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

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Abstract

Tourism services have seen marked growth over the last two decades. Many countries have also incorporated tourism specialization into their national development plans. Despite it's importance, there is still a significant amount that remains unanswered about the ability of tourism to generate improvements in welfare for a local population. There is also uncertainty about the degree to which gains from tourism are able to benefit households across the income distribution. I contribute to the literature by answering this question in the context of Jamaica, an emerging economy that has made tourism a major component of its national development strategy, but that has also experienced mixed economic outcomes over the past 2 decades. I contribute to the literature by employing two unique and powerful sources of data. First, I use a rich cross-section of Jamaican household expenditure data spanning the period between 2000 and 2021. Second, I use a dataset of granular tourist spending data from the Jamaican Ministry of Tourism covering the same period. Combining these, I use a shift-share instrumental variable estimation strategy to identify the effects of changes in tourism intensity in a municipality on real per capita consumption by local households. After accounting for cost-of-living differences between different areas of Jamaica, I find that an increase in tourist accommodation spending of 10 million US dollars yields a roughly 1% increase in real per-capita household expenditures for urban households outside of the capital Kingston. I find that these increases in expenditure occur across areas of food and nonfood consumption, along with healthcare and loan repayments. These increases are concentrated in medium-skilled occupations in non-tourism service sector and manufacturing industries, and for households roughly in the middle of the expenditure distribution. Overall, I find that tourism produces broad gains across income/expenditure but that there appear to be limited gains for workers within the tourism industry itself, consistent with low productivity growth and constant returns to scale production in labor.

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 the ability of tourism to generate economic growth that raises real consumption levels across a broad cross section of the population. There is also uncertainty about the scope for tourism to generate positive spillovers to other sectors of the economy through forward and backward linkages and the extent to which such linkages are feasible across different contexts. I help fill this gap in the literature by investigating the relationship between tourism and household consumption in the context of Jamaica, a country of upper middle income that 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 different LMICs choosing to develop master plans and frameworks for their development that feature tourism prominently. These include Indonesia[3], Botswana[4], and India [5].

I answer the following questions: 1. Do increases in tourist expenditures in municipalities in 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?

In general, I seek to understand whether it is feasible to develop a strong economy around tourism.

I contribute to the literature through my use of unique and rich micro household and tourism data to answer my questions. On the household side, I use nearly two decades of the Jamaican 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 data set provides me with a repeated cross section of roughly 30,000 households between the years 2000 and 2021. I also supplement my analysis with an unbalanced panel of roughly 8,000 households that I am able to extract from the larger repeated cross section because of the resampling of some households across years.

My tourism data come 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 about their

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

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. I must account for the likely endogeneity of an areas tourism intensity to my household variables of interest. To this end, I apply a shift-share instrumental variable identification strategy, exploiting variation between tourists from different origin countries and regions in what parts of Jamaica they choose to visit and how much they spend on accommodations in these localities.

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.

My study joins an extensive set of research that employs shift-share instrumental variable (SSIV) identification strategies to correct for endogeneity. Since being first introduced in Bartik (1991) in a study of the growth rate of employment in specific sectors, SSIVs have proven extremely versatile in a variety of areas, including trade and labor (D. 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 classification (Diamond 2016).

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 during the period of my study in which tourists from certain regions of origin choose to stay in Jamaica and how much they spend. My estimation strategy follows the exogenous shock-based framework proposed by Borusyak et al. (2022), as opposed to the exogenous share-based approach of (Goldsmith-Pinkham et al. 2020). The papers Borusyak et al. (2022), and Borusyak et al. (2024b), provide 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 to calculate standard errors that account for the correlation in the residuals of units exposed to similar shocks. In their paper Adão et al. (2019), they demonstrate that failure to account for residual correlations can lead to over-rejection of the null hypothesis. I use the approach of (Adão et al. 2019) in my own analysis.

In order to better understand the heterogeneity in the impacts of these shocks, I also estimate an instrumental variable quantile regression(IVQR) that provides me with insight into how the effects of tourism shocks vary across the consumption distribution. 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, in the middle 8 deciles of the expenditure distribution. I find that these effects are driven primarily by increases in per-capita spending by households in non-tourism services as well as manufacturing, who work mid-skilled occupations in private sector firms. There are no statistically significant impacts for those working in the tourism sector,

rural households for people performing "own-account" work.

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 through wages, sectoral spillovers, and agglomeration economies.

In their paper studying the relationship between 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 linkages 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 find that growth in tourism raises aggregate income but worsens inequality. They attribute these results to the lack of labor intensity in the Thai tourism product and to the fact that the general equilibrium effects of tourism shocks harm the Thai agricultural sector, a major employer of the poor. Other works in the literature have found that tourism produces short-run gains, but these gains do not extend over the long term (Çiftçi et al. 2007).

My study complements these existing works on several dimensions. Whereas Faber and Gaubert (2019) and Wattanakuljarus and Coxhead (2006) focus on long run municipal 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 plausibility of the general equilibrium channels modeled by Faber and Gaubert (2019) and Wattanakuljarus and Coxhead (2006). Another contribution of my work is that my analysis takes place in a country where tourism is an overwhelmingly exported good, with more 90% of Jamaican tourism revenue coming from international visitors in 2023 (STATIN 2019) compared to 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 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 the use of urban spatial equilibrium models to quantify the short-term welfare impacts of tourism in modern cities. In Allen et al. (2021), the authors study the short-run welfare impacts of tourist shocks in Barcelona. 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. The authors account for the endogeneity of the intensity of tourism 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) consider in a similar way the interplay between the welfare outcomes of local residents and the increased income resulting from the increase in tourism. The authors detail how the growth of 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 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. However, the lion share of tourist activity in Jamaica is much less integrated with the local Jamaican economy than is the case for either Barcelona or Amsterdam. A major reason for this is the dominance of the all inclusive resort model of tourism in most of the country's tourist areas, as is the case in many developing economies dependent on tourism (Tavares 2015). This resort model is characterized by accommodations that provide a comprehensive package of accommodations, dining and activities, restricted primarily to the resort premises (Issa and Jayawardena 2003). As a result, tourists often spend considerably less in the communities in which resorts are located than when staying in other types of accommodation (Çiftçi et al. 2007). These differences in spending patterns and the structure of tourism may well result in very different welfare outcomes even from shocks of comparable magnitudes, which further supports the relevance 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-led structural transformation, trade, and economic development. Canonical models such as the Dual Sector or Lewis Model (Lewis 1954), postulate that the 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 both a destination for surplus labor and as a source of productivity gains lies at the heart of the model. This subset of the literature is particularly concerned with quantifying the implications for development if countries progress directly from agriculture to 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 tourism growth such as Faber and Gaubert (2019) found in Mexico, this would support tourism activities that hold a prominent place in national development plans, as in Jamaica and other emerging economies.

If tourism, either fundamentally or within the specific context of a country, does not exhibit the inclusiveness of manufacturing or its capacity for growth through innovations and connections to other sectors, specialization may not yield the returns that policymakers sometimes hope for. The World Bank 2021 Report on Services (Nayyar et al. 2021),classifies the tourism related activities of Accommodation 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 a large number 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.

The autors also 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 reduction in the relative share of manufacturing in many economies is also discussed by Rodrik (2016). In the

The potential effects of deindustrialization 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 the capacity to grow 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), or the “Cost Disease” framework of Baumol and Bowen (1965).

India is shown by Fan et al. (2023) to have achieved great gains from service sector specialization in large part because of the increase in productivity in urban consumer services that benefited wealthier urban dwellers.They find that productivity growth in consumer services from 1987 to now has accounted for approximately $1/3$ of the increase in economic well-being that India’s citizens have experienced in the previous several decades. They also 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 on the impacts of local shocks on certain sectors and attempts to characterize how those shocks propagate through the local economy (Moretti 2010; Aragón and Rud 2013; Bonilla Mejía 2020).

Although there has not been extensive work on internal migration within Jamaica, based on my discussions with numerous Ministry of Tourism officials, 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 hinter-regions.

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 a large number 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 tourism comprising an average of 25% of Caribbean GDP between 2015 and 2019 according to the OECD (OECD and Inter-American Development Bank 2024).

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	
Total Tourist Arrivals to Jamaica (2024)	4.15 Million (MOT)
Total Stopvoer Arrivals to Jamaica (2024)	2.9 Million (MOT)
Total Cruise Passenger Arrivals to Jamaica (2024)	1.25 Million (MOT)
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 Number of 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).

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 (2001). The government created the Ministry of Tourism and instituted various laws such as The Tourist Board Act (*The Tourist Board Act* 1969), and the Hotel Incentives Act (*The Hotels (Incentives) Act | Laws of Jamaica* 1971) were instituted to support the development of the new sector. Considerable investments were made in infrastructure, the geographic base of the industry being the northern and western coasts of the country.

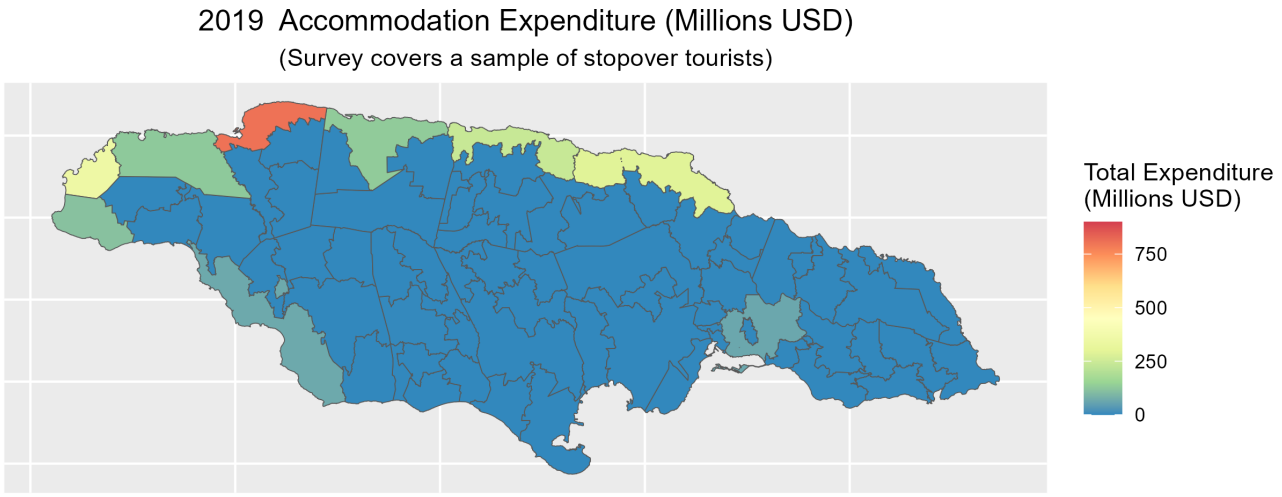


Figure 1: **Tourism Accommodation Expenditures Across The Island**

Of the more than 4.2 million visitor arrivals in 2024, roughly 2.7 million were "stopover" visitors; those who spent at least 24 hours in the country according to 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. Al-

though stopover visitors made up about 56% of total arrivals to Jamaica, their spending made up more than 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.

Table 2: **Tourist Summary Statistics**

	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 expected, the tourism industry is an important employer. According to the IADB, the tourism sector employed approximately 250,000 Jamaicans in 2019 directly or indirectly (Mooney 2020). This was roughly a quarter of the labor force at the time. Given spatial variation in 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 on average 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 have oscillated between 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-term growth improving living standards. This motivates my analysis of the relationship between tourism earnings and household welfare.

2 Jamaican Economy Background

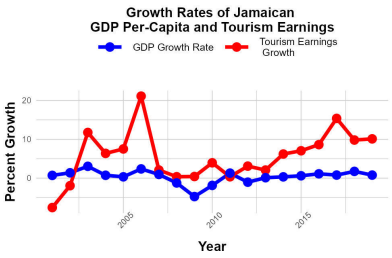


Figure 2: Tourism GDP Growth
Source: World Bank

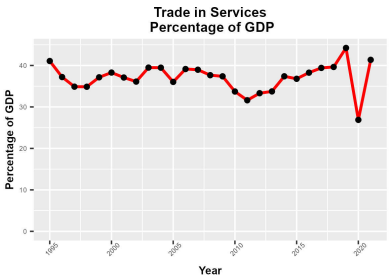


Figure 3: Services Sector Share
Source: World Bank

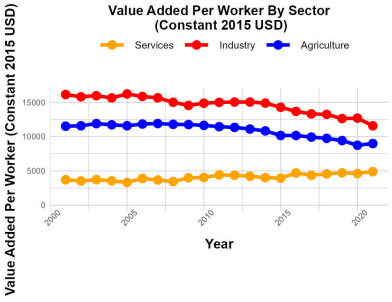


Figure 4: Multi-Sector Value Added
Source: World Bank

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. Although the average real consumption expenditure per capita 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 shown in panel b of the table 3. There are also statistically significant differences in the nonfood 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 consumption expenditures per capita when adjusting for regional differences in prices, as can be seen in table 4. The largest shares of the labor force are 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 Sectors**

	Agriculture		Consumer Services		Manufacturing		Not Specified		Other 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	1704.359	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 JSLC.

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. I also draw insights from Allen et al. (2021) and Almagro and Domínguez-Iino (2025) in their investigations of the

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.

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.

relationship between urban tourism and local welfare.

In the simpler framework of Moretti (2010) there is a non-tradable sector and a nationally traded sector that are competitive and both use labor in production. The labor supply is upward-sloping and is determined by the workers' preferences over locations. The supply of housing is determined by the local geography and policy. I adapt this framework to Jamaica. I consider each development area or municipality as a single economy. Non-traded goods will have locally determined prices. This category will include 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 non-tradable 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. The local labor supply for each type is upward sloping and depends on geographic mobility and the distribution of tastes for leisure.

Consider the case of a positive shock to tourism in the locality m resulting from the arrival of a new resort. The opening of the new property increases the room stock in the area, and thousands of additional tourists are now visiting. There is a permanent labor demand shock in the municipality m for the tourism sector x_1, which 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 2 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 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 labor technology is near constant returns to scale and labor supply is relatively elastic, 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 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 location, 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 elasticity of the local housing supply, as well as the amount by which the population increases due to the shock. Whether there is an increase in demand for local services will be determined by the 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 non-tradables. 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 the 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 offset 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 level 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 within Jamaica.

2. The tourism sector experiences an increase in its total wage bill through greater employment. Whether or not there is an increase in per-capita expenditures for these households depends on the supply elasticity of low-skilled labor.

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. The extent of this increase will depend on the size of the tourism shock, and the availability of low-skilled labor.

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.

In order to support findings from my baseline repeated cross-section specification, I also construct an unbalanced panel from a subset of the Jamaica Survey of Living Condition data following the methodology used by Handa (2007) in his analysis of households movement across the income distribution. Prior to 2018 the JSLC would occassionally re-sample households from previous years when the same sampling frame was being employed. On average about half of the households in one year may have been re-sampled. This the case for the years 2002-2003, 2004-2007, 2008-2010, 2013-2014, and 2015-2016. Following the Handa (2007) methodology I am able to construct an unbalanced panel of approximately 6000 Jamaican households representing

some 30,000 individuals.

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 5, showing the Greater Montego Bay development area and its urban and rural components.

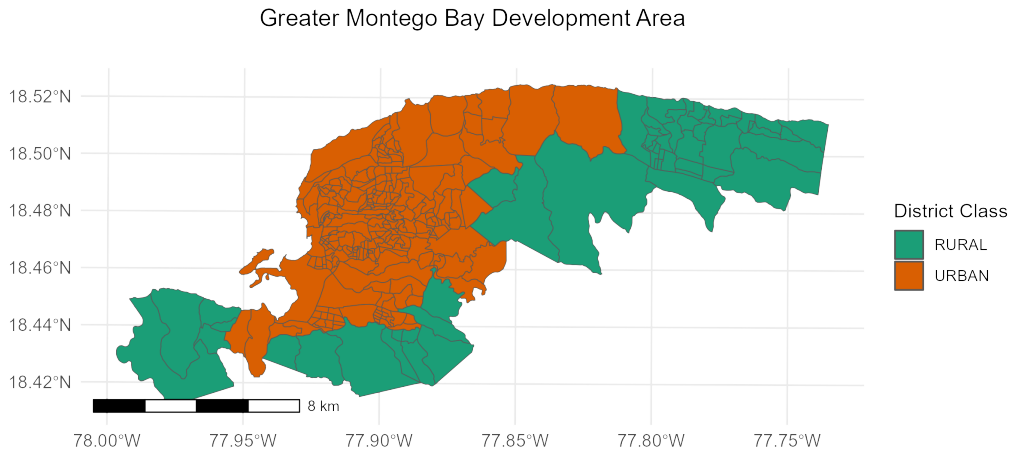


Figure 5: **Greater Montego Bay Development Area**

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 $Tourism_{dt}$ 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 $t : Tourism_{drt}$.

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

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:

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

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:

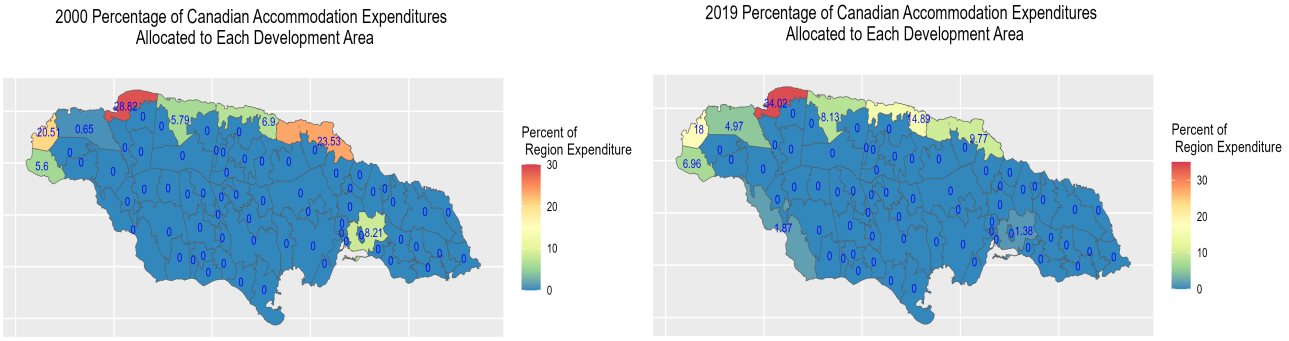
$$z_{dt} = \sum_{r \in R} s_{drt} \left[\frac{Tourism_{r1} - Tourism_{r0}}{Tourism_{r0}} \right] = \sum_{r \in R} s_{drt} g_{r1}. \tag{7}$$

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; D. 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, D. H. Autor and Duggan (2003) 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 figures 6a and 6b we can see variation in which parts of the island Canadians preferred to visit between 2000 and 2019. In my appendix I show the same figure but for tourists from the Southeastern United States.



(a) Canadians 2000

(b) Canadians 2019

Figure 6: Variation Over 2 Decades In Spatial Distribution of Canadian Tourist Expenditures

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 figures 7 and 16.

There was significant volatility in the global economy during this period that was a result of geopoliti-

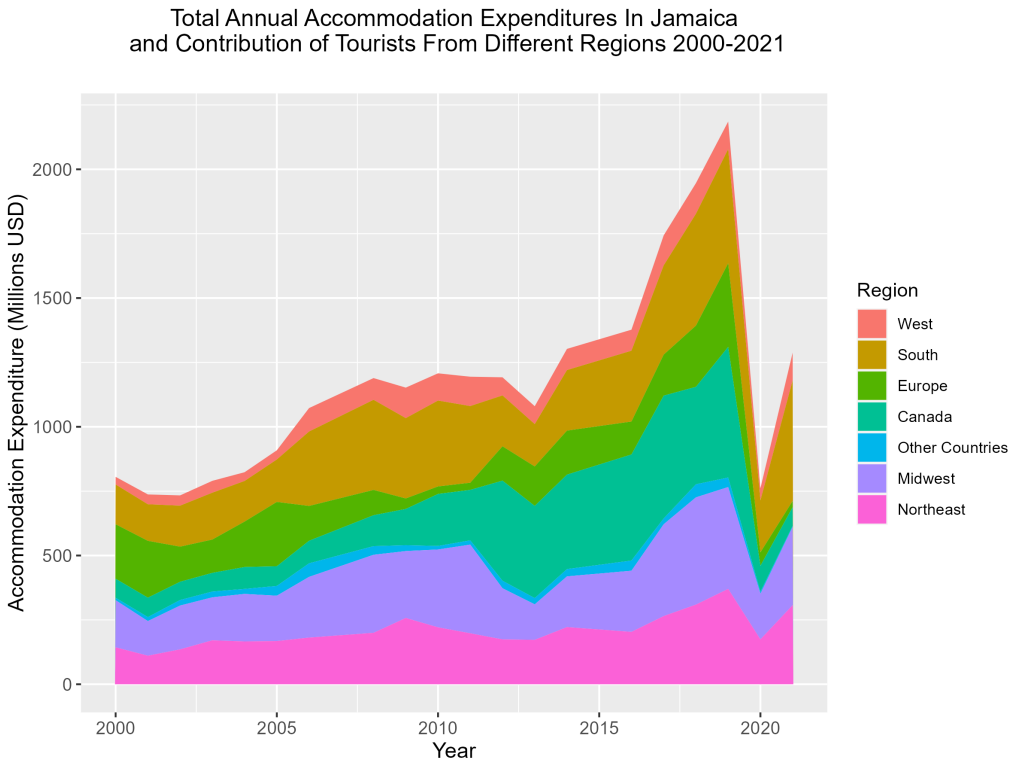


Figure 7: **Level of Expenditures By Region**

cal 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 development 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 varia-

tion 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 a 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 Kaplan and Sun (2017), and perform the regressions with the associated SIVQR command in Stata (Kaplan 2023). Because 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 right hand side variables 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 12.

Figure 8: **Scatterplot of the Shift-Share IV and Tourist Accommodation Spending**

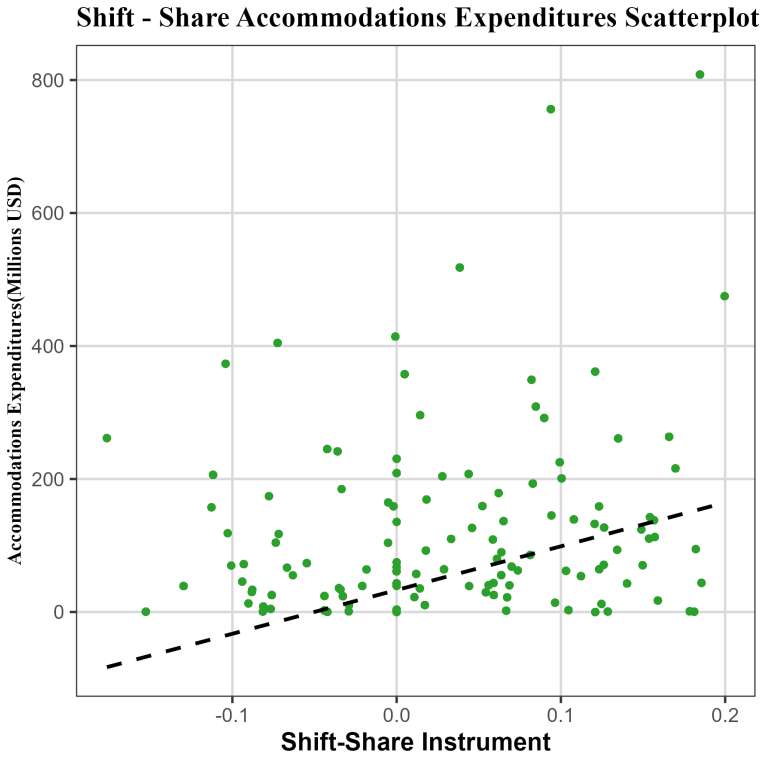


Table 8: IV: Aggregated SSIV Summary Statistics

	Variable	Mean
1	Mean Exposure Share	0.02
2	Median Exposure Share	0.00
3	Standard Deviation Exposure Share	0.07
4	Mean Shock	0.11
5	Median Shock	0.03
6	Standard Deviation of Shock	0.34
7	Inverse HHI: Shocks	280.19

Notes:

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 appendix 9.1.

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

	Accommodations Expenditures(Millions USD)		
	(1)	(2)	(3)
Shift-Share Instrument	1.7e+02	2.2e+02*	8.1e+01***
	(9.1e+01)	(1.1e+02)	(1.6e+01)
Household Size			6.5e-02
			(6.0e-02)
Female Household Head			-3.2e-01
			(3.8e-01)
Rural District			1.1e+00
			(3.2e+00)
First-Stage F-Statistic	3	4	26
Observations	38117	38117	38117
Standard Deviation	110.644	110.644	110.644
Household Controls	No	No	Yes
Development Area Dummies	No	No	Yes
Year Dummies	No	Yes	Yes

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

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 29. However, these findings change markedly when we focus on urban households in areas other than Kingston (the capital). In these localities the coefficient on per-capita tourism expenditures is .0026 at the .01 significance level. This can be seen in table 32. This implies that an increase of 1 million U.S. dollars in expenditure on accommodations in a development area causes an increase of .26 percent in per-capita expenditures for that area's households.

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

	Log Per-Capita Expenditure(USD)		
	(1)	(2)	(3)
Accommodations Expenditures(Millions USD)	1.2e-03**	1.4e-03	2.2e-04
	(4.3e-04)	(9.0e-04)	(6.3e-04)
Household Size			-1.4e-01***
			(3.7e-03)
Rural District			-1.4e-01***
			(2.0e-02)
Female Household Head			-6.2e-02***
			(1.1e-02)
First-Stage F-Statistic	3	4	26
Observations	38117	38117	38117
Standard Deviation	0.732	0.732	0.732
Household Controls	No	No	Yes
Development Area Dummies	No	No	Yes
Year Dummies	No	Yes	Yes

Notes: Accommodation Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks. Female Household Head indicates either a single adult female or household with multiple persons for which the household head or principal earner is female.

Said another way, an increase of 5 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 5 million dollars spent on accommodations in a development area. How economically significant is this increase? Table 13 shows that the median year over year change in accommodations spending for a development areas is 7.92 million U.S. dollars, while the median change over a five year period is 31.06 million.

Thus, we can expect that the median tourism specializing development area over 5 years will see real per-capita consumption expenditures increase by 185 U.S. dollars given existing trends in tourist arrivals and spending. This is an economically significant increase in real consumption for the average Jamaican, particularly those at the lower end of the income distribution. But how are the additional earnings spent by urban residents? In table 14 we can see that the increases in real consumption expenditures by those in urban communities are being spent on a combination of both food(column 1), and non-food(column 2) spending. I find that increases in tourism activity result in a precise and positive increase in real consumption of healthcare services for households on average. An increase in accommodations spending by tourists of 1 million U.S. dollars in a particular development area results in an increase in real per-capita consumption of healthcare services of U.S. $2.30. I also find evidence that there is an increase in how much urban households spend on loan repayments as a result of a positive tourism shock. Column 6 shows that an increase of 1 million U.S. Dollars of development area accommodations expenditures produces an increase of 2.70 U.S. dollars in loan repay-

ments for households. This is significant at the 10% level. In order to account for my urban-only subsample containing 34 or 35 clusters(depending on whether or not I include Kingston), I bootstrap my estimates and report the adjusted findings.

Table 11: IV-Breakdown Across Urban-Rural

	Comparison: Incl. Kingston			Comparison: Excl. Kingston		
	(1) Urban	(2) Rural	(3) All	(4) Urban	(5) Rural	(6) All
Tourism Expenditure(Millions USD)	-4.4e-04	6.7e-04	2.1e-04	2.6e-03***	-8.2e-04	1.2e-03
	(1.2e-03)	(1.5e-03)	(6.5e-04)	(6.0e-04)	(1.2e-03)	(7.7e-04)
Household Size	-1.5e-01***	-1.3e-01***	-1.4e-01***	-1.5e-01***	-1.3e-01***	-1.4e-01***
	(3.6e-03)	(2.9e-03)	(3.7e-03)	(4.4e-03)	(2.9e-03)	(2.9e-03)
Female	-1.2e-01***	-2.7e-02**	-5.8e-02***	-1.0e-01***	-2.7e-02**	-5.1e-02***
	(9.2e-03)	(1.1e-02)	(1.1e-02)	(2.0e-02)	(1.1e-02)	(1.2e-02)
First-Stage F-Statistic	98	23	37	95	18	42
Observations	17792	18865	36657	11125	18381	29506
Standard Deviation	0.730	0.703	0.733	0.711	0.703	0.717
Number of Clusters	35	58	60	34	57	59
Bootstrapped Standard Errors	Yes	No	No	Yes	No	No
HH Controls	Yes	Yes	Yes	Yes	Yes	Yes
DA Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Bootstrapped standard errors are provided in parentheses below the coefficient estimates. The bootstrapped confidence intervals are in brackets below the standard error estimates. Accommodations Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks. *** p<0.01, ** p<0.05, * p<0.1.

These initial findings lend support to the first testable hypothesis from my conceptual framework, with areas that are most exposed to tourists experiencing increases on average in real consumption. As I control for year, development area and household-specific attributes that may influence the outcome variables, along with adjustments to the outcome variables for differences in prices across Jamaica, I can be confident that I am measuring changes in real consumption. The second component of the first testable hypothesis argued that the extent of the increase in real per capita consumption would be determined by the supply elasticity of low-skilled labor within Jamaica. I report the AKM standard errors of a shock-level regression following the methodology of Adão et al. (2019) in table 12. In panels A, B, and C, the results of my baseline regression specifications are compared for all Jamaican households, urban households, and rural households, respectively. I show the implied estimates for five different standard error specifications: Homoskedastic, White standard errors, regular clustered standard errors, and finally, the AKM and AKM0 specifications. The AKM approach corrects for potential correlation in shocks between units that have similar exposure shares. For both the AKM and AKM0 standard errors, the results of my baseline regressions remain.

Table 12: Comparison of AKM Regression Results Across Methodologies

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.

Highly elastic and mobile low-skilled labor would mean that the labor demand shock is quickly met by the labor force, therefore constraining significant increases in wages. My data do not allow me to fully characterize labor market dynamics, but I can consider the likelihood of possible mechanisms indirectly over my study period. The next step is to compare the effects of tourist expenditures for households of different types of occupation.

We know that the earnings from tourism accrue most intensely to those in areas specializing in tourism services; we still want to know how the earnings are distributed across the socio-economic distribution. There may still be significant heterogeneity in who benefits most within these communities. This is clearly supported by our conceptual framework, which identifies the mobility of low-skilled labor as being particularly important for the impacts of a shock such as tourism. This also relates to the discussion of how the income from tourism is spread across different segments of the consumption distribution.

In order to begin I organize the urban sample by the skill-level of the occupation in which they are working. I use the ISIC-4 classification to sort the head/primary earner of the household into low, medium, or high skilled. In table 15 the only effect of tourism on per capita expenditures is experienced by households where the main earner is in a medium-skilled occupation, which I define as a level 2 of the ISIC-4 classification. Column 2 of table 15 shows that for urban areas outside of Kingston, a 10 million dollar increase in accommodations spending results on average in an increase of 2.5 percent in real per capita household expenditures. The fact that the known benefits of tourism appear to be concentrated in the middle segment of the distribution of occupation skills is notable, since one of the noted benefits of tourism is its ability to attract large amounts

of low-skilled labor (Nayyar et al. 2021).

Table 13: Variation In Tourist Expenditure Levels Over Time 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.

Does this result indicate that moderately skilled tourism occupations are those that benefit most from positive shocks, or is it that such moderately occupations outside of the tourism sector are the ones that benefit most from increasing tourism intensity? The second prediction of the framework is that the level of any increase in earnings experienced by those who work in the tourism sector depends on the supply elasticity of low-skilled labor. A lack of change in value-added from additional workers along with a high low-skill labor supply elasticity would imply little to no change in average real wages for workers in the sector, but potentially higher earnings for those in other local sectors owing to their being a higher number of total earnings in a particular locality. This is the outcome predicted by the third testable hypothesis.

Table 14: IV-Breakdown of Spending Across Sub-Categories- Urban Households(Not Including Kingston)

	Log Food	Log Non-Food	Log Non-Consumption	Healthcare	Utilities	Loan Repayment
Tourism Expenditure(Millions USD)	2.6e-03***	3.2e-03**	3.0e-03	2.3e+00***	1.4e+00	2.7e+00*
	(5.3e-04)	(1.3e-03)	(6.0e-03)	(7.6e-01)	(4.6e+00)	(1.5e+00)
First-Stage F-Statistic	56	58	62	56	58	67
Observations	11117	11110	7023	10295	11120	6767
Standard Deviation	0.704	0.861	1.971	990.399	520.181	1434.743
Number of Clusters	34	34	34	34	34	34
Bootstrapped Standard Errors	Yes	No	No	Yes	No	No
HH Controls	Yes	Yes	Yes	Yes	Yes	Yes
DA Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Bootstrapped standard errors are provided in parentheses below the coefficient estimates. The bootstrapped confidence intervals are in brackets below the standard error estimates. Accommodations Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks.

In order to be able to better understand the labor market dynamics that may be driving my results so far I further disaggregate my regressions along the dimensions of occupation, industry, employment type, and skill level. I use both my primary cross-sectional dataset and my panel dataset to support this analysis. In table 16 I show the results for workers across the 9 broad occupation categories used by the Statistical Institute of Jamaica. The coefficients and 95% confidence intervals are also shown in figure 9. There are statistically significant increases in per-capita expenditures for workers in primarily service sector occupations such as Service workers, sales, and craft and trade Work in column 1. Column 3 combines the service oriented column 1 with the elementary occupations category of column 2. Both columns 1 and 3 are significant at the 5 percent level. These findings could both reflect direct expenditures being received by those working directly in tourism, but it could also reflect impacts on the tourism sector on other industries as was predicted by the

conceptual framework. The estimated coefficients from 1 and 3 are both essentially equal to the overall overall urban coefficient obtained in table 11.

Table 15: IV - Relationship Between Skill-Level and The Effect of Tourism Expenditures on Log Real Per-Capita Consumption-Urban Households(Not Including Kingston)

	Low-Skilled	Medium-Skilled	High-Skilled
Tourism Expenditure(Tens of Millions USD)	1.9e-02	2.5e-02*	5.6e-02
	(2.2e-02)	(9.8e-03)	(1.6e-01)
First-Stage F-Statistic	30	74	3
Observations	1454	7939	1723
Standard Deviation	0.665	0.690	0.705
Number of Clusters	34	34	34
Bootstrapped Standard Errors	Yes	Yes	Yes
HH Controls	Yes	Yes	Yes
DA Dummy	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes

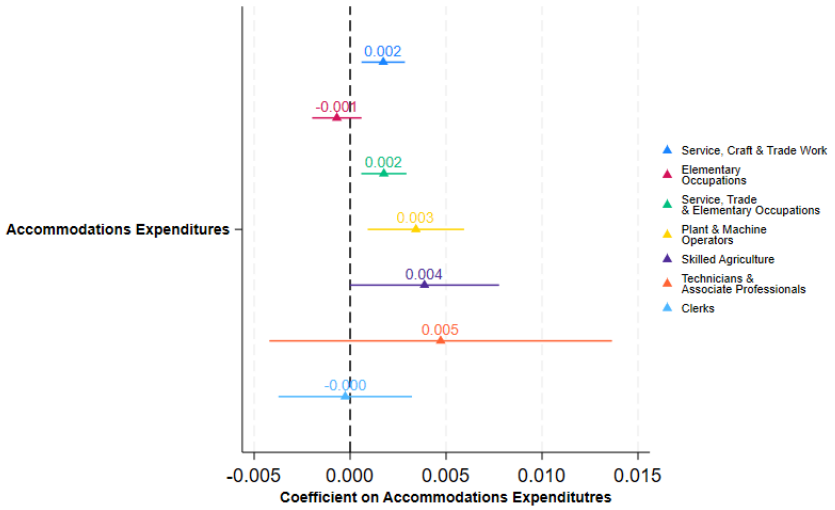
Notes: Accommodations Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks. Female Household Head indicates either a single adult female or household with multiple persons for which the household head or principal earner is female.

The strongest effect that I find is for Plant & Machine Operators in column 4 of table 16 where we see a coefficient of .0038 on development area accommodations expenditures. Workers in this occupations come largely from either transportation and manufacturing. Transportation is classified as a tourism related activity by STATIN and therefore it is possible that this effect is driven directly by tourism earning, or by spillovers to manufacturing via linkages, or through upward pressure on wages due to an inelastic labor supply. A limitation of a cross-sectional regression in this setting is that I am unable to determine whether these results reflect people moving from one occupation to another or if higher earnings for a particular occupation category reflect incumbent workers in a particular sector benefiting from increased demand for that sector's output. I next use my unbalanced rolling panel to shed light on the mechanisms underlying the increases in real consumption that I observe.

Because the panel dataset is significantly smaller than my repeated cross-section there are not enough observations to perform the same regressions as I conducted in in table 16 with the statistical power needed to obtain accurate estimates. For this reason I consider the aggregate industries in my regression as well as the original quintile in which I first observe a household.

In table 18 we can observe in columns 1-4 that the households in which the principal earner works in either broad non-tourism services or in manufacturing that experience gains resulting from the positive changes in the level of tourism spending in a development area. In column 5 we can see some evidence of returns from households working in the tourism sector as well with a coefficient of .0019. My panel specification complements my main repeated repeated cross-section approach in two ways. First, because I can observe the household head's employment in each of the periods in which they are observed, I am able to limit my regressions

Figure 9: **Cross-Section Comparison of IV Coefficients Across Occupation Categories In Urban Area Not Including Kingston**



to household heads who remain the same industry over the course of their survey periods. I can thus estimate how the effects of tourism shocks are felt by existing workers in a particular sector unlike the cross-section where I am unable to disentangle the effects of the shock on new vs existing workers in a given industry. A second strength of using the panel dataset is that I can also begin to consider how the effects of this shock differ depends on where the household falls on the expenditure distribution its its first period. This analysis is also one that I cannot do convincingly with only a repeated cross-section.

Table 16: IV-Per-Capita Consumption By Occupation Categories For Urban Non-Kingston Municipalities

	Service, Craft Trade Work	Elementary Occupations	Service, Trade & Elementary	Plant & Machine Operators	Skilled Agriculture	Technicians & Associate Professionals	Clerks
Tourism Expenditure(Millions USD)	1.7e-03**	-6.9e-04	1.8e-03**	3.4e-03***	3.9e-03	4.7e-03	-2.5e-04
	(5.6e-04)	(6.3e-04)	(5.8e-04)	(1.2e-03)	(1.9e-03)	(4.4e-03)	(1.7e-03)
First-Stage F-Statistic	82	11	73	114	36	9	43
Observations	3909	1436	5414	2838	845	503	625
P-Value	0.027	0.389	0.039	0.005	0.111	0.371	0.906
Number of Clusters	34	34	34	34	33	30	31
Bootstrapped Standard Errors	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Bootstrapped standard errors are provided in parentheses below the coefficient estimates. The bootstrapped confidence intervals are in brackets below the standard error estimates. Accommodations Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks.

Broadly, my results from table 18 and its associated figure 10 reiterate what my earlier findings suggested which is that the benefits of the tourism sector are being experienced by in the service sector as predicted by the framework, but also in manufacturing for which the implications of the framework were somewhat more unclear. While for columns 1 to 4 I require that households are in the same sector for each observation, for column 5 I stipulate that a household head has worked in tourism for at least one of the periods in which they are surveyed. The positive coefficient of .0023 for column 5 could reflect the increase in wages individuals receive moving to jobs in the tourism sector following a labor demand shock because of the arrival of

more tourists. While I do not directly observe wages, we can see from tables 4 comparing household summary statistics for those working in tourism versus those in agriculture that tourism sector household per-capita consumption is on average significantly higher than that for households involved in agricultural activities. Even if real wages in the sector do not increase with increasing tourism demand, if workers in the sector command relatively better wages than sectors such as agriculture, an increase in tourism activity may indeed result in an increase in real per-capita expenditures from people taking positions in the industry.

Table 17: IV - Tourism Industry Employment Likelihood By Sector & Rurality

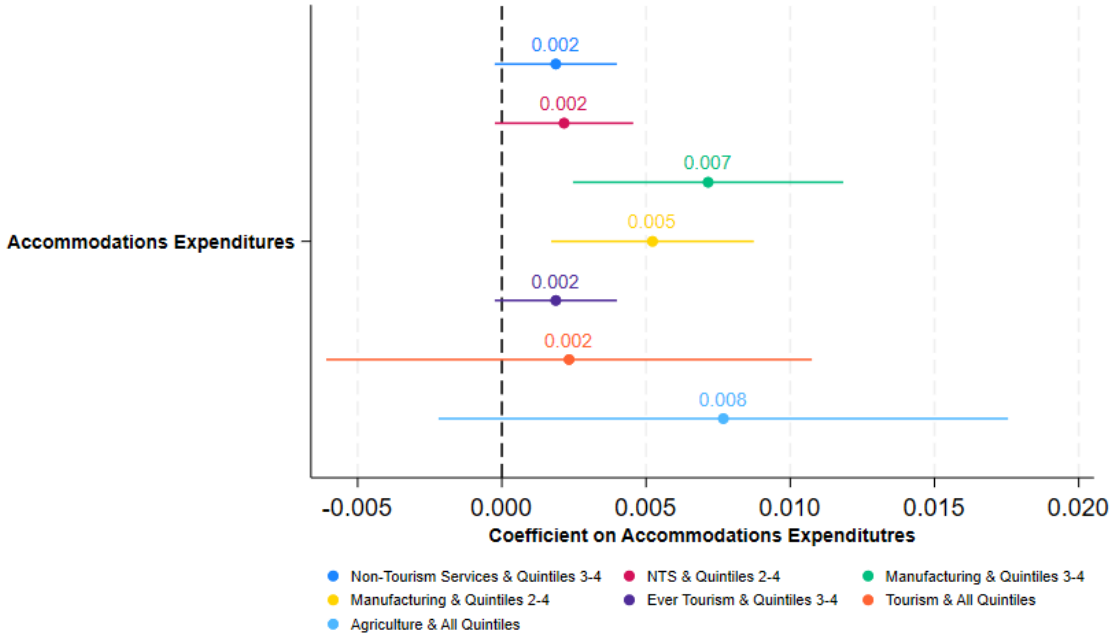
	Urban Tourism Employment Likelihood	Rural Tourism Employment Likelihood
Tourism Expenditure (Millions USD)	5.8e-04	5.3e-04*
	(3.8e-04)	(2.8e-04)
	[-0.000,0.001]	[-0.000,0.001]
First-Stage F-Statistic	61	23
Observations	17793	18866
Standard Deviation	0.280	0.250
Number of Clusters	35	58
HH Controls	Yes	Yes
DA Dummy	Yes	Yes
Year Dummies	Yes	Yes

Notes: The Tourism Industry outcome is binary variable with 1 indicating the household head or principal earner works in a tourism related industry and 0 indicating the individual works in a different industry. Bootstrapped standard errors are in parentheses below point estimates while the 95% bootstrapped confidence interval is in brackets below the standard errors. Accommodation Expenditures are calculated at the development area level ins of millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. Household expenditures are also adjusted to 2024 U.S. Dollar values. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks. Female Household Head indicates either a single adult female or household with multiple persons for which the head or principal earner is female.

This interpretation is supported by my cross-sectional regression of the an indicator for employment in a tourism relative activity on accommodations spending in a development area. This regression, as I show in table 17 shows a positive and statistically coefficient on tourism expenditures for rural households that is positive at the 10% significance level. This suggests than at increase in tourism earnings of approximately 2 million U.S. dollars results in an increase of 1 percentage point in the likelihood that a rural household works in the tourism industry. At the same time these results could also represent households switching into the non-tourism services and manufacturing occupations that benefit from the tourism demand shock. However the fact that there is no discernible increase in real expenditures that can be found for those in the tourism industry across all periods of their survey or for those classified as being in tourism related industries in the cross-section regressions supports the predictions of testable hypothesis 2. In essence, because of a possible lack of return to scale in tourism services, increases in tourism demand may produce a proportionate increase in demand for tourism labor, but the returns to labor within the sector do not change. In such a setting we would expect increases in household consumption to come from households moving out of lower wage sectors such as agriculture and into tourism, or from households in non-tourism services or manufacturing benefiting from a combination of increased local demand for services and goods as well as potential increases in wages that are the product of a labor supply shortage.

My data does not allow me to explore these potential mechanisms precisely, however I am able to to effectively characterize the heterogeneous impacts of changes in tourism on communities within Jamaica. So far we have seen that increases in tourism produce increases in real consumption for urban households in non-tourism industries, as well as households for which the survey head is employed in tourism for at least

Figure 10: **Panel Comparison of Coefficients Across Industries of Employment**



one survey period. The prior results suggest a relatively high labor supply elasticity, and is consistent with the lack of productivity gains from additional labor supply described by studies such as those by Baumol and Bowen (1965). Intuitively, as more tourists arrive, the ratio of workers to tourist needed to produce the tourism services such as entertainment, food, and other activities remains constant.

Table 18: **IV-Panel Per-Capita Consumption By Industry**

	NTS: 3-4	NTS: 2-4	Manuf.: 3-4	Manuf.: 2-4	Ever Tourism: 3-4	Tourism: 1-5	Agriculture: 1-5
Tourism Expenditure (Millions USD)	1.9e-03*	2.2e-03*	7.2e-03*	5.2e-03***	1.9e-03*	2.3e-03	7.7e-03
	(1.1e-03)	(1.2e-03)	(2.3e-03)	(1.7e-03)	(1.1e-03)	(4.1e-03)	(4.9e-03)
First-Stage F-Statistic	46	46	22	16	46	9	3
Observations	703	908	273	353	703	238	1129
Bootsrapped P-Value	0.082	0.077	0.037	0.005	0.082	0.577	0.125
Number of Clusters	46	50	36	43	46	34	55
Bootstrapped Standard Errors	No	No	Yes	No	No	No	No
Household Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Bootstrapped standard errors are provided in parentheses below the coefficient estimates. The bootstrapped confidence intervals are in brackets below the standard error estimates. Accommodations Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks.

7.1 Heterogeneous Impacts Across Skills

The degree to which tourism shocks benefit households across the skill distribution is important for Jamaica, and for emerging economies in general. What do the results of my study reveal about the extent to which tourism earnings produce real increases in per-capita consumption for households in particular skill levels. Furthermore, in what industries do different skill levels benefit. Testable hypothesis 3 predicts that to the ex-

tent that higher skills are associated with higher earnings and employment in non-tourism services, the benefits of a tourism demand shock may accrue to wealthier homes. Thus, the question of skills and employment type also relates to the broader question in my study about if a tourism based economy can produce welfare gains for a wide segment of the population.

In table 19 I estimate heterogeneity in the effects of changes in tourism intensity along the labor dimensions of skill and the employment status as defined by STATIN. I separate the data by the employment status categories of private sector, government, and own-account. In order to ensure that I have enough observations for the regressions along the skill dimension, I aggregate medium- and low-skilled occupations into a single "LM-Skill" category while levels 3 and 4 of the International Labour Office (2012) classification into the high-skilled category.

This approach allows me to compare the largest employment status segments of the Jamaican labor force. The private sector category refers to individuals working in enterprises with more than 1 employee. The government category refers to all occupations involving public officials such as teachers, social workers, etc. This employment category is useful because the salaries of these workers do not respond to short-term changes in tourism, but are set by the national government as a part of the national budget that is determined each June. As such, changes in tourism arrival spending should either have no effect on earners in this employment category or have a negative effect on real consumption as a result of rising prices. As testable hypothesis 4 of my framework predicts, increases in tourist accommodation spending intensity in a given development area will lead to price increases in the cost of local nontourism/nontradable services with the level of the increase depending on how integrated tourist activities and spending are with the activities of local residents.

Table 19: IV- Skills and Employment Categories

	Log Exp: Private Sector		Log Expenditure: Government		Log Expenditure: Own-Account	
	LM Skill	High Skill	LM Skill	High Skill	LM Skill	High Skill
Tourism Expenditure(Millions USD)	1.7e-03*	5.6e-03*	2.0e-04	-5.3e-03*	-2.7e-04	6.3e-03
	(7.8e-04)	(2.8e-03)	(2.7e-03)	(2.5e-03)	(1.4e-03)	(5.4e-03)
First-Stage F-Statistic	49	14	20	10	23	3
Observations	8887	1046	1307	1040	10315	1082
Standard Deviation	0.679	0.727	0.674	0.666	0.674	0.691
Number of Clusters	59	57	58	54	59	58
Bootstrapped Standard Errors	No	No	No	No	No	No
Household Control	Yes	Yes	Yes	Yes	Yes	Yes
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Bootstrapped standard errors are provided in parentheses below the coefficient estimates. The bootstrapped confidence intervals are in brackets below the standard error estimates. Accommodations Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks.

Finally, the own account worker category will be informative because it provides insight into a large segment of the labor force that is known to be heavily involved in informal activities. This will give me insight into how tourism impacts those who are self-employed. Many of these workers will be located in the agricultural sector. Incorporating skill-level of occupations will allow me to more fully grasp the heterogeneity within each of these employment categories. I estimate this regression in all of Jamaica's development areas excluding Kingston.

I find that positive effects on per-capita consumption are concentrated in the private sector for both low/medium skilled workers as well as high-skilled workers as well, though the first-stage F-Statistic is significantly stronger for the low/medium skilled category. For the government category of employment there is no observable effect for low/medium-skilled workers while there is a negative coefficient of -.0053 for high skilled occupations, though once again the F-statistic is support the low. I do not observe any effects for the own-account category of employment. These results lend further support to the argument that positive tourism shocks are beneficial to those at the lower and middle end of the skills distribution. The lack of change or decrease in real consumption among those in government sectors whose earnings would not change from an increase in touristic activity, but whose purchasing power may be lends further support to the hypotheses of the framework.

Testable hypothesis three posited that the the degree to which tourism's impacts are felt across a broad segment of the population would depend in part on the extent to which higher skills correlated with working in the local non-tradable sector. From results in the previous tables it is apparent that it is not only the non-tradable sector that may benefit from these local shocks,as we see increases in real consumption for manufacturing employed households as well. However it does appear that the true segmentation in the impacts of the sector may depend on whether or not workers are employed in private sector firms versus own-account, with the private sector exhibiting a higher share of higher skilled work than own-account type employment. This pattern may in turn hold implications for which households along the consumption distribution benefit the most. In my final results section I will combine my analysis of skills and employment with analysis of heterogeneous impacts by socioeconomic status.

7.2 Heterogeneous Effects Across The Consumption Distribution

I now move on to consider in more depth the degree to which the earnings of tourism growth are spread across the consumption distribution. I argue that this is in turn intimately tied to the skills and type of employment in which households are engaged. This section relates most closely to my third testable hypothesis as well as the fifth and final hypothesis regarding the effects of our observed tourism shocks on the likelihood of households falling into poverty.

First, to establish a baseline we can first consider the effects of the tourism across different regions of Jamaica. In table 20 I show that for various municipality types and grouping in Jamaica there is no statistically significant relationship between development area accommodation expenditures and the likelihood of a household falling below the poverty line. Therefore the fifth prediction of my framework is shown to not be accurate. What can we say about the effects of tourism on consumption among other segments of the expenditure distribution.

Table 20: IV - Relationship Between Tourism Earnings and Household Poverty Status by Municipality Type

	Household Likelihood of Being In Poverty			
	Full Sample	Full Sample(No Kingston)	Urban(No Kingston)	Rural(No Kingston)
Tourism Expenditure(Tens of Millions USD)	-2.1e-03	-2.1e-03	-2.6e-03	3.8e-03
	(1.7e-03)	(1.7e-03)	(3.8e-03)	(4.6e-03)
First-Stage F-Statistic	37	37	61	18
Observations	36659	36659	17793	18382
Standard Deviation	0.332	0.332	0.290	0.367
Number of Clusters	60	60	35	57
Bootstrapped Standard Errors	No	No	Yes	No
Household Controls	Yes	Yes	Yes	Yes
Development Area Dummy	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes

Notes: The poverty outcome is binary variable with 0 indicating a household is not below the poverty line and 1 indicating the household is below the poverty line. Accommodation Expenditures are calculated at the development area level in tens of millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks. Female Household Head indicates either a single adult female or household with multiple persons for which the head is female.

We know from the panel regressions by sector and for specific quintiles in table 18 that the effects of tourism expenditures appear to be strongest in roughly the middle of the expenditure distribution for non-tourism services and the manufacturing sector. The lack of a significant impact on the likelihood of households falling into poverty is consistent with this outcome. Furthermore, so far my resuls have shown that the benefits of tourism appear to accrue to those in moderately skilled/level 2 skill professions, rather than elementary occupations that we may expect to be held by the poorest segments of society. My panel data allows me to further investigate which segments of Jamaican households see improvements in real spending levels following positive tourism shocks.

In table 21 I conduct separate regressions based on the initial decile in which I observe a household. Whereas a cross-sectional regression of the same approach would be flawed because the decile in which I observe households in a cross-section is inherently endogenous, in this approach I am able to estimate effects of the tourism based on where households "begin" on the expenditure distribution. For these regression I exclude the cities of Kingston, Mandeville, and May Pen.

The first column of the table includes households from all deciles of the expenditure distribution. As we would expect there is no statistically significant effect, which is consistent with the baseline regression estimates from table 10. Furthermore, consistent with the lack of an impact of tourism activity on the likelihood of a household being below the poverty line in column 2 I find that there is no observable effect for tourism activity for those in the first per-capita expenditure decile. I observe statistically significant effects when I expand the regressions to include households in the bottom half of the expenditure distribution in column 4 as well as households in deciles 1-7 in column 5. I obtain a coefficient of .0052, which is noticeably higher than the coefficient of roughly .002 I obtain in earlier estimates. While column 5 is statistically significant at the 5 percent level, then first stage F-statistic is relatively low at 13. When I include the 8th and 9th deciles, the observed statistically significant effects disappear. Despite the variability of the first stage F-statistic these results imply that it is perhaps households in the middle to upper middle of the expenditure distribution to whom the benefits of tourism accrue, while there are few directly observed effects for those at the ends of the expenditure distribution.

In order to investigate this more robustly I employ instrumental variable quantile regression(IVQR) following the methodology of Kaplan and Sun (2017) and using the associated SIVQR package (Kaplan 2023) in STATA. I employ my main repeated cross-section dataset for this regression. Even with the larger number of observations of this dataset relative to the panel dataset, I still have to make adjustments to my baseline estimation strategy in order for the regression to run successfully. As IVQR uses a minimum distance procedure that is reliant on there being a sufficient number of observations in each quantile conditional on controls and dummy variables, I cannot estimate the IV quantile regression with the full set of controls and dummy variables as in my original specification. Instead, when conducting the quantile regression I control for household size and the sex of the household while also including a binary variable for whether or not the year is year is before or equal to 2010 or after.

The results of the instrumental variable quantile regression with log per-capita expenditure as an outcome variable can be seen in figure 11 and table 22. The pattern of the results in the quantile regression are consistent with the developing pattern of my results so far, with positive and statistically significant coefficients on tourism spending observefor the core of expenditure distribution from the 2nd to the 7th decile. There is no statistically significant effect on average for tourist accommodations expenditure on per-capita expenditures for the 1st decile or for deciles 8 and above. I do not include the 9th or 10th deciles in my figure because the 95 percent confidence intervals become massive and dwarf visuals of the other results.

Table 21: IV- Panel Based on Deciles for Urban Areas Excluding Kingston

	Log Per Capita Expenditure(USD) Separated by Deciles					
	(1-10)	(1)	(1-3)	(1-5)	(1-7)	(1-9)
Tourism Expenditure(Millions USD)	-3.8e-04	1.2e-02	6.0e-03	5.3e-03*	5.2e-03**	1.9e-03
	(7.2e-04)	(1.1e-02)	(3.4e-03)	(2.5e-03)	(2.0e-03)	(9.8e-04)
First-Stage F-Statistic	25	10	8	10	13	21
Observations	6032	371	1234	2202	2806	4910
Standard Deviation	0.711	0.524	0.488	0.495	0.505	0.583
HH Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Bootstrapped standard errors are provided in parentheses below the coefficient estimates. The bootstrapped confidence intervals are in brackets below the standard error estimates. Accommodations Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks.

The magnitude of the coefficients do not differ markedly over the course of the expenditure distribution, with an average effect of roughly .0013. The magnitude of the coefficients are on average smaller than the average effect of roughly .002 that I have found obtained in my other regressions but the estimates are largely close when considering the 95% confidence intervals, particularly for the 4th decile. This result demonstrates that there are on average statistically significant increase in real per-capita consumption resulting from tourism on a broad cross-section of the consumption distribution for Jamaican households. I consistently fail to find significant effects for the most affluent segments of the Jamaican population, but the same is also true for the poorest households. This is despite the fact that economic inclusion of the poorest workers is one of

the major goals of tourism based development. What can be said about how these varying outcomes across the consumption distribution vary with both employments and skillsets? Can we gain any additional insights into probable mechanisms from the results I observe. Once again I turn to my panel dataset.

Figure 11: Quantile Regression Coefficient Graph

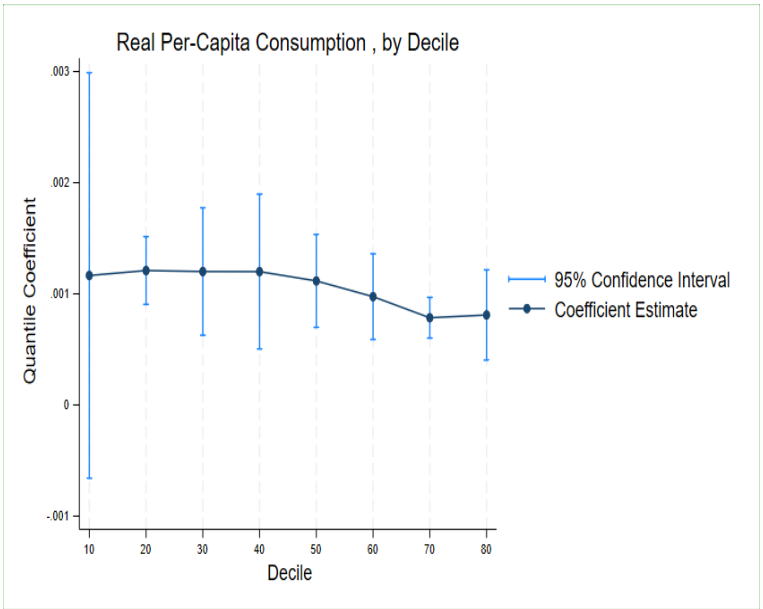


Table 22: IV: Quantile Regression of Log Per-Capita Consumption Expenditure on Tourist Accommodations Expenditures

	Log Per-Capita Expenditure(USD) by Expenditure Quantile							
	.1	.2	.3	.4	.5	.6	.7	.8
Tourism Expenditure(Millions USD)	1.3e-03	1.3e-03***	1.3e-03***	1.3e-03***	1.2e-03***	1.1e-03***	9.0e-04***	8.4e-04
	(1.7e-03)	(2.1e-04)	(1.5e-04)	(2.7e-04)	(2.4e-04)	(1.3e-04)	(8.8e-05)	(4.8e-04)
Observations	36657	36657	36657	36657	36657	36657	36657	36657
Smoothing Bandwidth	7.2e-02	8.1e-02	8.2e-02	8.1e-02	8.1e-02	8.1e-02	8.1e-02	8.0e-02
Household Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Group Dummies	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.

In table 23 I compare outcomes by employment categories, and skill-levels for households who are in various points along the expenditure distribution in the first period in which they are surveyed. The first column shows that for the 3rd to 4th quintiles on average across all employment types there is a positive and statistically significant at the 5 percent level coefficient of .003 for tourism expenditures. I next expand the sample to include the the 2nd, 3rd, and 4th quintiles of the expenditure distribution. At the same time I limit the sample to be only individuals who are in a low or middle skill level occupation during all periods they are surveyed. I obtain a statistically significant .0026 as a coefficient, though the first stage F-Statistic falls slighly to 18. This result is consistent with my findings up to this point with households that are middle and lower-skilled in middle segments of the expenditure distribution benefiting the most from tourism earnings. I then find in column 3 that this effect is in part driven by the low and middle skilled occupations in the private sector which is consistent with my earlier findings that manufacturing and non-tourism services benefited the most increases in tourism earnings. I do not obtain any effect for government positions or low/medium skilled

own-account positions.

Table 23: Panel Regression Comparing Outcomes By Employment Category and Skill Level For Households In Various Deciles

	All Employment:3-4	LM:2-8	LM:2-8 Private	LM:2-8 Own Account	LM:2-8 Gov	High-Skilled:2-8 Gov
Tourism Expenditure(Millions USD)	3.0e-03**	2.6e-03**	4.7e-03*	2.5e-03	-4.0e-04	1.9e-04
	(1.2e-03)	(1.2e-03)	(2.6e-03)	(2.0e-03)	(5.5e-03)	(3.6e-03)
First-Stage F-Statistic	25	18	19	12	2	7
Observations	2429	3651	707	1200	117	132
Standard Deviation	0.399	0.478	0.438	0.463	0.460	0.468
Number of Clusters	58	60	50	55	22	24
Bootstrapped Standard Errors	No	No	No	No	Yes	Yes
Household Control	Yes	Yes	Yes	Yes	Yes	Yes
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Bootstrapped standard errors are provided in parentheses below the coefficient estimates. The bootstrapped confidence intervals are in brackets below the standard error estimates. Accommodations Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks.

To what extend do these findings align with the logic of the framework with which I am working? The third testable hypothesis argued that a combination of the size of the tourism shocks,the degree to which being a skilled worker correlated with employment in non-tourism services, and the degree to which skill correlated with affluence tourism growth would benefit the most affluent. One way in which this prediction was inaccurate was that it did not consider the influence of tourism on the tradable manufacturing sector. My earlier results showed that workers in manufacturing particularly benefited from the tourism shock. I am unable to determine if this is because of back-linkages to tourism, increased local demand, or from wages rising because of a lack of available labor. What my results do suggest is that there appears to be some correlation between being a skilled worker and being employed in non-tourism services, but this correlation is not perfect. Indeed it seems that those who benefit the most directly tend to be those in moderately skilled occupations, and in non-tourism services or in manufacturing. Those at the highest and lowest ends of the skill distribution do not appear to benefit nearly as much by comparison directly at least.

As such the implications of the third testable hypothesis appear to be accurate with non-tourism services inviting a relatively wide spread of skill levels and thus increases in tourism benefiting a wide segment of the expenditure distribution. However, a major relevant dimension that may influence the importance of skills is the type of employment, as almost all the benefits of tourism appear to accrue to the private sector, with own account workers seeing almost no direct benefits. In so far as own account work is associated with low skill-sets and poverty, that implies tourism's impact may exclude those segments of the population.

7.3 Robustness and Demographic Heterogeneity

I finally consider additional demographic and economic characteristics of households to more completely characterize the nature of tourism's impact across the population, and to further confirm that my results capture real consumption changes.

A major source of wealth and a marker of relative affluence is home ownership. Differences in the impacts of tourism depending on whether a person/household own their home can also provide useful insight into who is benefiting most. In table 24 I run separate regressions of samples on urban home owners and urban renters

in localities outside of Kingston. I find that the coefficient on tourism earnings is statistically significant only for homeowners as is shown in column 1, with a coefficient of approximately .003. This further supports the prior findings that those in the middle to upper middle of the expenditure distributions appear to be some of the core beneficiaries of tourism shocks. We may however, be concerned that we are not accurately capturing the full influence of tourism on cost of living variables.

Table 24: **IV- Comparing The Impact of Tourism on Urban Homeowners vs. Urban Renters (Excluding Kingston)**

	Homeowner Expenditure	Renter Expenditure
Tourism Expenditure(Millions USD)	3.8e-03*	1.1e-04
	(1.4e-03)	(8.1e-04)
	[0.001,0.007]	[-0.002,0.002]
First-Stage F-Statistic	13	15
Observations	6063	9613
Standard Deviation	0.706	0.743
Number of Clusters	34	60
Bootstrapped Standard Errors	Yes	Yes
HH Controls	Yes	Yes
DA Dummy	Yes	Yes
Year Dummies	Yes	Yes

Notes: Bootstrapped standard errors are provided in parentheses below the coefficient estimates. The bootstrapped confidence intervals are in brackets below the standard error estimates. Accommodations Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks.

In order to further confirm that changes in per-capita expenditures are not capturing increases in the cost of living caused by these positive tourism shocks I further regress various cost of living outcome variables on per-capita tourism expenditures. As we can see in table 25, there is no statistically significant change in real per-capita spending on rent or property tax. There is a minor increase in per-capita utility expenditures of 1.4 U.S. dollars for every million dollars spent on area accommodations, that is barely significant at the 10 percent level. Results from table 11 showed that a 1 million dollar increase in tourist spending results in an increase of 7.4 USD in per-capita expenditures, this implies that around 6 dollars of this increase is no attributable to higher utility expenditures. Higher utility spending may also reflect higher consumption of water or electricity resulting tourism induced increases in household earnings. Taken together with the changes in per-capita expenditures and the statistically significant reductions in poverty, these results support the conclusion that tourism arrivals are raising real consumption. It is unclear from these findings whether the fourth testable prediction, relating to cost of living increases has proven accurate.

It is also worth noting that while I do not observe significant changes in consumption for various industry, employment types, and skill levels I see very little evidence of decreases in real consumption resulting from upward cost pressure resulting from tourists using local services and demanding more expensive amenities. The only example I have of some potential upward pressure is that in table 19 where there is a

statistically significant decrease in real consumption by government employees. However on average, as I described earlier, the segmented style of Jamaican tourism relative to the tourism product offered in cases such as Barcelona and Amsterdam (Allen et al. 2021; Almagro and Domínguez-Iino 2025) could potentially insulate Jamaican households in most areas of the country from the effects observed in other contexts.

Table 25: IV: Regression of Cost of Living Variables On Tourism

	Per-Capita Utilities	Per-Capita Rent	Per Capita Property Tax
Tourism Expenditure (Millions USD)	1.4e+00*	9.2e-01	8.1e-02
	(6.1e-01)	(1.0e+00)	(4.5e-02)
First-Stage F-Statistic	70	70	70
Observations	11522	11522	11522
Standard Deviation	535.996	594.928	47.613
Number of Clusters	39	39	39
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.

The statistically significant increase in the likelihood of individuals working in tourism related industries suggests that labor cost induced price increases in the costs of local services could still be a potential mechanism through which per-capita expenditures are increasing in non-tourism services. When I drill down further into the sectoral breakdown of per-capita expenditures, the increases are confined to urban households working in non-tourism services as well as households whose sector of employment is given as “Not Specified".

Table 26: 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)	-4.6e-04	1.2e-03	4.8e-04	1.4e-04
	(1.2e-03)	(1.7e-03)	(1.4e-03)	(1.5e-03)
	[-0.003,0.002]	[-0.002,0.005]	[-0.002,0.003]	[-0.003,0.003]
First-Stage F-Statistic	35	20	11	9
Observations	10989	9324	13351	7716
Standard Deviation	0.723	0.725	0.722	0.682
Number of Clusters	45	45	70	70
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.

Given statistically significant differences in education and overall socioeconomic outcomes for women and female-headed homes the inclusiveness of a particular sector on the dimensions of gender is also an outcome of particular importance. We also know that generally global tourism has been one of the most successful industries at inclusion of women. Do we see evidence of these outcomes in Jamaica as well? In table 26 I re-run my baseline per-capita expenditure outcome variables separating them by urban and rural, and by the sex of the head of household/principal earner. I find no statistically significant differences in how males and females benefit from positive tourism shocks, which suggests an equitable distribution of the impact.

8 Discussion and Conclusion

In this study I have answered the two questions, do increases in tourist expenditure produce increases in real per-capita consumption for Jamaican households, and to what extent are these consumption increases ob-

served among households at or below the poverty line? I use a shift-share instrumental variable identification strategy with identifying variation obtained from many exogenous shocks. I exploit heterogeneity in where tourists from different regions of origin choose to visit in Jamaica, and variation in their propensity to visit Jamaica at all to identify the coefficient on municipality accommodation expenditures.

I have found that an increase in spending on accommodations of 5 million U.S. dollars result in a 1 percent increase in real per-capita consumption for urban households in localities outside the Jamaican capital. As predicted by my conceptual framework inspired by Moretti (2010), positive shocks to the tourism industry produce an increase in demand for labor in the tourism sector, increasing the total number of households working in the sector. My results further indicate that gains in earnings accrue to households specializing in non-tradable services outside of the tourism industry. This result is also predicted by the conceptual framework, but because of data limitations I am unable to determine whether this increase is because of rising wages as a result of a lack of available labor because of increased tourism labor demand or increasing demand for local services as a result of the labor demand shock, or a combination of both influences. My instrumental variable quantile regressions indicate that the positive consumption effects from the tourism shock accrue to households in the 2nd to 7th deciles. These statistically and economically significant results shows broad effects across the core of the consumption distribution but, along with my regressions on poverty outcomes, show unclear results for the poorest Jamaican households. Finally, my results indicate that despite tourism's positive effects, the increases in per-capita expenditure appear to accrue mostly to urban males and male-lead households.

My study has also revealed that the individuals who benefit the most are those in mid-skilled occupations in non-tourism services and manufacturing in private sector firms. Indeed, it seems that because of a large number of mid-skilled opportunities in non-tourism services, and because much of the core of the expenditure distribution is composed of mid-skilled workers tourism has broad impacts across this segment of the population.

At the same time it appears that those in low-skilled occupations, in rural areas or who primarily do own-account work do not experience significant direct benefits from increases in tourism earnings. However, there is also evidence that increases in tourism intensity may benefit switchers out of other lower paying sectors in the economy.

Importantly I did not observe significant effect related to cost of living increases for locals as has been observed in other tourism studies. While I am not able to give a definitive statement on why cost of living were not as a significant a factor in the Jamaican case, some possible reasons are the the different level of integration of the all-inclusive resort-style tourism from the Jamaican context compared to the urban tourism style of tourism in many industrialized cities like Amsterdam (Almagro and Domínguez-Iino 2025) and Barcelona (Allen et al. 2021) where other studies have been conducted.

What are the implications of these outcomes for tourism-based development and service sector lead de-

velopment more generally? These results show that tourism based development is capable of producing some economically meaningful gains in welfare for some households, albeit indirectly. Positive tourism shocks move low-skilled workers, many of them poor into the tourism industry enabling higher real per-capita consumption relative to many alternatives available to them. While positive shocks to the tourism sector do not produce real within sector real consumption gains, possibly as a result of low scope for productivity growth and a plentiful supply of labor, there do appear to be gains in other segments of the local service sector.

These results suggest that tourism has the potential to produce gains relative to agriculture or resource intensive natural resources thanks to its labor intensity but it may have limitations in its ability to spark growth in other sectors via back-linkages in all contexts. This study suggests 3 possible routes for future research. Future work could build upon this study by more in depth analysis of the urban-rural linkages. Another area of research that could provide further insight is work looking into the spillover effects of investments in infrastructure for the tourism industry that may in turn benefit other sectors of the economy. Finally future work could also consider how different styles of touristic integration with local communities yield heterogeneous impacts on locals.

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9 Appendix

9.1 Appendix 1: First Stage Regressions

Table 27: 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***	1.2e+02***	1.2e+02***	1.1e+02***	1.1e+02***
	(2.3e+01)	(2.2e+01)	(1.8e+01)	(1.6e+01)	(1.3e+01)	(1.2e+01)
Household Size	9.9e-02	1.2e-01	-1.5e-02	-1.0e-01	-2.2e-01	1.2e-01
	(9.0e-02)	(8.8e-02)	(1.7e-01)	(3.3e-01)	(4.7e-01)	(3.0e-01)
Female	-4.4e-01	-4.9e-01	-5.8e-01	-1.4e+00*	-1.2e+00*	-1.2e+00*
	(4.2e-01)	(4.3e-01)	(3.9e-01)	(6.4e-01)	(5.5e-01)	(4.8e-01)
Rural Enum. District	3.4e+00	3.7e+00	4.1e+00	4.7e+00	6.7e+00	7.8e+00
	(3.6e+00)	(3.8e+00)	(4.1e+00)	(4.7e+00)	(5.9e+00)	(7.0e+00)
First-Stage F-Statistic	29	30	41	51	77	89
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.

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

Table 28: IV: Shift-Share Instrumental Variable Full Summary Statistics

	Year	Mean Exposure	Median Exposure	SD Exposure	Mean Shock	Median Shock	SD Shock	Inverse HHI: Shocks
1	2001	0.02	0.00	0.08	0.05	-0.01	0.29	236.76
2	2002	0.02	0.00	0.08	0.10	0.15	0.26	308.57
3	2003	0.02	0.00	0.08	0.07	0.04	0.11	280.96
4	2004	0.02	0.00	0.07	0.02	-0.00	0.20	298.28
5	2005	0.02	0.00	0.08	0.16	-0.02	0.32	267.17
6	2006	0.02	0.00	0.08	0.60	0.25	0.71	267.17
7	2008	0.02	0.00	0.07	0.04	0.10	0.25	270.23
8	2009	0.02	0.00	0.07	-0.04	-0.12	0.33	264.21
9	2010	0.02	0.00	0.07	-0.04	-0.09	0.26	258.78
10	2011	0.02	0.00	0.07	0.02	-0.01	0.11	258.27
11	2012	0.02	0.00	0.07	0.60	-0.13	1.39	250.70
12	2013	0.02	0.00	0.06	-0.10	-0.07	0.14	274.58
13	2014	0.02	0.00	0.07	0.24	0.24	0.14	243.03
14	2016	0.02	0.00	0.07	0.09	0.12	0.22	252.44
15	2017	0.02	0.00	0.06	0.21	0.26	0.29	351.61
16	2018	0.02	0.00	0.06	0.32	0.18	0.44	350.13
17	2019	0.02	0.00	0.06	0.07	0.01	0.21	293.13
18	2021	0.02	0.00	0.07	-0.43	-0.26	0.41	317.39

Notes:

Next I show graphs before and after my de-meaning of the shift-share tourism arrival shocks.

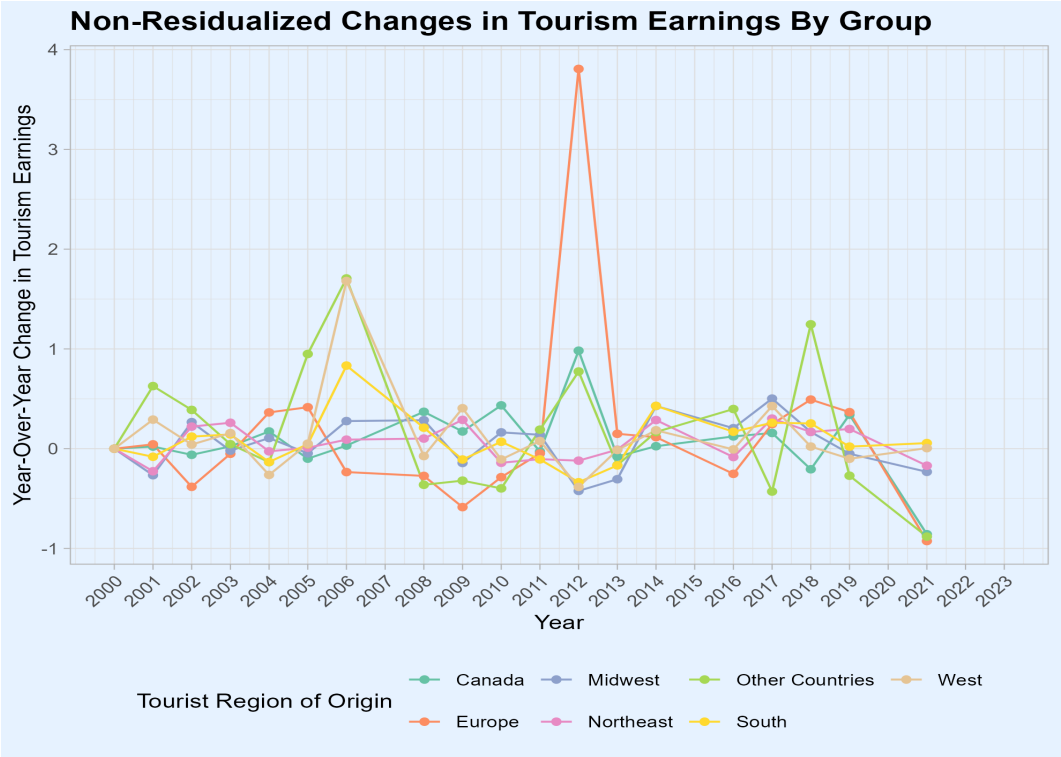

Figure 12: Graphs of Original Shift-Share Shocks

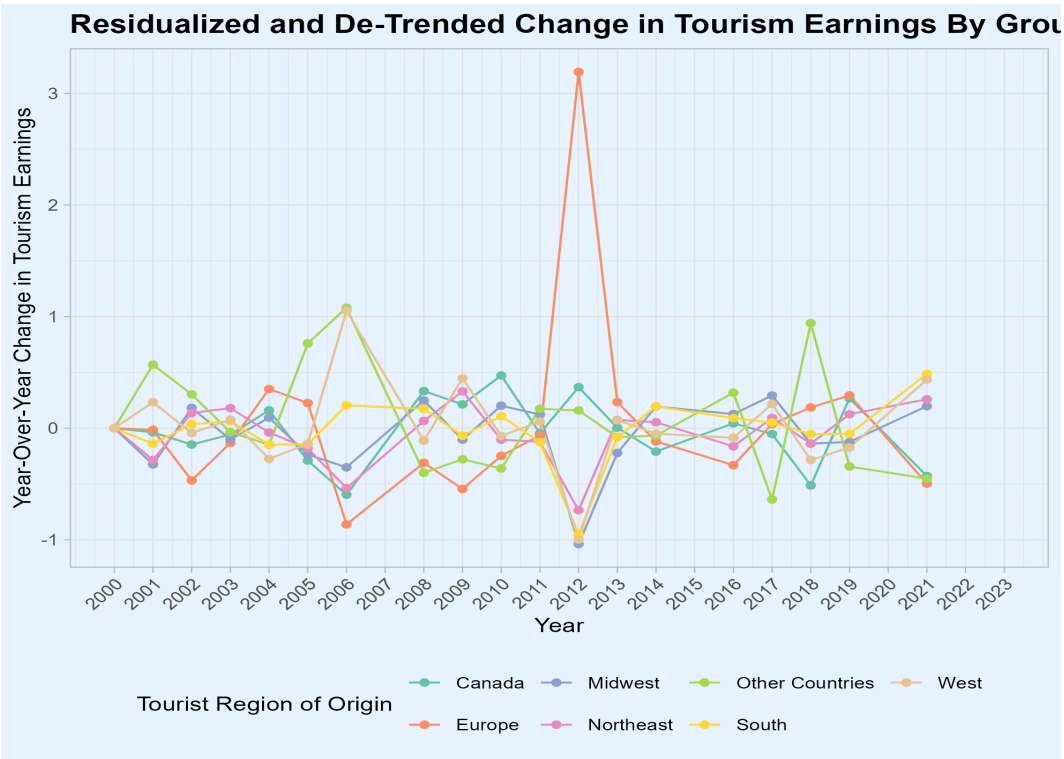

Figure 13: Graphs of De-Meaned Shift-Share Shocks

9.3 Appendix 3: Panel Regression Results

Table 29: IV: Panel Regression of Baseline Results

	Log Per-Capita Expenditure(USD)				
	(1)	(2)	(3)		
Accommodations Expenditures(Millions USD)	-3.3e-03	-3.6e-04	-3.6e-04	-3.6e-04	-3.8e-04
	(3.2e-03)	(7.5e-04)	(7.5e-04)	(7.5e-04)	(7.2e-04)
Household Size					-2.1e-01***
					(1.4e-02)
First-Stage F-Statistic	10	25	25	25	25
Observations	1048	6032	6032	6032	6032
Standard Deviation		0.711	0.711	0.711	0.711
Household Control		No	No	No	Yes
Household Fixed Effects		Yes	Yes	Yes	Yes
Year Fixed Effects		No	Yes	Yes	Yes

Notes: Accommodation Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks. Female Household Head indicates either a single adult female or household with multiple persons for which the household head or principal earner is female.

9.4 Appendix 4: Additional Regression Results

Figure 14: Map of Jamaican Parishes

Table 30: IV: Non-Consumption Expenditure

	Urban Log Per-Capita Non-Consumption Expenditure	Rural Log Per-Capita Non-Consumption Expenditure
Tourism Expenditure (Millions USD)	3.2e-03	3.8e-03
	(5.0e-03)	(2.1e-03)
	[-0.007,0.013]	[-0.000,0.008]
First-Stage F-Statistic	68	10
Observations	7282	11832
Standard Deviation	1.979	1.961
Number of Clusters	39	64
HH Controls	Yes	Yes
DA Dummy	Yes	Yes
Year Dummies	Yes	Yes

*Notes8:*Tourism expenditure is measured in millions and is measured at the level of the development area.

Table 31: IV-Relationship Between Tourism Earnings and Log Household Expenditure By Per-Capita Expenditure Decile Urban Households

	Log Per Capita Expenditure(USD) Separated by Deciles					
	(1-10)	(2-10)	(4-10)	(6-10)	(8-10)	(9-10)
Tourism Expenditure (Millions USD)	1.7e-03**	1.5e-03*	1.5e-03**	1.2e-03*	1.6e-03*	2.2e-03**
	(5.1e-04)	(5.7e-04)	(5.4e-04)	(5.6e-04)	(6.2e-04)	(6.7e-04)
First-Stage F-Statistic	70	69	54	61	66	48
Observations	11526	11005	9747	8050	5860	4457
Standard Deviation	0.721	0.654	0.589	0.544	0.522	0.535
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.

Table 32: IV - Relationship Between Tourism Earnings and Log Per-Capita Household Expenditure by Rurality

	Urban	Rural
Tourism Expenditure (Millions USD)	4.3e-04	-8.2e-04
	(8.8e-04)	(1.2e-03)
	[-0.001,0.002]	[-0.003,0.002]
First-Stage F-Statistic	61	18
Observations	17792	18381
Standard Deviation	0.730	0.703
Number of Clusters	35	57
HH Controls	Yes	Yes
DA Dummy	Yes	Yes
Year Dummies	Yes	Yes

Notes: Accommodations Expenditures are calculated at the development area level in millions of 2024 U.S. Dollars. Household expenditures are inflated or deflated based on Jamaican regional price indexes to obtain real consumption levels across different parts of the country. All shift-share instrument shocks are demeaned to extract the idiosyncratic component of the shocks. Female Household Head indicates either a single adult female or household with multiple persons for which the household head or principal earner is female.

Table 33: 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)	-5.5e-04	-5.5e-04	-1.9e-04	2.4e-04
	(8.1e-04)	(3.9e-03)	(5.6e-04)	(4.0e-04)
	[-0.002,0.001]	[-0.008,0.007]	[-0.001,0.001]	[-0.001,0.001]
First-Stage F-Statistic	27	90	4	20
Observations	1057	10391	1289	17875
Standard Deviation	0.257	0.305	0.252	0.373
Number of Clusters	34	34	56	57
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.

9.5 Appendix 4: Additional Maps And Geographic Summary Statistics

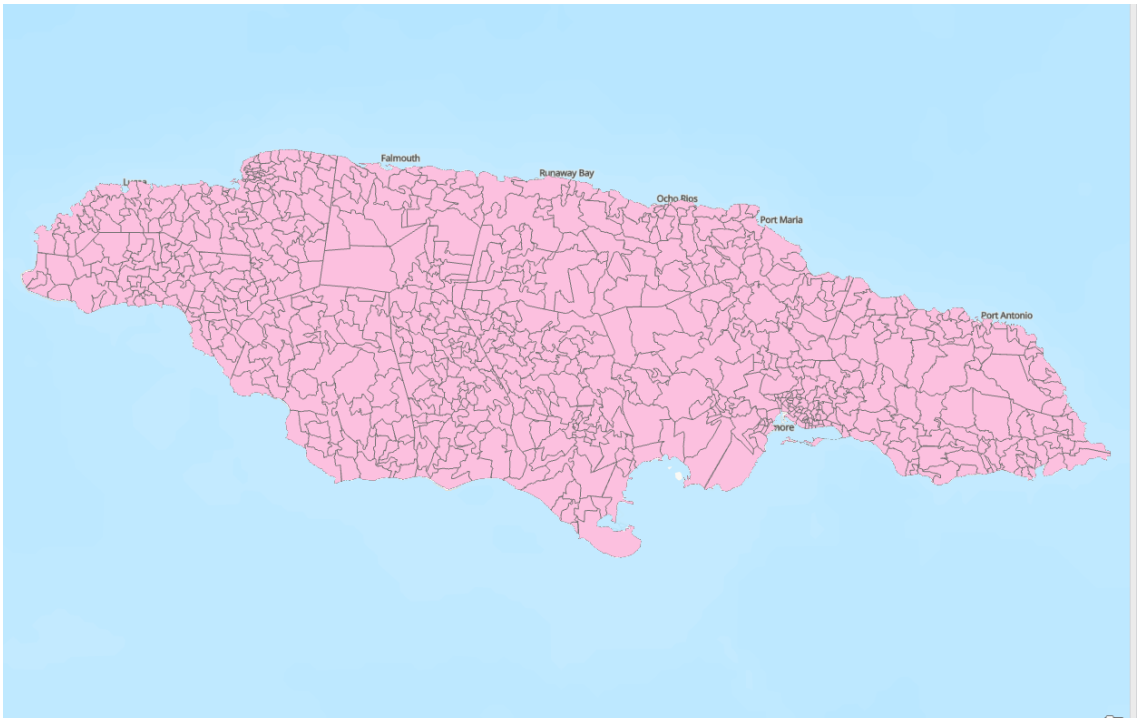

Figure 15: **Jamaica Community Boundaries 2011 (STATIN Geographic Services Unit)**

Table 34: Development Area Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Population	84	32,107.25	37,109.81	1,329	192,044
Area	84	130.52	88.58	3.56	446.33
Population.Density	84	610.98	1,429.67	42.12	8,410.05

Notes: Area is measured in square kilometers. Population is based on the 2011 Census.

9.6 Appendix 5: The Shifting Spatial Distribution of Jamaican Tourism

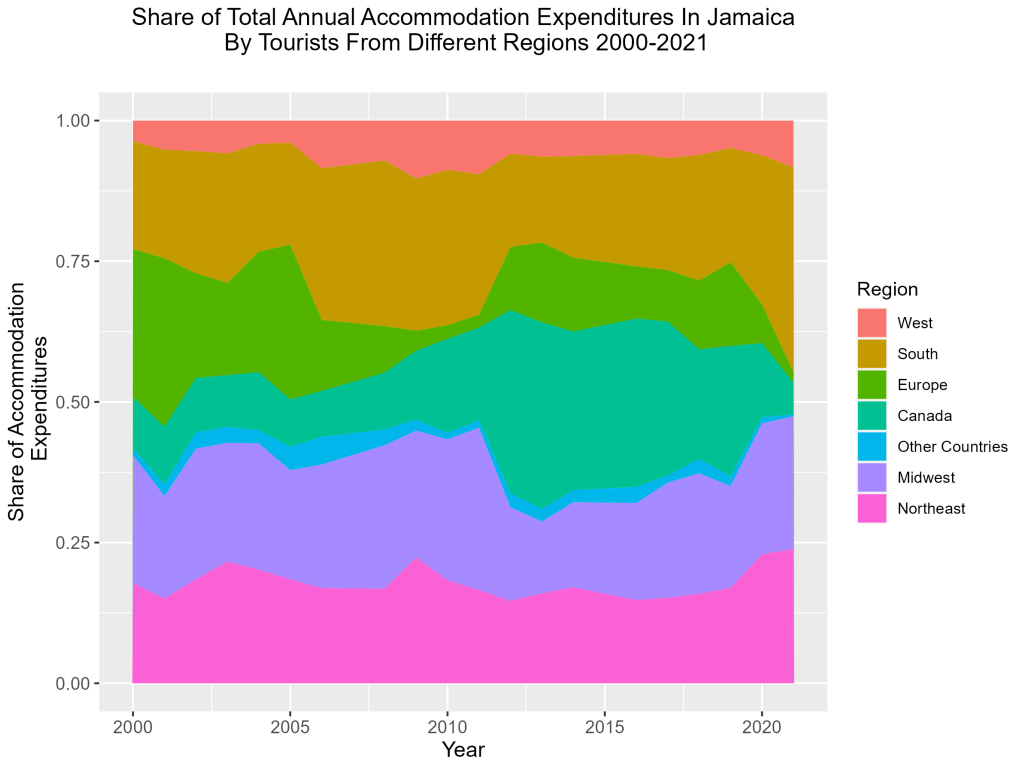

Figure 16: **Share of Expenditures by Region**

9.7 Appendix 6: Additional Labor Market Comparisons

Table 36: 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

Source: Author's own calculations based on the JSLC.