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The Vacation Is Over: Implications for the Caribbean of Opening U.S.-Cuba Tourism

The trade literature regularly seeks to explain how barriers affect trade. For example, recent work that more tightly linked the workhorse gravity trade model to its empirical applications solved a major puzzle as to why borders reduce trade.[1] Empirical studies have measured export growth after European Monetary Union (EMU) or World Trade Organization (WTO) accession, or the industrialization of China.[2] Similarly, this study seeks to estimate the impact on the Caribbean of normalizing bilateral tourism trade between the United States and Cuba.

The kaleidoscope of nationalities, languages, races, and political and colonial histories, coupled with what at first appears to be comparable endowments, makes the Caribbean a unique natural experiment for trade. Moreover, the importance of tourism for the region's economies fuels interest from policymakers and academics. For example, a recent passport mandate for U.S. travelers to the Caribbean set off intense lobbying by the affected economies to stop a transitory cost asymmetry relative to Mexico. Similar concerns were raised in response to the drop in banana and sugar exports to EU countries from their former Caribbean colonies.

Romeu is with the DevTech Systems, Inc. The views expressed here are those of the author and do not necessarily represent those of the IMF or IMF policy.

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1. Anderson and Van Wincoop (2003), Baldwin and Taglioni (2006).

2. For example, Micco and others (2003) on EMU and Subramanian and Wei (2007), and Rose (2004b) on WTO.

On the issue of the supply shock from an opening of U.S. tourist flows to Cuba, concerns have arisen over the need to brace for such competitive pressures.[3] For example, the very high cost of visiting Cuba compared with the perfect trade integration of the U.S. Virgin Islands suggests that the current restriction provides substantial trade protection to the latter. The rest of the Caribbean lies somewhere in between these two extremes, with U.S. tourist arrivals driven at least in part by preferential trade positions relative to Cuba. Under a scenario in which U.S. tourist flows to Cuba are unrestricted, the market will need to find a new equilibrium, as the largest consumer of tourism services in the region meets for the first time in nearly fifty years the region's largest potential producer. As this deadweight loss is lifted from U.S. consumers, Caribbean vacations will be repriced, based on fundamental costs, and new tourism consumption patterns will emerge across all destinations and visitor countries.

Previous research has not reached a consensus on the impact of liberalizing Cuba-U.S. tourism on the Caribbean. In particular, earlier work forecasting tourism without the current restrictions draws on potentially unreliable data or on untested assumptions. For example, Padilla and McElroy (2003) project arrivals based on a comprehensive historical review, including evidence from the 1950s and industry surveys. These projections appear plausible, but they are not tested econometrically and the resulting conclusions depend on qualitative evidence that is difficult to benchmark in the wake of a major structural change.[4] This study shapes a liberalized Cuba-U.S. tourism counterfactual by estimating a gravity trade model of the Caribbean tourism industry. This model, grounded in consumer optimization across differentiated international products, can successfully explain upward of 85 percent of the variation in the trade data used here. These estimations are anchored in macroeconomic, industry, and socioeconomic data from international sources so as to minimize Cuba-specific uncertainty. The measures employed are standard in gravity models, which have enjoyed great empirical success in the trade literature.[5] Moreover, the gravity model allows tests of whether Cuba and competing

3. Most recently with the liberalization of exit travel permits for Cuban citizens residing in Cuba.

4. Similar issues arise with Robyn, Reitzes, and Church (2002) and Saunders and Long (2002). The U.S. International Trade Commission (2001), in response to an inquiry by the U.S. House of Representatives Committee on Ways and Means, studied bilateral trade across all goods and services between the U.S. and Cuba, but focused very little on tourism and less on a Caribbean-wide equilibrium.

5. See Rose (2004a) for an overview of trade estimations using the gravity model.

Caribbean destinations adjust their tourism base to hedge potential gains or losses in the wake of free Cuba-U.S. tourism trade. The model estimates presented reflect both the current distortions in Cuba-U.S. tourism relations, as well as the underlying fundamentals that determine the long-run equilibrium.

The results presented here point toward two major findings. First, liberalized Cuba-U.S. bilateral tourism would increase overall arrivals to the Caribbean. This surge will likely drive tourism in Cuba to full capacity, although much is unknown about short-run supply constraints. As U.S. visitors overwhelm capacity, Organization for Economic Cooperation and Development (OECD) visitors currently vacationing in Cuba would be redirected toward neighboring countries. Hence, while short-run constraints bind in Cuba, the region would enjoy a period of sustained demand. In the wake of this change, some countries potentially stand to lose U.S. tourists but gain new non-U.S. tourists, as trade redistributes in line with fundamentals. The results suggest that total Caribbean arrivals will increase by approximately 4 percent.

The results present various benchmark and fundamental tourism costs that determine long-run equilibrium (beyond the Cuba-U.S. tourism restriction). First is geography. Unsurprisingly and in line with other studies, distance is an excellent proxy for trade costs, particularly since there are non-linear jumps in travel costs to the Caribbean for tourists from different continents. A simple back-of-the-envelope calculation of the average tourist-mile traveled reveals how competitive Cuba could become relative to the existing tourism situation. Using tourist-mile as a cost proxy for current tourism restrictions, the cost to U.S. consumers of traveling to Cuba is estimated to be equivalent to traveling to Oceania. Second, common languages and colonial history also play a major role in identifying costs (consistent with other trade studies). As Cuba would move toward full capacity, the spillover will shift in part to destinations with colonial ties to their OECD visitors.[6]

Finally, the impact of airlines is considered, although the explanatory power of the data is limited by the presence of major hubs in the region. The results suggest that airline access positively influences tourism industries, but the evidence does not suggest that nationally owned airlines will contribute positively to arrivals. That is, Caribbean countries with domestic flag carriers

6. Results are also robust to controls for natural disasters, oil and energy subsidies to Caribbean countries, and trade agreements such as Dominican Republic–Central America Free Trade Agreement (CAFTA-DR), North American Free Trade Agreement (NAFTA), Caribbean Basin Initiative, and others. See Romeu (2008).

flying into OECD countries will not do significantly better that those without domestically owned airlines.

The next section gives a brief overview of the gravity trade model and the impact of removing this trade barrier. The study then discusses the data in section three, and estimations are presented in section four, along with the forecast of the equilibrium tourist distribution in the Caribbean, followed by conclusions.

Adapting Gravity Trade Theory

The aim of this study is to judge the impact on Caribbean nations' tourism by opening U.S. tourism to Cuba. This impact is studied by modeling the current situation, capturing and isolating the effect of the bilateral tourism restrictions between the U.S. and Cuba, and then fitting a counterfactual that controls for their removal. Gravity trade theory accounts for the amount of tourism between countries on the basis of their sizes and trade costs. Traditionally, the gravity model allows for trade costs to be proxied by a variety of indicators, the most common being geographic distance between countries. Other cost proxies are also included, however, to capture the impact of free-trade agreements, preferential oil supplies, and other determinants of trade. The model used in this study is "off-the-shelf," based largely on Anderson and Van Wincoop (2003) and Baldwin and Taglioni (2006).

An alternative to the gravity model is the computational general equilibrium (CGE) approach, which relies heavily on country and sector modeling to capture the impact of policy changes on labor costs and market clearing trade quantities. However, the current uncertainty—particularly in the case of the Cuban economy—concerning factor and labor costs, elasticities, and the impact on these in the wake of a major policy change favors a first pass anchored on more reliable international trade and data. Nevertheless, while outside the scope of this study, a CGE approach would usefully benchmark the results presented here.

The presentation of the consumer choice among Caribbean destinations here draws liberally from Romeu and Wolfe (2011), which considers the labor-leisure decisions of consumers and maps business cycles in OECD economies to tourism outcomes. In that model, which combines the monopolistic competition of Blanchard and Kiyotaki (1987) with the gravity trade model of Anderson and Van Wincoop (2003), consumers first decide their labor or leisure and income, and then relative consumption between tourism and a

generic non-tourism good is decided. This section treats as exogenous the tourism expenditure (T_j) resulting from the optimization, and focuses on the determinants of tourism demand within a monopolistic tourism market. Hence, consumers living in j=1 to M OECD economies choose C_{ij}^{ρ} vacations (destinations indexed by i, with N destinations), given T_j tourism expenditure and p_{ij} vacation prices for each consumer-destination pair.

$$(1) \quad U_j = \left(\sum_{i=1}^{N} C_{ij}^{\rho}\right)^{1/\rho} \quad 0 < \rho < 1, \ \sigma \equiv 1/(1-\rho), \quad s.t. T_j - \sum_{i=1}^{N} p_{ij} C_{ij}^{\rho} = 0.$$

The problem of the consumer is reduced to maximizing across destinations that have some imperfect substitutability, with the elasticity of substitution given by σ.

$$(2) \quad L = \left(\sum_{i=1}^{N} C_{ij}^{\rho}\right) - \lambda\left(\sum_{i=1}^{N} p_{ij} C_{ij}^{\rho} - T_j\right).$$

The Lagrangian in equation (2) maximizes the monotonic transformation U^{ρ} for simplicity. The first-order conditions yield the following well-known ratio:

$$(3) \quad C_{ij} = \left(\frac{p_{ij}}{p_{ik}}\right)^{-\sigma} C_{ik}.$$

Summing across j's expenditure on all destinations,

$$(4) \quad C_{kj} = \left(\frac{T_j p_{kj}^{-\sigma}}{\sum_i p_{ij}^{1-\sigma}}\right) = \left(\frac{T_j p_k^{-\sigma} t_{kj}^{-\sigma}}{\sum_i p_{ij}^{1-\sigma}}\right), \quad with \ p_{kj} = p_k t_{kj}.$$

In equation (4), while the base price for vacationing in destination k is given by p_k, the final price paid by consumers is marked up by t_{kj} because of travel costs, trade barriers, and other factors to be specified below. Total expenditure by consumers from j is given by $T_j = \sum_{i=1}^{N} p_{ij} C_{ij}^{\rho}$. Income to destination i is defined as $T_i = \sum_{j=1}^{M} p_{ij} C_{ij}^{\rho} = \sum_{j=1}^{M} x_{ij}$. A price index faced by consumers for tourism is defined as the geometric average of the destination prices, and given by $P_j = \left(\sum_i p_{ij}^{1-\sigma}\right)^{1/1-\sigma}$, which is analogous to the "multilateral resistance" price index in Anderson and Van Wincoop (2003). Demand by consumers can then be expressed as:

$$(5) \quad C_{ij} = \left(\frac{T_j}{P_j}\right)\left(\frac{p_i t_{ij}}{P_j}\right)^{-\sigma}.$$

Destination i faces demand given by:

$$T_j = \sum_j \left(\frac{T_j}{P_j}\right)\left(\frac{p_{ij}}{P_j}\right)^{-\sigma} p_{ij} = p_i^{1-\sigma}\sum_j \left(\frac{t_{ij}}{P_j}\right)^{1-\sigma} T_j \quad \forall i. \tag{6}$$

From (6):

$$p_i^{1-\sigma} = \frac{T_i}{\sum_j \left(\frac{t_{ij}}{P_j}\right)^{1-\sigma} T_j}; \tag{7}$$

define the share of OECD tourism expenditure in the region as:

$$\theta_j = \frac{T_j}{\sum_j T_j} = \left(\frac{T_j}{T_W}\right). \tag{8}$$

Romeu and Wolfe (2011) show that with symmetric prices for two-way trade $t_{ij} = t_{ji}$, consumers and destinations face price indexes that are consistent with AV, and are the geometric average of the destination prices, labeled P_i and P_j, with $P_j^{1-\sigma} = \sum_i P_i^{\sigma-1} t_{ij}^{1-\sigma}\theta_i \quad \forall j$, and trade is given by:

$$x_{ij} = \left(\frac{T_j T_i}{T_W}\right)\left(\frac{t_{ij}}{P_j P_i}\right)^{1-\sigma}. \tag{9}$$

Through equation (9) the framework reflects the basic conclusions of Blanchard and Kiyotaki (1987) and Anderson and Van Wincoop (2003) in that the income effects (left implicit here) and the trade costs will have direct effects on the tourism demand from the OECD to the Caribbean region, which will depend on the degree of substitutability between countries. Fixed and variable production costs can be included in this framework by assuming each destination faces a tourism cost schedule as a function of the number of visitors that includes a fixed and a variable cost:

$$\chi(C_i) = f_i + m_i C_i. \tag{10}$$

In equation (10), f_i represents the fixed costs, C_i is the volume of tourism services as before, and m_i the marginal cost per additional tourist. Firms at each destination maximize profits, given by:

$$\pi_i = p_i C_i - w_i m_i C_i - w_i f_i, \tag{11}$$

where *w* captures the factor cost for destination *i.* Using the demand given in equation (4) and assuming a sufficiently large number of tourism firms such that the impact on the price index from a change in one firm's price is negligible, this expression simplifies and yields the familiar result that prices set by monopolistic firms depend on the variable costs and are independent of what others are doing:

$$p_i = \left(m_i w_i \Big/ \rho \right). \tag{12}$$

Combining equations (12) and (9) yields the gravity equation

$$C_{ij} = \left(T_j T_i \Big/ T_W \right) t_{ij}^{-\sigma} \left(P_j P_i \right)^{\sigma-1} \left(\rho \Big/ m_i w_i \right). \tag{13}$$

In log form, the estimable equation becomes:

$$\ln C_{ij} = c - (\sigma - 1)\ln P_j + \ln T_i - (\sigma - 1)\ln P_i - \ln w_i m_i - \sigma \ln t_{ij}. \tag{14}$$

Equation (14) groups the terms resulting from the log of (13), and can be simplified as:

$$\ln C_{ij} = \alpha_0 + \alpha_1 I_{it} + \alpha_2 I_{jt} + \alpha_3 \text{I.}trade_i + \alpha_4 \text{I.}us.cuba_t + e_{ijt}. \tag{15}$$

Equation (15) shows the estimable form of (14), with I_{it} and I_{jt} reflecting country-year and destination-year indicators, respectively, which capture non-systemic tourism determinants. I.*trade* represents instruments included in the estimable form of the trade costs in equation (14), which are standard (for example, Rose 2004). Finally, I.*us.cuba* reflects instruments that capture the relative changes in trade costs for travel to Cuba by persons under U.S. jurisdiction.

In equation (15), controlling for the idiosyncratic terms *destination-year* and *OECD source country-year pairs* is sufficient to obtain unbiased estimates. Additionally, geographic distance traditionally proxies for trade costs (that is, great circle distance along the Earth's surface between national capitals), applied here with additional continent indicators for OECD nations located in Europe or Asia.

The variables indicated by I.*trade* in equation (14) are intended to capture trade costs that determine the long-term tourism outcomes, as well as the current Cuba-U.S. tourism trade regime. Costs considered here include

free-trade agreements such as NAFTA, CAFTA (Caribbean Area Free Trade Agreement), and CARICOM (Caribbean Community), which spur investment in the sector and airline access from OECD countries to Caribbean destinations. In addition, measurement issues present for Puerto Rico that stem from its role as a transit hub, or the misclassification of its diaspora as tourist arrivals, are also controlled for, as well as the presence of low-income-per-capita nations such as Haiti or Grenada.

U.S.-Cuba Tourism Restriction Tests

In the log-linear estimated form, the effect of the tourism restriction between Cuba and the United States is measured directly by a bilateral indicator, similar to previous work measuring the impact of currency unions or membership in the WTO. By controlling for this restriction, the model can estimate a counterfactual in which tourism is liberalized.

Estimating U.S. travel in a post-opening of Cuba-U.S. tourism counterfactual of free Cuba-U.S. trade requires finding an instrument that identifies visitors' fundamental preferences for alternative destinations. Identification of these preferences is achieved in three steps:

1. The latent U.S. demand to travel to Cuba is directly identified in the panel regression by the estimated size of the U.S.-Cuba bilateral restriction.
2. The changes in U.S. tourism demand for visiting alternative destinations resulting from exogenous shocks to travel costs for U.S. tourists are benchmarked in the wake of major shocks observed in the data. There are two in the sample:

—Legislation was phased in starting in 2006 requiring all persons (including U.S. citizens) traveling to the United States from foreign countries (including Canada, Mexico, Central and South America, the Caribbean, and Bermuda) to present a valid passport, NEXUS card, or U.S. Coast Guard/Merchant Mariner document. This lowered the relative costs of traveling to U.S. overseas territories, namely, Puerto Rico and the U.S. Virgin Islands.

—The H1N1 virus outbreak in Cancun in 2009 came on the back of an already difficult tourism climate in Mexico stemming from OECD travel warnings in 2008. This captures U.S. divergence to competing destinations from a shock.

3. For each destination, the elasticity to U.S. arrivals can be measured. As the United States is the dominant consumer of tourism services in the Caribbean, increasing or decreasing U.S. arrivals to a destination elicits a response

by the rest of the world at that destination. This elasticity benchmarks second-round effects from changes in U.S. tourists arriving in Cuba (for example, how many non-U.S. tourists leave).

In summary, the trade restriction measures the size of the total increase in U.S. arrivals to Cuba. The counterfactual divergence of U.S. tourists from other destinations in the Caribbean toward Cuba that would occur under free U.S.-Cuba trade is identified via the U.S. Western Hemisphere Travel Initiative and H1N1 estimated elasticities. The exodus of non-U.S. visitors from Cuba (under the same free-trade counterfactual) toward the rest of the Caribbean (second round effect) is benchmarked by the elasticity of non-U.S. tourist arrivals to an increase in U.S. arrivals and the current distribution of non-U.S. tourists in the Caribbean.

Data

The data employed here provide a fairly comprehensive picture of the Caribbean tourism market. Table 1 gives descriptive statistics on the number of tourists arriving at each destination from individual OECD countries. The data used in the study record thirty-five destinations receiving tourists from twenty-eight OECD countries from 1995 to 2009. The Caribbean tourism industry grew rapidly from 1995 to 2005 and has since grown more slowly, as several shocks have affected the region including recessions in OECD economies, the intensification of natural disasters, and the H1N1 epidemic of 2009. Hence, the descriptive statistics focus on 2004 as a year with a steady-state distribution of tourism given current institutional and market characteristics.

The average number of tourist arrivals and rooms are reasonable indicators of market share for each country. The weighted average distance traveled by a tourist to arrive at a destination is also a useful measure, as geographic distance is one of the most prominent measures of trading costs in gravity models. These models routinely explain more than 70 percent of the observed variation in international trade data. The weighted mean distance reveals the average cost for a country, where cost is proxied by nautical miles traveled. If Cuba-U.S. tourism opens, this cost indicator falls precipitously, as 50,000 hotel rooms are opened up to over 10 million U.S. tourists at a distance measured in hundreds rather than thousands of nautical miles.

Figure 1 maps the Caribbean, with country shading reflecting average tourist arrivals at each destination in the years 2003–04. Unsurprisingly,

TABLE 1. Descriptive Statistics of Caribbean Tourism, ca. 2001–04[a]

Country	*Arrivals (thousands)*	*Standard deviation*	*Weighted average distance (naut. miles)*	*Rooms*	*Average stay (days)*	*Country*	*Arrivals (thousands)*	*Standard deviation*	*Weighted average distance (naut. miles)*
Anguilla	38	3.3	1,742	905	8.3	Australia	14	2.2	9.1
Antigua & Barbuda	165	22.0	2,626	n.a.	0.0	Austria	46	3.3	4.6
Aruba	537	45.4	1,882	7,440	7.5	Belgium	97	11.7	4.1
Bahamas	1,487	21.7	1,103	15,310	4.5	Canada	1,529	182.2	1.7
Barbados	409	13.3	2,933	6,420	7.0	Denmark	26	5.2	4.4
Belize	157	15.9	2,094	4,842	7.2	Finland	11	2.0	4.7
Bermuda	263	10.2	980	3,132	6.4	France	1,030	40.1	3.8
Bonaire	50	5.3	2,828	1,236	9.1	Germany	636	71.3	4.3
British Virgin Islands	246	9.4	1,743	2,688	10.5	Greece	9	1.4	5.1
Cancun	1,997	95.4	1,671	54,522	4.6	Ireland	14	1.7	3.6
Cayman Islands	272	25.5	1,426	5,264	4.7	Italy	436	29.9	4.6
Colombia	349	38.0	3,141	54,642	0.0	Japan	55	5.4	6.9
Costa Rica	774	120.5	2,505	34,034	11.0	Mexico	214	3.7	1.5
Cuba	1,469	107.8	3,130	42,612	10.5	Netherlands	302	35.1	4.3
Curaçao	120	13.4	3,374	3,423	8.5	New Zealand	3	0.2	7.0
Dominica	27	0.8	2,386	n.a.	8.4	Norway	17	1.0	4.4
Dominican Republic	2,288	264.4	2,676	56,019	9.4	Portugal	63	4.3	3.6

Grenada	79	4.6	2,878	1,752	7.4	Spain	455	56.8	3.9
Guadeloupe	113	9.5	3,503	7,350	4.2	Sweden	39	11.5	4.5
Guyana	67	8.6	2,313	n.a.	0.0	Switzerland	116	5.1	4.3
Haiti	115	n.a.	1,422	n.a.	0.0	United Kingdom	1,268	99.0	3.8
Jamaica	1,265	58.4	1,766	20,699	6.5	United States	11,247	518.1	1.3
Martinique	391	11.8	3,632	6,613	9.2				
Montserrat	5	0.3	2,645	n.a.	13.1				
Panama	194	20.3	2,381	14,463	2.2				
Puerto Rico	2,948	94.3	1,379	12,693	2.6				
Saba	7	1.8	2,823	85	0.0				
St. Eustatius	6	0.4	2,846	89	0.0				
St. Kitts & Nevis	48	11.5	1,862	1,591	9.6				
St. Lucia	196	14.8	2,588	4,145	9.9				
St. Maarten	305	15.4	1,959	3,540	0.0				
St. Vincent	45	2.5	2,576	1,728	11.1				
Trinidad	265	18.0	2,595	5,066	0.0				
Turks and Caicos	153	6.4	1,300	2,351	7.6				
U.S. Virgin Islands	512	27.1	1,438	5,055	4.5				
Venezuela	369	69.2	3,556	81,302	7.0				

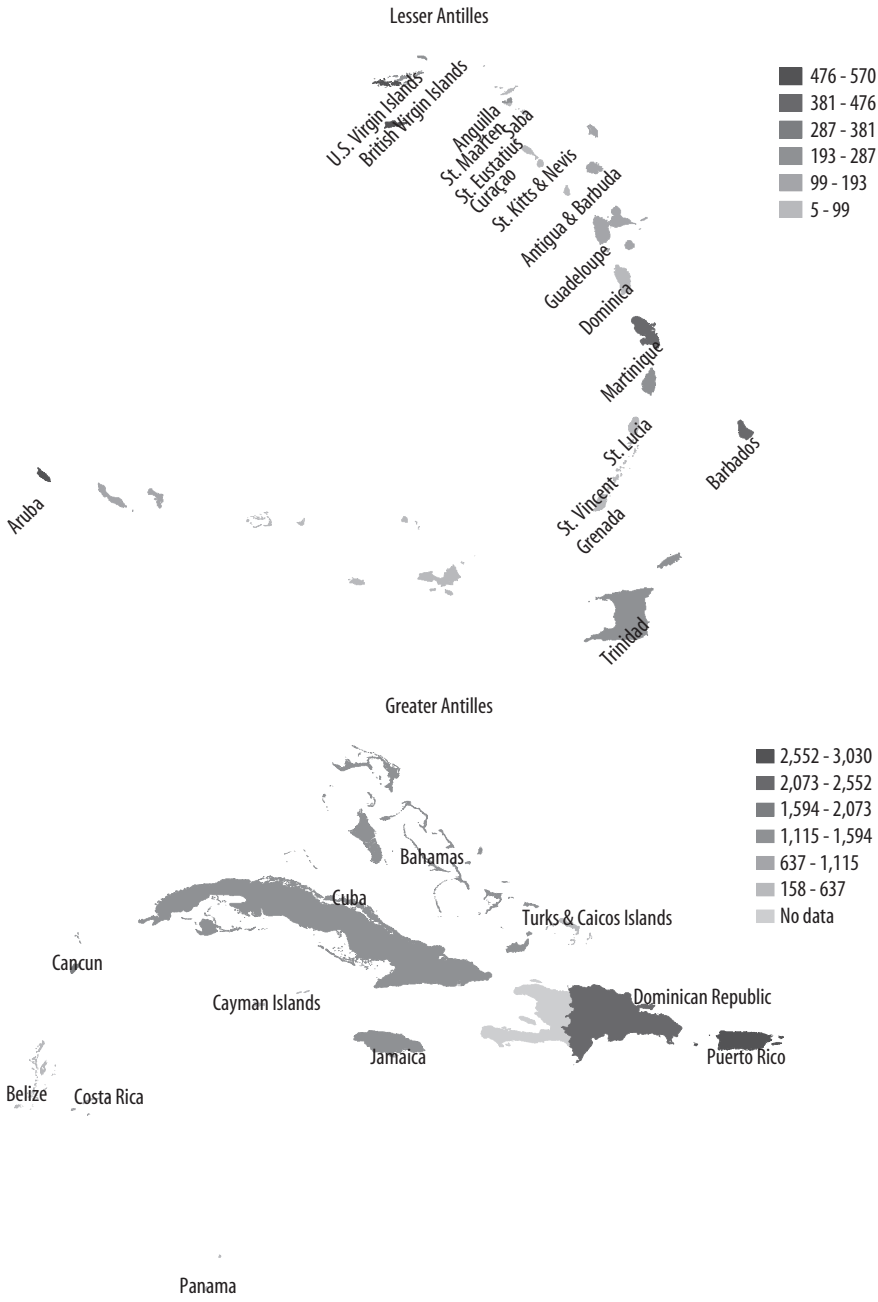
Sources: Author's estimates, World Trade Organization, Caribbean Trade Organization, country authorities.

n.a. = not available.

a. Data for 2001–04 from Romeu (2008). Subset selected to exclude one-off growth from 1990s for Cuba entering region and effect of global economic financial crisis starting in 2008.

FIGURE 1. OECD Tourist Arrivals, 2003–04

Thousands of tourists, averaged



Source: Author's estimates.

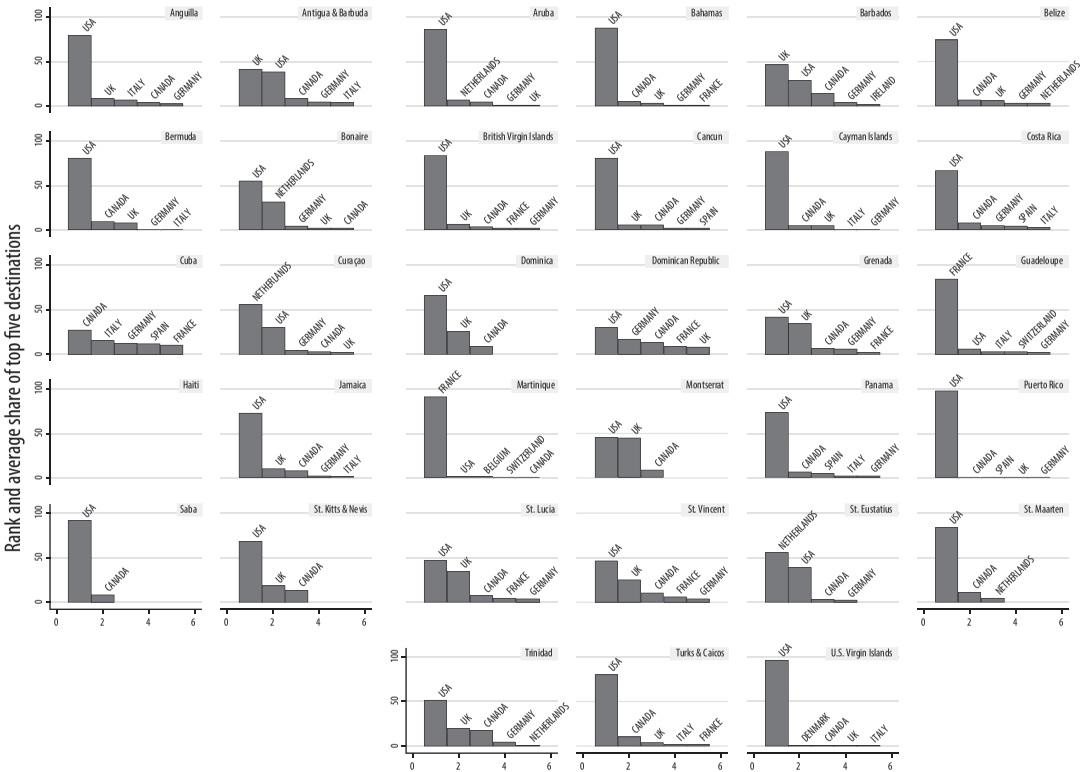
most arrivals are received by Puerto Rico, Cancun (Mexico), Jamaica, the Dominican Republic, and Cuba—the largest countries in the Caribbean by population and GDP. Nevertheless, observable differences between seemingly comparable destinations (for example, Cancun and Belize or Martinique and St. Vincent) are driven by costs other than geographical distance. Political autonomy matters since it is easier to travel within a country than internationally, and the countries vary greatly in this dimension. The destinations in the data range from overseas territories of OECD countries (for example, Guadeloupe is a department of France) to independent countries such as the Dominican Republic. Size also matters in determining trade costs, as economies of scale are unavailable for very small countries, for example, St. Vincent and the Grenadines, versus large countries such as Mexico—represented here by Cancun's international tourist arrivals. There is an array of languages and colonial histories represented in the Caribbean, as well as differing economic governance and income levels, ranging from very poor countries to high-income-per-capita nations, such as the British overseas territories. There are differing trade agreements such as Open Skies agreements for airlines, and preferential trade agreements such as the U.S. Caribbean Basin Initiative and NAFTA or CAFTA, which affect travel and investment accords.

The United States is a major tourist source for the majority of large destinations—except for Cuba and the Dominican Republic. Figure 2 focuses on the top five visitor countries for each tourist destination (take, for example, a country with roughly equal-sized bars showing dependency equally across its top five OECD clients and contrast this with the dependence of Martinique on incoming French tourism versus the diversification of Barbados). Figure 3 shows the five most-visited destinations for each OECD country in the sample (with roughly equal-sized bars indicating that the OECD country spreads its visitors equally across several Caribbean destinations). Notice that many countries in the OECD show dispersed distributions across destinations, implying these countries differ sharply in their preference for destination variety.

Estimation

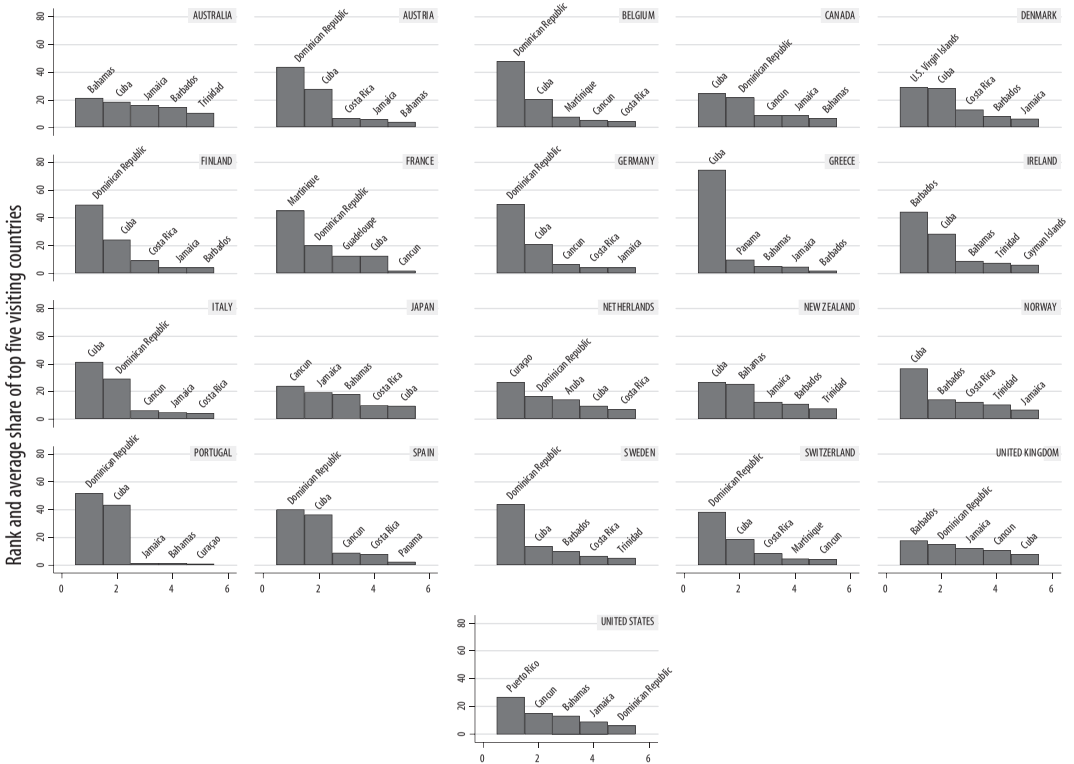
No recent data record open Cuban-U.S. tourism, so that identifying the impact of such an event must be done indirectly. To this end, the estimations identify significant determinants of tourist arrivals after controlling for the

FIGURE 2. Top Five Clients of Caribbean Destinations, 1995–2004



Sources: Author's estimates, WTO, CTO, country authorities.

F I G U R E 3 . Top Five Destinations of OECD Visitors, 1995–2004



Sources: Author's estimates, WTO, CTO, country authorities.

Cuba-U.S. tourism restrictions, and test for a relative easing of the current policy. The tests reveal that arrivals to Cuba from OECD countries culturally different from the United States respond to relative easing or tightening of U.S. restrictions. Moreover, the estimates confirm that language and colonial ties as well as non-linearity in distance (that is, continent changes) are also important determinants of arrivals. Finally, the estimations show that U.S. policy imposes significant costs on U.S. tourists traveling to Cuba. Taken together, the evidence suggests that removing U.S. restrictions would sharply increase U.S. arrivals in Cuba (as costs drop significantly), while redirecting non-U.S. tourists currently in Cuba to other regional destinations. The evidence suggests that non-U.S. tourists would redistribute away from Cuba toward destinations that are related by colonial or national ties or specialize in receiving them. This section explains the estimation results and projects potential arrival scenarios.

Table 2 gives the results of estimating equation (0.15), first including only basic tourism costs, and then progressively adding other costs outlined above. The basic estimation controls for distance, continents, common language, and common country, for Puerto Rico and poor countries, and for September 11, 2001 (into 2002). Indicators also control for NAFTA, CARICOM, the U.S. Caribbean Basin Initiative, and U.S. tourism policy with Cuba. Finally, an indicator for destinations in Europe shows the non-linearities present in long-distance travel.

Each successive column in Table 2 augments the previous estimation with additional costs. The second column, labeled *2,* adds the individual elasticities for each destination. In effect, each estimated coefficient $\beta_{\Delta US}$ captures the change in arrivals at a destination from a non-U.S. country in response to an increase in U.S. arrivals at that destination. For example, an increase in U.S. arrivals in St. Kitts and Nevis lowers arrivals from the rest of the world by 20 percent. Model 3 adds the airline cost indicators—as the availability of air travel is an important concern for the success of a destination. Figure 4 shows the number of OECD flag carriers (including regular OECD-based charters) reaching Caribbean destinations, as well as international Caribbean flag carriers with Cancun and the Dominican Republic standing out. Of the largest destinations, only the Dominican Republic has not had an airline that competed with OECD carriers in these data. In the regression, there are two indicators. The first measures, for each country-destination pair, the number of OECD airlines with routes between the Caribbean destination and the OECD tourist home country. The second measures the number of Caribbean

TABLE 2. Gravity Estimates of Caribbean Tourism[a]

		1	*2*	*3*
Distance		−0.81*	−0.91*	−1.00**
U.S.-Cuba restrictions		−2.45***	−2.83***	−2.45***
Tightening of restrictions		−1.05***	−0.86***	−0.89***
Low-income economy		−1.41***	−1.82***	−1.55**
9/11/2001		−2.08**	−2.71**	−0.56
Common language		1.10***	0.93***	1.01***
Common colonial ties		1.49***	1.65***	1.24***
Europe indicator		−1.40***	−0.68	−0.75*
Puerto Rico		3.04***	1.64***	0.09
NAFTA		1.19***	1.46***	−1.88***
CAFTA		0.21	0.28*	−0.43
Caricom membership		−0.81	−1.84***	−0.73
U.S. Caribbean Basin Initiative		0.28	1.41***	0.00
OECD airlines				0.29***
Caribbean airlines				−0.02
β_{H1N1}	H1N1 shock/passport requirement	1.17*	0.27	0.87**
$\beta_{\Delta US}$	Costa Rica		0.00	
	Dominican Republic		0.07**	
	Guatemala		−0.02	
	Haiti		−0.12***	
	Nicaragua		−0.08**	
	Panama		0.03	
	Venezuela		0.01	
	Antigua & Barbuda		0.09*	
	Anguilla		−0.21***	
	Bahamas		0.02	
	Aruba		−0.09***	
	Barbados		0.08*	
	Bermuda		−0.18***	
	Dominica		0.00	
	Grenada		0.06*	
	Guadeloupe		−0.16***	
	Belize		0.06	
	Jamaica		0.04	
	Martinique		0.04	
	Montserrat		−0.23***	
	Curaçao		0.04	
	Puerto Rico		−0.19***	
	St. Kitts & Nevis		−0.20***	
	St. Lucia		0.03	
	St. Vincent & the Grenadines		0.02	
	Trinidad & Tobago		−0.09*	
	British Virgin Islands		−0.10***	
	U.S. Virgin Islands		−0.26***	
	Cayman Islands		−0.19***	
	Turks & Caicos Islands		−0.31***	

(*continued*)

TABLE 2. Gravity Estimates of Caribbean Tourism[a] (*Continued*)

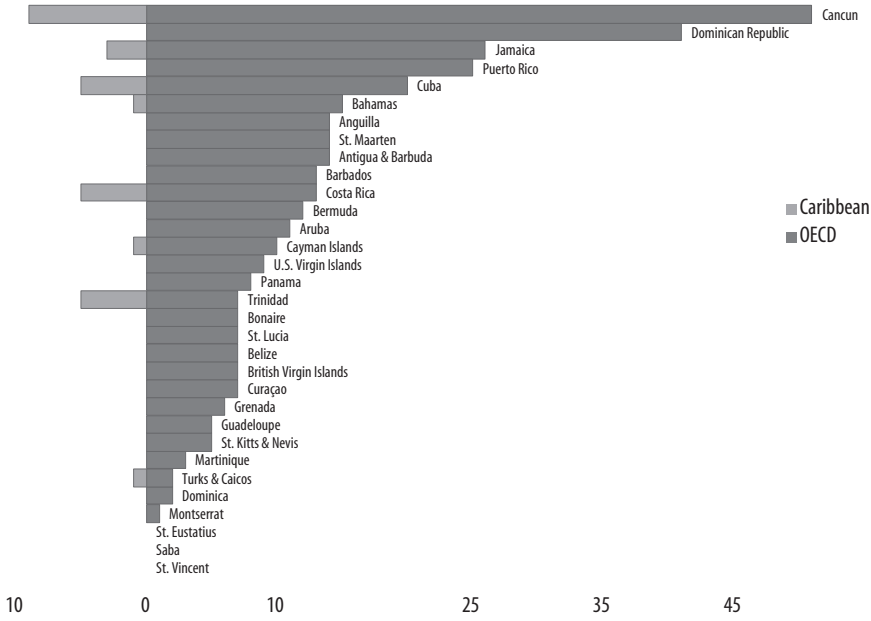
	1	*2*	*3*
Saba		0.02	
St. Eustatius		0.07	
St. Maarten		0.02	
Cuba		−0.12***	
Cancun		0.00	
N	6,588	6,511	5,334
R^2	0.88	0.90	0.86

Sources: Author's estimates, WTO, CTO, country authorities.

Significance: *** = 0.01; ** = 0.05; * = 0.1.

a. Great circle distance nautical miles; "comlan" and "comcou" indicate common language and country with visitors; "prgf" captures poverty; "power" captures market concentration; "oecdair" and "localair" measure international OECD and Caribbean air carriers, respectively. Clusters given by (1) the United States, (2) similar northern Europe, and (3) culturally different southern Europe. Least squares estimation with Huber-White robust standard errors; country-year dummies not presented.

FIGURE 4. Airlines Owned by OECD and Caribbean Countries



Source: Author's estimates, country sources, Official Airline Guide Worldwide Travel Database.

flag carriers traveling to OECD destinations (for example, Mexicana Airlines and Cubana de Aviación).

The gravity model's success in explaining observed trade data present in other studies occurs here as well. The model explains over 85 percent of the observed variation in tourism arrivals. Moreover, estimated coefficients remain broadly constant as different proxies for trade costs are added to the basic model, indicating stable parameters. The core determinants of trade commonly included in gravity models—distance, common language, and common country—are significant and with expected signs. These anchor long-term expectations of tourism that would hold in the wake of an opening of Cuba to U.S. tourism. For countries in Europe, the cost proxied by bilateral distance is augmented by the highly significant coefficients for their continent. The Puerto Rico indicator appears to pick up the aforementioned measurement errors due to its status as a cruise ship and airline hub, as well as returning expatriates. The poverty (labeled PRGF) indicator appears insignificant, but with a negative sign as expected for extremely poor countries that may not meet the basic tourism services threshold (for example, Haiti).

The indicator for September 11 is significantly negative.

The results indicate that (not surprisingly) the current Cuba-U.S. travel restrictions significantly lower bilateral tourism between these two countries across all models and specifications. The magnitude of the estimated coefficient suggests that this restriction increases the cost of travel to Cuba for a U.S. tourist beyond what Asian tourists pay. Its magnitude is comparable but opposite in sign to Puerto Rico. Hence, the reduction in U.S. tourists to Cuba mirrors the increases in arrivals to Puerto Rico from its expatriates, as well as its status as a U.S. overseas territory, an airline hub, and a cruise ship port. The tightening of travel policy in the years 1996–97 and 2004–08 shows increasing travel costs.

In a scenario of unrestricted Cuba-U.S. tourism, arrivals are projected from the model's fit absent the estimated embargo coefficient. In this event, all models project between 3 million to 3.5 million U.S. tourists entering Cuba. The increase in U.S. arrivals in Cuba can imply losses for competing destinations, or, alternatively, this can represent new U.S. tourists to the region.

Table 3 shows projected tourist arrivals for free Cuba-U.S. tourism and travel. The projection is based on the point estimates of Model 2 in table 2. For each destination listed on the left, the current arrivals (based on 2008) are shown; the elasticity due to shocks to relative prices as well as to increases in U.S. tourists, the implied gain or loss in arrivals from the United States and

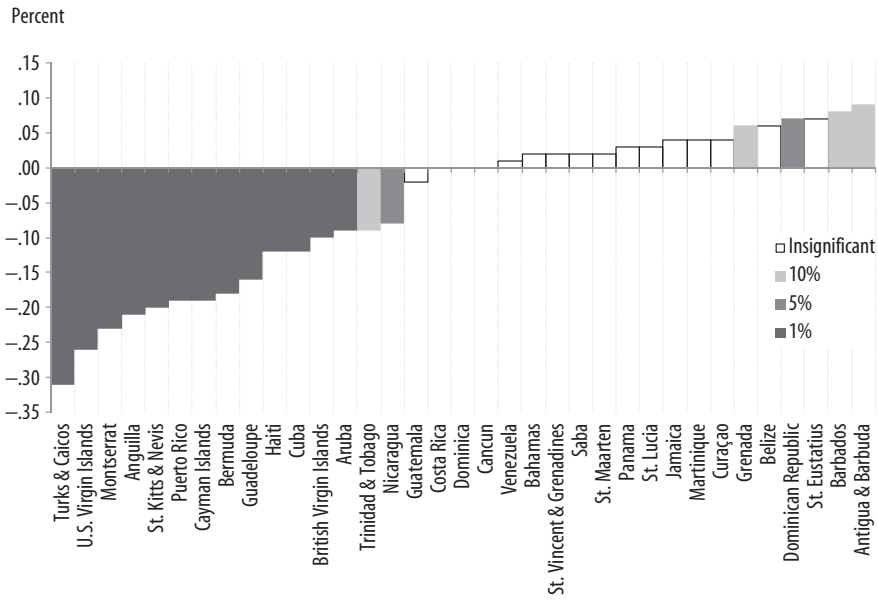
TABLE 3. The Impact on the Caribbean of Opening U.S. Tourism to Cuba
Number of visitors and percent change

	Status quo			Sensitivity to changes		Impact of free trade		Projection under free trade			
Country	*U.S.*	*Non-U.S.*	*Total*	*Loss of U.S. to free trade (β_{H1N1})*	*Sensitivity of non-U.S. to U.S. ($\beta_{\Delta US}$)*	*New U.S.*	*New non-U.S.*	*Total U.S.*	*Total non-U.S.*	*Total free trade*	*Change in percent*
Cuba	42	2,131	2,173	0.2	–0.31	2,969	–1,565	3,011	566	3,577	64.6
Venezuela	90	677	767	0.2	0.01	–16	114	74	791	865	12.8
Colombia	315	879	1,194	0.2	–0.05	–56	162	259	1,040	1,299	8.8
Dominican Republic	1,092	3,567	4,659	0.2	0.07	–195	554	896	4,121	5,018	7.7
Costa Rica	807	1,145	1,952	0.2	0.00	–144	196	663	1,341	2,004	2.7
Cancun	2,584	1,803	4,386	0.2	0.00	–462	309	2,121	2,112	4,233	–3.5
Jamaica	1,151	602	1,753	0.2	0.04	–206	98	945	700	1,645	–6.2
Barbados	132	57	189	0.2	0.08	–24	9	108	66	174	–7.8
Trinidad & Tobago	187	53	240	0.2	–0.09	–33	10	153	64	217	–9.6
St. Vincent & the Grenadines	24	7	31	0.2	0.02	–4	1	20	8	28	–10.2
Grenada	21	6	28	0.2	0.06	–4	1	18	7	25	–10.3
Montserrat	2	0	2	0.2	–0.23	0	0	2	0	2	–11.0

Saint Lucia	109	26	135	0.2	0.03	−19	4	89	31	120	−11.2
Saba	4	1	5	0.2	0.02	−1	0	4	1	5	−12.9
Bermuda	189	27	217	0.2	−0.18	−34	6	156	33	189	−13.0
Dominica	20	3	24	0.2	0.00	−4	1	17	4	21	−13.0
Curaçao	44	7	51	0.2	0.04	−8	1	36	8	44	−13.0
Antigua & Barbuda	84	13	97	0.2	0.09	−15	2	69	15	84	−13.4
St. Maarten	258	34	292	0.2	0.02	−46	6	212	40	252	−13.9
St. Kitts & Nevis	63	7	70	0.2	−0.20	−11	1	52	8	60	−14.0
Belize	148	18	165	0.2	0.06	−26	3	121	20	142	−14.3
Bahamas	1,177	115	1,292	0.2	0.02	−210	19	966	134	1,100	−14.8
Cayman Islands	240	19	259	0.2	−0.19	−43	4	197	23	220	−15.1
Aruba	538	32	570	0.2	−0.09	−96	6	442	39	480	−15.8
Anguilla	40	2	42	0.2	−0.21	−7	0	33	3	36	−15.9
U.S. Virgin Islands	673	9	682	0.2	−0.26	−120	2	552	11	564	−17.4
Puerto Rico	1,185	16	1,201	0.2	−0.19	−212	3	973	19	992	−17.4
Cuban diaspora			214							214	
Total	***11,218***	***11,258***	***22,690***			***969***	***−51***	***12,188***	***11,207***	***23,609***	***4.0***

Source: Author's estimates.

FIGURE 5. Elasticity of Non-U.S. Tourists to Increases in U.S. Arrivals by Destination[a]



Source: Author's estimates.

a. Bars show the destination-specific elasticity to the arrival of American tourists. Bar tint represents the statistical significance level of the estimates: Black is significant at 1 percent; white means insignificant. Turks and Caicos exhibit the strongest negative elasticity to U.S. tourists (that is, an increase in U.S. tourist arrivals by 1 percent lowers non-U.S. arrivals by 0.3 percent), whereas the Dominican Republic and Antigua have high statistically significant elasticities, indicating that as U.S. tourists increase, so do non-U.S. tourists.

the OECD, and the final tally are shown. The sensitivity of non-U.S. visitors to changes in U.S. visitors used to project arrivals under free trade is graphed for each destination in figure 5. Bars show the destination-specific elasticity to the arrival of American tourists. Dark bars represents the statistical significance level of the estimates (black is significant at 1 percent; white means insignificant). Turks and Caicos exhibit the strongest negative elasticity to U.S. tourists (that is, an increase in U.S. tourist arrivals by 1 percent lowers non-U.S. arrivals by 0.3 percent), whereas the Dominican Republic and Antigua have highly statistically significant elasticities, indicating that as U.S. tourists increase, so do non-U.S. tourists. For Cuba, the elasticity of non-U.S. arrivals to changes in U.S. arrivals is assumed to be the maximum of the observed estimates for the region (that is, –0.31). For most countries, a change in U.S. arrivals can be thought of as a marginal change, but for Cuba, this change implies a nearly

tenfold increase, so that there would be significant effects, and hence a large reaction is assumed. The estimate for the change in U.S. tourists in response to relative prices (estimated via the H1N1 and passport shocks in table 2) is also assumed to be slightly lower than the point estimate of 0.27 (that is, the scenario assumes 0.2). This point estimate implies that each country loses 20 percent of its current U.S. tourists to Cuba in an eventual opening, instead of 27 percent. The reason for the adjustment is (i) binding capacity constraints in Cuba and (ii) the 27 percent is not statistically different from zero.

The projection in table 3 suggests that Cuba would gain approximately 3 million U.S. tourists on impact (not including another approximately 250,000 U.S.-based Cuban expatriates). Of these, approximately 1 million would be new to the region, and the other 2 million would come from the loss of U.S. tourists in competing destinations as travel costs change. The estimate of $\beta_{Passport,\ H1N1} = 0.27$ implies that approximately 27 percent of U.S. tourists elsewhere in the Caribbean would divert to Cuba with this relative price shock (0.2 is used in the projection to accommodate short-run capacity constraints in Cuba). This inflow would cause approximately three-fourths of Cuba's non-U.S. tourists to exit (based on $\beta_{\Delta US} = -0.3$, the maximum of observed elasticities to U.S. arrivals (–0.31 times the log-change in U.S. arrivals from 41,000 to 3 million subtracted from the log of non-U.S. arrivals in Cuba, approximately 2 million). Hence, Cuba would go from having 2 million non-U.S. tourists and 41,000 U.S. tourists to having approximately 3 million U.S. tourists and approximately 750,000 non-U.S. tourists (including 250,000 Cuban expatriates).

The 1.5 million non-U.S. tourists exiting Cuba are assumed distributed across Caribbean destinations according to the current distribution. In addition, the decline in U.S. tourists would be positively associated with increases in non-U.S. tourists for some destinations and negatively for others (figure 5). The table shows the growth rate in the final analysis, which indicates that Cuba would gain the most from the relative price decline for U.S. tourists, increasing arrivals by approximately 64 percent. Nonetheless, other large and well-diversified destinations would increase total arrivals as well, for example, Costa Rica and the Dominican Republic. Destinations such as Cancun or Jamaica that depend heavily on U.S. arrivals would be unable to compensate for the loss with non-U.S. arrivals. Finally, the results show Venezuela and Colombia as gaining in percentage terms, and though these countries have substantial potential given their size and geographic location, they are still relatively small destinations in absolute terms.

Conclusions

Imposing trade barriers raises costs and distorts the flow of commerce. Using tourist-miles as a cost proxy for current tourism restrictions, the cost to U.S. consumers of traveling to Cuba is estimated to be at least 7,000 nautical miles. This cost increase has permitted distant tourist destinations to accommodate artificially high numbers of U.S. arrivals for decades, when in the absence of this restriction, less costly alternative destinations are available.

The results presented suggest an increase of Caribbean tourism arrivals of roughly 4 percent, and a shift toward U.S. tourism. U.S. consumers will experience an increase in purchasing power as the deadweight loss of the current policy is eliminated. For Caribbean competitors, opening Cuba to U.S. tourists implies hedging toward alternative tourist sources, as U.S. visitor losses will occur on impact. The results suggest that binding capacity constraints in Cuba would likely displace current tourists as new U.S. arrivals with immensely lower travel costs compete for limited hotel rooms. Capturing this short-term dislocation is important for offsetting potential U.S. tourist losses. The results also suggest that permanent declines in travel costs for U.S. tourists alongside their importance in this market could increase their long-term presence in the region. As U.S. tourists are able to spend less on getting to their destination, they are able to outbid other visitors for greater tourism quality and quantities.

While future industry uncertainty is unavoidable, a long-term strategy to deal with the elimination of the implicit trade protection afforded by restricted tourism is needed. The results suggest a number of directions for competing in an unrestricted Caribbean tourism industry. First, there is scope for breaking up the value chain, specializing, and delivering customized services to clients that base demand on differing cultures and nationalities. Second, while there is no evidence that having a domestic airline significantly helps tourism, access to OECD airlines is important, so that increasing overall access to airlines (including charters) helps. Natural disasters affect countries differently, and the evidence presented here and in other studies supports improving building codes and preparedness, lowering transaction costs, and improving financial sector soundness and the macro framework to weather net capital inflows in the wake of these storms. Opening to trade in other areas through, for example, free-trade agreements, also boosts arrivals, as does strengthening historical and colonial links. Most important, delaying until a time when this policy is potentially reversed is a missed opportunity that could prove costly—deliberately acting to reform ahead of this large loss in implicit trade preferences is crucial.

Comment

Lorenzo L. Perez: This is an excellent paper that addresses the tricky question of the implications for the Caribbean of opening up Cuba to U.S. tourism. Romeu does a very professional job. The data collection is carefully done and the well-known trade gravity model is specified in line with the requirements of the case. Romeu's model has very strong explanatory power, which is rare for this type of model.

The model estimates the impact of prohibiting U.S. citizens from travel to Cuba as tourists to be very large. For U.S. citizens the prohibition has the same effect as if Cuba were in Oceania (7,000 nautical miles away). Therefore, were the prohibition removed, American citizens would experience a sharp drop in travel costs to Cuba. The not-too-surprising conclusion is that were the travel prohibition lifted, the number of American tourists could reach some 3 million in Cuba. This would lead to very important changes in Caribbean tourism.

However, Romeu's results also indicate that, overall, there will be an increase in U.S. tourism to the Caribbean because Americans will have more purchasing power to travel to this area after the prohibition is lifted. This, combined with the fact that Cuba is likely to reach full capacity quickly with the existing investment in tourism, will tend to displace non-U.S. tourists to other Caribbean destinations. Romeu estimates that overall tourism to the Caribbean will increase by about 4 percent and that more Americans will travel to the Caribbean in general once travel restrictions to Cuba are lifted.

So not all is lost. While other Caribbean countries will be negatively affected by the opening of Cuba, Romeu's analysis also shows that if they exploit assets such as cultural affinities, have more open trade in other areas (for example, free-trade agreements), and take advantage of specialized parts of the tourist market, they should be able to attract non-U.S. tourists who previously traveled to Cuba, and this will help offset some of the losses from Americans being diverted to Cuba. So this paper is able to go beyond the

obvious analysis and draws some conclusions that have policy implications for Caribbean countries.

Notwithstanding these clear and empirically backed conclusions, two comments can be made regarding them.

First, the short-run effect of the lifting of the prohibition of U.S. citizens to travel to Cuba may be actually underestimated by the model because of the novelty factor, which cannot be fully captured by a gravity model. Because Cuba has been "forbidden fruit" for decades, and there is a strong pent-up American demand, it is quite possible that more American tourists will travel to Cuba during the first few years after the ban is lifted than has been estimated by this model.

Second, over the medium term, Cuba will need to be competitive with the rest of the Caribbean. Cuba is among the high-cost destinations in the region, and it is not clear that the country is very competitive in terms of value for your money or quality of service. Also, it is possible that unless changes are made, as tourists become more familiar with the economic and political conditions facing the Cuban people, the country could become a less attractive destination to visit.

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