditures for household i, in development area d in year t. The term $Tourism_{dt}$

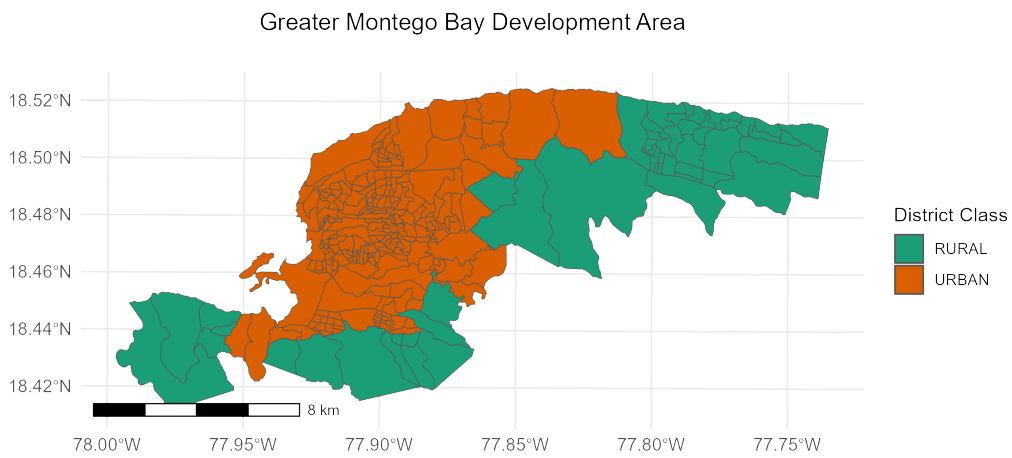

Figure 5: **Greater Montego Bay Development Area**

represents total tourist accommodation expenditures in the development area d for the same period, X_{idt} is a vector of household characteristics, and α is a constant and ϵ_{idt} is an idiosyncratic error term. The The equation is the following:

$$Y_{idt} = \alpha + \beta Tourism_{dt} + \psi X_{idt} + \gamma_t + \lambda_d + \epsilon_{idt}. \tag{1}$$

However the level of tourism in a given development area is not random and it is therefore likely that $Tourism_{dt}$ is correlated with our error term. For example areas that have higher levels of tourism revenue may also be areas with qualities that attract more affluent households to live there, or that lead to better economic outcomes for locals. Perhaps development areas preferred by tourists have more attractive beaches as in Faber and Gaubert (2019), resulting in more affluent Jamaicans choosing to reside in those locations, and this results in amenities that in turn attract tourists. The endogeneity of $Tourism_{dt}$ motivates my use of a shift-share instrumental variable(SSIV) that will provide variation that is orthogonal to the attributes of the municipality that may influence household welfare.

In the shift share equation, $g_1, ..., g_k$ represent shocks common to all units, while $s_{i1}, ...sik$ are the exposure shares that vary across units. A shift-share instrumental variable takes the form:

$$z_i = \sum_{k=1}^{K} \underbrace{s_{ik}}_{\text{Share}} \underbrace{g_k}_{\text{Shift}}, \tag{2}$$

with the final instrument z_i being a share-weighted average of the shifts.

In my study I will exploit two facts about tourism in Jamaica. The first is that tourists from different regions of origin vary both cross-sectionally and over time in the areas of Jamaica they prefer to visit. The second is that tourists from different places of origin visit Jamaica in different magnitudes from year to year. Exposure shares will be the share of expenditure on accommodations in a development area that is received

from specific regions of origin. The shifts will be the changes in total accommodation spending by tourists from that region of origin in Jamaica overall.

Jamaica's main tourism markets are the United States, Canada, and the United Kingdom, with secondary markets including the Caribbean,Continental Europe,and Latin America. For the United States and Canada, the exit surveys also provide information on the states or provinces where tourists are visiting from. I divide tourist arrivals across 7 regions given by the vector $r \in$(Northeast U.S., West U.S.,Midwest U.S.,South U.S., Canada, U.K. & Europe, Other Countries).

In my tourist region of origin based instrumental variable below $(g1, ...gk)$ are shifts that are common to all units(development areas). The vector $(s_{i1}, ..., s_{iK})$ are the exposure shares that vary across units. The term $Tourism_{dt}$ represents total tourist accommodation spending in development area d, in year t. This is equal to the sum of each region of origin r's expenditure on accommodations in the development area in year $t : Tourism_{drt}$.

$$Tourism_{dt} = \sum_{r \in R} \left[Tourism_{drt} \right] \tag{3}$$

Area d's exposure to region r tourists in year t is given by

$$s_{drt} = \frac{Tourism_{drt}}{\sum_r Tourism_{drt}} = \frac{Tourism_{drt}}{Tourism_{dt}} \tag{4}$$

With all development areas being a part of the set $\mathbf{D}$, total spending in Jamaica on accommodations by tourists from region r in year t is therefore:

$$T_{rt} = \sum_{d \in \mathbf{D}} \left[Tourism_{drt} \right]. \tag{5}$$

We can then define the "shift", the change in total expenditures by tourists from region r between period $t = 1$ and period $t = 0$ as:

$$g_{r1} = \frac{Tourism_{r1} - Tourism_{r0}}{Tourism_{r0}}. \tag{6}$$

The shift-share instrument therefore is given by:

$$z_{dt} = \sum_{r \in R} s_{drt} \left[\frac{Tourism_{r1} - Tourism_{r0}}{Tourism_{r0}} \right] = \sum_{r \in R} s_{drt} g_{r1}. \tag{7}$$

When constructing the shifts in my estimation I use a "leave-one-out" shift construction. In this approach, discussed and employed throughout the shift-share literature (Borusyak et al. 2022; Goldsmith-Pinkham et al.

2020; Autor et al. 2013),the shift-share instrument is written:

$$z_{dt} = \sum_{r \in R} = \sum_{r \in R} s_{drt} g_{r1,-d}, \tag{8}$$

meaning the calculated change total spending in Jamaica by the region r tourists does not include group's change in spending for area d. This construction is meant to avoid bias in the instrument for area d potentially caused by including area d shifts. In their paper, <**empty citation**> show that including own-unit shifts could lead to a substantially stronger instrumental variable, though Goldsmith-Pinkham et al. (2020), show that the leave-out correction has a relatively minor effect when shifts average over many observations.

Over time tourists from different regions of origin have shifted the frequency with which they visit particular areas of Jamaica. For example in figure **??** we can see variation in which parts of the island Canadians preferred to visit between 2000 and 2019, and we can see the same for visitors from the Southeastern United States in figure **??**.

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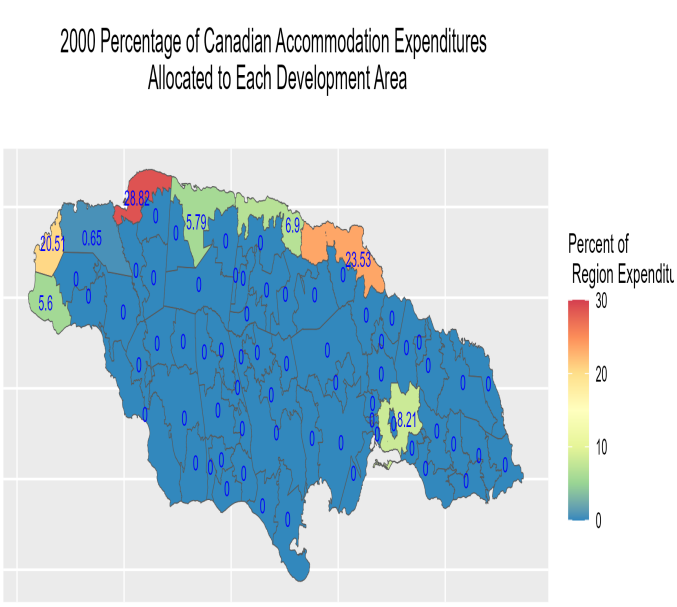

Figure 6: Canadians 2000

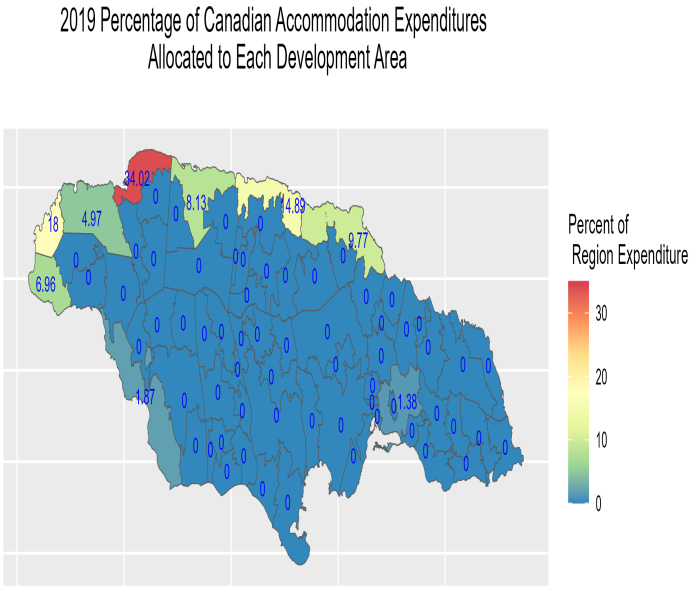

Figure 7: Canadians 2019

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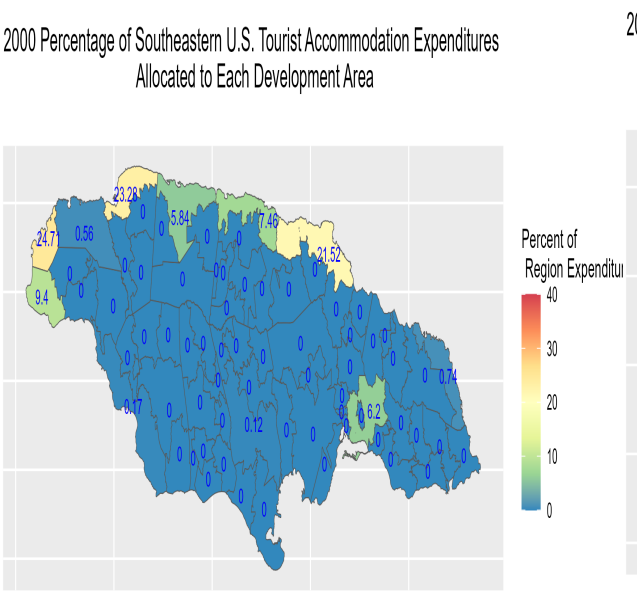

Figure 8: SE Americans 2000

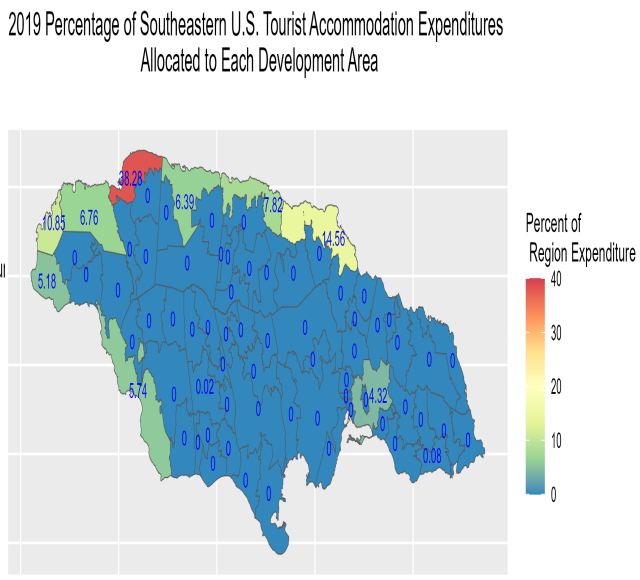

Figure 9: SE Americans 2019

Over the period 2000 to 2021, there has been substantial year-to-year variation in aggregate arrivals from these regions as well as substantial variation in where members of these groups tend to go. This variation is driven by a combination of changing local economic conditions in the origin regions, changes in access to Jamaica via available air routes, shifting preferences, and other potential factors. Some of this variation can be seen in 10a and 10b.

There was significant volatility in the global economy during this period that was a result of geopolitical and economic events such as the September 11th terrorist attacks, the 2008 Global Financial Crisis, and COVID-19 pandemic among others. These shocks produced changes in travel and vacation patterns, and these changes may have differed depending on economic and political characteristics of particular regions of origin. My argument is that the shifts that occur for specific regions of origin are orthogonal to features of specific development areas that may influence my outcome variables of interest.

As encouraged by Borusyak et al. (2024a), I motivate my shift-share instrumental variable identification strategy through the logic of an idealized experiment. I argue that year-to-year variation in the arrivals of tourists from different regions of the world coupled with the differential levels of exposure of various Jamaican development areas generates variation in local accommodations expenditures that is orthogonal to the characteristics of those localities that may influence my outcome variables of interest.

Imagine that the Jamaican government provides subsidies for airlines to decrease seat prices and increase the number of flights, but randomly assigns the routes to which these subsidies are applied. To the extent that tourists are sensitive to airline ticket prices, we would expect there to be a larger increase in tourists visiting Jamaica from regions that have received larger subsidies (once controlling for distance from Jamaica and differences in taxes), relative to regions that have received smaller subsidies. We would also expect that de-

(a) **Level of Expenditures By Region**

(b) **Share of Expenditures by Region**

velopment areas that are more exposed to tourists from high-subsidy regions would experience an increase in accommodation revenues relative to areas with higher exposure to low-subsidy regions. Therefore, as a result of random assignment of the subsidy, the changes in development area tourism earnings will result from variation that is exogenous to characteristics of the area that may influence our outcome variables of interest.

I can now define my 2SLS specification, where Y_{idt} will be either per-capita expenditure, or an indicator for poverty status (0: Above Poverty Line, 1: Below Poverty Line) for household i, in development area d, in year t, measured in both logs and levels. Tourism intensity is given by $Tourism_{dt}$, and is calculated as total expenditures on accommodations in as development area in a given year, Z_{dt} is the shift-share instrument, η_{idt} is an idiosyncratic error term for the first stage, and second stage terms are the same as stated in the structural equation.

Stage 1:

$$Tourism_{dt} = \chi + \phi Bartik_{dt} + \iota X_{idt} + \omega D_t + \pi C_d + \eta_{idt} \tag{9}$$

Stage 2:

$$Y_{idt} = \alpha + \beta Tourism_{dt} + \psi X_{idt} + \rho D_t + \lambda C_d + \epsilon_{idt}, \tag{10}$$

Within the vector of household controls X_{idt} I include the number of members in a household, the sex of the household head, and whether or not the household is located in a rural enumeration district. As my identifying variation occurs at the development area level, and because I expect the residuals of households within the same development areas to be correlated, I cluster my standard errors at this level, also.

5.1 Identification Checks

The key identifying assumption in using this shift-share instrument is that year-to-year variation in the accommodations expenditures of tourists from specific regions of origin r visiting Jamaica are uncorrelated with unobserved characteristics of the development areas or the households within them that may impact our outcome variables of interest. That is, whatever factors are driving the changes in spending by different tourist groups, and/or their decision of where they choose to spend their vacations in Jamaica, are not correlated with the unobserved characteristics of households and development areas I observe. Formally this can be represented as

$$\mathbb{E}[Z_{dt}\epsilon_{idt}] = 0 \tag{11}$$

In order for my instrument to be valid it must satisfy relevance and the exclusion restriction. My first stage regressions for my baseline findings show that instrument functions well with a first-stage of 29 for the specification including all controls and dummy variables. This strength is also reflected in graphs of my correlations shown in my appendix.

In order to satisfy the exclusion restriction the instrument must only affect household welfare through tourist expenditures on accommodations conditional on controls. This would be violated if the instrumental variable impacts per-capita expenditures through channels such as cost of living. For example, the instrument may also be correlated with higher per-capita expenditures through its effect on the prices of locally produced services as a result of tourist spending in the community. I account for such a channel I inflate or deflate expenditures according to Jamaican regional price indices. As I also normalize all expenditures to 2024 US dollars, my expenditure outcome variables capture real per-capita spending behavior and should not reflect price changes induced by local tourism activity.

I also employ Instrumental Variable Quantile Regressions(IVQR) in order to further elucidate the effects of shocks to development areas for household's across the expenditure distribution. I motivate the IVQR with regressions on households binned by expenditure decile. Given that I am using a repeated cross-section and the decile within which a household falls is likely endogenous, IVQR provides a more accurate representation of the distributional impacts of the tourism shocks. I utilize the method based on <**empty citation**> Be-

cause this method utilizes a distance minimization technique that requires a sufficient number of observations for each quantile conditional on controls and dummy variables, I am unable to estimate the quantile regression with the full set of controls and dummies from my 2SLS specification. Instead, I employ dummy variables for each of Jamaica's 14 parishes, and a dummy variable indicating whether the observation is before or after the year 2010.

6 Shift-Share Instrument Diagnostics

The literature on shift-share instrumental variables has recommended a number of different approaches for ensuring accurate shift-share inference, and I employ these in my study. Following guidance from Borusyak et al. (2024a), I include a table of summary statistics on the components of my instrument.

Both Borusyak et al. (2024a) and Adão et al. (2019), describe how standard errors can be underestimated in shock-based shift-share analyses if correlation between units exposed to similar shocks is not considered. They propose two approaches to calculating standard errors, and 95% confidence intervals that correct for these biases. I will refer to these calculation approaches as AKM and AKM0 following the terminology in their paper. In each of these calculations I consider shock-level variation, and cluster the shocks based on the country. I calculate both of these standard errors for each of regression in addition to the my baseline clustered standard errors and bootstrapped standard error calculations. Neither of these approaches fundamentally change my results. A sample of the all the standard errors from my baseline regressions can be seen in table 8.

Table 8: Baseline Results Coefficient Comparisons Across Methods

Method	Estimate	Std.Error	P.Value	Left.CI	Right.CI
Panel A: IV Estimates All Regions					
Panel A: IV Estimates All Regions					
Homoscedastic	2e-04	5e-04	0.7102	-7e-04	0.0011
EHW	2e-04	5e-04	0.7166	-7e-04	0.0011
Reg. Cluster	2e-04	7e-04	0.8078	-0.0012	0.0015
AKM	2e-04	2e-04	0.3069	-2e-04	5e-04
AKM0	2e-04	2e-04	0.2502	-1e-04	8e-04
Panel B: IV Estimates Urban Households					
Panel B: IV Estimates Urban Households					
Homoscedastic	0.002	6e-04	0.0011	8e-04	0.0032
EHW	0.002	6e-04	0.0016	8e-04	0.0033
Reg. Cluster	0.002	4e-04	0	0.0011	0.0029
AKM	0.002	5e-04	1e-04	0.001	0.003
AKM0	0.002	7e-04	0	0.0013	0.004
Panel C: IV Estimates Rural Households					
Panel C: IV Estimates Rural Households					
Homoscedastic	-3e-04	6e-04	0.6459	-0.0016	0.001
EHW	-3e-04	6e-04	0.6465	-0.0016	0.001
Reg. Cluster	-3e-04	0.0011	0.7841	-0.0024	0.0018
AKM	-3e-04	3e-04	0.255	-8e-04	2e-04
AKM0	-3e-04	3e-04	0.2225	-9e-04	2e-04

Notes: The tourism expenditure is measured in millions and is measured at the level of the development area.

Another concern identified by Borusyak et al. (2024a) is that in panels or repeated cross-sections shift-share instruments there may be correlation in the shocks across periods. If this is the case, the analysis would suffer from omitted variable bias, with past shifts influencing present outcome variables. One solution they provide is to extract the idiosyncratic component of each shift before constructing the instrument. In order to this I de-mean shifts over my study period for each region of origin r, and I then utilize the de-meaned values for each period in constructing my instrument. I provide a comparison of the two versions of the shocks in my appendix.

7 Results

I now present the finding from my study investigating the relationship between changes in tourism intensity and changes in household welfare for Jamaican households. I will organize my findings according to the testable hypotheses obtained from the conceptual framework I explained earlier. I scale my findings so that tourism expenditures are reported in millions of 2024 U.S. Dollars.

The first testable hypothesis was that real per-capita household expenditures would increase in those development areas where there are positive tourism shocks. For my baseline regressions I take the log of the outcome variables to allow for interpretation of the coefficients as a percent. My initial findings with the full dataset of urban and rural households do not support this hypothesis as the coefficient on ccommodation expenditures is not statistically significant as can be seen in table 24. However, these findings change markedly when I focus on only urban households in areas other than Kingston (the capital), the coefficient on per-capita tourism expenditures at precisely estimated at .002, in column 1 of table 10. This implies that an increase of 1 million U.S. dollars in expenditure on accommodations in a development area causes an increase of .002 percent in per-capita expenditures for that area's households.

Table 9: IV: Relationship Between Tourism Earnings and Log Household Expenditure

	Log Per-Capita Expenditure(USD)		
	(1)	(2)	(3)
Tourism Expenditure (Millions USD)	1.1e-03***	5.9e-04**	8.8e-04
	(2.9e-04)	(2.0e-04)	(6.9e-04)
HH Size			-1.4e-01***
			(3.0e-03)
SEX			
RURAL			
First-Stage F-Statistic	18	18	29
Observations	30678	30678	30678
Standard Deviation	0.722	0.722	0.722
HH Controls	No	No	Yes
DA Dummies	No	No	Yes
Year Dummies	No	Yes	Yes

*Notes:*Accommodation expenditure is calculated at the development area level in millions of 2024 US Dollars.Expenditures are inflated or deflated based on region price indexes. All Bartik instrument shocks are residualized in order to extract the idiosyncratic component of the shocks.

Said another way, an increase of 10 million U.S. dollars in spending on accommodations results in a 1 percent increase in per-capita spending by urban households. As table 3 shows that the average Urban household spends 3600 U.S. Dollars per capita a year, this translates to a 36 dollar average increase for every additional 10 million dollars spent on accommodations in a development area. How economically significant is this increase?

The initial findings support my basic hypothesis that tourist expenditures would be associated with increases in per-capita household spending. In column three of 24 I have my full baseline specification with controls for household characteristics such as size, the gender of the household head and whether or not the household is located in a rural enumeration district. The estimated coefficient on development area accommodation expenditure is $6.7e-10$ and highly significant, with a first stage F-Statistic of 25. This value on accommodation expenditure implies that a roughly 14.92 million dollar increase in total expenditures on accommodations is needed to generate a 1% increase in per-capita household expenditures within a particular development area. Since the mean per-capita household expenditure among households sits at roughly $3700 US Dollars, this would be an increase of approximately 37 US dollars in per-capita expenditures for the average household.

Whether a 14 million dollar increase in accommodation spending to a yielding a 1% increase in per-capita expenditures is economically significant depends on the segments of society to which these expenditure increases are accruing. A major aim in promoting tourism lead development in Jamaica as well as other global settings is for the purpose of living people out of poverty. If welfare gains from tourism expenditures are tak-

ing place among the poorest households in Jamaica, then we may very well consider an increase in per-capita expenditures of 1% from a 14 million dollar increase in hotel expenditures to be a success. In 10 I regress per-capita household expenditures on tourist accommodation expenditures but I separate households depending on where they are located along the per-capita expenditure distribution. What I find is that the effects of tourist spending are concentrated among households in the middle and upper per-capita expenditure deciles.

Table 10: IV: Relationship Between Tourism Earnings and Log Household Expenditure By Per-Capita Expenditure Decile

	Log Per Capita Expenditure(USD) Separated by Deciles					
	(1-10)	(2-10)	(4-10)	(6-10)	(8-10)	(9-10)
Tourism Expenditure (Millions USD)	2.0e-03***	9.4e-04	1.0e-03	1.1e-03	1.5e-03***	2.1e-03***
	(5.4e-04)	(6.8e-04)	(5.7e-04)	(5.5e-04)	(4.3e-04)	(5.3e-04)
First-Stage F-Statistic	52	36	47	54	62	64
Observations	11526	28513	23826	18610	12777	9460
Standard Deviation	0.721	0.642	0.578	0.548	0.563	0.615
HH Controls	Yes	Yes	Yes	Yes	Yes	Yes
DA Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Tourism expenditure is measured in millions. All household controls are included.

In columns 1 and 2 of table 10, I run the per-capita expenditure regressions for deciles $1-5$ and $6-10$, respectively. Coefficients for both are insignificant. In column 3 I look at households in deciles 3-7, and observe a positive coefficient that is significant at the 5% level. The strongest results by far are in column 4 where I use households in deciles 4 through 8. As such, these results demonstrate that the households for whom the effects of increases in tourism are greatest are those between the 80th and 40th percentile of per-capita expenditures.Said another way, these results would suggest that per-capita expenditure increases occur among households ranging from the lower to upper middle class in Jamaica. The coefficient on tourism expenditures is slightly lower at than the baseline in table 24 at $2.5e-10$.

The fact that increases in tourism seem to most directly effect households in the Jamaican middle class raises the question of whether or not increases in a development areas tourism levels have any poverty reducing effects. Given the rural to urban transition that is taking place throughout Jamaica, it is also important to consider the geographic concentration of the impacts of tourism.

Table 11: IV: Relationship Between Tourism Earnings and Household Poverty Status

	Household Likelihood of Being In Poverty		
	(Full Sample)	(Urban Households)	(Rural Households)
Tourism Expenditure (Tens of Millions USD)	-1.4e-03	-3.7e-03*	7.6e-04
	(2.3e-03)	(1.6e-03)	(4.3e-03)
First-Stage F-Statistic	29	70	12
Observations	30680	11527	19153
Standard Deviation	0.345	0.300	0.368
HH Controls	Yes	Yes	Yes
DA Dummy	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes

*Notes:*1.Tourist hotel expenditure is measured in tens of millions of 2024 US Dollars.

In table 11 I regress a household's poverty status on total tourist accommodation expenditure for that household's development area in a given year. For the outcome variable a 1 means that the household is be-

low the poverty line and 0 means that the household is above the poverty line. I have to remove some of the later years in my study such as 2014-2019 for these regressions because of a first stage that is too weak. In column 1 I look at my full remaining sample. The coefficient on tourism expenditure is negative, and statistically significant at the 1% level, implying that higher tourist spending in a development area is on average associated with a decrease in the likelihood of household's being below the poverty line. More specifically these findings suggest that an increase in accommodation spending of about 31.25 million U.S. within a development area is associated with a 1% decrease in likelihood of households within that development area being below the poverty line.

In columns 2 and 3 of table 11 I regress rural and urban households separately, and find that the decrease in poverty is entirely driven by households in rural enumeration districts. The coefficient on tourist expenditure for rural households is statistically significant and has a magnitude of almost twice that of the full sample regression from column 1. The column 3 regression on the urban sample return a statistically insignificant coefficient.

Table 12: IV: Relationship Between Tourism Earnings and Household Poverty Status (2001-2013): Testing The Difference in Coefficients Between Urban and Rural Households

	Household In Poverty
	(1)
Tourism Expenditure	1.4e-03
	(2.3e-03)
Rural Enumeration District × Tourism Expenditure	-1.8e-03
	(2.2e-03)
Rural Enumeration District	1.2e-01
	(1.1e-01)
Constant	-7.9e-02
	(9.7e-02)
First-Stage F-Statistic	0
Observations	30472
Standard Deviation	0.340
HH Controls	Yes
Year Dummies	Yes

*Notes:*1.The tourism expenditure is measured in millions and is measured at the level of the development area.

In table 22 I again run the poverty regression on the full urban and rural sample, and also include an interaction term between a rural household and tourism expenditure in order to further confirm the differential impacts of tourism on poverty for rural and urban households. This regression further demonstrates that the anti-poverty effects of tourism are primarily driven by effects on rural Jamaican households. This regression does show an effect for urban households as well that is a little less than a third as strong as the effect on ru-

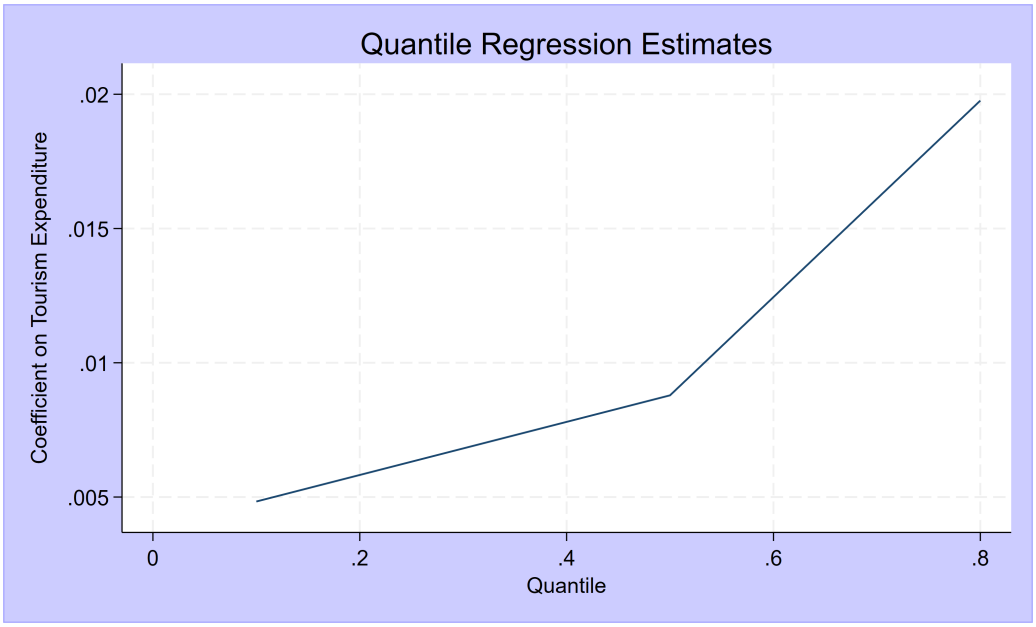

Figure 11: **Graph of Expenditure Quantiles**

ral households and is significant at the 5% level.

8 Distributional Impacts: Quantile Regressions

Table 13: IV: Quantile Regression of Log Per-Capita Consumption Expenditure on Tourist Accommodations Expenditures

	Log Per-Capita Expenditure(USD)								
	.1	.2	.3	.4	.5	.6	.7	.8	.9
Tourism Expenditure (Millions USD)	1.4e-03	1.3e-03***	1.6e-03***	1.4e-03***	1.2e-03***	1.0e-03***	7.9e-04***	7.5e-04	6.3e-04
	(7.1e-02)	(2.0e-04)	(1.2e-04)	(1.1e-04)	(2.2e-04)	(7.7e-05)	(1.0e-04)	(2.8e-02)	(2.0e+00)
HH Size	-1.1e-01***	-1.2e-01***	-1.3e-01***	-1.3e-01***	-1.4e-01***	-1.5e-01***	-1.5e-01***	-1.6e-01***	-1.6e-01***
	(2.8e-03)	(2.4e-03)	(2.3e-03)	(2.1e-03)	(1.9e-03)	(2.0e-03)	(2.2e-03)	(2.1e-03)	(3.3e-03)
SEX	-4.5e-02**	-4.0e-02***	-3.7e-02***	-3.8e-02***	-4.2e-02***	-4.4e-02***	-4.5e-02***	-5.2e-02***	-6.0e-02***
	(1.4e-02)	(1.1e-02)	(9.6e-03)	(9.3e-03)	(9.1e-03)	(8.9e-03)	(9.2e-03)	(9.9e-03)	(1.3e-02)
RURAL									
Observations	30678	30678	30678	30678	30678	30678	30678	30678	30678
Smoothing Bandwidth	0	0	0	0	0	0	0	0	0
HH Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parish Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Group Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The tourism expenditure is measured in millions and is measured at the level of the development area.

Table 14: IV: Quantile Regression of Log Per-Capita Consumption Expenditure on Tourist Accommodations Expenditures (Urban Households)

	Urban Log Per-Capita Expenditure(USD)		
	.2	.5	.8
Tourism Expenditure (Millions USD)	4.1e-04	-3.9e-05	-1.1e-04
	(2.6e-04)	(1.5e-04)	(3.5e+00)
HH Size	-1.3e-01***	-1.5e-01***	-1.7e-01***
	(4.7e-03)	(3.4e-03)	(3.8e-03)
SEX	-9.9e-02***	-9.4e-02***	-1.0e-01***
	(1.8e-02)	(1.4e-02)	(1.7e-02)
Observations	11526	11526	11526
Smoothing Bandwidth	0.097	0.096	0.097
HH Controls	Yes	Yes	Yes
Region Dummies	No	No	No
Year Group Dummies	Yes	Yes	Yes

*Notes:*The tourism expenditure is measured in millions and is measured at the level of the development area.

Table 15: IV: Quantile Regression of Log Per-Capita Consumption Expenditure on Tourist Accommodations Expenditures (Rural Households)

	Rural Log Per-Capita Expenditure(USD)		
	.2	.5	.8
Tourism Expenditure (Millions USD)	1.8e-03*	1.6e-03***	1.1e-03*
	(7.3e-04)	(3.3e-04)	(5.2e-04)
HH Size	-1.1e-01***	-1.3e-01***	-1.5e-01***
	(2.7e-03)	(2.2e-03)	(2.7e-03)
SEX	-1.1e-02	-1.6e-02	-3.1e-02*
	(1.4e-02)	(1.1e-02)	(1.3e-02)
Observations	19152	19152	19152
Smoothing Bandwidth	0.088	0.088	0.088
HH Controls	Yes	Yes	Yes
Region Dummies	No	No	No
Year Group Dummies	Yes	Yes	Yes

*Notes:*The tourism expenditure is measured in millions and is measured at the level of the development area.

9 Results By Industry

Table 16: IV: Impacts on Poverty By Industry Category

	Urban		Rural	
	Tourism Related Industry	Non-Tourism Industry	Tourism Related Industry	Non-Tourism Industry
Tourism Expenditure (Millions USD)	-7.1e-04*	-2.6e-04	-1.6e-04	1.7e-04
	(3.1e-04)	(1.5e-04)	(4.2e-04)	(4.5e-04)
First-Stage F-Statistic	25	68	4	13
Observations	1050	10477	1286	17867
Standard Deviation	0.256	0.304	0.253	0.374
Number of Clusters	39	39	63	64
Bootstrapped P Values	0.128	0.212	0.650	0.666
Bootstrapped CI	[-.001518, .0003494]	[-.0006057, .0002452]	[-.0008987, .0007303]	[-.0007907, .001012]
HH Controls	Yes	Yes	Yes	Yes
DA Dummy	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes

*Notes:*The tourism expenditure is measured in millions and is measured at the level of the development area.

Table 17: IV: Regression of Log Per-Capita Expenditure By Industry

	Urban		Rural	
	Tourism Related Industry	Non-Tourism Industry	Tourism Related Industry	Non-Tourism Industry
Tourism Expenditure (Millions USD)	-1.0e-03	2.2e-03***	1.7e-03	-6.8e-04
	(9.9e-04)	(4.5e-04)	(1.4e-03)	(1.1e-03)
First-Stage F-Statistic	25	68	4	13
Observations	1050	10476	1286	17866
Standard Deviation	0.690	0.723	0.668	0.703
Number of Clusters	39	39	63	64
Bootstrapped P Values	0.277	0.009	0.146	0.516
Bootstrapped CI	[-.004623, .001233]	[.0007388, .003527]	[-.00116, .005151]	[-.002738, .001524]
HH Controls	Yes	Yes	Yes	Yes
DA Dummy	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes

*Notes:*The tourism expenditure is measured in millions and is measured at the level of the development area.

Table 18: IV: Industry Employment Likelihood By Sector & Region

	Urban Tourism Employment Likelihood	Rural Tourism Employment Likelihood
Tourism Expenditure (Millions USD)	0.00104***	0.000649*
	(0.000251)	(0.000282)
First-Stage F-Statistic	70	12
Observations	11527	19153
Standard Deviation	0.288	0.250
Number of Clusters	39	64
Bootstrapped P Values	0.033	0.020
Bootstrapped CI	[.0002166, .001994]	[.00008691, .001321]
HH Controls	Yes	Yes
DA Dummy	Yes	Yes
Year Dummies	Yes	Yes

*Notes:*The tourism expenditure is measured in millions and is measured at the level of the development area.

10 Results By Gender of Household Head

Table 19: IV: Regression of Log Per-Capita Expenditure By Gender of Individual or Household Head

	Urban		Rural	
	Male-Headed Households	Female Headed Households	Male-Headed Households	Female Headed Households
Tourism Expenditure (Millions USD)	2.2e-03***	1.6e-03*	-3.9e-05	-4.8e-04
	(5.8e-04)	(7.5e-04)	(1.2e-03)	(1.2e-03)
First-Stage F-Statistic	34	53	12	10
Observations	6471	5055	12173	6979
Standard Deviation	0.724	0.705	0.716	0.679
Number of Clusters	39	39	64	64
Bootstrapped P Values	0.014	0.175	0.943	0.648
Bootstrapped CI	[.0007479, .004392]	[-.001435, .003775]	[-.002275, .00254]	[-.002751, .002222]
HH Controls	Yes	Yes	Yes	Yes
DA Dummy	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes

Notes: The tourism expenditure is measured in millions and is measured at the level of the development area.

Table 20: Average Magnitudes Over Various Lags

Statistic	1 Year Lagged Value	5 Year Lagged Value	10 Year Lagged Value
Mean Expenditure Change	21.09	46.04	63.53
Median Expenditure Change	7.92	31.06	36.73
Min Expenditure Change	0	0.02	0.02
Max Expenditure Change	235.54	430.92	449.26
SD Expenditure Change	33.35	63.34	89.45

Notes: All expenditures are in millions of US Dollars corrected for inflation to the year 2024.

10.1 Checking The Cost Side

11 Quantifying The Findings

Table 21: IV: Regression of Cost of Living Variables On Tourism

	Per-Capita Utilities	Per-Capita Rent	Per Capita Property Tax
Tourism Expenditure (Millions USD)	1.1e+00	-6.3e-01	-3.9e-02
	(8.6e-01)	(8.4e-01)	(6.8e-02)
First-Stage F-Statistic	29	29	29
Observations	20296	20297	20297
Standard Deviation	556.977	770.752	44.737
Number of Clusters	45	45	45
Bootstrapped P Values	0.245	0.632	0.611
Bootstrapped CI	[-.4695, 4.716]	[-2.175, 2.094]	[-.1939, .1435]
HH Controls	Yes	Yes	Yes
DA Dummy	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes

Notes: Tourism expenditure is measured in millions and is measured at the level of the development area.

Table 22: IV: Non-Consumption Expenditure

	Urban Log Per-Capita Non-Consumption Expenditure	Rural Log Per-Capita Non-Consumption Expenditure
Tourism Expenditure (Millions USD)	1.7e-03	2.7e-03
	(2.4e-03)	(1.5e-03)
First-Stage F-Statistic	27	11
Observations	12814	13002
Standard Deviation	1.970	1.965
Number of Clusters	45	70
Bootstrapped P Values	0.493	0.058
Bootstrapped CI	[-.002656, .008398]	[-.0001479, .005359]
HH Controls	Yes	Yes
DA Dummy	Yes	Yes
Year Dummies	Yes	Yes

*Notes:*Tourism expenditure is measured in millions and is measured at the level of the development area.

12 Discussion and Conclusion

The results of this paper have demonstrated the feasibility of an empirical study of the welfare effects of the tourism sector on Jamaican households. My formulation of a Bartik style instrument reliably predicts my endogenous variable of interest, development area-level tourism expenditure.

The results that I have obtained generally support my hypothesis that tourism earnings would be associated with increased per-capita expenditures for households located closest to the major tourism zones. My findings demonstrated that on average 14 million dollar increase in spending on accommodations in a development area is associated with a roughly 1% increase in per-capita expenditures for households in those areas.

My findings also demonstrated that there is meaningful heterogeneity in how the impacts of tourism are felt across the socioeconomic distribution and across space. I found that the bulk of the increases in per-capita expenditure were concentrated among households in deciles 4 though 8, that we may consider as the Jamaican middle class. When moving to look at poverty, there were statistically significant impacts of tourism expenditures in reducing the likelihood of households being below the poverty line. These impacts were overwhelmingly driven by households located in rural enumeration districts, of which there are many in the environs of major tourist districts. This result in particular demonstrates the potential for meaningful spatial

spillovers from urban areas for a tradable industry such as tourism.

This study provides a strong empirical analysis of the impacts of Jamaica's largest industry, and one of the largest industries in the world, on the welfare of local households. The level of increases in tourism needed to generate economically significant increases in per-capita expenditures may or may not lend support to a tradable service sector lead development strategy. The final answer on the effectiveness depends ultimately on the goals of such a policy as well as possible alternatives. In this case we see that growth in a sector like tourism can produce statistically significant increases in per-capita spending for people around the middle of the income distribution and those located in rural areas.

That being said, there are a number of possible areas for extension of this research, including the disaggregation of the effects of tourism across categories of spending, or other household demographic characteristics such as the level of education of the members. Understanding the heterogeneous effects of particular types of tourism (All-Inclusive vs. European Plan etc), or types of tourism spending would also be very informative. These extension would help to continue to build a comprehensive understanding of the role of tourism and other service-sector industries in household well-being. This better understanding can then be used to inform welfare-improving service-sector policies.

13 Appendix

13.1 Appendix 1: First Stage Regressions

Table 23: First Stage of IV: Relationship Between Tourism Earnings and Log Household Expenditure

	Accommodations Expenditures (Millions USD)		
	(1)	(2)	(3)
Shift-Share Instrument	3.8e+02***	4.4e+02***	1.2e+02***
	(8.9e+01)	(1.0e+02)	(2.3e+01)
HH Size			9.9e-02
			(9.0e-02)
SEX			
RURAL			
First-Stage F-Statistic	18	18	29
Observations	30678	30678	30678
Standard Deviation	114.956	114.956	114.956
HH Controls	No	No	Yes
DA Dummies	No	No	Yes
Year Dummies	No	Yes	Yes

Notes: Accommodation expenditure is calculated at the development area level.

Table 24: First Stage of IV: Expenditure Deciles

	First Stage Log Per Capita Expenditure(USD) Separated by Deciles					
	(1-10)	(2-10)	(4-10)	(6-10)	(8-10)	(9-10)
Bartik Inst.	1.2e+02***	1.2e+02***	1.1e+02***	1.1e+02***	1.1e+02***	1.1e+02***
	(2.1e+01)	(2.0e+01)	(1.7e+01)	(1.6e+01)	(1.4e+01)	(1.4e+01)
HH Size	1.1e-01	1.4e-01	-2.7e-03	-9.7e-02	-2.1e-01	1.1e-01
	(1.0e-01)	(9.9e-02)	(1.8e-01)	(3.3e-01)	(4.8e-01)	(3.1e-01)
Female HH Head	-4.8e-01	-5.3e-01	-6.1e-01	-1.4e+00*	-1.3e+00*	-1.2e+00*
	(4.3e-01)	(4.4e-01)	(4.0e-01)	(6.4e-01)	(5.9e-01)	(5.0e-01)
Rural Enumeration District	3.6e+00	3.9e+00	4.3e+00	4.9e+00	6.8e+00	7.8e+00
	(3.6e+00)	(3.7e+00)	(4.0e+00)	(4.6e+00)	(5.9e+00)	(6.9e+00)
First-Stage F-Statistic	35	36	47	54	62	64
Observations	30678	28513	23826	18610	12777	9460
HH Controls	Yes	Yes	Yes	Yes	Yes	Yes
DA Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Accommodation expenditure is calculated at the development area level.

13.2 Appendix 2: Shift-Share Instrument Diagnostics and Summary Statistics

13.3 Appendix 3: Regression Results With All Controls

13.4 Appendix 4: Additional Maps

Figure 12: Map of Jamaican Parishes

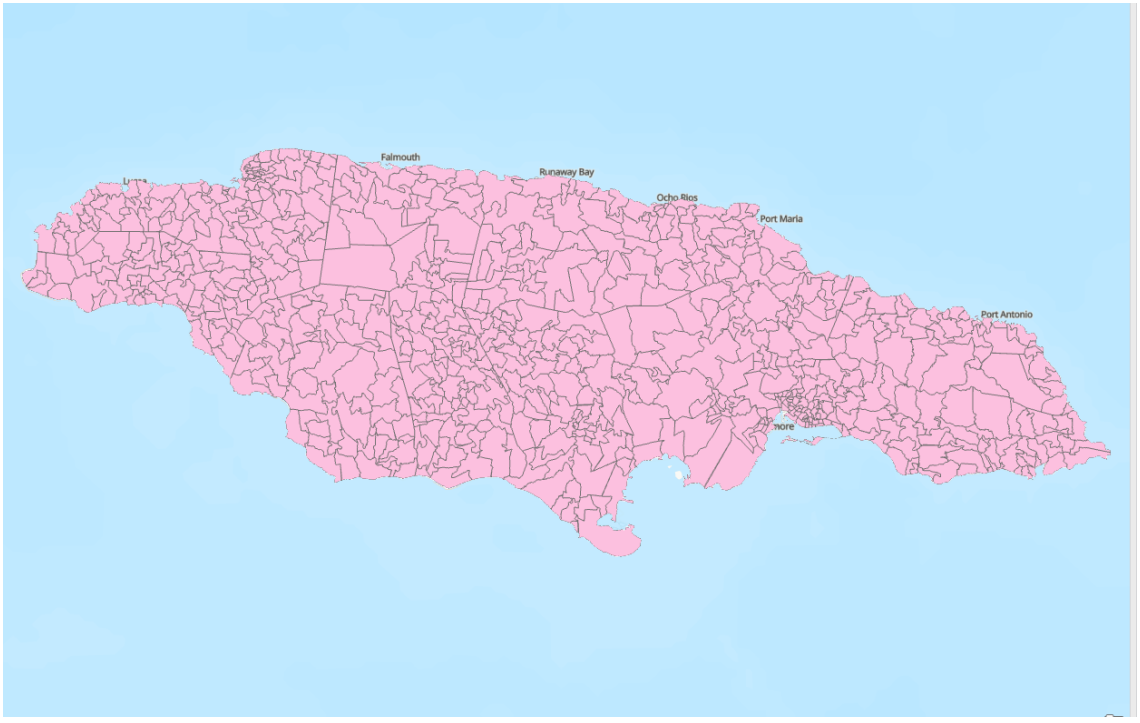

Figure 13: Jamaica Community Boundaries 2011 (STATIN Geographic Services Unit)

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