Market Structure and Development: Firm Competition in Jamaica*

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Abstract

Growing specialization in services has become a defining feature of many emerging economies, and the tradable service sector of tourism has been a key contributor to this growth. Despite the importance of tourism services, the roles of market structure and product composition in shaping the development outcomes of specialization in tourism are not well understood. This paper fills this gap in the literature by characterizing the relationship between the organization of the Jamaican hotel industry and three development objectives. I estimate a nested logit demand system for the Jamaican hotel industry, and the supply function for hotel parent companies to form a partial equilibrium model of the country's accommodations sector. I then conduct counterfactual simulations in which I vary the entry of new hotels to Jamaican markets, the ownership structures of these hotels, and the tax regime applied to the sector. I find that demand for accommodations is relatively price-inelastic with a mean own-price elasticity of -1.43, which is consistent with the more premium-focused tourism style of Jamaica. Consumers are generally inelastic in their preferences for multinational-owned all-inclusive resorts, and counterfactual simulations show that the entry of these firms largely attracted customers who otherwise would not have visited. The addition of new products by non-incumbent firms is optimal for increasing arrivals and employment, and a more progressive ad-valorem tax structure can raise tourism tax revenues 55 percent with minimal impact on employment and total tourist expenditures.

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1 Introduction

Service sector industries have rapidly become key contributors to the economies of many developing countries. The growth of the tradable service sector of tourism has been one of the driving forces behind the rising importance of services for lower- and middle-income economies. Tourism is a critical industry for a diverse set of countries, from industrialized nations such as Spain—where it comprises 16 percent of GDP[1]—to emerging economies like Brazil, where it makes up 7.7 percent[2] of economic output, to small island states like Barbados where tourism is 31 percent[3] of the economy. For many developing economies in particular, international tourism serves as a major employer, foreign-exchange generator, and source of fiscal revenue. A small but growing literature has studied the effects of tourism specialization local economies, with some work finding that tourism can contribute to development through spillovers to other sectors (McKetty 2026; Faber and Gaubert 2019), and other work highlighting how the effects of tourism-specialization on local populations can vary depending on factors such as local preferences over tourist-serving amenities (Almagro and Domínguez-Iino 2025), and tourism-driven inflationary pressures (Allen et al. 2021). Tourism markets are characterized by a diverse array of competitive structures, firm sizes, and product formats[4] and while there has been discussion in other fields about the optimal structure of tourism for economic development[5], there has been no work in economics studying how different approaches to the organization of tourism services can shape their impact on local economic development outcomes.

This paper addresses the gap in the economics literature on tourism by answering the question: What market structure and product composition is optimal for leveraging tourism for economic development? This study utilizes the all-important tourism sector of Jamaica as laboratory in which to understand how market structure, consumer preferences, and govern-

[1]WTTC: Spain's tourism sector could exceed 260 billion Euros by 2025, according to WTTC

[2]WTTC: WTTC forecasts Brazil's Travel & Tourism sector to surpass 167 billion USD contribution by 2025

[3]UNDP: First Impact Data

[4]WBG: Tourism and Competitiveness

[5]See Behuria (2025), Issa and Jayawardena (2003), World Tourism Organization (UNWTO) (2018), and Tavares (2015)

ment policies interact to influence the larger effects of tourism on development objectives. I evaluate this question through three development outcomes-total tourist expenditures, total tax revenues, and total employment-and answer the question in three steps. First, I identify the rigidity of tourist preferences across different accommodation and package types,and next I evaluate how different market structures shape equilibrium outcomes. Having characterized the role of market structure and ownership, I finally assess whether more targeted, progressive taxation can raise government revenue without reducing tourism activity.

In order to conduct this analysis, I construct an equilibrium model of demand and supply for hotel services in each of the four tourism regions of Jamaica. On the demand-side, representative tourists make a discrete choice between reservations of either "7 Days or Less" or "8 Days or More" at individual large hotels and hotel categories for small and medium properties. Individual and aggregated hotels offer one of two packages: All-Inclusive or European Plan.[6] On the supply-side, each market is composed of profit-maximizing parent companies that each maintain a portfolio of properties in the given market. The parent companies each engage in Nash-Bertrand competition, settings prices for reservations for each length of stay segment at each of their properties, subject to a property-specific soft capacity constraint.

I estimate this model with data from the Jamaican Ministry of Tourism (MOT) on tourist spending and demographic data, the number and capacities of different hotel categories in the main markets and aggregate tourist arrival and spending data. Data on individual purchases and market shares comes from representative exit surveys from 2001-2023 collected by the MOT on representative samples of departing tourists from Jamaica's main international airports in which tourists provide detailed information on their expenditures.[7] Data on aggregate arrival behavior come from publicly available MOT reports and combine survey estimates with aggregate data to obtain estimates of the number of reservations at different

[6]All-Inclusive reservation types offer bundled packages in which the price of the reservation includes the room, all meals, entertainment, along with other amenities such as transportation to and from activities outside the resort (Issa and Jayawardena 2003). European Plan reservations do not include most (if any) meals in the base reservation price or other additional amenities.

[7]Tourists provide detailed breakdowns of their spending on accommodations, food, and other subcategories,their length of stay, the number of persons in their travel party, and crucially, the property at which they stayed.

accommodations. Hotel and room supply data come in part from the MOT datasets[8], with disaggregated hotel and resort data on room capacity and year of entry coming from hotel websites and news publications.

Armed with these data I estimate a nested logit model of consumer demand with consumers making a discrete choice between reservations from both length of stay bins for large disaggregated properties in one nest and aggregated small and medium accommodations for a given market in another nest, and an outside option. I estimate the supply function utilizing generalized method of moments. Disaggregated firms face property-level soft capacity constraints, with the marginal cost curve increasing in average annual congestion for each property. Marginal cost for each reservation by property (or property category) combination consists of a duration-specific linear component and a nonlinear component that is based on average property-level occupancy for a particular year and a plan-specific component meant to reflect likely differences in the increasing costs to a firm of approaching capacity based on the different services demanded per-tourist for All-Inclusive versus European Plan style bookings. Thus, parent companies set prices to optimize overall profits across all of the properties and reservation length bins in their portfolio. The property-specific soft capacity component reflects how hotels internalize that longer reservations produce a greater marginal increase in congestion-related costs, and that this in turn contributes to higher prices for longer reservations.

The exit survey data provide accounting parameters that I use to estimate the development outcomes. The first is the hotel-type specific share of spending outside the resort by tourists. For each accommodation-type I assign this share based on the average obtained from the representative exit surveys of departing tourists. In order to estimate direct accommodation employment outcomes, I calculate the ratio workers per-tourist, and then scale the ratio by the number of arriving tourists to provide estimates of employment. I estimate tax revenues using known tax rates and the estimated sales for different accommodations. The primary benefit of estimating a structural model is to be able to test different counterfactual scenarios,

[8]These datasets provide breakdowns of the number and types of properties in each Jamaican tourism market in each year, as well as the number of rooms available in specific accommodation types.

and I employ my demand- and supply-side parameter estimates to investigate the impacts of counterfactual product entries, different ownership structures, and tax policy changes.

The recovered demand parameters provide a picture of price-inelastic consumers, with strong preferences for particular hotel brands and package types. The recovered price coefficient is $-.010$, with coefficients on the log of the within-nest share at 0.144 and 0.236 for the large accommodations nest and small-medium accommodations nest, respectively, showing some degree of intra-nest similarity between products, but also demonstrating that consumers view most products as distinct. [9] Analysis of conditional diversion ratios shows that tourists have highly inelastic preferences for large all-inclusive resorts, with 85 percent of large all-inclusive tourists substituting to the outside option when all-inclusives are not available, as opposed to 49 percent for Small European Plan (SEP) tourists in the absence of SEP hotels. Supply-side estimates show a greater effect of congestion on marginal costs for All-Inclusive properties compared to European Plan accommodations (Table 6). Equipped with estimates of demand- and supply-side primitives, I next conduct four counterfactual simulations, which address the questions regarding market structure and government policy. The first counterfactual thus studies the effects of the entry of new parent products and parent companies through the 'Spanish Invasion' of Montego Bay in 2008, which saw the arrival of three major Spanish chains: Fiesta Group, Iberostar Group, and Riu Hotels & Resorts in quick succession.[10]. I simulate scenarios in which one, two, or all three of the new properties do not open. For each scenario, market concentration increases while prices and bookings decline, resulting in lower tourist expenditures, tax revenues, and employment. These results demonstrate that the arrival of these properties expanded tourist arrivals and improved development metrics through the availability of new products that attracted tourists who otherwise would not have visited.

The second counterfactual evaluates the importance of the ownership structure of expansion,

[9]The relatively inelastic mean own-price elasticity of -1.67 is consistent with Jamaica specializing in more premium tourism products relative to other countries in the region. In conversations with the Tourism Enhancement Fund (TEF) division of the Ministry of Tourism, officials expressed that Jamaican tourism zones largely do not compete on price with rivals such as Mexico, the Dominican Republic, and The Bahamas. This is in part attributed to high costs of energy in Jamaica.

[10]TravelAge West: Jamaica Branches Out (2008)

testing if there are differences in outcomes when new hotels are added by non-incumbent parent companies (like during the 'Spanish Invasion' of Montego Bay), versus when they are added by existing firms. In the Negril-Southcoast market, I study the 2006 addition of two new hotels by parent companies with existing properties in the market and run scenarios where the new properties are either added under single-property parent companies, or are not added at all. Expansion under single-property increases employment and bookings by 2.22 percent relative to baseline as a result of lower firm market power and markups, but tourist expenditures and tax revenues decrease. The third simulation considers the future, looking ahead to 2030 and testing different possible market structures for the expansion of the Jamaican South Coast. I run counterfactuals in new rooms are added to the area and either all of those rooms are added under All-Inclusive hotels, all are added under Small-European Plan hotels, or the addition of the new rooms is mixed. The mixed approach provides the greatest balance between the different outcomes. The fourth set of simulations tests proposed tax policies currently being debated by the Jamaican government. I find that increases to the ad valorem General Consumption Tax (GCT) are far more effective at increasing revenues without harming tourism earnings or employment than increases to the Guest Accommodation Room Tax (GART). I demonstrate the potential benefits of a more progressive structure to the GCT with tax increases for larger accommodations and tax cuts for smaller operators.

This study is the first to utilize structural demand estimation of the tourism sector to investigate its role in economic development. Tourism is one of the world's most important sectors, comprising 10 percent of global GDP (World Tourism Organization 2023), and has great potential for the developing world (World Tourism Organization 2024), with various countries attempting to incorporate tourism into their development frameworks.[11] However, little work has been done that combines rich micro-data with structural estimation and simulation to understand how the different types of tourism may imply different development results. It is commonly accepted that the goods in which a country specializes in producing matter for its economic performance (Hausmann et al. 2006). Considering the incredible

[11]See:(1) Blue Tourism in Islands and Small Tourism-Dependent States and (2) Tourism for Development - Volume 1: Key Areas For Action

heterogeneity of tourism approaches (World Tourism Organization (UNWTO) 2018), and its current and future importance for emerging economies, this paper fills an important academic and policy gap in the literature. A major strength of this paper is that the use of structural estimation allows the testing of policy counterfactuals that can shed light on active policy discussions in Jamaica and elsewhere. My study benefits from detailed and reliable micro-data collected over a two-decade period to generate the parameter the estimates that are used in the simulation. Thus, this work provides novel insights by applying techniques from the IO field in a unique manner.

This paper contributes to the literature that has studied various aspects of tourism and the hotel industry. This paper contributes first by studying the role of accommodation sector structure and government policy on the tourism sector's impacts on local economic outcomes, namely tax revenues, employment, and spending by tourists in local areas. Additionally, this article contributes to the study of the accommodation sector by characterizing how consumer preferences over the bundle of different hotels affect demand, and, in turn, affect economic development. Some of the literature on tourism has focused on the role of tourism in aggregate economic development in emerging economies (Faber and Gaubert 2019; Wattanakuljarus and Coxhead 2006), but has not investigated how factors such as the competitive and ownership structure of the sector impact development outcomes. Other work has focused on the implications of tourism for local populations (Almagro and Domínguez-Iino 2025; Allen et al. 2021), but primarily focused on urban settings in individual cities in industrialized countries, while this study is a country-wide analysis in a developing small-open economy. There is a more extensive literature on the tourism sector's impacts on local economic development outside of economics. Works in this segment of the literature have considered topics such as whether specialization in luxury tourism is optimal for development (Behuria 2025), the impact of tourism specialization on the livelihoods of those who reside in tourist-serving communities (Stanfield et al. 2023), and the evolution of tourist preferences for different types of hotels and vacation packages (Tavares 2015).

Another branch of this literature has centered on the industrial organizational aspects of the accommodation sector. Some studies have focused on accommodation markets in North

American cities, such as Farronato and Fradkin (2022) who studied the welfare impacts of the entry of AirBnB into major urban areas and McClure (2025) who investigated the impacts of parent company mergers on market power and cost efficiencies. Additional work in this space (Lewis and Zervas 2019; Armona et al. 2021) has focused on how to measure the supply and demand of accommodation services. Like Farronato and Fradkin (2022), my study considers the implications of the entry of new accommodations products, and as in McClure (2025), the impacts of ownership structures are key to my analysis, but the conceptual focus of my paper differs fundamentally from these works. Whereas consumer welfare is the key object of interest in Farronato and Fradkin (2022) and McClure (2025), my study focuses on key development objectives that are important for public welfare. In addition, these studies analyzed urban accommodation markets in the context of an industrialized country. My paper studies the accommodation sector across different geographies (large urban, rural, medium and small cities), in a developing country context with a different mixture of hotel products and format types than those of other analyses.[12] A major focus in the literature on demand estimation is understanding how market features such as ownership, conduct, or events such as mergers or the entry of new varieties affect consumer well-being (Berry 1994; Goldberg 1995; Petrin 2002; Farronato and Fradkin 2022; McClure 2025). In this paper, the goal is to understand what structure of tourism is optimal for development. The analysis of consumer well-being and preferences is only important insofar as it impacts the optimal mix of products and policies to increase tax revenues, employment, and spending by tourists in the local economy.

This paper contributes to the broad literature studying trade and competition in developing economies. This work shares some similarities with the burgeoning literature on the entry of foreign multinationals or chains into local economies. These include studies on the impacts on consumer welfare from the entry of foreign supermarket chains (Atkin et al. 2018) and chain-run convenience stores (Talamas Marcos 2025) in Mexico, as well as work by Ghazzai et al. (2023) studying the effects of sectoral competition on poverty. Another portion of this literature has investigated the role of entry on the behavior and performance of incumbents

[12] All-Inclusive resorts are largely located in developing countries. One argument for their growth in such contexts has been tourist concerns about safety (Tavares 2015)

(Medina 2024; Busso and Galiani 2019). This paper also shares similarities with studies that aim to apply methods from industrial-organization to understanding the functioning markets in emerging economy contexts, with works such as those by Bergquist and Dinerstein (2020) and Wiseman (2023) focusing on rural agricultural markets. This study is distinct in three main ways from existing work. First, the industry of focus in my context differs in the primary consumers of focus. Unlike the retail sector of studies such as Atkin et al. (2018) and Talamas Marcos (2025), or Busso and Galiani (2019), the accommodations sector in the Jamaican context is overwhelmingly export-focused, with the vast majority of consumers being international stop-over tourists. Thus, the primary focus of this paper is not the welfare improvement for local consumers stemming from additional varieties or lower prices. The second difference is that the local outcomes of concern in this paper relate public-welfare focused such as overall tourist spending, employment, and tax revenues. Finally, this paper analyzes how consumer preferences constrain optimal policies towards a major sector, exploiting the recovered parameters from a structural demand estimation to do so.

Finally, this paper contributes to the literature studying the growth of service sector industries in developing economies. Much of the work in this areas has focused on the scope for productivity gains in services, with studies such as Fan et al. (2023) showing that productivity growth in nontradable services contributed meaningfully to the structural transformation of the Indian economy, and work by Peters et al. (2026) examining the ability of service specialization to generate sustainable improvements in living standards. Studies by Eckert et al. (2022) and Hsieh and Rossi-Hansberg (2023), have highlighted the potential for productivity growth in Information and Communication Technology (ICT), while Nayyar et al. (2021) has emphasized the challenge of combining both productivity growth and employment growth in a single service sub-sector. This study contributes by studying the role of market structure, product variety, and consumer preferences on the effects of a major tradable service sector on development outcomes. I am able to utilize tools from industrial organization literature to provide strong micro-foundations in my analysis of how tourism-specialization impacts a local economy. More broadly, this paper can also provide insights for other Mode 2 Services, services that involve the movement of consumers for use of the service. These include education and healthcare services. Tourism makes an excellent sector with which to investigate

fundamental aspects of service sector market structure on development outcomes. Like other services tourism is heavily labor-intensive. Tourism accommodations in the Jamaican context also exhibit distinct branding and market power based on signaled quality, with brand reputations playing an important role as in retail (Atkin et al. 2018).

The paper will progress as follows. In Section 2 I provide an overview of the Jamaican accommodations sectors, its importance to the Jamaican economy, and the key aspects of its changing structure over the period 2001-2023. In Section 3 I provide an overview of my data sources. In Section 4 I explain my equilibrium model and estimation strategy, and describe three key testable hypotheses derived from the model. Section 5 details the results of my estimation. In Section 6 I detail the results of my counterfactual simulations. In Section 7 I conclude.

2 Context and Background

Jamaica is an upper middle-income island nation of roughly 2.8 million people located in the Northern Caribbean Sea. Services comprise about 58.2% of all economic activity (World Bank 2022), with the biggest contributor being tourism services. Tourism services directly account for 9.7% of the national GDP (STATIN 2019), and roughly 33% when considering back linkages. (Mooney 2020). The heart of the tourism industry is the Jamaican accommodations sector.

These geographic patterns of these initial investments have continued on to the present as well, with the vast majority of Jamaica's international tourism taking place in the north and west of the country. The vast majority of the southern coast of the country remains largely undeveloped for mass-market tourism. The most populous regions of the country are also located along the coasts as well. The capital and primary industrial and financial hub of the country is Kingston in the Southeast.

The largest markets for arriving tourists are the U.S., Canada, and the United Kingdom, with smaller shares from continental Europe, Latin America, and other Caribbean countries.

Table 1: **Tourist Summary Statistics**

	Mean	Median	S.D.
Share of Bookings: All-Inclusive Plan	0.84	1.00	0.36
Mean Total Exp. per Person	1885.44	1711.60	1020.42
Mean Hotel Exp. per Person	1186.87	978.05	885.71
Mean Room Night Exp. per Reservation	398.82	325.59	310.70
Mean Attraction Exp. Person	138.84	97.45	147.41
Mean Non-Hotel Restaurant Exp. per Person	138.92	77.21	195.12
Accommodation Share	0.61	0.62	0.14
Total Outside Exp. Share	0.39	0.38	0.14
Outside Non-Attraction Share	0.32	0.29	0.14
Share Reservations Montego Bay	0.45	0.00	0.50
Share Reservations Ocho Rios-Port Antonio	0.25	0.00	0.43
Share Reservations Negril-Southcoast	0.23	0.00	0.42
Share Reservations Kingston	0.06	0.00	0.24
Share Visiting for Vacation	0.91	1.00	0.29
Mean Length of Stay (Days)	6.53	6.00	3.56
Mean Size of Party	2.03	2.00	0.90
Share 7 Days or Under	0.80	1.00	0.40
Share 8 Days or Over Stay	0.20	0.00	0.40
Share With Income 50,000 USD and Over	0.75	1.00	0.44
Share of Spanish-Owned AI Brands	0.33	0.00	0.47
Share US/International-Owned AI Brands	0.31	0.00	0.46
Share Jamaican-Owned AI Brands	0.36	0.00	0.48
Booking Observations	109708		
Individual Observations	222292		

Notes: Data are obtained from the Ministry of Tourism Exit Survey from 2001-2023. These data include all travel parties that stayed in any accommodation type other than a private home (Private home residing tourists are likely to be Jamaicans visiting relatives as they often have very low or no expenditure on rooms). All expenditure variables are provide in 2024 USD. Bookings Observations is the number of travel parties surveyed while Individual Observations is the sum of the Size of Party across all surveyed parties.

Based on my own conversations with the Ministry of Tourism (MOT), Jamaica's primary competitors are The Bahamas, Mexico, and the Dominican Republic. One characteristic of Jamaican tourism mentioned by the MOT officials is that it is more expensive relative to Jamaica's main competitors.

Much of the development took place along the northern and western coasts of the country, lead by Jamaica's second largest city Montego Bay, in the northwest of the country. The Jamaican MOT divides the country into 6 "Resort Areas" (RAs) when advertising, discussing tourism development policies. The resort areas are marketed as each providing distinct vacation experiences, and this approach informs my own designation of accommodation products for my demand estimation later in the study. The RAs are mostly named for the largest city within the designated region. They are: Kingston, Montego Bay, Ocho Rios, Negril, Port Antonio, and Southcoast/Mandeville (henceforth Southcoast).

The Jamaican hotel and lodging industry forms the base of the country's all-important tourism sector. Jamaica's main tourism centers welcomed 2.9 million stopover visitors in 2024 (Jamaican Ministry of Tourism 2025), the overwhelming majority of whom stayed in one of the 33,722 rooms across 892 properties. Given that tourism is the country's primary service exports, with 90 percent of the income derived from stopover visitors (Jamaican Ministry of Tourism 2025), the hotel sector is the key intermediary in outcomes for the larger economy. The landscape of the Jamaican tourism industry has changed considerably since 2000, thanks in part to aggressive government efforts to attract foreign direct investment in the form of new hotels.[13]

A major aim of the Jamaican government has been the growth of the hotel industry, in the hopes of attracting greater foreign exchange, generating higher levels of employment, and attracting greater arrivals. The period 2001-2023 saw significant growth of the sector with a near doubling of the room inventory, and the arrival of numerous new properties and firms. There has been significant entry of multinational, branded all-inclusive resort corporations, with a particularly large influx of Spanish-owned chains dubbed "The Second Spanish Invasion".[14] Prior to the arrival of these companies the sector was largely composed of Jamaican or Caribbean brands, and a large number of independent European-Plan style properties.[15]

[13]See: Jamaican Ministry of Tourism: Fiscal Incentives (Miscellaneous Provisions Act,2013)

[14]See: Jamaica Gleaner: The second Spanish Invasion

[15]In Jamaica's largest tourism market, the city of Montego Bay, whereas in 2001 the market share of the five largest parent companies was 72 percent, in 2023 their share was 59 percent(Table 23). At the same time the share of the room stock in Montego Bay held by the five largest parent companies

These changes in market structure and product variety have been associated with a near doubling of the number of arrivals, and tourism revenue over the period 2001-2023.[16] These changes have also generated debate about whether the additional variety and competitiveness of Jamaican hotel markets has helped Jamaica achieve progress toward its development goals.[17] Criticisms have in-part focused on growth of the All-Inclusive model of tourism which is often viewed as promoting less engagement with local communities than other approaches to tourism (Issa and Jayawardena 2003).[18] Other points of contention are the considerable government resources that are invested in promoting the entry of foreign multinational hotels (Ministry of Tourism and Entertainment 2015) at the expense of locally owned, independent properties.[19]. Looking to the future, there are also questions about the government-backed expansions planned for the accommodation sector in the future.[20] What would be the most effective way to organize these future investments for development?

2.1 Hotel Types and Characteristics

There are five main types of accommodations in the Jamaican tourism sector. These are: 1. All-Inclusive Resorts. 2. European Plan style hotels. 3. Resort Villas. 4. Guesthouses. 5. Resort Apartments. All-Inclusive Resorts have become the lion's share of the Jamaican tourism sector. All-Inclusive Resorts form by far the largest share of the market in terms of where tourists choose to stay. In this style of hotel booking, all meals, entertainment, and various amenities are included in the booking price. They often include amenities such as spas, restaurants specializing in particular types of cuisine, nightly entertainment, and packaged deals to different sites and attractions. All-Inclusive resorts are also significantly larger than other types of accommodations averaging roughly 280 rooms per property as

rose from 39 percent to 56 percent(Table 24). These shifts reflect greater competitiveness in the Montego Bay market over time, even as the room stock has become more concentrated.

[16]According to the Ministry of Tourism stopover arrivals have increased from 1.2 million in 2001 to 2.9 million in 2024 (Jamaican Ministry of Tourism 2025)

[17]See Oxford Economics: Travel & Tourism as a Driver of Economic Development in Jamaica (2012)

[18]Jamaica Gleaner: JHTA's Russell rejects negative claim against all-inclusive properties.

[19]See: Jamaica Gleaner: Death knell for small hotels and Jamaica Gleaner: Allen backs progressive taxation in hotel sector

[20]JHTA: Minister Bartlett unveils ambitious tourism expansion plans

opposed to roughly 40 rooms for hotels operating different plans.

European plan style hotels refer to accommodations for which complimentary breakfast and some minor amenities will be included in the price of booking, but for which more extensive services such as lunch or dinner come at an additional fee if they are offered at all. These may offer continental breakfast, and usually will feature a restaurant for paid meals. These hotels average approximately 35 rooms. Villas may offer one residence or several as part of particular property. They are usually staffed with personnel for cleaning and preparing meals. The primary draw of villas is privacy, as an entire villa can be used for one travel party. They are often marketed towards larger travel groups. Guesthouses are more scaled down hotels, usually including a staff and sometimes providing meal offerings. They are usually among the cheapest vacation options. Vacation apartments are usually self-serving and similar to villas, offer more privacy than some other accommodation options.

The increasing market share of AI type hotels is also reflected in the increasing supply of hotels of larger sizes, and conversely, a decrease in the number of some other categories of accommodations as is shown in Figure 7. While the number of hotels in Jamaica over 200 rooms has nearly doubled from 23 to 45 between 2000 and 2019, there has been a decrease in the number of hotels in the 51-200 room range, as well as decrease in the number of villas and apartments. At the same time there has been an increase by nearly 200 in the number of guesthouses, from 313 to 510 while the number of hotels under 50 rooms has remained largely the same, only increased from 118 to 123.

The differences between the accommodation types are important both as they relate to consumer preferences but especially in how they relate to local economic engagement. A frequent criticism of all-inclusive style hotels is that they function as enclaves, with the aggregation of accommodations with meals, entertainment, transportation, excursions, and other activities, limiting the time and money spent by visiting tourists directly in the communities where they stay (Issa and Jayawardena 2003). Within Jamaica and elsewhere, leakage of tourism dollars out of communities by virtue of the bundled vacation services of all-inclusive resorts has been a major point of contention. During my study period, tourists in Small European Plan (SEP) hotels spend on average 9.2 percent more than those who stay in Large All-Inclusive

Table 2: Overview of Active Major Hotel Brands Operating in Jamaican Markets

Brand	Parent Company	Entry Year	Adults Only	All-inclusive	Properties	Resort Areas
Domestic						
Couples	Couples Resorts	Pre-2000	✓	✓	4	2
Sandals	Sandals Resorts	Pre-2000	✓	✓	7	4
Beaches	Sandals Resorts	Pre-2000		✓	2	2
Spanish Multinationals						
Riu	Riu Hotels & Resorts	2001		✓	6	3
Iberostar	Iberostar Group	2007		✓	3	1
Grand Palladium	Fiesta Group	2008		✓	1	1
Grand Bahia	Grupo Pinero	2008		✓	1	1
Riu Palace	Riu Hotels & Resorts	2013	✓	✓	1	1
Melia	Melia Hotels International	2016		✓	1	1
Ocean	H10 Hotels	2020		✓	2	1
US/International						
Hedonism	Marshmallow Limited	Pre-2000	✓	✓	2	2
Sunset	Sunset Resorts	Pre-2000	✓	✓	2	2
Royal Decameron	Decameron Hotels & Resorts	2002		✓	2	2
Hilton	Blackstone Group	2009		✓	1	1
Azul	Karisma Hotels & Resorts	2009	✓	✓	1	1
Holiday Inn	Octagon Hotels Group	2009		✓	1	1
Jewel	Playa Hotels and Resorts	2010		✓	4	2
Royalton	Blue Dimaond Hotels & Resorts	2013		✓	4	2
Moon Palace Resorts	Palace Resorts	2015		✓	1	1
Hyatt	Playa Hotels and Resorts	2015		✓	2	1
Breathless	AMResorts	2017	✓	✓	1	1
Excellence	Excellence Group Luxury Hotels & Resorts	2018	✓	✓	1	1
AC	Marriot Resorts International	2019			1	1

Notes: The ownership and brand relationships shown here describe the large accommodation markets as of 2023, the final year of the study period. This table does not include brands that closed before 2023. Hotels of particular brands can sometimes be operated by different accommodations firms. Foreign branded hotels can also sometimes be franchised, and locally owned. I describe the parent company as the company owning and operating a particular resort.

(LAI) hotels on non-tourist attraction goods and services.[21]

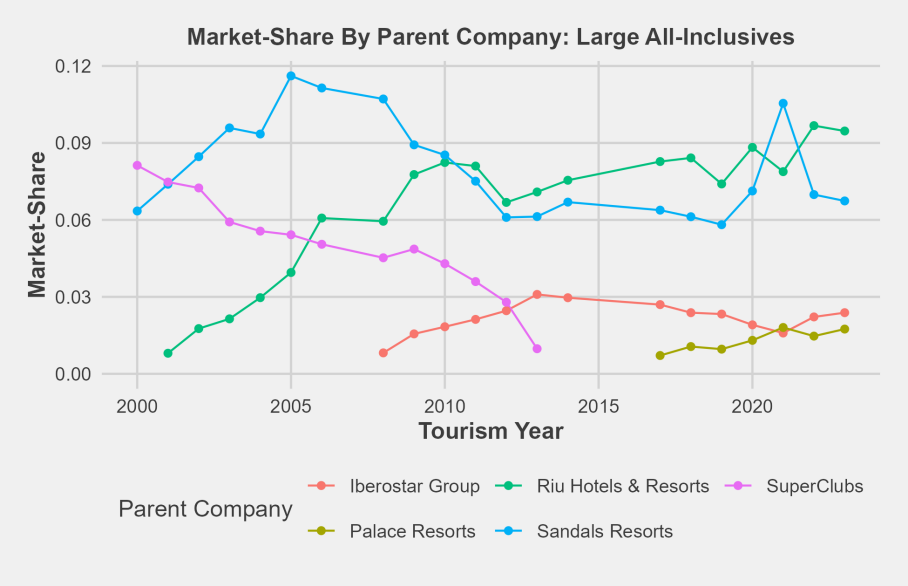
2.2 Major Parent Companies and Product Descriptions

The major parent companies in the Jamaican context have also varied greatly over time. In 2000, the two largest parent companies in Jamaica were the domestically owned brand Sandals Resorts, and the resort chain SuperClubs. Significant shifts in the market and the rapid entry of new brands as part of the

"Spanish Invasion" contributed to the significant decline of the SuperClubs brand over the period 2000 to 2015. Arguably the most notable entrant during this period has been by Riu Hotels & Resorts, which since 2001 has added 16,000 rooms across 7 properties. Other major players in the sector are Palace Resorts, and Iberostar. Parent companies often oversee different hotel brands that cater to different market segments in terms of prices and experiences.

[21] See Table 30

Figure 1: Market Shares By Parent Companies for Large All-Inclusive Resorts



Notes: Market shares are computed using observed stays for largest parent companies in Jamaica by market share over the course of the study period. Estimates of market shares come from the Ministry of Tourism Exit Survey for 2001-2023.

For example, Sandals Resort operates the Sandals brand of adults-only resorts, and Beaches brand properties that caters to families.

2.3 Policy Context

The Jamaican government has attempted to pursue a strategy of development based heavily around the expansion of the tourism sector. This has involved significant government policy measures meant to encourage foreign direct investment and the construction of new hotels. Announcements of new resort projects are often heralded for the new jobs and additional revenue they will provide.

As such there is a substantial policy regime meant to promote resort entry and construction. In the years shortly following independence in 1962 the government passed policies such as the Hotel Incentives Act, and the Tourism Board Act. These acts were updated in 2013 with the Tourism Omnibus Package. These laws provide for tax relief, in the form of the national General Consumption Tax (GCT), a national Value Added Tax from 15% for 10% for approved tourism enterprises. Approved tourism projects are also guaranteed to receive

tax write-offs. Tourism is also an important generator of tax revenue. The 10% GCT on all approved earnings provides the largest set of earnings. In 2012, the Guest Accommodation Room Tax (GART) was also passed. This tax is a per-roomnight tax that differs based on the size of a particular hotel, and is charged for each night a room is occupied. Are these policies optimally applied given market concentration levels? This is what I will investigate in this paper. There have been a number of important objections raised about the current structure and conduct of the Jamaican tourism sector.

The first is that whether or not the changes in the makeup of the industry are welfare improving for Jamaicans is not clear. On one hand, the increased room capacity from large AI type hotels have provided new jobs and perhaps brought tourists to the island who would not otherwise have visited. On the other hand, the AI model has been criticized for having smaller per-dollar impacts on local communities than more traditional accommodation models (Issa and Jayawardena 2003), and for the limited contact that guests at AIs have with the destination area. However, Issa and Jayawardena (2003), pointed out that the AI model developed in Jamaica in part to protect tourists from violent crime. What are some possible trade-offs that the government may have to make regarding the Jamaican tourism industry, and how do these relate to more fundamental questions about firm market power, trade, and economic development? One the one hand, increased accommodations promotes greater arrivals by increasing the room stock. These projects thus produce greater arrivals and produce larger tax revenue.

The development outcomes of focus for this study are each recognized as important aspects of the growth process for emerging economies. Tax revenue is critical for government funding of public services and investments in infrastructure, and, more broadly, for enabling the government to create a stable environment in which development can occur. Employment opportunities are key to enabling individuals to lift themselves and their families out of poverty, invest in human capital through education, and develop resilience to shocks. Spending on local services by visitors are important for enabling businesses to thrive, driving employment, and providing access to foreign exchange, and can be viewed as a shock to demand for local services.

3 Data

The core consumer data comes from the Jamaican Ministry of Tourism Exit Surveys from 2001 to 2023. These surveys cover a representative sample of departing tourists from either of the islands two international airports. Tourists are asked questions about the values of their expenditures on their trip to Jamaica across categories such as accommodations, food, transportation and others. Altogether this dataset comprises 100,000 tourists and approximately 200,000 individuals. I utilize aggregate datasets on arrivals provided by the tourism ministry to validate my findings.

The supply-side data comes from a combination of detailed government data on the number of properties of each type in each resort area, resort websites, news articles from various Jamaican newspapers and international tourism sites on the opening of new resorts, and travel booking websites. My estimates for the number of workers employed in given markets are based on Ministry of Tourism data on direct accommodations employment.

4 Short-Run Model and Estimation

I propose a short-run equilibrium model of tourist demand for differentiated Jamaican accommodation types in local Jamaican markets, and the supply of accommodation services by multi-product hotel parent companies.

In this model parent companies sell bookings at differentiated hotels for one of two potential reservation lengths, to representative consumers. The equilibrium is composed of the average annual price per-person, per-booking, for a particular accommodation, which will depend on demand levels, and hotel capacities. Hotels are classified by their room count and package type as either Large All-Inclusive, Large European Plan, Small All-Inclusive, Medium European Plan, or Small European Plan.

I define a market m as a resort area a in a year t.[22] I combine the resort area of Southcoast

[22]New hotels regularly open in November or December in advance of the winter tourism season. Defining tourism years, and markets as beginning in November helps reduce the number of properties that are present for only part of a given 12-month period.

with Negril, and the resort area of Port Antonio with Ocho Rios to create four resort areas. In total, the analysis covers 76 markets. The demand side is given by a nested logit model (Berry 1994; Goldberg 1995; Cardell 1997), where rooms are differentiated across either individual hotels for large properties, or across aggregated categories based on the package type for small and medium-sized categories.

For the supply of lodging services, I assume that parent companies p engage in Bertrand competition in prices with differentiated products across individual hotels h and booking durations b for large properties, and across aggregated categories and booking durations for small and medium accommodations. Large properties differ in terms of their room capacities. Small and medium properties are undistinguished within their aggregated categories. Bookings differ in their marginal cost to produce based on the duration of the booking as well as the intensity with which marginal cost increases with occupancy, which depends on whether a property is European Plan or All-Inclusive.

4.1 Demand

A consumer i makes a discrete choice between different potential bookings b and an outside option($u_0 = 0$). A booking is reservation at a hotel h, for a duration bin d. Hotels are sorted into nests n based on their size, with Large All-Inclusives and Large European Plan hotels in a 'Large Accommodation' nest, and Small All-Inclusive, and Small or Medium European Plan resorts being placed in a Small or Medium Accommodation Nest. In the equation below, ξ_{hm} represents the market-specific mean utility derived from booking b that is common to all consumers, p_{bm} is price per-person per-booking for booking b, and x_{bm} is a vector of linear characteristics.

Following Berry (1994) and Cardell (1997), the idiosyncratic component of representative utility is composed of a product-specific component, ϵ_{ibm}, as well as an idiosyncratic nest-level preference η_{inm} for nest n. The term σ_n is the within-nest correlation in utility for products in nest n. The set of accommodation products in nest n are $\mathcal{N}_n$, with product $b \in \mathcal{N}_n$. The utility for a consumer purchasing a reservation b in market m is

$$u_{ibm} = \alpha p_{bm} + \beta x_{bm} + \xi_{hm} + \eta_{inm} + (1 - \sigma_n)\epsilon_{ibm}, \tag{1}$$

and the full idiosyncratic error term has the form

$$\eta_{igt} + (1 - \sigma)\epsilon_{ijt}, \tag{2}$$

The nest-specific preference and the idiosyncratic error term are distributed Type-1 Extreme Value, and therefore, the entirety of the idiosyncratic component of utility is distributed Type-1 Extreme Value. I simplify the consumer decision of booking length by sorting reservations lengths of stay into two bins indexed by d that are $d = 1$:"7 Nights and Under" and $d = 2$:"8 Nights and Over". The finite index set for duration bins is:

$$\mathcal{D} = \{1, 2\}.$$

This segmentation of the booking duration is motivated by the fact that the distribution of reservation lengths has distinct peaks around 7 nights and 14 nights. Furthermore, there are non-linearities in the pricing of roomnights between bookings of less than one week and those for longer durations. The nest vector is

$$\mathbf{N} = (\text{Large Accommodations Nest}, \text{Small \& Medium Accommodations Nest}),$$

and the nested structure of the discrete choice that tourists make is given by figure 2.

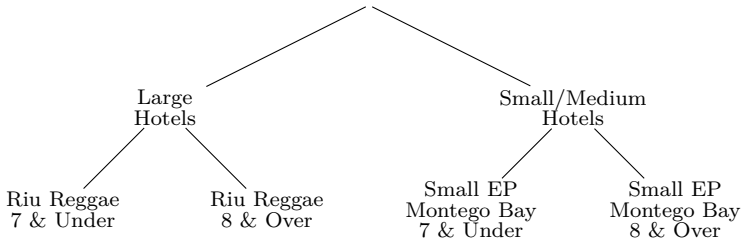


Figure 2: Nested structure of hotel categories and stay-length segments.

I assume that tourists hold differentiated preferences over individual Large All-Inclusive and

Large European Plan hotels and the two reservation duration bins. Tourist are indifferent between different types room types within the same property for the same duration. Within each aggregated accommodation category, tourists are indifferent between different properties and different room types within a given category-resort area pairing in a similar spirit to Farronato and Fradkin (2022)'s aggregation of hotels within the same tier. For example, for the resort area of Montego Bay, I aggregate all Small European Plan properties into a single Small European Plan Montego Bay hotel, which offers reservations of each of the stay duration bins in B.

A booking or reservation b for travel party i is fully described by a vector R of relevant components. These are the booking duration bin d, the booking property or hotel h,the nest n, the accommodation category g, the resort area a in which the property is located, the parent company f, and the market m. The vector is written:

$$\mathbf{R}_b = (d_b, h_b, n_b, g_b, a_b, f_b, m_b).$$

It is however, sufficient for us to describe a booking as the intersection of a property h and a booking duration bin d in a particular market. I assume that the size of each market S_m is given by a multiple of the total number of estimated travel parties to visit the resort area a in year t, an adaptation of the roomnights-based market size approach of papers Farronato and Fradkin (2022) and McClure (2025). I abstract away from the length of stay decision within each bin, and I assume that tourists book reservations for the same number of night l_{dm} in a given bin, which I set equal to average length of stay for bookings in that bin for a given market.

We can define the mean utility from product b in market m as

$$\delta_{mn} \equiv x_{jt}\beta - \alpha p_{jt} + \xi_{jt}. \tag{3}$$

Given representative utility, the quantity of reservations T_{bm} purchased for booking b in market m is given by

Table 3: Hotel Nests in 2019

Large Hotel Nest	**Small and Medium Sized Hotel Nest**
Jewel Runaway Bay	AC Hotel Kingston
Excellence Oyster Bay	Jamaica Pegasus
Royal Decameron Club Montego Bay	Small Non All-Inclusive Southcoast
Jewel Dunn's River	Medium Non All-Inclusive Kingston
Sandals Grande Beach and Villa Resort	Medium Non All-Inclusive Montego Bay
Royalton Negril	Medium Non All-Inclusive Negril
Moon Palace Jamaica Grande	Small Non All-Inclusive Ocho Rios - Port Antonio
Melia Braco Village	Small Non All-Inclusive Montego Bay
Hilton Rose Hall Resort & Spa	Small Non All-Inclusive Kingston
Hyatt Ziva	–
RIU Montego Bay - RIU Palace Mobay	–
Couples Tower Isle	–
Hedonism II	–
Holiday Inn Sunspree Resort	–
RIU Reggae	–
Royal Decameron Montego Bay	–
Azul Sensatori	–
Sandals Montego Bay	–
Small All-Inclusive Montego Bay Category	–
Small All-Inclusive Ocho Rios-Port Antonio Category	–
Small All-Inclusive Negril Category	–

Notes: This table shows the representative hotels included in each nest in 2019.

$$T_{bm} = S_m \frac{\exp\left(\frac{\delta_{bm}}{1-\sigma_n}\right)}{\left(\sum_{b\in\mathcal{N}_n}\exp\left(\frac{\delta_{bm}}{1-\sigma_n}\right)\right)^{\sigma_n}\left[\sum_{n=0}^{2}\left(\sum_{b\in\mathcal{N}_n}\exp\left(\frac{\delta_{bm}}{1-\sigma_n}\right)\right)^{1-\sigma_n}\right]}, \tag{4}$$

and the nested logit estimating equation is:

$$\ln(s_{bm}) - \ln(s_{0m}) = \beta x_{bm} + \alpha p_{bm} + \xi_{bm} + \sigma_n \ln(\bar{s}_{bm|nm}), \tag{5}$$

thus converting what was a nonlinear equation into a linear format which can then be estimated by an instrumental variable regression. In my estimation x_{bm} contains year fixed

effects to account for shocks common across markets in a particular year, and resort area fixed effects to capture the effects of region-specific attributes that are constant across time and may influence demand. There is also an interaction of duration bin fixed effects and year fixed effects that is meant to capture the effects of aggregate variation in reservation durations that are common across a given year.

4.2 Supply-Side

The supply side is composed of parent companies, f, that maintain portfolios $\mathcal{H}_f$ of properties h, and engage in static Bertrand-Nash competition in prices in the sale of bookings b of '7 Days & Under' and '8 days & Over' for each of their properties. Therefore, every property sells 2 products. Parent companies select a per-person per booking price p_{bm}. Parent companies maximize profits, and solve an unconstrained problem with a property-level soft-capacity constraint. The soft constraint is a nonlinear component of the cost function which is increasing in the congestion of a hotel. The linear component of marginal cost is c_{bm}.

For ease of interpretation, in the parent company profit function below I index the prices and marginal costs associated with the products b by the individual hotels h, and the duration bin d. The term q_{dhm} represents the total number of individuals who are included across all bookings at property, while $\tilde{q}_{dhm}$ is the number of bookings, travel parties or reservations. The parameter τ^v is a value added tax charged on every booking transaction. We can denote the average number of individuals in a party i in a particular market as $\bar{i}_m$, and therefore

$$q_{dhm} = \tilde{q}_{dhm} \cdot \bar{i}_m \tag{6}$$

gives us the total number of individuals with reservation duration d at hotel h in market m. The term ρ_{hm} denotes the average occupancy of hotel h in market m, which I will refer to simply as occupancy going forward. The profit of parent company f is given by

$$\Pi_{fm}(p) = \sum_{h \in \mathcal{H}_f} \left[\sum_{d \in D} \left(\frac{p_{dhm}}{1+\tau^v} - c_{dhm} \right) q_{dhm}(p_{dhm}) - \gamma \cdot ln\left(1 + \frac{\rho_{hm}}{\lambda(1-\rho_{hm})}\right) \right], \tag{7}$$

where λ is a dampening parameter to control the growth of the nonlinear component of costs. The occupancy is defined as

$$\rho_{hm} = \frac{\sum_{d \in \{1,2\}} \tilde{q}_{dhm}\, l_{dm}}{k_{hm}},$$

with k_{km} the capacity of hotel h in market m in roomnights. The linear component of marginal costs c_{dhm}, is composed of baseline linear costs $\tilde{c}_{dhm}$ as well as a Guest Accommodation Room Tax (GART) τ^r_{hm}, that is charged for every night that a room is occupied. Because $\tilde{c}_{dhm}$ is per-person per-booking marginal costs and the room tax is applied per-booking roomnight, with a per-night dollar amount based on the rooms in the hotel the total linear component of marginal costs is

$$c_{dhm} \equiv \tilde{c}_{dhm} + \frac{(\tau^r_{hm} l_{dm})}{\bar{i}_m}. \tag{8}$$

In order to simplify the profit expression, we can then define a congestion function g as

$$g(\rho; \lambda) \equiv ln\left(1 + \frac{\rho_{hm}}{\lambda(1-\rho_{hm})}\right) \Bigg]. \tag{9}$$

The maximization problem for parent company f is now the following:

$$\max_p \Pi_{fm}(p) = \max_p \sum_{h \in \mathcal{H}_f} \left[\sum_{d \in \mathcal{D}} \left(\frac{p_{dhm}}{1+\tau^v} - c_{dhm} \right) q_{dhm}(p_{dhm}) \; - \; \gamma\, g(\rho_{hm}; \lambda_{hm}) \right]. \tag{10}$$

Therefore, the first order condition of the profit maximization function of the with respect to p for a booking of duration j where $j \in \mathcal{D}$ at property h for which $h \in \mathcal{H}_f$ is

$$\frac{\partial \Pi_f(p)}{\partial p_{jhm}} = q_{jhm} + \sum_{h \in \mathcal{H}_f} \sum_{d \in \mathcal{D}} (p_{dhm} - c_{dhm}(1+\tau^v)) \frac{\partial q_{bhm}}{\partial p_{jhm}} - \gamma \frac{\partial g(\rho_{hm}; \lambda_{hm})}{\partial p_{jhm}} (1+\tau^v) = 0 \quad (11)$$

$$\frac{\partial \Pi_f(p)}{\partial p_{jhm}} = q_{jhm} + \sum_{h \in \mathcal{H}_f} \sum_{d \in \mathcal{D}} (p_{dhm} - c_{dhm}(1+\tau^v)) \frac{\partial q_{dhm}}{\partial p_{jhm}} - \gamma \frac{\partial g(\rho_{hm}; \lambda_{hm})}{\partial q_{dhm}} \frac{q_{dhm}}{p_{jhm}} (1+\tau^v) = 0 \quad (12)$$

which then gives us

$$q_{jhm} + \sum_{d \in \mathcal{J}_f} \left(p_{dhm} - (1+\tau^v)\, c_{dhm}\right) \frac{\partial q_{dhm}}{\partial p_{jhm}} - (1+\tau^v) \sum_{h' \in \mathcal{H}_f} \gamma_{h'}\, g'(\rho_{h'm}) \sum_{k \in \mathcal{J}(h')} \alpha_{kh'm} \frac{\partial q_{kh'm}}{\partial p_{jhm}} = 0 \quad (13)$$

Let $\mathbf{p} \in \mathbb{R}^N$ be consumer (tax-inclusive) prices per person, $\mathbf{c} \in \mathbb{R}^N$ the linear per-person marginal cost vector $(\tilde{c} + (\tau^r \odot \ell)/\bar{i})$, $\mathbf{q} \in \mathbb{R}^N$ quantities (persons), $\mathbf{J}_q = \partial \mathbf{q}/\partial \mathbf{p}$ the quantity Jacobian (in the same units as $\mathbf{q}$), and Ω the ownership matrix. Define

$$\Delta \equiv -(\Omega \circ \mathbf{J}_q).$$

For each property h, let ρ_h be occupancy, $s_h \equiv \gamma_h g'(\rho_h)$ with

$$g'(\rho) = \frac{1}{(1-\rho)(\lambda(1-\rho)+\rho))},$$

and for each product i in property h let $\alpha_i = \ell_i/(K_h \bar{i})$ (persons units) Define the within-property projection $w_{hj} \equiv \sum_{i \in \mathcal{J}(h)} \alpha_i\, (\mathbf{J}_q)_{ij}$. Let the congestion vector be $e_j \equiv \sum_{h \in \mathcal{H}_{f(j)}} s_h\, w_{hj}$.

The stacked first-order condition can be written as

$$\mathbf{q} + \mathbf{J}_q^\top \big[\Omega\, (\mathbf{p} - (1+\tau^v)\mathbf{c})\big] - (1+\tau^v)\, \mathbf{e} = \mathbf{0}.$$

Equivalently,

$$\Delta\left(\mathbf{p}-(1+\tau^{v})\mathbf{c}\right)=\mathbf{q}-(1+\tau^{v})\,\mathbf{e},\qquad\Delta\equiv-(\Omega\circ\mathbf{J}_{q}).$$

Hence the pricing equation in consumer prices is

$$\boxed{\mathbf{p}=(1+\tau^{v})\,\mathbf{c}+\Delta^{-1}\mathbf{q}-(1+\tau^{v})\,\Delta^{-1}\mathbf{e}.}$$

I assume that parent companies only hold properties from the Large All-Inclusive and Large European Plan accommodation categories. Since the other categories of accommodations products are assumed to all be homogeneous within the same resort area, these hotels are modeled as being held by the same parent company.

4.3 Equilibrium

The equilibrium for a given market m is therefore the vector of prices,

$$\mathbf{P_m}=(p_{11m},p_{21m},...,p_{DHm}) \tag{14}$$

the vector of demand parameters,

$$\mathbf{\Theta}=(\alpha,\sigma_{LH},\sigma_{SMH}) \tag{15}$$

supply parameters,

$$\mathbf{\Sigma}=(\gamma_{EP},\gamma_{AI},\lambda,\tau^{v},\tau^{r}_{hm}) \tag{16}$$

and quantity of reservations for each accommodation product in market m

$$\mathbf{T_m}=(T_{11m},T_{21m},...,T_{DHm}). \tag{17}$$

From the models equilibrium quantities, I construct total tourist expenditures, tax revenues,

and employment. Total tourist expenditure is obtained using the visitor expenditure surveys. For an individual tourist i staying at accommodation type h with duration bin m, per-person expenditure is

$$\text{expenditure}_{im} = \text{hotel}_{ihm} + \text{non\_hotel}_{ihm}. \tag{18}$$

To recover non-accommodation spending from observed patterns, I use the tourist exit surveys to compute, for each accommodation group g, the average share of total spending allocated to non-accommodation goods and services:

$$\text{non\_hotel\_share}_g = \frac{1}{N_g} \sum_{i \in g} \frac{\text{non\_hotel}_{ihm}}{\text{hotel}_{ihm} + \text{non\_hotel}_{ihm}}. \tag{19}$$

This share provides a mapping from accommodation expenditures in the model to implied expenditures on all other goods and services.

Given equilibrium quantities q_{ihm} (measured in persons), total tourist expenditure in market m is

$$\text{TotalExpenditure}_m = \sum_h \sum_i q_{ihm} \, \text{hotel}_{ihm} \Big(1 + \text{non\_hotel\_share}_{g(h)}\Big). \tag{20}$$

where $g(h)$ denotes the accommodation group associated with property h. This formulation ensures that per-person expenditures are consistently scaled by the model-predicted number of tourists. The model simulations yield the total amount spent on accommodations on different accommodations. Using the spending share accounting parameter, $non\_hotel\_share_g$ obtained from the exit surveys, I then estimate the total amount spent outside hotel properties, and the total amount spent overall in a given market.[23]

[23]These calculations implicitly assume that hotel and non-hotel spending are complements and consumed in fixed-ratios for each of the accommodation types. For this analysis I abstract away from the likely joint-decision that consumers make between how much to spend on accommodations and how much to spend on activities.

Total tax revenue in a market is the sum of General Consumption Tax (GCT) revenue and Guest Accommodation Room Tax (GART) revenue. It is given by

$$TaxRevenue_m = \tau^v \text{hotel}_m + \sum_h \sum_{d \in \mathcal{D}} \frac{(\tau^r_{hm} l_{dm})}{\bar{i}_m} \cdot q_{dhm}. \tag{21}$$

Finally, total employment is measured based on the ratio $tourist\_worker\_ratio_m$) of the number of tourists to the number of workers in direct accommodation employment in a particular market. Data for both of these come from the Ministry of Tourism annual reports. Thus, in this modeling framework, the total number of workers in a given area is a constant fraction of the number of visitors. Total employment in market m is therefore

$$\text{Employment}_m = tourist\_worker\_ratio_m \cdot q_m$$

4.4 Instruments and Estimation

The key challenge in estimating a demand system is the endogeneity of price. Prices are functions of the marginal costs of producing a particular good or service, as well as the quantity of a good or service that is demanded. Therefore a parameter obtained from an Ordinary Least Squares regression of consumer choice on price will be biased. We thus require instrumental variables for price, that are uncorrelated with shocks to demand.

I utilize five instruments that shift marginal cost independently of demand shocks. The first instrument is the room capacity of a particular property. Greater room capacity implies larger overall property size and likely larger facility operating costs than comparatively smaller properties that are uncorrelated with a particular demand shock. These include costs of providing a basic level of air conditioning regardless of the number of guests, basic maintenance and repair costs, and the labor to conduct such upkeep. However, given a basic level of necessary spending to operate a large property, additional guests visiting a larger property may in fact lower marginal costs thanks to economies of scale. Thus, I would expect the coefficient on this variable to be negative.

The second instrument is similarly based upon room capacity, but is the number of rooms held the same firm across other properties. Multi-product firms internalize the effects of the costs of producing each of their good across their entire portfolio. Thus, properties that are parts of portfolios with large alternatives will likely reap the benefits of the economies of scale described for the first instrument, and thus face lower company-wide operating costs, and thus have a negative impact on prices. For a third instrument I interact the property capacity with the annual maximum property tax rates for specific years. A larger number of rooms is an effective proxy for larger overall property size and therefore we can expect that the upper bound of the property tax rate will particularly penalize larger firms. The fourth instrument interacts the total number of rooms in a company's portfolio with the highest marginal tax rate, once again following the argument of costs being shared across a firm.

F interact the weekly minimum wage with the property size. The minimum wage has varied over the years. Larger hotels are more likely to be all-inclusive, and provide greater services per guest, and thus likely also feature greater numbers of staff per booking relative to a smaller (and likely EP hotel). We can expect that an increase in the minimum wage will have a greater impact on the marginal costs of larger firms compared to smaller ones.

In the nested logit framework it is also necessary to find instruments for the log of within nest shares. As instruments I follow the standard approach in the literature of using the number of products in a particular nest, and the total number of products in a market. I estimate nest specific coefficients on the log within nest share.

I estimate the supply side of the model with a 2-step Generalized Method of Moments (GMM) approach. I use 5 instruments for price. The first instrument is Guest Accommodation Room Tax (GART) rate, which varies with hotel size. The second instrument is the mean price of products not owned by the same parent company, not of the same stay duration length, in other markets during the same year. I next utilize the number of rooms in the same market in different categories than the product for which we are instrumenting. The final two instruments are the number of rooms in different categories in different markets, and the number of rooms in the same category in other markets.

I use 2-stage to estimate the baseline linear marginal costs $\bar{c}$ and the increasing cost com-

ponent on congestion γ. I assume that these values are the same across occupation types and sizes. As instruments I utilize the price of products of different length by different corporations in different markets in the same tourism year, a shift-share instrument exploiting variation in the origin regions of tourists, and the number of rooms in the same market as a firm but from a different category. In order to determine the optimal level of the dampening parameter λ, I perform a grid search over a sample of possible values for a given set of initial parameter estimates, and select between several values that minimize the J-Criterion to similar levels of precision.

4.5 Counterfactual Simulation Procedure

I solve for each counterfactual market equilibrium by iterating on prices until the multi-product Bertrand FOCs and capacity constraints are both satisfied. The algorithm used is a stabilized Newton-Levenberg-Marquardt method with each iteration computing the Jacobians and forming a damped Newton step. I apply backtracking line search using a merit function with both the FOCs and capacity residuals. The capacity residuals are scaled by the size of the market, and are adjusted in importance as the algorithm approaches the optimum. Additionally, step sizes and damping parameters are adjusted in order to aid convergence. Each simulation is run for 1000 iterations. I declare that a market has "strictly converged" if the sum of the FOC and capacity residuals is below $1e-8$, has "close converged" if the residuals are under .005, and have leniently converged if they are below 0.01. I reject any markets for which the residual sum is greater than 0.01. 40 of the 76 markets that I simulate achieve at least lenient convergence.

5 Results

In this section I will present the results of the demand and supply side estimations. I will also particularly focus on analyzing the recovered own-and cross-price elasticities of different products, as well as diversion ratios for the inside option. These findings will then motivate the counterfactual simulations.

5.1 Demand Parameter Estimates

Table 4 presents the parameter estimates for the nested logit demand model. The terms $\alpha, \sigma_{LH}, and \sigma_{SMH}$ are the coefficients on price, and the coefficients on log within-nest share for the large hotels nest, and the coefficient for the log within-nest share of the small and medium hotels nest. Each coefficient is statistically significant at the 1 percent level.

Table 4: Demand Parameter Estimates

Variables	(1)
α: Price	-0.010***
	(0.001)
σ_{LH}: Log LH Within Nest Share	0.144***
	(0.053)
σ_{SMH}: Log SMH Within Nest Share	0.236*
	(0.120)
F Statistic	30.5
Mean Own-Price Elasticity	-1.67
Median Own-Price Elasticity	-1.49

Notes: The given price is the price per-person, per booking. Prices were all adjusted to 2024 U.S. Dollars. Standard errors are clustered at the market level. Significance codes are given as: *Signif. Codes: ***: 0.01, **: 0.05, *: 0.1.*

The price is given in terms of price per-person, per booking. The obtained price coefficient is -0.010, with a median own-price elasticity of -1.4887. These are consistent with Jamaican tourism typically being more highly priced, with relatively less price-sensitive customers than other comparable destinations. The coefficients on the within-nest shares confirm a statistically significantly but relatively low level of within-nest correlations at .14 and .23. This is consistent with consumers viewing the products within each of these nests as generally being quite distinct from one another, and lends initial support to the view that additional variety in the portfolio of Jamaican tourism may add consumers who would otherwise not visit.

Own-price elasticities range from -.98 to -4.3. These results do differ from the results in McClure (2025) and Farronato and Fradkin (2022), though as mentioned before, the setting and product space differ considerably. An important difference is that whereas in other

papers, the consumer is making a discrete choice for a single roomnight, in my case the consumer is deciding about an entire reservation of multiple days. In essence, these demand estimates also capture the decision of whether or not to vacation in a Jamaican hotel at all, rather than the marginal decision of whether to choose another roomnight.

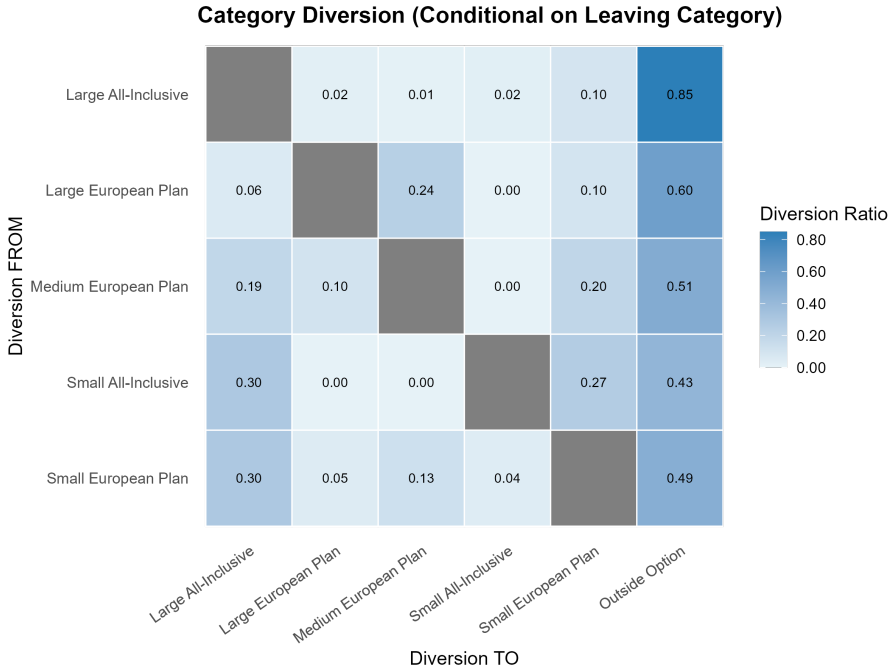


Figure 3: Heatmap of Diversion Ratios For Major Lodging Categories

Notes: Shown are the average diversion ratios for each of the main product groups conditional on a particular group not being available. The first row shows the diversion ratios for large-all inclusive tourists when large all-inclusive resorts are not available, with the second row showing the diversion ratios for large EPs conditional on an LEP not being available, and so on.

The structure of this product market does enable some analysis of marginal decisions on whether or not to book a longer vacation, by comparing the elasticities between reservations of a week or less, versus 8 days or more. Own-price elasticities are distinctly higher as we may expect for longer duration stays, with table 5 showing that the mean own-price elasticity for Large All-Inclusive category accommodations is -1.47 for the 7 day bin, compared to -2.79 for the 8 day bin. Figure 4, provides a visual breakdown of the differences in elasticities across different product types.

Table 5: Recovered Summary Table

LOS	Mean Price	Mean Markups	Mean Marginal Costs	Mean Own-Price Elasticity	Mean EPS per $100	Mkts.
Large All-Inclusive						
$\leq$ 7 Days	1,205.03	864.56	340.47	-1.47	-12.14	57
	(171.30)	(27.28)	(170.88)	(0.21)	(0.15)	
$\geq$ 8 Days	1,415.03	860.61	554.41	-1.79	-12.66	57
	(250.27)	(21.58)	(240.89)	(0.32)	(0.09)	
Large European Plan						
$\leq$ 7 Days	1,025.98	926.99	99.00	-1.14	-11.10	9
	(82.16)	(31.67)	(77.64)	(0.09)	(0.41)	
$\geq$ 8 Days	1,361.58	935.76	425.82	-1.71	-12.56	9
	(289.12)	(31.32)	(288.26)	(0.37)	(0.11)	
Small All-Inclusive						
$\leq$ 7 Days	1,110.19	783.87	326.32	-1.47	-13.23	18
	(112.32)	(33.03)	(133.95)	(0.18)	(0.39)	
$\geq$ 8 Days	1,228.10	788.68	439.42	-1.72	-13.97	18
	(227.42)	(37.24)	(224.89)	(0.31)	(0.19)	
Small European Plan						
$\leq$ 7 Days	1,061.89	894.40	167.48	-1.28	-12.12	30
	(165.14)	(61.44)	(152.37)	(0.19)	(0.53)	
$\geq$ 8 Days	1,207.10	896.20	310.90	-1.62	-13.42	30
	(269.72)	(63.18)	(258.63)	(0.36)	(0.39)	
Medium European Plan						
$\leq$ 7 Days	1,664.75	837.98	826.77	-2.13	-12.59	22
	(488.63)	(125.91)	(578.42)	(0.75)	(1.16)	
$\geq$ 8 Days	1,960.30	860.86	1,099.44	-2.76	-14.01	22
	(681.40)	(131.18)	(751.33)	(1.00)	(0.36)	

Notes: Prices are given for per-person, per-booking in 2024 USD. Standard deviations are provided in parentheses. These estimates are calculated without some of the observations that return negative marginal costs. This occurs for some Small European Plan observations because the aggregation of the individual properties in an area results in an understating of substitution away from SEPs which in turn result in higher estimated markups and lower recovered marginal costs. This also occurs for Large European Plan properties because most are located in Kingston, exhibit considerable market power because of the lack of supply in many years, which again results in higher estimated markups and erroneously low marginal cost estimates for some observations.

5.2 Supply Parameter Estimates

The supply estimates returned in table 6, estimated with Generalized Method of Moments are all statistically significant at the 1 percent level. The linear component of marginal cost for reservations in the 7 Day & Under bin is 254 USD, while the amount for 8 Days & Over bookings is 480 USD. The coefficient on the nonlinear component of marginal cost is 265 USD for European Plan bookings, and 742 USD for All-Inclusive bookings. The dampening parameter λ, constrains nonlinear component at high occupancies, preventing explosions of

Figure 4: Mean Own-Price Elasticities by Accommodation Category and Duration Segment

Notes: This figure shows the mean own-price elasticities per dollar for hotels in each of the accommodation categories for each of the duration segments. The per-dollar scaling is meant to account for differences in prices across the different accommodation types. As we may expect, the elasticities are higher for the longer duration segments reflecting substitution from longer vacations to shorter ones.

marginal cost.

The difference in linear marginal costs between the stay duration bins aligns with intuition as needing to provide for guests for a larger number of days naturally demands greater inputs in terms of labor and services, and hence results in higher marginal costs for the longer stay duration bin. The nonlinear component of costs being different across plan type reflects the differing level of services provided per-guest between All-Inclusive Plan and European Plan style hotels.

Broadly my estimation does not find practically significant effects of estimated occupancy on marginal costs. The first contributing factor to this is the fact that I am providing an average measure of occupancy over the course of a given tourism year, not nightly levels of bookings as in many other papers on accommodations. This means that occupancy related

Table 6: **Accommodation Supply Estimates**

Parameter	Category	Estimate	Std. Error
Panel A: Linear Marginal Cost			
C_7	Length of Stay: $\leq$7 Days	254***	21
C_8	Length of Stay: $\geq$8 Days	480***	27
Panel B: Nonlinear Congestion Parameter (γ)			
γ_{EP}	Hotel Type: European Plan	265***	44
γ_{AI}	Hotel Type: All-Inclusive	742***	171
Model Statistics			
Number of Observations			890
λ (Dampening Parameter)			50
J Criterion			0.023

Notes: Estimates reported from the GMM estimation from the model of supply. All values are in 2024 USD. C_b is the linear component of marginal cost for stay duration b. The number of observations refers to the number of product x market interactions, rather than the number of observed transactions.

pricing changes may not be as evident in the context of the data. A second potential reason is that hotels are known not to drop prices below certain thresholds for reputational concerns, even when they have available capacity (Farronato and Fradkin 2022; McClure 2025). Conceptually this implies a price floor in booking levels that in turn makes it more challenging to differentiate between high and low congestion pricing effects.

6 Counterfactual Analysis

The results of the demand- and supply-side estimations motivate analyses investigating how the arrival of new hotels, changes in hotel ownership structure, and shifts in taxation impact total tourist expenditures, government tax revenues, and local employment. I conduct four sets of simulations. The first three consider counterfactual scenarios are concerned with market composition, ownership structure, and with the optimal approach to scaling local tourism sectors. Counterfactual simulation 1 studies the so-called 'Spanish Invasion' of Montego Bay, which saw the arrival of several Spanish-Owned All-Inclusive brands in 2008 that came to dominate a significant segment of the market. What was the effect of these new products and new parent companies on the tourism sector and the main development variables of

interest? Next, in counterfactual simulation 2 I study whether there are differences in the effects of expansion driven by incumbent parent companies or new entrants to a market. I focus on the Negril-Southcoast resort area, and tests the effect of the portfolio expansions of incumbent firms in the area, and observe the impacts of the new products entering under single-property firms. The third set of analyses look ahead to the year 2030 and simulate different potential market structures and product compositions for the South Coast of Jamaica. Counterfactual 4 tests the effects of changes in the value-added and specific taxes levied on the hotel sector. Taken together, these four simulations provide a thorough picture of important considerations in optimizing Jamaica's tourism markets for development outcomes.

6.1 Counterfactual 1: The 'Spanish Invasion'

What is the effect of the entry of new products and new parent companies into a tourism market on total tourist spending, tax revenues, and employment. Might the scale of the entrants relative to the incumbents potentially outweigh the pro-competitive effects of their arrival? To investigate these questions, this set of simulations study the 'Spanish Invasion' of the Montego Bay Resort Area in 2008. These tests provide a foundation for considering the effects of the entry of new products and new firms. These entrants, in terms of scale and quality, enjoyed significant market power and distinctly altered the structure of offerings in Montego Bay (Table 32). In 2008, Fiesta Group opened the Grand Palladium Resort, Iberostar Resorts opened the Iberostar Montego Bay Resort, and Riu Hotels & Resorts opened Riu Montego Bay.[24] Each of the new properties were the first in the Montego Bay portfolio for these parent companies. After entering, these three hotels comprised over 25 percent of the Montego Bay room stock, as can be seen in Figure 5. Each of the hotels enjoyed significant success in the following years, and Montego Bay saw considerable growth in total arrivals.[25] What would have been the implications for our development outcomes if this 'Invasion' had been smaller in scale, or if it had not occurred at all? The opening of new

[24]See: Travel Weekly: Iberostar all-suite resort opens in Jamaica, Travel Weekly: Riu Montego Bay debut undeterred by Gustav

[25]Travel Weekly: Jamaica reports nearly 4% visitor increase for '08

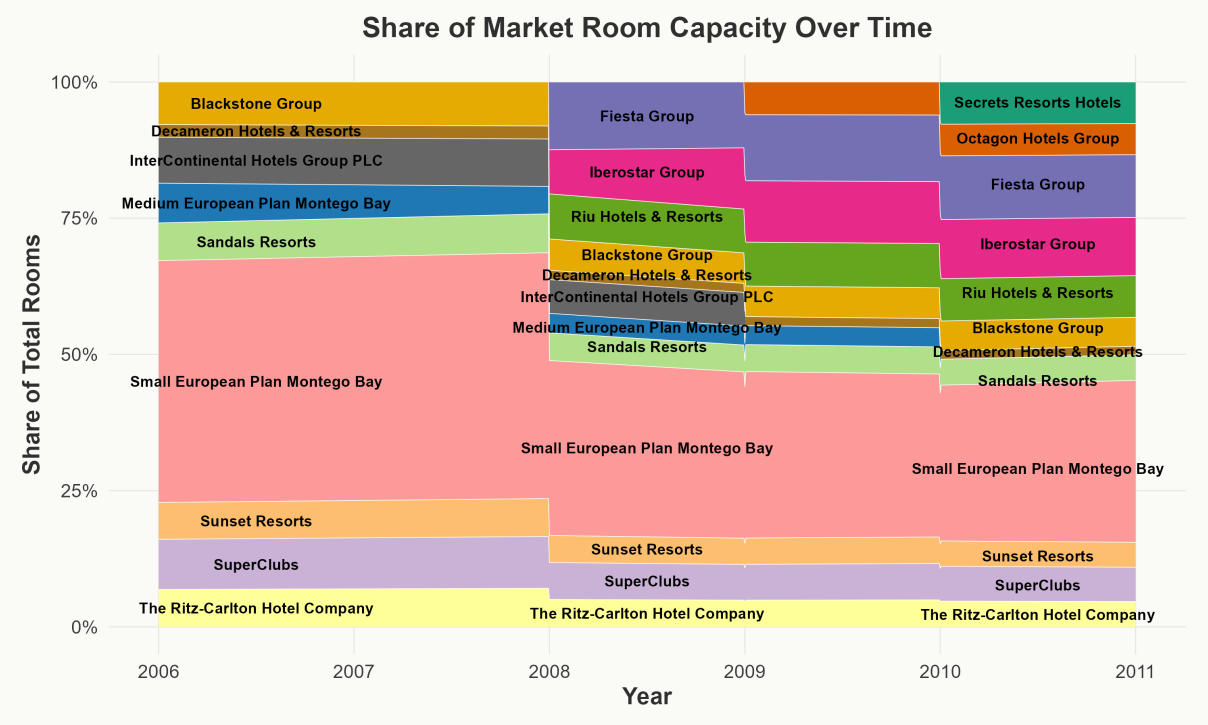


Figure 5: Spanish Invasion Montego Bay 2006–2011

Notes: This figure shows the expansion of Spanish hotel chains in Montego Bay from 2006–2011, measured as the share of total room capacity.

properties for three distinct brands that were not previously available could act to bring new consumers who would not otherwise have visited the area otherwise. The diversion ratios conditional on Spanish All-Inclusives being unavailable can be seen in Table 7. They show that in the absence of a Spanish-owned All-Inclusive hotel offering, 54 percent of would-be Spanish All-Inclusive tourists substitute to the outside option, suggesting significant potential for these new entrants to increase the share of the inside option, by attracting tourists who would not otherwise visit Montego Bay. Since we calculate employment as a constant ratio of total arrivals, these diversion ratios also suggest a generally positive effect of these entrants on employment as well. I simulate counterfactuals in which I remove 1, 2, or all 3 of the properties for Montego Bay in 2008, 2009, 2010, 2011, and 2012. All other characteristics of these markets remain constant. The results are shown in Table 8.

The 'Baseline' column in the table presents the average of each variable for the Montego Bay resort area across the years being considered. There is a consistent pattern in the effects

Table 7: **Spanish All-Inclusive Diversion Ratios**

	Mean Diversion Ratios		
Spanish Owned AI	Spanish AI Diversion	Non-Spanish Diversion	Outside Option
Non-Spanish Owned	-	.501	.499
Spanish Owned AI	-	.456	.544

Notes: This shows the mean conditional diversion ratios at baseline for tourists choosing one of the Spanish All-Inclusive options in Montego Bay. This table shows what tourists would choose in the absence of Spanish All-Inclusive resorts being available depending on what they originally chose. Those who originally chose Spanish All-Inclusives are somewhat more likely (54.4 percent) to select to substitute towards the outside option in the absence of Spanish AIs, as opposed to those who did not originally choose Spanish AIs (49.9 percent).

of removing one or multiple of the Spanish properties, with a decrease of 1.61, 3.29, and 4.47 percent in total tourist expenditures, for 1, 2, and 3 hotel removals, respectively. These equate to decreases in total expenditures of 13.5 million, 27 million and 37 million USD. There are identical percentage decreases in tax revenues as all of the measured tax revenues for these years come from the General Consumption Tax (GCT), which is a constant 10 percent of the price. Employment declines between $-.59$ and -2.12 percent, or between 56 positions and 200 positions,owing to similar decreases in the number of bookings. The decrease in the number of bookings is notable given that average prices decrease by 1.07, 3.05, and 2.80 percent when 1, 2, or 3 properties are removed, respectively.

These findings are consistent with the observed diversion ratios, and reflect the fact that the entry of differentiated hotel products that commanded a higher price attracted new consumers, to Montego Bay, and thus increased area tourism earnings, tax revenues, and employment. The new arrivals increased competitiveness in the market as reflected by the HHI, though average prices still increased as a result of product-specific attributes and quality. This set of counterfactual simulations show that the initial wave of the Montego Bay

Table 8: **Counterfactual 1: The 'Spanish Invasion' of Montego Bay**

	Baseline (Levels)	Counterfactuals (%Δ)		
		(1)	(2)	(3)
Variable	Baseline	Remove 1	Remove 2	Remove All
Development Outcomes				
Total Exp. (Millions USD)	838.65	-1.61	-3.29	-4.47
Total Tax Revenues (Millions USD)	48.06	-1.61	-3.29	-4.47
Employment	9477.00	-0.59	-1.11	-2.12
Demand Outcomes				
Average Price	1590.14	-1.07	-3.05	-2.80
Bookings (Thousands)	206.00	-0.60	-1.13	-2.09
HHI	2093.38	4.89	9.83	18.94

Notes: This simulation covers the period 2006 to 2012 in Montego that saw the entry of 3 major Spanish-owned multinational brands into the market: Riu Hotels & Resorts, Iberostar Resorts, and Fiesta Group, an event dubbed the 'Spanish Invasion. Entries in columns 1-3 show the average percentage change in the variables from baseline for the given counterfactual scenario, with the level estimates given in the 4th column. For the column 1 simulation, I remove 1 of the new properties, in column 2 I remove 2, and in the 3rd column I remove all 3 properties. I keep all other market and product characteristics constant. All monetary values are given in 2024 U.S. Dollars.'Total Exp represents total tourist expenditures. 'Employment is the number of workers in the market employed in accommodations. 'Total Tax Revenues is the sum of revenues from the valued added General Consumption Tax (GCT) and the Guest Accommodation Room Tax. 'Average Price represents average price per person, per booking. 'Bookings is the number of reservations made, and 'HHI is the Herfindahl-Hirschman Index (HHI).

'Spanish Invasion' was on average beneficial for the key development outcomes of aggregate tourist expenditures, government revenues, and employment . The new products raised quality of the room stock, attracting customers who otherwise would not have visited, leading to higher prices and tax revenues, a larger number of bookings, and greater total expenditures by tourists. Thus, the entry of single-property parent companies had pro-competitive effects that were in line with the goals outlined by the government for the tourism sector. In the next set of counterfactuals, we consider the impacts of incumbent expansion in the Negril-Southcoast resort area.

6.2 Counterfactual 2: Negril-Southcoast Incumbent Expansion

The results of the first simulation demonstrated that the addition of new hotel properties, under brands that were previously present in a market, and that are the only holdings of a parent company in an area carry generate economically meaningful results for the development outcomes on which we are concentrated. Do the benefits of such additions persist in cases new hotels are added by incumbent parent companies? If the development outcomes

differ as a result of these changes, by what magnitude do they differ? These are relevant concerns for scaling an industry such as the Jamaican tourism sector, because while the greatest benefits may be experienced in cases of brand new, single product-portfolio entrants, in many cases the expansion that takes place may be characterized by intensive margin increases where incumbent firms add to their existing portfolios. Whether there are non-trivial differences in outcomes for differing structures of expansion is an important consideration when evaluating how to scale and optimize and industry such as tourism for development aims.

There are two ways in which incumbent expansion may influence development differently than new-entrant lead expansion that these counterfactual simulations will scrutinize. Incumbents may be far more willing to expand portfolios than new entrants given considerations such as entry costs, knowledge of the market, existing contractual relationships, among others. It has also been shown that multi-property hotel parent companies can benefit from cost efficiencies across different properties in their portfolios (McClure 2025). Given Bertrand competition in prices across multiple properties, we can expect parent companies to maximize profits jointly across their holdings, and thus in so far as reservations at different properties are substitutes we can expect higher markups. Such markups may increase total tourism expenditures, and consequently, also increase revenues from the GCT. Depending on the scale of the markups relative to the price sensitivity of consumers, these changes could result in lower bookings, or greater bookings of shorter durations, with lower number of total arrivals resulting in less employment. Thus, the type of expansion preferred by policy-makers may vary with the relative priority of different development outcomes.

This analysis considers the Negril-Southcoast resort area. In 2005 Sandals Resorts opened the 365-room Sandals Whitehouse Beach property, which joined Sandals Negril and Beaches Negril as Sandals' offerings in the area.[26] Also in 2005, Couples Resorts opened Couples Swept Away in Negril, joining its incumbent Couples Negril property. These additions increased the area's room stock, and were associated with an increase in total arrivals to the Negril market. The market demand concentration increased somewhat following the entry, though

[26]See: Travel Weeklt: Sandals Whitehouse: Far from Jamaicas tourist path

still remained competitive, with the HHI increasing to 1157 in 2012 as opposed to 709 in 2001.[27].

In order to compare the effects of hotel entry under incumbent parent companies with entry under new parent companies, I first simulate a counterfactual scenario in which Sandals Whitehouse and Couples Swept Away each join the market under the ownership of single-property parent companies. I assume that each of the booking products under each hotel have the same level of mean utility in order to isolate the effects of ownership structure on the outcome variables. The results of the this simulation are shown by column 1 of Table 9. The counterfactual entry of each of the new hotels under single-property parent companies

Table 9: **Negril Incumbent Expansion Simulations**

	Baseline (Levels)	Counterfactuals (%Δ)	
		(1)	(2)
Variable	Baseline	Ownership	Removal
Development Outcomes			
Total Exp. (Millions USD)	910.01	-2.64	-9.63
Total Tax Revenues (Millions USD)	50.46	-2.64	-9.63
Employment	9281.00	2.22	-5.95
Demand Outcomes			
Average Price	1674.31	-4.64	-1.73
Bookings (Thousands)	213.00	2.22	-6.03
HHI	2256.50	-28.64	-3.05

Notes: This simulation covers the period 2006 to 2011 in the Negril-Southcoast market which saw two incumbent parent companies, Sandals Resorts and Couples Resorts, expand their portfolios in the Resort Area with the addition of 1 property each. Entries in columns 1-2 show the average percentage change in the variables from baseline for the given counterfactual scenarios across years, with the level estimates given in the 3rd column. In column 1, I simulate a world in which each of these properties entered under single-property parent companies, assuming that the level of quality remains the same. In column 2, I simulate a world in which neither of the new properties enter the market. All monetary values are given in 2024 U.S. Dollars. 'Total Exp represents total tourist expenditures. 'Employment is the number of workers in the market employed in accommodations. 'Total Tax Revenues is the sum of revenues from the valued added General Consumption Tax (GCT) and the Guest Accommodation Room Tax. 'Average Price represents average price per person, per booking. 'Bookings is the number of reservations made, and 'HHI is the Herfindahl-Hirschman Index (HHI).

produces as 2.64 percent or 24 million USD decrease in total tourist expenditures and total tax revenues.[28] Employment increases by 2.22 percent or 245 positions, as a result of an

[27] Table 31

[28] As in Counterfactual 1, the GART was not yet implemented during the period covered by this analysis, so all of the tax revenues measured here come from the ad-valorem GCT.

equivalent increase in the number of bookings. This increase in bookings is driven by the 4.64 percent decrease average per-person booking prices.

Therefore, all things equal, expansion of existing firms can yield higher total tourist expenditures, and tourism revenues because of greater parent company pricing power resulting from multi-product firm ownership. Single property firm entry on the other hand, reduces this market power, and lowers prices, resulting in lower total tourist expenditures and tax revenues, but a larger number of tourists arriving as a result of the more affordable services, generating additional employment. If employment is the priority, these results imply a less concentrated market ownership structure is optimal through greater arrivals as a result of less firm pricing power. However, when tax revenues or total foreign expenditure are given priority, incumbent expansion may be preferable.

A criticism of the prior scenario may be that in many cases, the only firms looking to expand in a given area are incumbents. If that is the case, the choice facing a government may be incumbent-lead growth or no growth at all. In such a case, what would be optimal, incumbent expansion or no expansion? To test this, I run simulations of a counterfactual where no properties are added. Column 2 of Table 9 shows that even though more dispersed expansion may be desirable in some cases, any expansion, regardless of ownership structure is better than none. In the removal counterfactual, tourist expenditures and tax revenues decrease by 9.6 percent or 4.6 million USD, with a decrease in employment of 5.95 percent. As in the case of Montego Bay, removal of the entrants decrease prices, as well as bookings, emphasizing how substantial product differentiation and brand loyalty can enable new products to attract tourists to an area who would have otherwise chosen the outside option. Thus optimal market structure for development shifts with the relative priority of different development outcomes, the level of differentiation of products in the market, and the rigidity of consumer preferences. The third set of simulations will consider how changes in tax policy can be employed in markets for development aims.

6.3 Counterfactual 3: Expanding The Southcoast

We have considered alternatives to existing expansion scenarios, and now using insights from the previous two simulations, we can look to the years ahead and consider different possible expansion structures for Jamaican tourism. The third set of simulations consider how best to organize the expansion of the Southcoast resort area in the coming years. The Southcoast is the least developed of the major tourism areas, and has tended to cater to smaller scale styles of tourism, with Sandals Whitehouse being the only Large All-Inclusive in the area. The Ministry of Tourism aims for Jamaica to add an additional 10,000 hotel rooms across all resort areas in the coming years. As a part of this expansion, the MOT is actively working to further growth the tourism industry of the Southcoast resort area. The current plan is for the region to remain small-scale in terms of its tourism offerings, in part to avoid concerns about over-tourism.[29]

While discussions around over-tourism are beyond the focus of this study, it is important to also consider the trade-offs of different potential structures of the future Southcoast market. To that end, I run three simulations of different market compositions and ownership structures for the Southcoast in 2030. For the market size, I utilize the average growth rates of the Negril-Southcoast market size for the period of my study and project forward from the last year of my data, 2023, until 2030, resulting in a size of 702,000 parties. I assume that all properties present in Negril-Southcoast are present in 2030, and that the non-changes properties keep the same levels of mean utility for each of the booking products. For each of the three simulations I consider the addition of 2500 rooms to the area.

For the first simulation, I consider a scenario in which the additional rooms are divided across 5 new Large All-Inclusive properties each with 500 rooms. There are three new parent companies, with 2 of the companies owning 2 of the 5 properties, and one being a single-property firm. I sample the mean utilities for these properties' products from the empirical distribution of mean utilities for LAI products across my entire dataset. For the second simulation, I assume that all of the 2500 rooms are in Small European Plan properties. I sample the new mean utilities for the updated aggregate SEP category from the empirical

[29] JHTA: Minister Bartlett unveils ambitious tourism expansion plans (2025)

Table 10: **Counterfactual 3: Southcoast Expansion**

	Baseline (Levels)	Counterfactuals (%Δ)		
		(1)	(2)	(3)
Variable	Baseline	New AIs	New EPs	AI and EPs
Development Outcomes				
Total Exp. (Millions USD)	1565.12	26.03	27.47	26.98
Total Tax Revenues (Millions USD)	93.40	27.71	27.47	27.40
Employment	12123.00	33.88	27.47	31.11
Demand Outcomes				
Average Price	1516.04	-5.53	0.00	6.75
Bookings (Thousands)	334.00	34.01	27.47	31.18
HHI	2171.21	-29.67	0.00	-17.21

*Notes:*This table shows simulations of potential future market structures and expansion for the Negril-Southcoast Resort Area in 2030. As the baseline I use Negril-Southcoast from 2022. I assume that the market size for 2030 is 600,000 travel parties. The first simulation in column 1 considers a future where 2500 additional rooms are added, split across 5 all-inclusive resort properties, 2 owned by (simulated) Parent Company A, 2 by Parent Company B, and 1 by Parent Company C. The quality of these properties is drawn from the empirical distribution of all-inclusive quality in Jamaica. The second simulation considers 2500 new rooms all added within the Small European-Plan category of accommodation. The final simulation considers a combination of the first two, with 1500 rooms added across 3 All-Inclusive properties owned by single-property firms, and 1000 rooms under the Small European Plan Category. All monetary values are given in 2024 U.S. Dollars. Total Exp represents total tourist expenditures. 'Employment is the number of workers in the market employed in accommodations. 'Total Tax Revenues is the sum of revenues from the valued added General Consumption Tax (GCT) and the Guest Accommodation Room Tax. 'Average Price represents average price per person, per booking. 'Bookings is the number of reservations made, and 'HHI is the Herfindahl-Hirschman Index (HHI).

distribution of SEP products. Finally for simulation 3 I test a mixed allocation of the 2500 rooms, with 1000 rooms being split across 2 LAI hotels of 500-rooms each, owned by single-property parent companies. The remaining 1500 rooms are allocated to SEP properties. I sample the mean utilities using the same approach as the prior two simulations.

The results of the simulations in Table 10, show in column 1 that allocating all 2500 new rooms to LAIs results in a 26 percent or 406 million USD increase in total expenditures a 27.71 percent or 25 million USD increase in total tax revenues and a 33.88 percent or 4000 position increase in employment relative to the 2023 baseline. The increase in total expenditures is driven by the an increase of 34 percent in bookings, in part because of a 5.53 percent decrease in average price. If all the rooms are allocated to small European Plan hotels, there is an incredibly trivial change in average prices, and because there is 27.47 percent increase in bookings, there is a resulting 27.47 percent increase for each of the development outcomes. Finally, the third simulation results in increases in expenditure, tax revenues, and employment that are similar but slightly higher, slightly lower, and slightly

below the values for the first simulation, respectively. The most significant difference from the previous two simulations is that there is a 6.75 percent or 102.17 USD increase in average prices. Bookings increase by a smaller amount than in column 1, 31.18 percent, which based on the results from Montego Bay and Negril-Southcoast in the earlier sections is likely to reflect both price effects and the lack of the distinct, branded LAI properties present in simulation 1.

These simulated future market structures for the Southcoast are consistent with the pattern observed in the first two simulation sections, with the optimal structure differing depending on desired goals, but reflecting the interaction of product differentiation and consumer preferences in deciding on the best development outcomes. If total tourist expenditures are the primary focus, then Small EP expansion (which is closest to the current plans) is marginally more optimal, while LAI expansion is best for tax revenues, and employment. However a mixed approach may turn out to be optimal if attempting to balance the maximizing of the main development variables, with concerns about over-tourism (there is smaller increase for scenario 3 compared to scenario 1) and domestic ownership (a majority of the added rooms are SEP).

6.4 Counterfactual 4: Employing Tax Policies For Development

How can tax policy be best applied to markets for development goals? Tourism is a major source of tax revenue for the Jamaican government. Taxes are also a key policy lever for incentivizing tourism undertaking such as new or expanded hotels, attraction, and tourism amenities. As multinational hotel companies have become the dominant players in Jamaica, there has been greater discussion of whether smaller, domestically-owned hotels should receive more support, with some calling for a more progressive tax structure on the hotel sector.[30] There is also an active debate regarding plans to raise taxes on the sector as a whole, that smaller operators argue will further weaken their ability to compete with large multinationals.[31] These counterfactual simulations contribute to this discussion by showing how differing taxation approaches ay result in varying effects on economic development. Fur-

[30]See: Jamaica Gleaner: Allen backs progressive taxation in hotel sector (2021)
[31]See: Jamaica Gleaner: Death knell for small hotels

thermore, they show that the preferred approach to taxation may vary with the development outcomes on which a government places the greatest priority.

As this model is static in nature, these simulations should be viewed as testing the effects of different tax policies conditional on existing products and current ownership structure of a market. The aim of these experiments is to reveal how, given multi-product Bertrand pricing for single- and multi-property firms tax policy may change prices and consumer decision-making. Importantly, these experiments will study two approaches to taxation: a value added tax, and a specific tax based on the number of nights a room is occupied. The effects of these taxes are likely to differ depending on factors such as the quality-level of specific bookings, the concentration of the market, and consumer preferences. For example, if taxes are raised on bookings at a hotel type for which there is a high own-price elasticity and which also has a high conditional diversion ratio to the outside option, we may be concerned that the increases in tax revenue per customer will be partially offset by tourists not coming to the resort area at all.

These policy experiments focus on two key taxes for the Jamaican hotel industry. The first is the Guest Accommodation Room Tax (GART), which was first instituted in 2012. The GART is a specific tax levied on accommodations for every night that rooms are occupied, and it is tiered depending on the size of the property. For hotels under 50 rooms, 1 USD is charged for each night of a booking, while for hotels with between 51 and 100 rooms 2 USD is charged per night. Hotels with 101 rooms or more are charged 4 USD per night of a booking.[32] Properties over 100 rooms are either Large All-Inclusives, Large European Plans, Medium European Plans, or Small All-Inclusives (Table 22). Properties under 100 rooms are either Small European Plan or Small All-Inclusives. These tend to be domestically owned, and are generally not part of branded chain, which often is part of their appeal.[33]. Therefore the GART, by directly incorporating scale into its tiered structure, has also indirectly imposed a higher level of taxation on mostly foreign-owned large hotels than mostly domestically owned smaller properties. Has the GART aided development and could it be made more effective?

[32]See: Jamaica Observer: Guest Accommodation Room Tax made easy (2012)

[33]See: Jamaica Gleaner: Buying Local Spreads Economic Benefits-Hotelier(2018) and Charela Inn: How Locally Owned Hotels in Jamaica Enhance Your Trip

Table 11: **Counterfactual 4.1: Room Tax Simulations Exhibit**

	Baseline (Levels)	Counterfactuals (%Δ)	
		(1)	(2)
Variable	Baseline	No GART	Adj. GART
Development Outcomes			
Total Exp. (Millions USD)	3841.53	-0.69	-0.09
Total Tax Revenues (Millions USD)	230.18	-7.83	2.58
Employment	41645.00	0.25	-0.03
Demand Outcomes			
Average Price	1560.36	-0.90	-0.79
Bookings (Thousands)	926.00	0.24	-0.04
HHI	2375.25	0.05	0.03

Notes: This set of simulations covers the years 2014, 2018, and 2020-2023 for all Jamaican resort areas. These simulations examine the implications of changes to the Guest Accommodations Room Tax (GART), which was first instituted in 2013. The GART is a specific tax levied on a per-night basis with the rate varying with property size. The nominal value of the tax has not changed since its inception. The Baseline column gives the average national values for the variables across the investigated years. Entries in columns 1-2 show the average percentage change in the variables from baseline for the given counterfactual scenarios across years, with the level estimates given in the 3rd column. Column 1 shows the simulated effect of removing GART. Column 2 simulates indexing the GART to inflation. All monetary values are given in 2024 U.S. Dollars. 'Total Exp represents total tourist expenditures. 'Employment is the number of workers in the market employed in accommodations. 'Total Tax Revenues is the sum of revenues from the valued added General Consumption Tax (GCT) and the Guest Accommodation Room Tax. 'Average Price represents average price per person, per booking. 'Bookings is the number of reservations made, and 'HHI is the Herfindahl-Hirschman Index (HHI).

I first simulate the effect of removing the GART in the years after it was first-implemented in 2012. Table 11 shows the country-level baseline variables (averaged across years), and average changes from baseline across resort areas for the different years covered in the analysis. Column 1 shows that removing the room tax results in a .69 percent decrease in total tourist expenditures, and a 7.83 percent decrease in total tax revenues. On average these equate to a decrease of 26.5 million U.S. dollars in total expenditures, and 18.01 million U.S. Dollars in tax revenues. The decrease in expenditures is driven by a .9 percent decrease in average prices, which also contribute to an increase in the number of bookings by 2222, which, using the tourist-worker ratio results in an increase in the number of jobs by 104. Thus, the levying of the GART produced small increases in both tourist expenditures and revenues, but slightly reduced the number of tourists and employment relative to baseline. This presents an initial conflict in development outcomes between different policies, demonstrating the tradeoffs of different taxes, with the GART benefiting tourist expenditures and government revenue, but slightly harming employment.

We see that the levying of the GART had mixed impacts on the main development variables. Now we will consider the effect of changing its value. In the second column I run counterfactual simulations where the GART is indexed to inflation. The current GART is imposed in nominal terms, thus in real terms, per-booking GART revenues have declined considerably since it was first introduced as a result of inflation. In the second simulation, I adjust each band of the GART in the years following 2013 based on average inflation. We can think of this as an annual increase in the specific tax during the study period. Results are again mixed, but with different magnitudes and some different signs. Total tourist expenditures decrease by 0.09 percent or 3.5 million USD, while tax revenues increase by 2.58 percent, or 5.9 million USD on average. Employment falls by roughly 13 positions as a result of a 0.04 percent decrease in bookings. Therefore, indexing the rates for the GART to inflation could produce minor increases in total tax revenues relative to baseline, but the decrease in total tourism expenditures is still nearly 60 percent of the size of the increase in revenues. Overall, adjusting the current GART produces mixed and relatively marginal effects on our intended outcomes of interest. We next turn to consider the effects of proposed changes in the General Consumption Tax.

To further investigate the implications of progressively taxing hotels, I next turn to studying proposed changes in the General Consumption Tax, ad-valorem tax imposed on most transactions. While the national standard rate for the GCT is 15 percent, the Hotel Incentives Act (Parliament of Jamaica 1969), reduces this to 10 percent for all hotels, regardless of size. However, there is a significant debate underway about potentially increasing the GCT on tourism activities to the standard 15 percent. There has been significant opposition to this change by stakeholders within the tourism industry, with many arguing that the proposed revenue measures will harm the competitiveness of the sector, and Jamaica's development goals overall.[34] Is this the case, and are there ways to tailor these tax changes to avoid harming the sector and the main development goals of focus?

One of the main concerns of the industry has been the potential negative impacts of these tax increase on small and medium enterprises. I thus first simulate the effect of a tax cut

[34]See: Radio Jamaica: Tourism Stakeholders reject proposed tax hike on industry. (2026)

Table 12: **Counterfactual 4.2: GCT Exhibit Simulations**

	Baseline (Levels)	Counterfactuals (%Δ)		
		(1)	(2)	(3)
Variable	Baseline	Tax Cut	Tax Increase	Combined
Development Outcomes				
Total Exp. (Millions USD)	3865.57	-0.06	0.01	-0.05
Total Tax Revenues (Millions USD)	231.45	-8.45	32.64	24.11
Employment	42532.00	0.12	-0.21	-0.09
Demand Outcomes				
Average Price	1556.29	-0.25	1.11	0.87
Bookings (Thousands)	936.00	0.12	-0.20	-0.08
HHI	2398.91	-0.02	0.30	0.28

Notes: This set of simulations covers the years 2014, and 2017-2023 for all Jamaican resort areas. These simulations test the effects of changes to General Consumption Tax (GCT) rate for Jamaican accommodation. The GCT is a national value added tax, and tourist-focused goods and services are subject to a 10% rate. The Baseline column gives the average national values for the variables across the investigated years. Entries in columns 1-3 show the average percentage change in the variables from baseline for the given counterfactual scenarios across years, with the level estimates given in the 4th column. Column 1 shows results for a simulated tax cut for small and medium European plan accommodations lowering their GCT rate to 5%. Column 2 simulates raising the GCT to 15% for Large All-Inclusives and European Plans, while holding the rates for other property types at 10%. Column 3 simulates instituting both the tax cut and the tax increase. All monetary values are given in 2024 U.S. Dollars. 'Total Exp represents total tourist expenditures. 'Employment is the number of workers in the market employed in accommodations. 'Total Tax Revenues is the sum of revenues from the valued added General Consumption Tax (GCT) and the Guest Accommodation Room Tax. 'Average Price represents average price per person, per booking. 'Bookings is the number of reservations made, and 'HHI is the Herfindahl-Hirschman Index (HHI).

for small and medium-sized European Plan establishments. In Table 12, the first column simulates reducing the GCT rate paid by Small and Medium European Plan hotels to 5 percent, while keeping all other variables constant. Column 2 simulates imposing proposed 15 percent GCT for only Large All-Inclusives and Large European Plan resorts, while keeping all other hotel categories at the standard 10 percent rate. Finally, in column 3, I combine both of the changes from the first two simulations.

The reduction in the GCT tax rate for Small and Medium European Plan hotels generates on average an 8.45 percent, or 19.6 million USD decrease in total tax revenues and a .06 percent or 2.3 million USD decrease in total tourist expenditures along with an increase in employment of 51. Increasing Taxes on Large All-Inclusives and Large European Plan hotels generates a significant increase on average in total tax revenues of 32 percent 74 million USD, along with a small increase in total expenditures of 0.01 percent and a decrease in employment of 89 positions. The increase in total expenditures is driven by the increase in

average prices of 1.11 percent, reflecting the market power of the larger, multinational hotels. While there is a slight decrease in bookings of .2 percent, the increase in prices more than accounts for this. In column3, the combination of both policy changes yield 24.11 percent or 55.44 million USD increase in revenues, with 0.05 percent decreases in total tourism expenditures and only a 0.09 percent decrease in employment, as opposed to the .21 percent decrease in simulation 2. Tax cuts on smaller properties can thus mitigate some of the small but negative effects on bookings and total employment resulting from tax increases on larger properties. Though small in aggregate, it is notable that the reduction in taxes on smaller properties reduces by the half the magnitude of the decrease in bookings seen in simulation 2 from $-.20$ to -0.08 percent.

The simulations on tax policy have shown that increases to the ad valorem GCT provide significantly greater increases in tax revenues with proportionally far fewer negative effects relative to changes in the GART. Indeed, increasing the GCT to 15 percent for large accommodations actually yields a small increase in total expenditures as opposed to a small decrease in total revenues resulting from an increase in the GART that produces about $1/16th$ of the additional tax revenues. Many of the relatively small negative effects of increasing the GCT for large properties can also be offset by a tax cut for small and medium European Plan hotels, with the government still earning an additional 55 million in revenue while total expenditures only fall by 1.9 million and total employment by 34. These results likely in part reflect the substantial market power exerted by the large and differentiated hotel products of the major parent companies, allowing them to pass on tax increases to their consumers without seeing substantial drops in customers. This market and product structure can then be useful for the Jamaican government when attempting to extract greater revenues from tourism activity.

7 Discussion and Conclusion

This paper has investigated the role of the type of tourism a country pursues in shaping the industry's impact on economic development. Combining methods from industrial organization with unique micro-data on the tourism sector of Jamaica, this study has broken new

ground in studying the role of market structure, product composition, government policy, and consumer preferences on determining the impacts of tourism specialization on the outcomes of tourist expenditures, tax revenues, and employment. This study has also highlighted the trade-offs between different types of market structures and development outcomes, showing that the optimal approaches to scaling a tourism sector may depend on the development aims that are given the highest priority. Additionally this study has also shown the scope for tax policy to be applied to achieve different development goals through the tourism sector, and also shown that some approaches yield far better outcomes than others.

This study utilized the setting of Jamaica as a context in which to answer the research questions of focus. With a tourism sector that has grown considerably over the past quarter-century, and that has seen a dramatic shift in its product composition thanks to the entry of foreign chains, Jamaica provided an ideal setting for this analysis. The decisions the Jamaican government has made regarding the type of tourism to pursue, and the policy levers they have used to encourage its growth are similar to the decisions facing other lower and middle-income nations deciding how best to capitalize on international tourism for development.[35] In order to first determine the rigidity of tourist preferences over different accommodation types and packages, I estimated a nested logit demand system of Jamaican hotel markets during the period 2001-2023, with the nests based on the size of the accommodations. This demand system had tourists making a discrete choice between different hotel properties and different length of stay segments. I then estimate the supply function of multi-product and multi-property parent companies, maximizing profits subject to a nonlinear cost function with property specific soft capacity constraints. Armed with the demand and supply-side parameter estimates, I then ran four counterfactual simulations in order to understand the optimal tourism market structures and expansion styles for development.

I find that tourists are relatively price inelastic, consistent with Jamaica's more premium tourism product. Tourists are particularly inelastic in their preferences for large branded All-Inclusive resorts, with conditional diversion ratios to the outside option in the absence of these products sitting at 85 percent, compared to 49 percent for Small European Plan

[35]World Bank (Tourism & Competitiveness)

hotels. As expected, the longer length of stay products have higher own-price elasticities than the shorter length of stay segment, consistent with consumers substituting from longer reservations to shorter ones in the face of higher prices. My counterfactual analysis of the 2008 Spanish Invasion finds that the arrival of the new firms raised expenditures, tax revenues, and employment by introducing new, and differentiated brands that in turn attracted customers who would not otherwise have visited, consistent with the demand estimates. In simulating the expansion of incumbent firms in Negril-Southcoast I find that while any sort of new product entry is positive for development, it is optimal for new properties to be added by new parent companies rather than incumbent ones in a market if the primary goal of the expansion is additional employment or growing the *number* of arrivals. The market power parent companies enjoy from expanding their portfolio of differentiated products results in higher markups and lower total visitors as opposed to a scenario in which the new products are added by new firms. On the other hand if the goal is to increase tourist expenditures and tax revenue, then incumbent expansion is the ideal route to pursue.

Continuing with the focus on expansion, the third simulation considers whether it would best to grow Negril through purely new AI properties, new Small EP properties, or a mixture of the two. While the first two options both have their merits, the mixed approach provides a balance of additional spending, revenue, and employment while also still allowing for the promotion of smaller-scale locally owned tourism ventures through the inclusion of new EPS. Finally, I test counterfactual tax policies currently being debated by the Jamaican government. I find that the ad valorem GCT is far more effective as a revenue instrument than the GART both in terms of the magnitude of revenues raised, and in terms of the negative effects on the tourism sector. The most balanced approach is to increase the GCT on the large accommodations while providing small and medium European Plan hotels with a tax cut, which raises revenue by over 50 percent while offsetting most of the negative effects on total expenditures and employment that come from only instituting the tax increase.

These results have shown that broadly a tourism strategy that prioritizes differentiated branded conglomerates can be effective at attracting new consumers, raising total tourism earnings, revenues and employment. Less concentrated expansion can be particularly helpful

for employment as too much market power can result in less bookings. That being said a more concentrated sector with a more premium product can be particularly effective for attracting consumers that are more price inelastic and therefore from whom more taxes can be extracted without significant loss of arrivals. Additionally more premium-leaning products can earn larger amounts of revenue per-customer which may also be beneficial when there are concerns about overcrowding. At the same time, premium multinational firms may require substantial incentives (Ministry of Tourism and Entertainment 2015) in order to enter, so the benefits must be weighed against the costs of such supportive policies. The optimal mix for a particular setting is likely to vary with the most pressing development needs and the preferences of the available consumers.

This paper also highlights new potential areas for research. One informative route would be to consider firm entry and exit in a dynamic framework. This would be particularly useful for weighing the short-run effects of tax policies against potential long-term effects on whether parent companies choose to enter or expand their portfolios. Another promising area would be to model and study the labor market effects of changes in the market like those considered in this paper. While this study tabulated the effects of market structure and policies on the number of jobs, work studying the effects of monopsony power in the labor market on wages and the *quality* of jobs created would be an excellent area for future analysis. Finally, it would be useful for future work to consider the development effects of changes in market structure caused by the entry of peer platforms like AirBnB in developing country contexts.

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A Appendix

A.1 Full Derivations

Demand Derivations

Given representative utility, the annual quantity of roomnights T_{nm} purchased for booking b in market m is given by

$$T_{bt} = S_m \frac{\exp\left(\frac{\delta_{bm}}{1-\sigma_n}\right)}{\left(\sum_{b\in\mathcal{N}_n} \exp\left(\frac{\delta_{bm}}{1-\sigma_n}\right)\right)^{\sigma_n} \left[\sum_{n=0}^{2} \left(\sum_{b\in\mathcal{N}_n} \exp\left(\frac{\delta_{bm}}{1-\sigma_n}\right)\right)^{1-\sigma_n}\right]} \tag{22}$$

The choice probabilities for product j, in nest g, in market t will take the form:

$$s_{ijt} = \frac{\exp\left(\frac{\delta_{jt}}{1-\sigma_g}\right)}{\left(\sum_{j\in\mathcal{N}_g} \exp\left(\frac{\delta_{jt}}{(1-\sigma_g)}\right)\right)^{\sigma_g} \left[\sum_{g=0}^{2} \left(\sum_{j\in\mathcal{N}_g} \exp\left(\frac{\delta_{jt}}{(1-\sigma_g)}\right)\right)^{(1-\sigma_g)}\right]} \tag{23}$$

The choice probabilities for product j, in nest g, in market t will take the form:

$$s_{ijt} = \frac{\exp\left(\frac{\delta_{jt}}{1-\sigma_g}\right)}{\left(\sum_{j\in\mathcal{N}_g} \exp\left(\frac{\delta_{jt}}{(1-\sigma_g)}\right)\right)^{\sigma_g} \left[\sum_{g=0}^{2} \left(\sum_{j\in\mathcal{N}_g} \exp\left(\frac{\delta_{jt}}{(1-\sigma_g)}\right)\right)^{(1-\sigma_g)}\right]} \tag{24}$$

Since this is the choice probability of the representative tourist, s_{ijt} also defines the market share for accommodation product j in market t, $s_{ijt} = s_{jt}$ We then obtain the number of roomnights purchased from hotel j, T_{jt} by multiplying the choice probability by the market size M_t:

$$T_{jt} = s_{jt} M_t \tag{25}$$

In order to estimate the the coefficient on price, following from Berry (1994), we invert the market share equation

$$\mathbf{s} = s(\delta, \sigma), \tag{26}$$

where $\mathbf{s}$ is a vector of the observed market shares across all markets. The inversion produces

$$\delta = s^{-1}(\mathbf{s}) \tag{27}$$

in which the observed market shares of each hotel property uniquely determines the means of consumer utility for each accommodation product in each market. Because the utility specification is for a representative tourist, the market share function does not depend on any unknown parameters other than those from δ.

We can therefore write the estimating equation as

$$\delta_{jt}(\mathbf{s}) = x_{jt}\beta - \alpha p_{jt} + \xi_{jt} \tag{28}$$

.

Following convention the utility derived from the outside option is normalized to 0, with x_0, ξ_0, and p_0 all assumed to be 0. In this context the outside option will be either choosing a private home accommodation or The share of product j within nest g is defined as

$$\bar{s}_{jt|gt} = \frac{\exp\left(\frac{\delta_{jt}}{1-\sigma_g}\right)}{D_g}, \tag{29}$$

where D_g is

$$D_{gt} \equiv \sum_{j \in \mathcal{N}_g} \exp\left(\frac{\delta_{jt}}{(1-\sigma_g)}\right). \tag{30}$$

The market-share of the outside option is s_{0t}, which is given by

$$s_{0t} = \frac{\exp\left(\frac{\delta_{0t}}{\sigma_0}\right)}{D_{gt}\sum_{l=0}^{2}\left(\sum_{j\in\mathcal{N}_g}\exp\left(\frac{\delta_{jt}}{\sigma_g}\right)\right)}, \tag{31}$$

$$s_{0t} = \frac{\exp\left(\frac{\delta_{0t}}{1-\sigma_g}\right)}{(D_{gt})^{\sigma_g}\left[\sum_{g=0}^{2}\left(\sum_{j\in\mathcal{N}_g}\exp\left(\frac{\delta_{jt}}{1-\sigma_g}\right)\right)^{1-\sigma_g}\right]} \tag{32}$$

which reduces to $\frac{1}{\sum_{j\in\mathcal{N}_g}}$

As shown by Berry (1994), given the normalization of the outside good we can write

$$\begin{aligned}
\frac{\ln(s_{jt})}{\ln(s_{0t})} &= \ln(s_{jt}) - \ln(s_{0t}) \\
&= \ln\left(\frac{\exp\left(\frac{\delta_{jt}}{1-\sigma_g}\right)}{(D_{gt})^{\sigma_g}\left[\sum_{g=0}^{2}\left(\sum_{j\in\mathcal{N}_g}\exp\left(\frac{\delta_{jt}}{1-\sigma_g}\right)\right)^{(1-\sigma_g)}\right]}\right) \\
&\quad - \ln\left(\frac{\exp\left(\frac{\delta_{0t}}{1-\sigma_g}\right)}{(D_{gt})^{\sigma_g}\left[\sum_{g=0}^{2}\left(\sum_{j\in\mathcal{N}_g}\exp\left(\frac{\delta_{jt}}{1-\sigma_g}\right)\right)^{(1-\sigma_g)}\right]}\right) \\
&= \frac{\delta_{jt}}{1-\sigma_g}\ln(e) - \ln\left((D_{gt})^{\sigma_g}\left[\sum_{g=0}^{2}\left(\sum_{j\in\mathcal{N}_g}\exp\left(\frac{\delta_{jt}}{1-\sigma_g}\right)\right)^{(1-\sigma_g)}\right]\right) \\
&\quad - \frac{\delta_{0t}}{1-\sigma_0}\ln(e) + \ln\left((D_{gt})^{\sigma_g}\left[\sum_{g=0}^{2}\left(\sum_{j\in\mathcal{N}_g}\exp\left(\frac{\delta_{jt}}{1-\sigma_g}\right)\right)^{(1-\sigma_g)}\right]\right)
\end{aligned} \tag{33}$$

After some rearranging and combining of similar terms we obtain.

$$\delta_{jt} = \ln(s_{jt}) - \sigma_g \ln(\bar{s}_{jt|gt}) - \ln(s_{0t}) \tag{34}$$

Combining this with equation 3 we obtain the nested logit estimating equation

$$\ln(s_{jt}) - \ln(s_{0t}) = x_{jt}\beta - \alpha p_{jt} + \xi_{jt} + \sigma_g \ln(\bar{s}_{jt|gt})), \tag{35}$$

thus converting what was a nonlinear equation into a linear format which can then be estimated by linear instrumental variable methods.

Supply Derivations

Therefore the full expression for the firm's profit maximization problem is:

$$\max_p \Pi_f(p) = \max_p \sum_{h \in \mathcal{H}_f} \left[\sum_{b \in B} \left(p_{bht}\, q_{bht}(p_{bht}) - c_{bht}\, q_{bht} \right) - \gamma \cdot log(\left(\frac{\frac{q_{bht}(p_{bht}) + q_{eht}(p_{eht})}{k_{ht}}}{1 - \left(\frac{q_{bht}(p_{bht}) + q_{eht}(p_{eht})}{k_{ht}} \right)} \right) \right] \tag{36}$$

We can then define

$$\text{logit}_\lambda(x) \;\equiv\; \ln\left(\frac{x}{\lambda\,(1-x)} \right) = \text{logit}(x) - \ln\lambda, \qquad \text{where } \text{logit}(x) = \ln\left(\frac{x}{1-x} \right). \tag{37}$$

$$\max_p \Pi_{fm}(p) = \max_p \sum_{h \in \mathcal{H}_f} \left[\sum_{d \in \mathcal{D}} \left(\frac{p_{dhm}}{1+\tau^v} - c_{dhm} \right) q_{dhm}(p_{dhm}) \;-\; \gamma \ln\left(1 + \frac{\rho_{hm}}{\lambda_{hm}\big(1-\rho_{hm}\big)} \right) \right]. \tag{38}$$

which, when taking the first order conditions gives us

$$q_{jhm} + \sum_{d \in \mathcal{J}_f} \left(p_{dhm} - (1+\tau^v)\, c_{dhm}\right) \frac{\partial q_{dhm}}{\partial p_{jhm}} - (1+\tau^v) \sum_{h' \in \mathcal{H}_f} \gamma_{h'}\, g'(\rho_{h'm}) \sum_{k \in \mathcal{J}(h')} \alpha_{kh'm}\, \frac{\partial q_{kh'm}}{\partial p_{jhm}} = 0 \quad (39)$$

Let $\mathbf{p} \in \mathbb{R}^N$ be consumer (tax-inclusive) prices per person, $\mathbf{c} \in \mathbb{R}^N$ the linear per-person marginal cost vector $(\tilde{c} + (\tau^r \odot \ell)/\bar{i})$, $\mathbf{q} \in \mathbb{R}^N$ quantities (persons), $\mathbf{J}_q = \partial \mathbf{q}/\partial \mathbf{p}$ the quantity Jacobian (in the same units as $\mathbf{q}$), and Ω the ownership matrix. Define

$$\Delta \equiv -(\Omega \circ \mathbf{J}_q).$$

For each property h, let ρ_h be occupancy, $s_h \equiv \gamma_h g'(\rho_h)$ with

$$g'(\rho) = \frac{1}{(1-\rho)(\lambda(1-\rho)+\rho))},$$

and for each product i in property h let $\alpha_i = \ell_i/(K_h \bar{i})$ (persons units) Define the within-property projection $w_{hj} \equiv \sum_{i \in \mathcal{J}(h)} \alpha_i\, (\mathbf{J}_q)_{ij}$. Let the congestion vector be $e_j \equiv \sum_{h \in \mathcal{H}_{f(j)}} s_h\, w_{hj}$.

The stacked first-order condition can be written as

$$\mathbf{q} + \mathbf{J}_q^\top \big[\Omega\, (\mathbf{p} - (1+\tau^v)\mathbf{c})\big] - (1+\tau^v)\, \mathbf{e} = \mathbf{0}.$$

Equivalently,

$$\Delta\, \big(\mathbf{p} - (1+\tau^v)\mathbf{c}\big) = \mathbf{q} - (1+\tau^v)\, \mathbf{e}, \qquad \Delta \equiv -(\Omega \circ \mathbf{J}_q).$$

Hence the pricing equation in consumer prices is

$$\boxed{\mathbf{p} = (1+\tau^v)\, \mathbf{c} + \Delta^{-1}\mathbf{q} - (1+\tau^v)\, \Delta^{-1}\mathbf{e}.}$$

A.2 Full Simulation Tables

Table 13: **Counterfactual 2.1: Spanish Invasion Montego Bay**

	Baseline (Levels)	Counterfactuals (%Δ)		
		(1)	(2)	(3)
Variable	Baseline	Remove 1	Remove 2	Remove All
Price & Expenditures				
Average Price	1590.14	-1.07	-3.05	-2.80
Accom Exp. (Millions USD)	511.58	-1.61	-3.29	-4.47
Non-Accom Exp. (Millions USD)	239.44	-1.49	-3.06	-4.05
Total Exp. (Millions USD)	838.65	-1.61	-3.29	-4.47
Demand				
Bookings (Thousands)	206.00	-0.60	-1.13	-2.09
Roomnights (Millions)	1.15	-0.14	-0.20	-1.19
Tax Revenues				
GCT Tax Revenues (Millions USD)	46.51	-1.61	-3.29	-4.47
Total Tax Revenues (Millions USD)	48.06	-1.61	-3.29	-4.47
Employment & Firm Outcomes				
Employment	9477.00	-0.59	-1.11	-2.12
Total Firm Revenues (Millions USD)	465.07	-1.61	-3.29	-4.47
Firm Profits (Millions USD)	315.38	-2.35	-4.79	-5.76
Market Structure & Welfare				
HHI	2093.38	4.89	9.83	18.94
Inside Option Share	0.76	-0.60	-1.13	-2.09
Consumer Surplus	1362.39	-1.49	-2.78	-5.18
Consumer Welfare (Millions USD)	647.95	-2.06	-3.83	-7.12
Average Markup Share	0.71	-0.96	-1.96	-0.73
Average Occupancy	0.22	6.61	16.32	26.85

Notes: This simulation covers the period 2006 to 2012 in Montego that saw the entry of 3 major Spanish-owned multinational brands into the market: Riu Hotels & Resorts, Iberostar Resorts, and Fiesta Group, an event dubbed the 'Spanish Invasion. Entries in columns 1-3 show the average percentage change in the variables from baseline for the given counterfactual scenarios across years, with the level estimates given in the 4th column. For the column 1 simulation, I remove 1 of the new properties, in column 2 I remove 2, and in the 3rd column I remove all 3 properties. I keep all other market and product characteristics constant. All monetary values are given in 2024 U.S. Dollars. Average price represents average price per person, per booking. 'Accom Exp is the total amount spent on accommodations in a particular market, while Non-Accom Exp represents the total amount spent on services that are not . 'Total Exp represents total tourist expenditures. 'Employment provides the number of employees working in the market working in accommodations. 'GCT Tax Revenues represent all revenues collected on accommodations spending from value-added, General Consumption Tax (GCT), while 'Total Tax Revenues includes both revenues from GCT as well as revenues from the room taxes. 'HHI is the Herfindahl-Hirschman Index. The 'Inside Option Share is the share of parties in the market choosing the inside option: one of the categories of accommodations studied, in the Montego Bay Resort Area in one of the given years. 'Consumer Surplus is the dollar-value of surplus that tourists earn from purchasing accommodation services at the average market prices. 'Consumer Welfare is the surplus multiplied by the number of people purchasing the inside option. 'Average Occupancy is given by the number of room nights purchased at a property over the total number of roomnights a property can sell in each market.

Table 14: **Negril Simulations**

	Baseline (Levels)	Counterfactuals (%Δ)	
		(1)	(2)
Variable	Baseline	Ownership	Removal
Price & Expenditures			
Average Price	1674.31	-4.64	-1.73
Accom Exp. (Millions USD)	555.11	-2.64	-9.63
Non-Accom Exp. (Millions USD)	264.31	-2.81	-8.18
Total Exp. (Millions USD)	910.01	-2.64	-9.63
Demand			
Bookings (Thousands)	213.00	2.22	-6.03
Roomnights (Millions)	1.26	2.20	-4.17
Tax Revenues			
GCT Tax Revenues (Millions USD)	50.46	-2.64	-9.63
Total Tax Revenues (Millions USD)	50.46	-2.64	-9.63
Employment & Firm Outcomes			
Employment	9281.00	2.22	-5.95
Total Firm Revenues (Millions USD)	504.64	-2.64	-9.63
Firm Profits (Millions USD)	343.31	-4.97	-11.62
Market Structure & Welfare			
HHI	2256.50	-28.64	-3.05
Inside Option Share	0.73	2.22	-6.03
Consumer Surplus	1219.09	4.61	-10.72
Consumer Welfare (Millions USD)	537.18	6.95	-15.93
Average Markup Share	0.73	-2.49	-1.11
Average Occupancy	0.23	2.20	5.27

Notes: This simulation covers the period 2006 to 2011 in the Negril-Southcoast market which saw two incumbent parent companies, Sandals Resorts and Couples Resorts, expand their portfolios in the Resort Area with the addition of 1 property each. Entries in columns 1-2 show the average percentage change in the variables from baseline for the given counterfactual scenarios across years, with the level estimates given in the 3rd column. In column 1, I simulate a world in which each of these properties entered under single-property parent companies, assuming that the level of quality remains the same. In column 2, I simulate a world in which neither of the new properties enter the market. All monetary values are given in 2024 U.S. Dollars. Average price represents average price per person, per booking. 'Accom Exp is the total amount spent on accommodations in a particular market, while Non-Accom Exp represents the total amount spent on services that are not lodging, spa, or attraction-related expenditures. 'Total Exp represents total tourist expenditure. 'Employment provides the number of employees working in the market working in accommodations. 'GCT Tax Revenues represent all revenues collected on accommodations spending from value-added, General Consumption Tax (GCT), while Total Tax Revenues includes both revenues from GCT as well as revenues from the room taxes. 'HHI is the Herfindahl-Hirschman Index. The 'Inside Option Share is the share of parties in the market choosing the inside option: one of the categories of accommodations studied, in the Negril-Southcoast Resort Area in one of the given years. 'Consumer Surplus is the dollar-value of surplus that tourists earn from purchasing accommodation services at the average market prices. 'Consumer Welfare is the surplus multiplied by the number of people purchasing the inside option. 'Average Occupancy is given by the number of room nights purchased at a property over the total number of roomnights a property can sell in each market.

Table 15: **Counterfactual 3: Room Tax Simulations By Panel**

	Baseline (Levels)	Counterfactuals (%Δ)	
		(1)	(2)
Variable	Baseline	No Tax	Adj. Tax
Price & Expenditures			
Average Price	1590.14	-0.90	-0.79
Accom Exp. (Millions USD)	511.58	-0.69	-0.09
Non-Accom Exp. (Millions USD)	239.44	-0.69	-0.08
Total Exp. (Millions USD)	838.65	-0.69	-0.09
Demand			
Bookings (Thousands)	206.00	0.24	-0.04
Roomnights (Millions)	1.15	0.51	0.16
Tax Revenues			
GCT Tax Revenues (Millions USD)	46.51	-0.69	-0.09
Room Tax Revenues (Millions USD)	1.55	-100.00	36.83
Total Tax Revenues (Millions USD)	48.06	-7.83	2.58
Employment & Firm Outcomes			
Employment	9477.00	0.25	-0.03
Total Firm Revenues (Millions USD)	465.07	-0.69	-0.09
Firm Profits (Millions USD)	315.38	0.30	-0.86
Market Structure & Welfare			
HHI	2093.38	0.05	0.03
Inside Option Share	0.76	0.24	-0.04
Consumer Surplus	1362.39	0.62	-0.06
Consumer Welfare (Millions USD)	647.95	0.87	-0.08
Average Markup Share	0.71	0.57	-3.35
Average Occupancy	0.22	0.51	0.16

Notes: This set of simulations covers the years 2014, 2018, and 2020-2023 for all Jamaican resort areas. These simulations examine the implications of changes to the Guest Accommodations Room Tax (GART), which was first instituted in 2013. The GART is a specific tax levied on a per-night basis with the rate varying with property size. The nominal value of the tax has not changed since its inception. Entries in columns 1-2 show the average percentage change in the variables from baseline for the given counterfactual scenarios across years, with the level estimates given in the 3rd column. In column 1, I simulate the effect of the removal of the GART. In column 2, I simulate a scenario in which the GART is indexed to inflation. All monetary values are given in 2024 U.S. Dollars. Average price represents average price per person, per booking. 'Accom Exp is the total amount spent on accommodations in a particular market, while Non-Accom Exp represents the total amount spent on services that are not lodging, spa, or attraction-related expenditures. 'Total Exp represents total tourist expenditure. 'Employment provides the number of employees working in the market working in accommodations. 'GCT Tax Revenues represent all revenues collected on accommodations spending from value-added, General Consumption Tax (GCT), while Total Tax Revenues includes both revenues from GCT as well as revenues from the room taxes. 'HHI is the Herfindahl-Hirschman Index. The 'Inside Option Share is the share of parties in the market choosing the inside option: one of the categories of accommodations studied, in the Negril-Southcoast Resort Area in one of the given years. 'Consumer Surplus is the dollar-value of surplus that tourists earn from purchasing accommodation services at the average market prices. 'Consumer Welfare is the surplus multiplied by the number of people purchasing the inside option. 'Average Occupancy is given by the number of room nights purchased at a property over the total number of roomnights a property can sell in each market.

Table 16: **Counterfactual 4: GCT Simulations**

	Baseline (Levels)	Counterfactuals (%Δ)		
		(1)	(2)	(3)
Variable	Baseline	Tax Cut	Tax Increase	Combined
Price & Expenditures				
Average Price	1556.29	-0.25	1.11	0.87
Accom Exp. (Millions USD)	2358.00	-0.06	0.01	-0.05
Non-Accom Exp. (Millions USD)	1096.37	-0.04	0.03	-0.01
Total Exp. (Millions USD)	3865.57	-0.06	0.01	-0.05
Demand				
Bookings (Thousands)	936.00	0.12	-0.20	-0.08
Roomnights (Millions)	5.37	0.25	-0.43	-0.18
Tax Revenues				
GCT Tax Revenues (Millions USD)	214.36	-8.99	35.32	26.25
Total Tax Revenues (Millions USD)	231.45	-8.45	32.64	24.11
Employment & Firm Outcomes				
Employment	42532.00	0.12	-0.21	-0.09
Total Firm Revenues (Millions USD)	2143.63	0.83	-3.53	-2.68
Firm Profits (Millions USD)	1431.60	1.10	-5.27	-4.15
Market Structure & Welfare				
HHI	2398.91	-0.02	0.30	0.28
Inside Option Share	0.77	0.12	-0.20	-0.08
Consumer Surplus	1420.98	0.21	-0.49	-0.28
Consumer Welfare (Millions USD)	3190.93	0.33	-0.70	-0.36
Average Markup Share	0.73	-0.09	-0.49	-0.59
Average Occupancy	0.25	0.25	-0.43	-0.18

Notes: This set of simulations covers the years 2012,2014, and 2017-2023 for all Jamaican resort areas. These simulations test the effects of changes to General Consumption Tax (GCT) rate for Jamaican accommodation. The GCT is a national value added tax, and tourist-focused goods and services are subject to a 10% rate. Entries in columns 1-3 show the average percentage change in the variables from baseline for the given counterfactual scenarios across years, with the level estimates given in the 4th column. In column 1, I simulate a tax cut for small and medium European plan accommodations, lowering their GCT rate to 5%. In column 2, I simulate raising the GCT to 15% for Large All-Inclusives and European Plans, while holding the rates for other property types at 10%. Finally, in column 3 I simulate the combined effect of both the tax cut and the tax increase. All monetary values are given in 2024 U.S. Dollars. Average price represents average price per person, per booking. 'Accom Exp is the total amount spent on accommodations in a particular market, while Non-Accom Exp represents the total amount spent on services that are not lodging, spa, or attraction-related expenditures. 'Total Exp represents total tourist expenditure. 'Employment provides the number of employees working in the market working in accommodations. 'GCT Tax Revenues represent all revenues collected on accommodations spending from value-added, General Consumption Tax (GCT), while Total Tax Revenues includes both revenues from GCT as well as revenues from the room taxes. 'HHI is the Herfindahl-Hirschman Index. The 'Inside Option Share is the share of parties in the market choosing the inside option: one of the categories of accommodations studied, in the Negril-Southcoast Resort Area in one of the given years. 'Consumer Surplus is the dollar-value of surplus that tourists earn from purchasing accommodation services at the average market prices. 'Consumer Welfare is the surplus multiplied by the number of people purchasing the inside option. 'Average Occupancy is given by the number of room nights purchased at a property over the total number of roomnights a property can sell in each market.

Table 17: **Counterfactual 4: Southcoast Expansion**

	Baseline (Levels)	Counterfactuals (%Δ)		
		(1)	(2)	(3)
Variable	Baseline	New AIs	New EPs	AI and EPs
Price & Expenditures				
Average Price	1516.04	-5.53	0.00	6.75
Accom Exp. (Millions USD)	954.72	26.03	27.47	26.98
Non-Accom Exp. (Millions USD)	462.51	19.85	27.47	25.92
Total Exp. (Millions USD)	1565.12	26.03	27.47	26.98
Demand				
Bookings (Thousands)	334.00	34.01	27.47	31.18
Roomnights (Millions)	2.06	29.56	27.47	29.56
Tax Revenues				
GCT Tax Revenues (Millions USD)	86.79	26.26	27.47	26.98
Room Tax Revenues (Millions USD)	6.60	46.72	27.47	32.97
Total Tax Revenues (Millions USD)	93.40	27.71	27.47	27.40
Employment & Firm Outcomes				
Employment	12123.00	33.88	27.47	31.11
Total Firm Revenues (Millions USD)	867.93	26.26	27.47	26.98
Firm Profits (Millions USD)	586.47	23.89	27.47	25.49
Market Structure & Welfare				
HHI	2171.21	-29.67	0.00	-17.21
Inside Option Share	0.81	5.13	0.00	2.91
Consumer Surplus	1499.52	14.85	0.00	7.93
Consumer Welfare (Millions USD)	1086.38	53.69	27.47	41.51
Average Markup Share	0.72	-0.85	0.00	0.20
Average Occupancy	0.42	-5.53	-3.11	-1.52

*Notes:*i. This table shows simulations of potential future market structures and expansion for the Negril-Southcoast Resort Area in 2030. As the baseline I use Negril-Southcoast from 2022. I assume that the market size for 2030 is 600,000 travel parties. The first simulation in column 1 considers a future where 2500 additional rooms are added, split across 5 all-inclusive resort properties, 2 owned by (simulated) Parent Company A, 2 by Parent Company B, and 1 by Parent Company C. The quality of these properties is drawn from the empirical distribution of all-inclusive quality in Jamaica. The second simulation considers 2500 new rooms all added within the Small European-Plan category of accommodation. The final simulation considers a combination of the first two, with 1500 rooms added across 3 All-Inclusive properties owned by single-property firms, and 1000 rooms under the Small European Plan Category. All monetary values are given in 2024 U.S. Dollars. Average price represents average price per person, per booking. 'Accom Exp is the total amount spent on accommodations in a particular market, while Non-Accom Exp represents the total amount spent on services that are not lodging, spa, or attraction-related expenditures. 'Total Exp represents total tourist expenditure. 'Employment provides the number of employees working in the market working in accommodations. 'GCT Tax Revenues represent all revenues collected on accommodations spending from value-added, General Consumption Tax (GCT), while Total Tax Revenues includes both revenues from GCT as well as revenues from the room taxes. 'HHI is the Herfindahl-Hirschman Index. The 'Inside Option Share is the share of parties in the market choosing the inside option: one of the categories of accommodations studied, in the Negril-Southcoast Resort Area in one of the given years. 'Consumer Surplus is the dollar-value of surplus that tourists earn from purchasing accommodation services at the average market prices. 'Consumer Welfare is the surplus multiplied by the number of people purchasing the inside option. 'Average Occupancy is given by the number of room nights purchased at a property over the total number of roomnights a property can sell in each market.

A.3 Evolution of Property Sizes By Accommodation Type

Large Montego Bay

A.4 Market Characteristics: Montego Bay

A.5 Market Characteristics: Negril

Table 18: **Negril 2006 Diversion Ratios**

	Mean Diversion Ratios					
Category	Large **AI** Diversion	Large **EP** Diversion	Small **AI** Diversion	Medium **EP** Diversion	Small **EP** Diversion	Outside Option
Large All Inclusive	0.426	0	0.048	0	0.085	0.441
Small All Inclusive	0.285	0	0.066	0	0.241	0.408
Small European Plan	0.301	0	0.142	0	0.126	0.431

Notes: Baseline Category Diversion Ratios From Negril in 2006

A.6 Price Summary Statistics

Table 19: **Mean Prices By Accommodation Category and Duration Bin**

	7 Days & Under		8 Days & Over	
Category	Mean	SD	Mean	SD
Large All-Inclusive	1216.55	381.61	1538.03	626.17
Large European Plan	876.93	251.94	1150.35	465.58
Medium European Plan	1381.28	525.25	1653.07	737.15
Small All-Inclusive	1089.61	141.30	1228.10	227.42
Small European Plan	864.02	215.90	982.78	320.76

Notes: Estimates are provided in 2024 USD, and are based on Ministry of Tourism Exit Survey Data covering the period 2001-2023.

A.7 Capacity Statistics

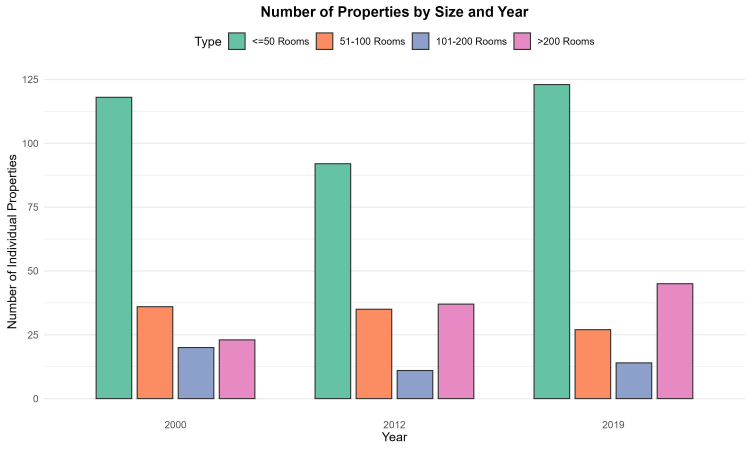

Figure 6: **Breakdown of Properties by Size Band Across Years: All-Jamaica**

Source: Ministry of Tourism accommodation datasets.

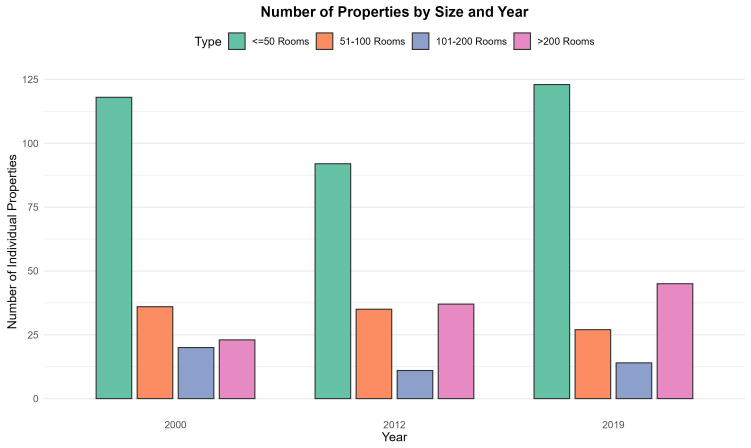

Figure 7: **Breakdown of Properties by Accommodation Type Across Years: All-Jamaica**

Source: Ministry of Tourism accommodation datasets.

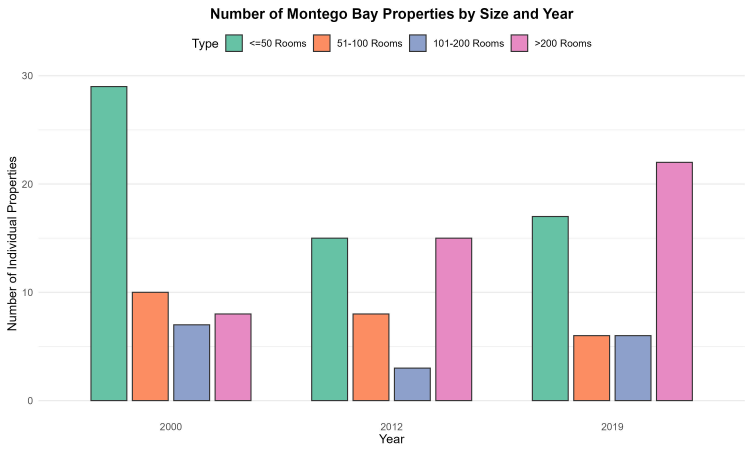

Figure 8: **Breakdown of Properties by Size Band Across Years: Montego Bay**

Source: Ministry of Tourism accommodation datasets.

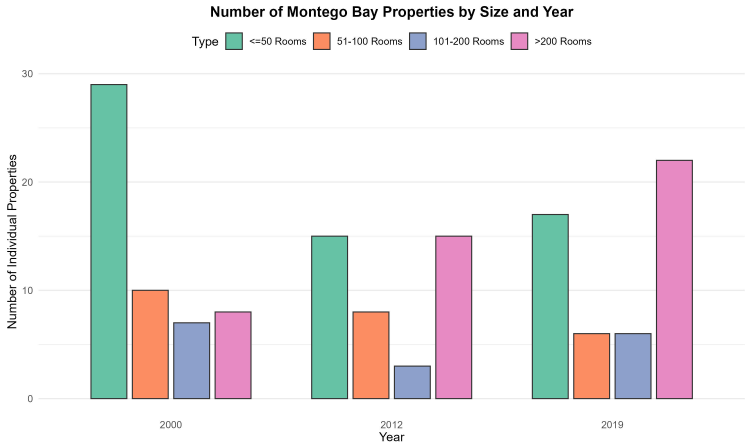

Figure 9: **Breakdown of Properties by Accommodation Type Across Years: Montego Bay**

Source: Ministry of Tourism accommodation datasets.

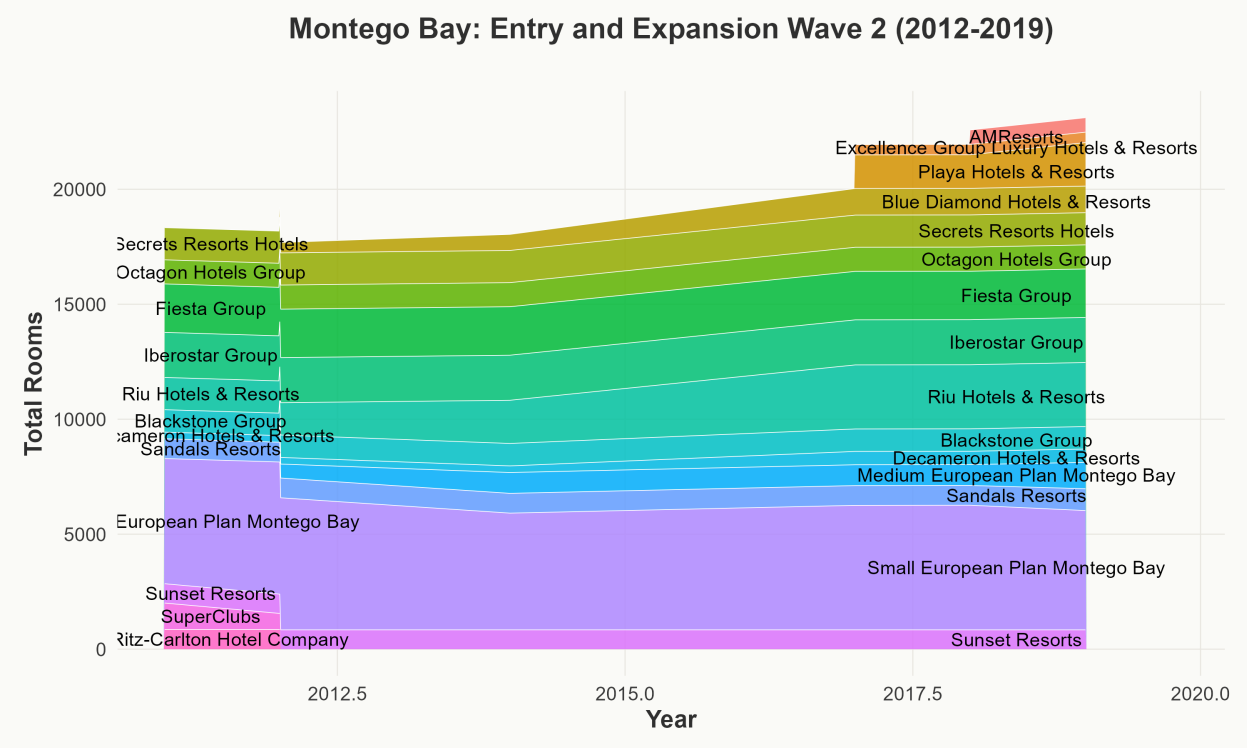

Figure 10: **Evolution of Room Share Montego Bay: Second Wave of Entry (2012-2019)**

Source: Ministry of Tourism accommodation datasets, news articles, product websites.

Figure 11: Share of Room Supply From Accommodations of Different Sizes

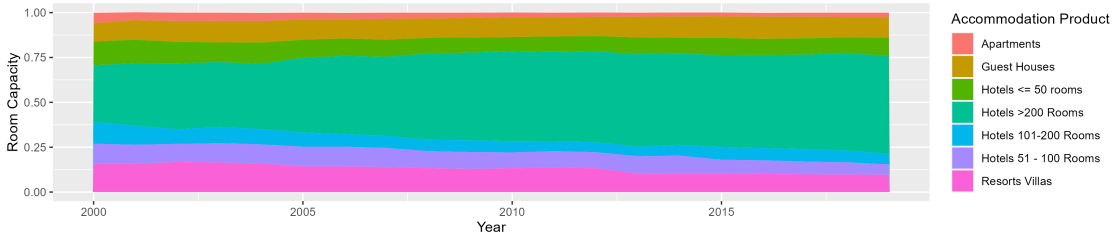

Table 20: **Mean Prices By Resort Area, Accommodation Category, and Duration Bin**

		7 Days & Under		8 Days & Over	
Resort Area	Category	Mean	SD	Mean	SD
Kingston	Large European Plan	872.03	259.45	1116.75	474.56
	Medium European Plan	984.68	122.82	1176.58	310.34
	Small European Plan	653.48	124.48	796.01	320.07
Mobay	Large All-Inclusive	1123.60	328.59	1345.54	568.46
	Medium European Plan	1824.54	437.04	2185.61	713.72
	Small European Plan	953.25	218.72	947.54	282.38
Negril	Large All-Inclusive	1392.48	410.15	1838.97	603.97
	Small All-Inclusive	1089.61	141.30	1228.10	227.42
	Small European Plan	825.01	132.32	996.39	201.86
Ocho Rios	Large All-Inclusive	1179.91	367.97	1513.58	616.63
	Large European Plan	921.05	192.25	1452.74	234.60
	Small European Plan	1017.95	181.14	1179.49	356.78

Notes: Estimates are provided in 2024 USD, and are based on Ministry of Tourism Exit Survey Data covering the period 2001-2023.

Table 21: **Resort Area By Room Category Arrival Data (2001-2023)**

Resort Area	Category	Metric	2001	2023	% Δ
Montego Bay	Large All-Inclusive	Room Nights	780971.00	2139890.00	174.00
		Parties	149239.00	509214.00	241.00
		Persons	285154.00	1088590.00	282.00
	Medium European Plan	Room Nights	60941.00	0.00	0.00
		Parties	14217.00	0.00	0.00
		Persons	26786.00	0.00	0.00
	Small European Plan	Room Nights	140606.00	96863.00	−31.00
		Parties	30002.00	20870.00	−30.00
		Persons	56865.00	44757.00	−21.00
Ocho Rios	Large All-Inclusive	Room Nights	335392.00	1136675.00	239.00
		Parties	71748.00	246859.00	244.00
		Persons	135963.00	529257.00	289.00
	Large European Plan	Room Nights	147671.00	0.00	0.00
		Parties	30059.00	0.00	0.00
		Persons	57164.00	0.00	0.00
	Small European Plan	Room Nights	137221.00	95500.00	−30.00
		Parties	23156.00	20342.00	−12.00
		Persons	44696.00	43641.00	−2.00
Negril	Large All-Inclusive	Room Nights	286230.00	926269.00	224.00
		Parties	61025.00	191398.00	214.00
		Persons	115670.00	411041.00	255.00
	Small All-Inclusive	Room Nights	132753.00	62506.00	−53.00
		Parties	26014.00	11867.00	−54.00
		Persons	49610.00	25562.00	−48.00
	Small European Plan	Room Nights	235445.00	392682.00	67.00
		Parties	41479.00	72291.00	74.00
		Persons	79773.00	155909.00	95.00
Kingston	Large European Plan	Room Nights	36581.00	41215.00	13.00
		Parties	9765.00	9711.00	−1.00
		Persons	18250.00	20766.00	14.00
	Medium European Plan	Room Nights	41556.00	70845.00	70.00
		Parties	9655.00	15662.00	62.00
		Persons	18195.00	33560.00	84.00
	Small European Plan	Room Nights	18629.00	56053.00	201.00
		Parties	3363.00	12556.00	273.00
		Persons	6456.00	26893.00	317.00

Notes: Estimates are obtained by combining the Ministry of Tourism tourist exit survey datasets with the publicly available Annual Reports on aggregate arrival data by resort area and accommodation types from the MOT

Table 22: **Breakdown of Capacities By Hotel Categories**

Year	Category	Room Capacity	Unique Properties	Room Nights Capacity
2001	Large All-Inclusive	12056	40	4216328
	Large European Plan	2696	6	984040
	Medium European Plan	592	14	627600
	Small All-Inclusive	272	14	441650
	Small European Plan	23670	3480	8639550
2011	Large All-Inclusive	26434	60	9565242
	Large European Plan	1236	4	451140
	Medium European Plan	286	8	359160
	Small All-Inclusive	272	12	364270
	Small European Plan	23110	3428	8435150
2021	Large All-Inclusive	29280	56	10687200
	Large European Plan	1068	4	389820
	Medium European Plan	526	12	554070
	Small All-Inclusive	192	8	219000
	Small European Plan	15750	1238	5748750

Notes: This table shows the capacity of different hotel categories by year. Data for this table comes from Jamaican Ministry of Tourism. The roomnight capacity is the number of rooms multiplied by the number of days in the given year.

Table 23: **Market Share of The 5 Largest Parent Companies**

Resort Area	2001	2012	2023
Montego Bay	0.72	0.61	0.59
Ocho Rios	0.81	0.75	0.85
Negril	0.50	0.68	0.65
Kingston	0.54	0.41	0.36

Notes: Parent Company rank is based upon the their booking or reservation market shares. Shares are relative to the inside option.‘

Table 24: **Share of Rooms Owned By 5 Largest Parent Companies**

Resort Area	2001	2012	2023
Montego Bay	0.39	0.42	0.56
Ocho Rios	0.40	0.48	0.77
Negril	0.27	0.37	0.53
Kingston	0.39	0.36	0.43

Notes: Parent company rank for these statistics is based on the number of rooms in their portfolio. Shares given are for only the inside option.

Table 25: **Prices by Accommodation and Length of Stay**

	7 days & under			**8 days & over**			**Difference**	
Category	N (7d)	Mean (7d)	SD (7d)	N (8d)	Mean (8d)	SD (8d)	Diff (7 8)	p
Large All-Inclusive	70,446	1,193.4	851.2	16,465	1,369.1	981.7	-175.7	<1e-16
Large European Plan	3,460	945.2	584.2	627	1,391.8	914.0	-446.5	<1e-16
Small All-Inclusive	4,348	1,014.5	784.1	1,331	1,249.7	929.4	-235.2	1.1e-16
Medium European Plan	4,013	1,161.5	1,130.8	739	1,384.6	1,222.1	-223.1	4.5e-06
Small European Plan	5,726	880.5	780.6	2,553	1,038.9	965.3	-158.4	3.5e-13

Notes: Based on Tourist Exit Surveys.

Table 26: **Outside Spending Shares by Accommodation Types**

	Large AI		Large EP		Medium EP		Small AI		Small EP	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Outside Non-Attraction Share	0.31	0.12	0.30	0.18	0.34	0.22	0.33	0.14	0.39	0.19
Total Outside Exp. Share	0.39	0.12	0.33	0.18	0.36	0.22	0.40	0.14	0.43	0.20
Accommodation Share	0.61	0.12	0.67	0.18	0.64	0.22	0.60	0.14	0.57	0.20
Outside Non-Attraction Spending	567.45	350.61	473.71	548.41	568.30	628.84	535.68	381.84	619.62	536.63
Total Outside Spending	733.97	419.76	514.72	563.05	604.87	647.01	668.94	439.99	691.34	569.80
Accommodation Spending	1202.57	710.71	1048.67	855.38	1182.42	1027.71	1033.64	665.48	998.40	859.56

Notes: Based on Tourist Exit Surveys.

Table 27: **Outside Spending Shares by Accommodation Type for Large All-Inclusive and Small European Plan Hotels**

	Large All-Inclusive		Small European Plan	
	Mean	Standard Deviation	Mean	Standard Deviation
Outside Non-Attraction Share	0.31	0.12	0.39	0.19
Total Outside Exp. Share	0.39	0.12	0.43	0.20
Accommodation Share	0.61	0.12	0.57	0.20
Outside Non-Attraction Spending	567.45	350.61	619.62	536.63
Total Outside Spending	733.97	419.76	691.34	569.80
Accommodation Spending	1202.57	710.71	998.40	859.56

Notes: Based on Tourist Exit Surveys.

Table 28: **Brand Shares: Montego Bay**

	Market Share		
Brand	2001	2012	2023
Sunset	0.201	0.061	
Holiday Inn	0.167	0.098	0.049
Wyndham	0.119		
Small All-Inclusive Montego Bay	0.117	0.010	0.020
Sandals	0.101	0.107	0.078
Small European Plan Montego Bay	0.085	0.044	0.012
Trelawny Beach	0.084		
Medium European Plan Montego Bay	0.054	0.018	0.024
Grand Lido	0.038		
Ritz-Carlton	0.035	0.030	
Grand Palladium		0.160	0.081
Iberostar		0.126	0.078
Secrets		0.113	0.080
Riu		0.107	0.247
Hilton		0.060	0.054
Breezes		0.036	
Royal Decameron		0.020	0.027
Braco Beach Resort & Spa		0.009	
Ocean			0.089
Hyatt			0.053
Excellence			0.036
Royalton Luxury Resorts			0.030
Jewel			0.029
Breathless			0.014
Survey Observations	2742	1427	3659

Notes: Based on Tourist Exit Surveys.

Table 29: **Length of Stay Observations**

Length of Stay (Days)	Survey Bookings
1	701
2	2460
3	9451
4	17497
5	16247
6	13352
7	28284
8	5320
9	2756
10	2888
11	1414
12	759
13	869
14	5642
15	626
16	261
17	182
18	111
19	105
20	105
21	228
22	449

Notes: Based on Tourist Exit Surveys.

Table 30: **Outside Spending Shares: Large All-Inclusive vs Small European Plan**

	Large All-Inclusive			Small European Plan			Difference & Test (LAI SEP)	
Metric	N (LAI)	Mean (LAI)	SD (LAI)	N (SEP)	Mean (SEP)	SD (SEP)	LAI SEP	p-value
Outside Non-Attraction Share	86910	0.31	0.12	8279	0.39	0.19	-0.08	<0.0001
Total Outside Exp. Share	86910	0.39	0.12	8279	0.43	0.20	-0.04	<0.0001
Accommodation Share	86910	0.61	0.12	8279	0.57	0.20	0.04	<0.0001
Outside Non-Attraction Spending	86910	567.45	350.61	8279	619.62	536.63	-52.18	<0.0001
Total Outside Spending	86910	733.97	419.76	8279	691.34	569.80	42.63	<0.0001
Accommodation Spending	86910	1202.57	710.71	8279	998.40	859.56	204.17	<0.0001

Notes: Based on Tourist Exit Surveys.

Table 31: **HHI Across Years**

Resort Area	HHI Type	2001	2012	2023
Montego Bay	Booking HHI	1091	940	992
	Room Stock HHI	356	483	867
	Room Nights HHI	1194	940	979
Ocho Rios	Booking HHI	1841	1306	1702
	Room Stock HHI	451	524	1404
	Room Nights HHI	1653	1332	1760
Negril	Booking HHI	709	1157	981
	Room Stock HHI	205	359	680
	Room Nights HHI	583	1106	896
Kingston	Booking HHI	1422	1051	733
	Room Stock HHI	721	594	911
	Room Nights HHI	1229	946	724

Notes: Shares are relative to the inside option. Market shares for the aggregated accommodations categories are calculated by dividing the overall market share by the number of unique properties in the category.

Table 32: **Market Shares by Parent Company in Montego Bay**

Parent Company	2001	2002	2003	2004	2005	2006	2008	2009	2010	2011	2012	2014	2017	2018	2019	2020	2021	2022	2023	Entry Year
Sandals Resorts	0.128	0.143	0.144	0.166	0.159	0.156	0.171	0.121	0.106	0.102	0.086	0.084	0.067	0.079	0.069	0.105	0.178	0.085	0.062	2001.000
InterContinental Hotels Group PLC	0.147	0.171	0.115	0.112	0.081	0.108	0.102													2001.000
Medium European Plan Montego Bay	0.073	0.052	0.066	0.066	0.076	0.056	0.063	0.022	0.020		0.019	0.023	0.022	0.012	0.019	0.025	0.036	0.019		2001.000
Small European Plan Montego Bay	0.155	0.140	0.113	0.114	0.133	0.148	0.098	0.082	0.074	0.060	0.067	0.059	0.036	0.026	0.040	0.035	0.019		0.039	2001.000
Sunset Resorts	0.141	0.143	0.154	0.143	0.145	0.139	0.097	0.068	0.070	0.051	0.061	0.060	0.053	0.048	0.040					2001.000
SuperClubs	0.155	0.100	0.128	0.133	0.153	0.127	0.096	0.083	0.062	0.062	0.036									2001.000
The Ritz-Carlton Hotel Company	0.049	0.095	0.116	0.124	0.101	0.110	0.079	0.050	0.035	0.050	0.032									2001.000
Wyndham International	0.151	0.157	0.164	0.122	0.123															2001.000
Decameron Hotels & Resorts				0.019	0.029	0.034	0.032	0.033	0.023	0.015	0.020	0.021	0.024	0.018	0.023	0.029		0.029	0.031	2004.000
Blackstone Group						0.120	0.108	0.079	0.074	0.059	0.061	0.095	0.068	0.066	0.063	0.070	0.081	0.069	0.063	2006.000
Fiesta Group							0.047	0.170	0.174	0.120	0.161	0.145	0.125	0.121	0.124	0.158	0.103	0.074	0.101	2008.000
Iberostar Group							0.054	0.093	0.101	0.116	0.128	0.151	0.129	0.116	0.109	0.109	0.076	0.099	0.096	2008
Riu Hotels & Resorts							0.053	0.106	0.115	0.146	0.107	0.126	0.173	0.208	0.181	0.222	0.229	0.239	0.201	2008
Octagon Hotels Group								0.091	0.082	0.086	0.097	0.073	0.072	0.057	0.064	0.062	0.019	0.038	0.056	2009
Secrets Resorts Hotels									0.063	0.134	0.113	0.121	0.077	0.095	0.073	0.096	0.110	0.097	0.087	2010.000
Blue Diamond Hotels & Resorts											0.010	0.042	0.058	0.049	0.063	0.056		0.052	0.044	2012
Melia Hotels International													0.020		0.017					2017
Playa Hotels & Resorts													0.077	0.080	0.082		0.118	0.081	0.075	2017
AMResorts														0.013						2018
Excellence Group Luxury Hotels & Resorts														0.012	0.032	0.035	0.031	0.049	0.042	2018.000
H10 Hotels																		0.071	0.103	2022.000

Notes: Estimates are based on the Ministry of Tourism Exit Surveys and scaled to aggregate arrival data also available from the MOT.

Table 33: **Market Shares by Parent Company in Negril-Southcoast**

Parent Company	2001	2002	2003	2004	2005	2006	2008	2009	2010	2011	2012	2014	2017	2018	2019	2020	2021	2022	2023	Entry Year
Couples Resorts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2001
Riu Hotels & Resorts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2001
Sandals Resorts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2001
Small All-Inclusive Negril-Southcoast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2001
Small European Plan Negril-Southcoast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2001
SuperClubs	0	0	0	0	0	0	0	0	0	0	0									2001
Blue Diamond Hotels & Resorts												0	0	0	0	0	0	0	0	2014
Marshmallow Ltd.												0	0	0	0	0	0	0	0	2014
Karisma Hotels & Resorts														0	0	0	0	0	0	2018

Notes: Estimates are based on the Ministry of Tourism Exit Surveys and scaled to aggregate arrival data also available from the MOT.

A.8 Nest Data Descriptions

Table 34: Hotel Nests

All-Inclusive Nest	**Non All-Inclusive Nest**
Large All-Inclusive 1	Large Non All-Inclusive 1
Large All-Inclusive 2	Large Non All-Inclusive 2
...	...
Large All-Inclusive J_a	Large Non All-Inclusive J_e
Small All-Inclusive Montego Bay Category	Small Non All-Inclusive Kingston
Small All-Inclusive Ocho Rios-Port Antonio Category	Small Non All-Inclusive Montego Bay
Small All-Inclusive Negril Category	Small Non All-Inclusive Ocho Rios - Port Antonio
–	Small Non All-Inclusive Southcoast
–	Medium Non All-Inclusive Kingston
–	Medium Non All-Inclusive Montego Bay
–	Medium Non All-Inclusive Negril

A.9 Diversion Ratios and Elasticities

Table 35: **Category Diversion Ratios**

	Mean Diversion Ratios					
Category	Large **AI** Diversion	Large **EP** Diversion	Small **AI** Diversion	Medium **EP** Diversion	Small **EP** Diversion	Outside Option
Large All-Inclusive	0.482	0.011	0.012	0.005	0.050	0.440
Large European Plan	0.045	0.222	0.000	0.189	0.077	0.467
Medium European Plan	0.167	0.090	0.000	0.130	0.171	0.441
Small All-Inclusive	0.280	0.000	0.064	0.000	0.250	0.407
Small European Plan	0.263	0.044	0.035	0.113	0.117	0.429

Notes: Diversion ratios across general accommodation categories.

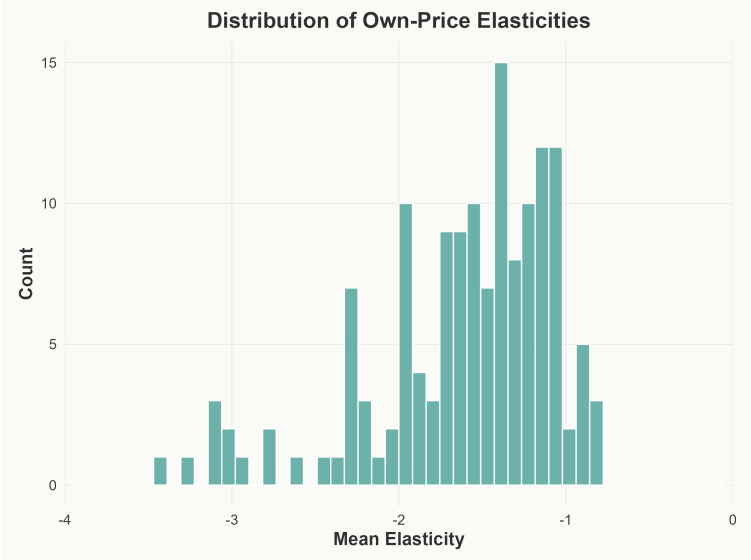

Figure 12: **Median Own-Price Elasticities**

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Figure 13: Median Own-Price Elasticities by Resort Area

Figure 19: Map of Jamaica

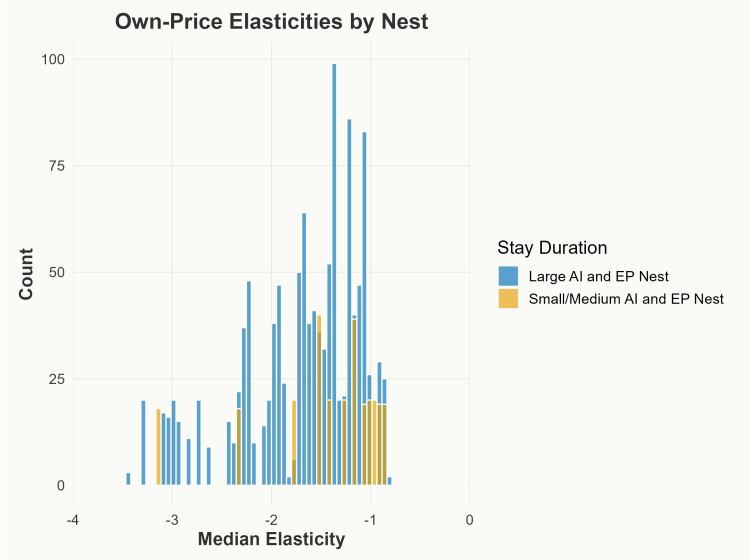

Figure 14: **Nest Elasticities**

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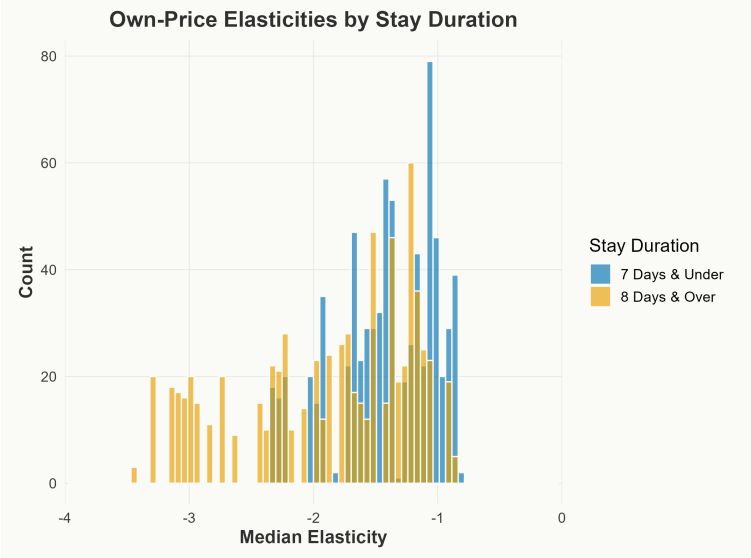

Figure 15: **Median Own-Price Elasticities by Length of Stay**

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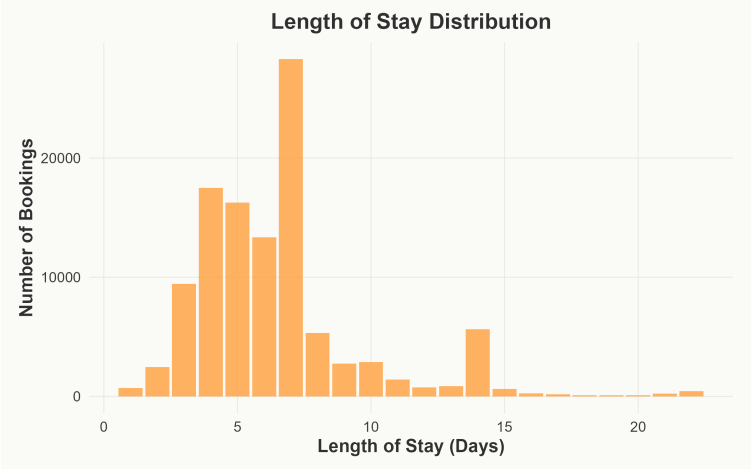

Figure 16: **Length of Stay Distribution**

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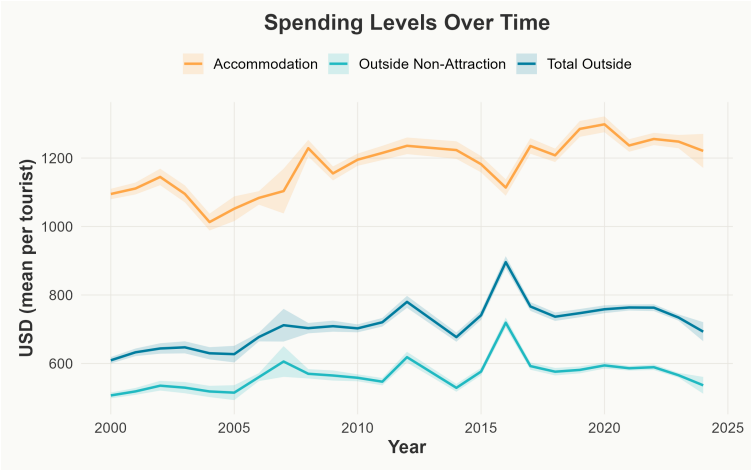

Figure 17: **Average Outside-Hotel Spending Levels by Year**

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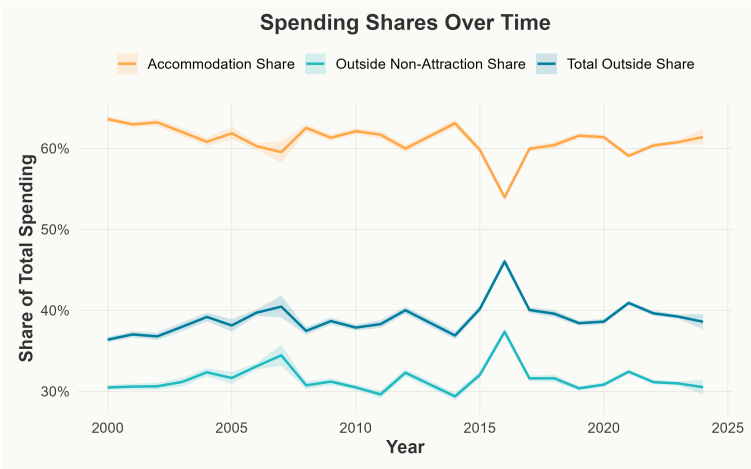

Figure 18: **Average Outside-Hotel Spending Shares by Year**

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Figure 20: Representative Accommodation Types

(a) All-Inclusive Resort

(b) Non-All-Inclusive Hotel

(c) Resort Villa

(d) Guesthouse

(e) Apartment