Online Appendix: Tourism and Economic Development: Evidence from Mexico's Coastline

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Abstract

Appendix 1 presents figures and tables referenced in the main text. Appendix 2 provides additional description of the datasets. Appendix 3 expands on solution for model-based counterfactuals. Appendix 4 provides details of calibration and counterfactual estimation.

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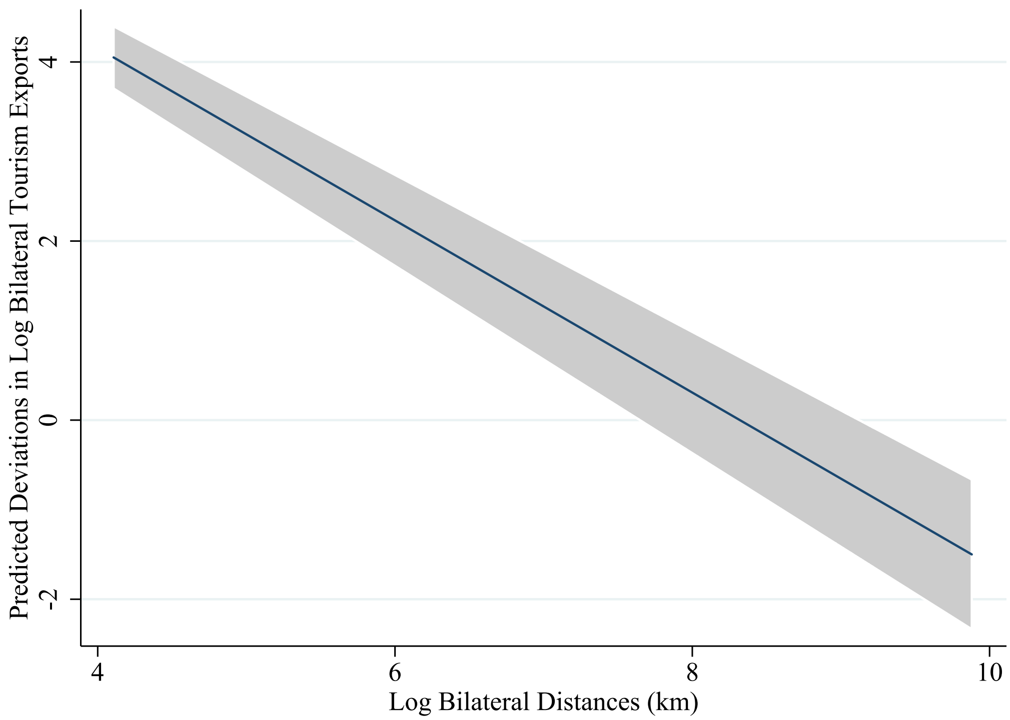
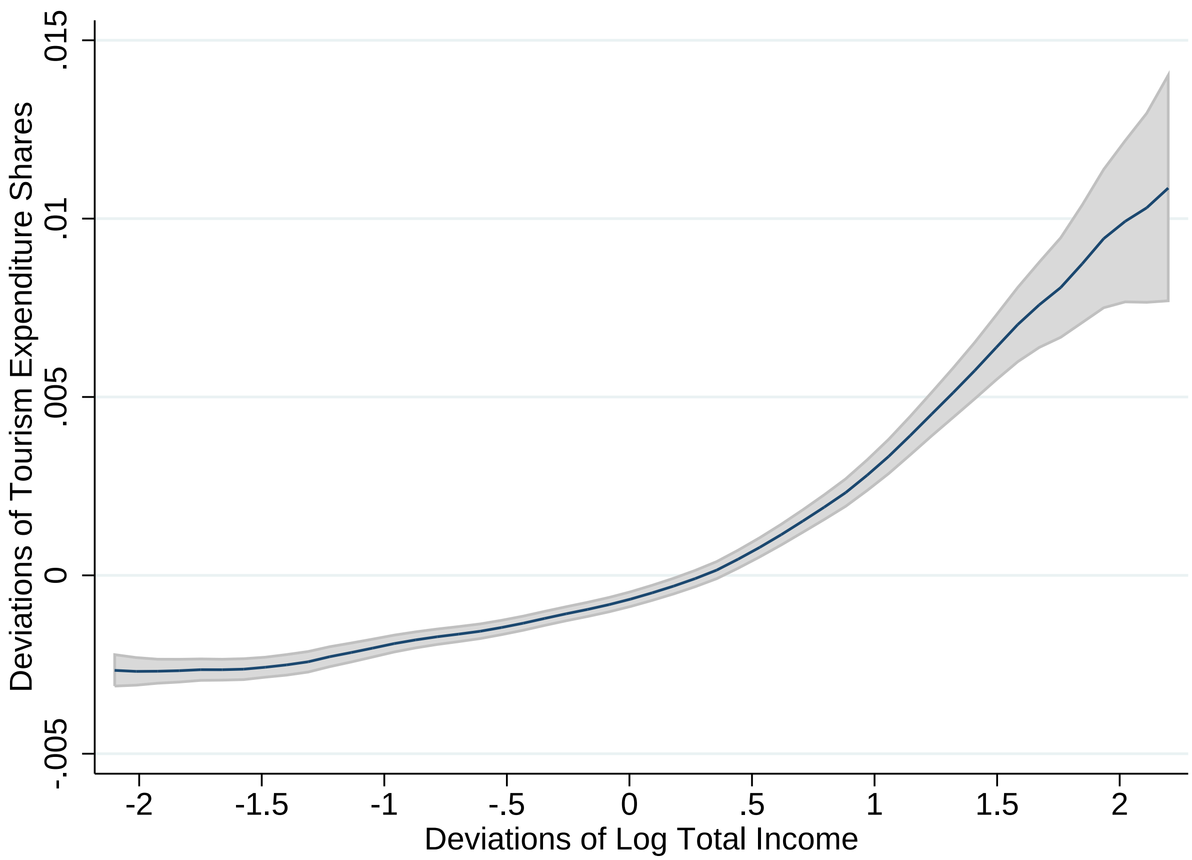
Appendix 1: Additional Figures and Tables

Figure A.1: Tourism's Distance Decay



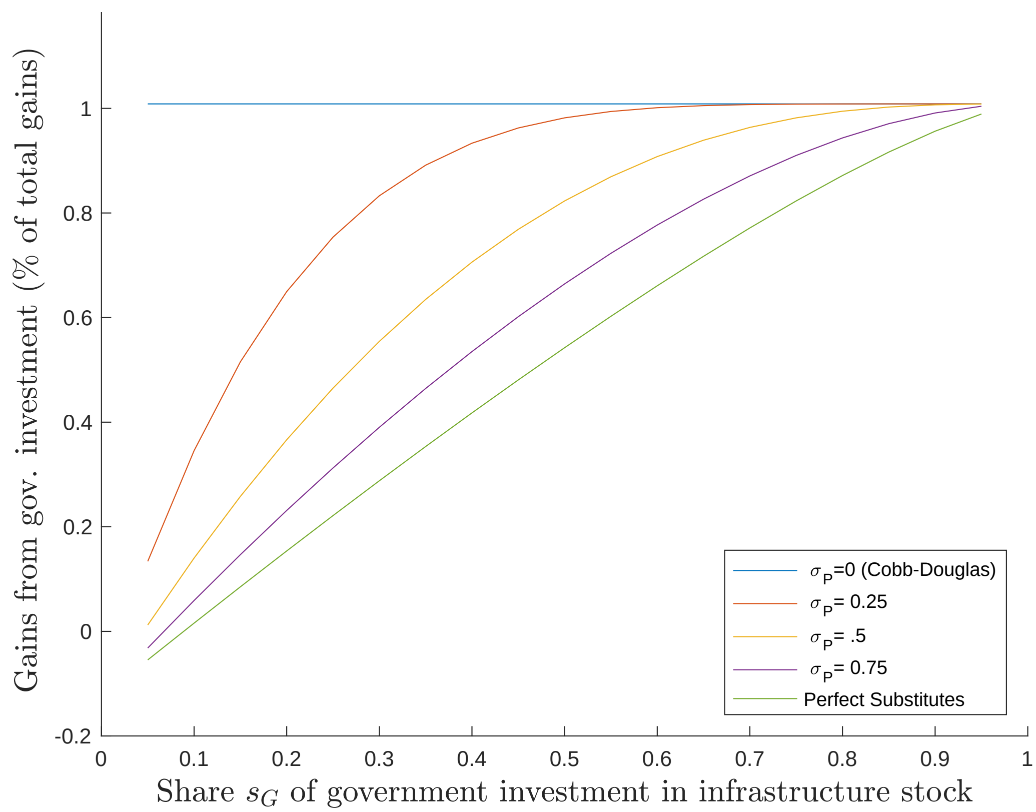
Notes: See Section 5.1 for discussion. The estimated slope and confidence interval are based on the partial prediction from a PPML regression with bilateral tourism exports on the left-hand side and log bilateral distances in addition to origin-by-year fixed effects, destination-by-year fixed effects, and dummies for common border, language, colonial ties and travel visa requirements on the right-hand side. The figure depicts 95% confidence intervals based on standard errors that are clustered at the level of origin-destination pairs.

Figure A.2: Tourism Engel Curve



Notes: See Section 5.2 for discussion. The graph depicts a non-parametric plot of deviations of tourism expenditure shares (y-axis) against deviations of log household income, both relative to municipality-by-period means. The data source is the Mexican household income and expenditure survey 2004 (ENIGH). The graph also depicts confidence intervals based on standard errors that are clustered at the level of municipalities. The number of household observations is 22,595, and the point estimate of the slope is 0.0033 estimated with a t-statistic of 11.09.

Figure A.3: The Role of Government Investment Across Alternative Cases of the Tourism Production Function



Notes: See Appendix 4.6 for discussion.

Table A.1: Descriptive Statistics

Data Source	Variable	1998 Censos Economicos or 2000 Population Census					2008 Censos Economicos or 2010 Population Census				
		N	mean	sd	min	max	N	mean	sd	min	max
Censos Economicos	state id	2,434	19.30	7.32	1.00	32.00	2,455	19.26	7.34	1.00	32.00
	gdp	2,434	1,528,000.00	9,613,000.00	6.00	251,800,000.00	2,455	4,480,000.00	27,220,000.00	21.00	704,200,000.00
	log gdp	2,434	9.92	2.97	1.79	19.34	2,455	10.92	2.96	3.05	20.37
	hotel sales	2,434	12,847.00	138,994.00	0.00	5,230,000.00	2,455	38,668.00	433,757.00	0.00	13,730,000.00
	log hotel sales	2,434	3.28	3.92	0.00	16.16	2,455	4.53	4.26	0.00	17.13
	number of hotels	2,434	4.42	18.53	0.00	431.00	2,455	7.51	26.72	0.00	457.00
Population Census	population	2,434	39,832.00	119,060.00	105.00	1,763,000.00	2,455	45,603.00	132,175.00	90.00	1,794,000.00
	log population	2,434	9.34	1.50	4.65	14.38	2,455	9.42	1.56	4.50	14.40
	employment	2,434	14,542.00	48,042.00	34.00	825,945.00	2,455	17,999.00	60,391.00	37.00	874,120.00
	log employment	2,434	8.17	1.56	3.53	13.62	2,455	8.27	1.64	3.61	13.68
Satellite Data and GIS	coast id	2,434	0.06	0.24	0.00	1.00	2,455	0.06	0.24	0.00	1.00
	island dummy	2,434	0.0189	0.136	0	1	2,455	0.0191	0.137	0	1
	share of nice beach within 100 m of coast	2,434	0.000367	0.00602	0	0.177	2,455	0.000366	0.00599	0	0.177
	presence of pre-Hispanic ruins	2,434	0.0312	0.174	0	1	2,455	0.0318	0.175	0	1
	distance to northern border (km)	2,434	753.40	265.80	6.59	1,348.00	2,455	755.10	266.00	6.59	1,348.00
	distance to Mex City (km)	2,434	453.70	372.50	2.30	2,271.00	2,455	454.20	372.10	2.30	2,271.00
Mexican Statistical Institute (INEGI)	state capital dummy	2,434	0.02	0.14	0.00	1.00	2,455	0.02	0.14	0.00	1.00
	old city dummy	2,434	0.02	0.13	0.00	1.00	2,455	0.02	0.13	0.00	1.00
	colonial port dummy	2,434	0.00	0.03	0.00	1.00	2,455	0.00	0.03	0.00	1.00
	average monthly temperature (Celsius x 10)	2,434	197.30	40.30	104.50	290.30	2,455	197.40	40.36	104.50	290.30
	average monthly precipitation (mm)	2,434	88.79	50.57	5.99	336.50	2,455	89.15	50.77	5.99	336.50

See Section 2 for a description of the datasets.

Table A.2: Accommodation Share in Total Mexican Tourism Expenditure 2003-2013

Year	Share of Accommodation in Total Tourism Expenditure
2003	0.130
2004	0.125
2005	0.126
2006	0.124
2007	0.126
2008	0.126
2009	0.125
2010	0.127
2011	0.127
2012	0.127
2013	0.129
Average 2003-13	0.127

Notes: See Sections 2 and 3 for discussion. The data source is the tourism satellite account of Mexico's national account statistics.

Table A.3: Wavelength Ranges Among the Top-Ranked Beaches in Mexico

Beaches	Bandwidth 1		Bandwidth 2		Bandwidth 3		Bandwidth 4		Bandwidth 5		Bandwidth 6	
	min	max	min	max	min	max	min	max	min	max	min	max
Playa del Carmen	72	125	67	110	79	120	119	175	69	142	41	93
Tulum	81	106	74	94	99	120	121	153	97	133	56	84
Cozumel	71	111	66	101	78	102	113	157	96	138	59	86
Cancun	81	111	72	101	74	102	38	149	15	125	7	71
Acapulco	50	53	56	59	64	67	76	78	80	94	60	76
Mazatlan	50	53	56	60	64	68	76	81	81	81	55	57
Puerto Vallarta	56	58	71	73	87	89	101	105	120	125	103	108
Los Cabos	55	59	78	97	84	89	86	105	85	121	59	101

Notes: See Section 3 for discussion. The table presents the wavelength ranges of the top 8 beaches in Mexico as identified by U.S. News. The data source are LandSat satellite data from 1980s and 90s at a resolution of 30x30 meters.

Table A.4: Model-Based Test of Direct Effect on Local Residential Amenities

Dependent variable:	Log Municipality Residential Amenities		
	(1)	(2)	(3)
	Not Using Island Dummy	Not Using Beach Measure	Not Using Ruins Dummy
Left -Out Measure of Attractiveness	-0.0238	0.0997	0.183
	(0.323)	(2.958)	(0.365)
Coast FX	✓	✓	✓
Full Set of Controls	✓	✓	✓
Observations	300	300	300
R-Squared	0.344	0.354	0.349
Number of Clusters	32	32	32

Notes: See Sections 3.2 and 5.1 for discussion. Nearby Island Dummy is an indicator whether an offshore island is within 5 km of the municipalities' coastline. Onshore Fraction of White Beach is the fraction of municipality area within 100 m of the coastline covered by white sand pixels that lie within the wavelength ranges of the 8 top-ranked Mexican beaches. Pre-Hispanic Ruins Dummy is an indicator of the presence of archaeological ruins. Standard errors are clustered at the level of Mexican states. * 10%, ** 5%, *** 1% significance levels.

Table A.5: Checking Correlations of Amenity Measures

Dependent Variable: Log of Estimated Municipality Amenities	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log Average Temperature	3.087***						
	(1.107)						
Log Fraction of Green Land in Municipality		0.336***					
		(0.110)					
Log Robberies Per Capita			-0.334				
			(0.216)				
Log Density of Cars (Cars per Capita)				-0.674***			
				(0.238)			
Log Square Km of Water Bodies in Municipality					0.265***		
					(0.0636)		
Log Number of Water Bodies in Municipality						0.340***	
						(0.0888)	
Log Distance to Ocean							-0.251**
							(0.0996)
Coast FX	✓	✓	✓	✓	✓	✓	✓
Observations	300	288	276	275	300	300	300
R-Squared	0.171	0.186	0.098	0.155	0.237	0.237	0.110
Number of State Clusters	32	32	32	32	32	32	32

Notes: See Section 2 and Appendix 2 for description of the data and Sections 3.2 and 5.1 for discussion. The data on parcels of green land relative to total land, the number of robberies and the number of registered vehicles are from the year 2005 and were provided to us as part of INEGI's Sistema Estatal y Municipal de Bases de Datos (SIMBAD). Access to inland bodies of water and ocean stem from aerial surface data from INEGI's geo-statistics division. Where applicable, distance is defined in terms of centroids. Standard errors are clustered at the level of Mexican states. * 10%, ** 5%, *** 1% significance levels.

Table A.6: Heterogeneity of the Reduced Form

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable:	Number of Municipality Immigrants (Active & Retired)			Log (IHS) Number of Municipality Immigrants (Active and Retired)			Log (0+1) Number of Municipality Immigrants (Active and Retired)			Log Number of Municipality Immigrants (Active and Retired)		
Island Dummy	3,050**			2.077***			2.093***			1.617***		
	(1,477)			(0.301)			(0.298)			(0.315)		
Island * Retired Dummy	-3,636**			-1.870***			-2.024***			-1.838***		
	(1,446)			(0.194)			(0.178)			(0.237)		
Onshore Fraction of White Beach		102,405			17.39**			17.64**			11.91	
		(65,179)			(7.633)			(7.595)			(8.364)	
Onshore Beach * Retired Dummy		-108,599*			-7.848			-11.70**			-18.29***	
		(62,905)			(5.091)			(4.571)			(3.252)	
Ruins Dummy			936.6**			1.390***			1.374***			1.187***
			(462.4)			(0.212)			(0.212)			(0.211)
Ruins * Retired Dummy			-1,015**			-0.960***			-1.033***			-0.889***
			(460.4)			(0.163)			(0.156)			(0.269)
Coast-By-Period FX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	9,778	9,778	9,778	9,778	9,778	9,778	9,778	9,778	9,778	5,545	5,545	5,545
R-Squared	0.048	0.068	0.035	0.599	0.596	0.599	0.562	0.557	0.561	0.158	0.151	0.159
Number of Municipality Clusters	2455	2455	2455	2455	2455	2455	2455	2455	2455	2432	2432	2432

Notes: See Section 2 and Appendix 2 for description of the data and Section 3.2 for discussion. Nearby Island Dummy is an indicator whether an offshore island is within 5 km of the municipalities' coastline. Onshore Fraction of White Beach is the fraction of municipality area within 100 m of the coastline covered by white sand pixels that lie within the wavelength ranges of the 8 top-ranked Mexican beaches. Pre-Hispanic Ruins Dummy is an indicator of the presence of archaeological ruins. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.7: Using Panel Variation to Estimate Effect of Tourism on Population (Decadal Changes)

	Population Censuses 1921-2010											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable: Log Municipality Population	Island Dummy				Onshore Fraction of White Beach				Pre-Hispanic Ruins Dummy			
	OLS	OLS	Shift-Share IV	Shift-Share IV	OLS	OLS	Shift-Share IV	Shift-Share IV	OLS	OLS	Shift-Share IV	Shift-Share IV
Log Tourist Arrivals Interacted with Attractiveness	0.155**	0.176**	0.149**	0.172**	3.516	4.486*	4.215	5.187*	0.103**	0.0562	0.116**	0.0701
	(0.0681)	(0.0749)	(0.0668)	(0.0741)	(2.705)	(2.553)	(2.841)	(2.698)	(0.0446)	(0.0447)	(0.0464)	(0.0463)
Year-By-Coast FX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Municipality FX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full Set of Controls Interacted with Time FX	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓
Observations	24,340	24,340	24,340	24,340	24,340	24,340	24,340	24,340	24,340	24,340	24,340	24,340
Number of Municipalities	2434	2434	2434	2434	2434	2434	2434	2434	2434	2434	2434	2434

Notes: See Section 2 for description of the data and Section 3.2 for discussion. The table is based on 10 rounds of decadal census data for consistent spatial units starting in 1921 and ending in 2010. Shift-share IV uses time series data on US airfares in constant USD to instrument for international tourist arrivals to Mexico. Nearby Island Dummy is an indicator whether an offshore island is within 5 km of the municipalities' coastline. Onshore Fraction of White Beach is the fraction of municipality area within 100 m of the coastline covered by white sand pixels that lie within the wavelength ranges of the 8 top-ranked Mexican beaches. Pre-Hispanic Ruins Dummy is an indicator of the presence of archaeological ruins. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.8: IV Estimation Robustness

Dependent variable:				Panel A: Log Municipality Employment 2000, 2010			
	Baseline	Omitted Variables			Excluding Origin Municipalities of Beach Ratings	Sensitivity to Cutoffs	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Coastal Elevation	Fishery Potential	Both		Island Within 10 km	Beach Cover Within 200 m
	Three IVs	Three IVs	Three IVs	Three IVs	Three IVs	Three IVs	Three IVs
Log Hotel Sales	0.245***	0.230***	0.246***	0.231***	0.255***	0.241***	0.250***
	(0.0406)	(0.0435)	(0.0404)	(0.0433)	(0.0532)	(0.0409)	(0.0399)
Log Mean Coastal Elevation		-0.411*		-0.420*			
		(0.243)		(0.241)			
Log Stand Dev of Coastal Elevation		0.108		0.118			
		(0.137)		(0.138)			
Log Mean Ocean Primary Productivity			0.0371	0.0392			
			(0.0608)	(0.0603)			
Year-By-Coast FX	✓	✓	✓	✓	✓	✓	✓
Full Set of Controls	✓	✓	✓	✓	✓	✓	✓
Observations	4,889	4,889	4,889	4,889	4,874	4,889	4,889
Number of Municipalities	2455	2455	2455	2455	2447	2455	2455
First Stage F-Stat	15.13	14.53	15.36	14.83	7.899	16.68	20.44
Over-ID Test P-Value	0.662	0.556	0.639	0.550	0.512	0.749	0.628
Dependent variable:				Panel B: Log Municipality Population 2000, 2010			
Log Hotel Sales	0.200***	0.183***	0.201***	0.183***	0.214***	0.195***	0.206***
	(0.0416)	(0.0443)	(0.0414)	(0.0442)	(0.0528)	(0.0419)	(0.0407)
Log Mean Coastal Elevation		-0.441*		-0.452*			
		(0.252)		(0.251)			
Log Stand Dev of Coastal Elevation		0.157		0.168			
		(0.141)		(0.141)			
Log Mean Ocean Primary Productivity			0.0345	0.0416			
			(0.0635)	(0.0623)			
Year-By-Coast FX	✓	✓	✓	✓	✓	✓	✓
Full Set of Controls	✓	✓	✓	✓	✓	✓	✓
Observations	4,889	4,889	4,889	4,889	4,874	4,889	4,889
Number of Municipalities	2455	2455	2455	2455	2447	2455	2455
First Stage F-Stat	15.13	14.53	15.36	14.83	7.899	16.68	20.44
Over-ID Test P-Value	0.699	0.686	0.678	0.680	0.470	0.807	0.676

Notes: See Section 3.3 for discussion. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Discussion: In columns 2-4, we find little support for the concern that our IV estimates may be driven by correlations with sea accessibility (flat terrain vs coastal cliffs) or local fishery potential (measured by primary ocean productivity). In column 5, we find little sensitivity to excluding the origin municipalities of the top-ranked beaches. In the final two columns, we find that doubling the cutoff values for island proximity or coastline ranges does not affect the point estimates.

Table A.9: Controlling for Local Crime and Security

	Population Census 2000, 2010					
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variables:		Log Employment			Log Population	
	Baseline	Control for Total Crime	Refined Crime Controls	Baseline	Control for Total Crime	Refined Crime Controls
Log Hotel Sales	0.245***	0.244***	0.232***	0.200***	0.199***	0.186***
	(0.0406)	(0.0406)	(0.0425)	(0.0416)	(0.0416)	(0.0437)
Total Reported Crimes Per Capita		-13.04***			-4.066	
		(5.007)			(5.100)	
Robberies Per Capita			52.94			75.87
			(43.37)			(48.69)
Homicides Per Capita			-99.41***			-86.63***
			(14.04)			(17.29)
Battery (Physical Violence) Per Capita			37.25			47.65
			(129.9)			(127.2)
Assault Per Capita			-107.8**			-82.01*
			(49.31)			(47.88)
Extorsion Per Capita			-54.77***			-52.23***
			(13.73)			(13.29)
Fraud			44.13			96.29
			(73.19)			(84.19)
Drug-Related Offenses Per Capita			332.7			1,047*
			(559.8)			(546.7)
Year-By-Coast FX	✓	✓	✓	✓	✓	✓
Full Set of Controls (Not Shown)	✓	✓	✓	✓	✓	✓
Observations	4,889	4,889	4,889	4,889	4,889	4,889
Number of Municipalities	2455	2455	2455	2455	2455	2455
First Stage F-Stat	15.13	15.89	15.31	15.13	15.89	15.31
Over-ID Test P-Value	0.662	0.640	0.727	0.699	0.691	0.825

Notes: See Section 2 for description of the data and Sections 3.3 and 5.1 for discussion. The data on different types of local crimes were provided to us as part of INEGI's Sistema Estatal y Municipal de Bases de Datos (SIMBAD). Crimes refer to both local and federal convictions occurring in the municipality. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Discussion: Related to the placebo test in Table 4, we also check the sensitivity of the IV estimates to the inclusion of a comprehensive list of controls for differences in the local crime and security environment. This exercise is useful to judge the extent to which the observed positive effect of tourism on total employment and population could be mediated by an improvement of local security due to tourism, which is a specific type of local amenity. Reassuringly, we find that the IV point estimates remain close to unchanged, while several of the crime controls (e.g. homicides, assaults, extorsions per capita) enter significantly and with the expected negative sign.

Table A.10: Share of Accommodation Expenses and Professional Travel across Destinations

Dependent Variables:	Share of Accommodation Expenditure in Tourism Expenditure at Destination		Share of Hotel Nights from Professional Travel			
	(1)	(2)	(3)	(4)	(5)	(6)
Share of Hotel Nights Spent	0.0154	0.0180	-0.0741***	-0.0723***	-0.00218	-0.00511
in Coastal Regions	(0.0147)	(0.0135)	(0.0111)	(0.0103)	(0.0218)	(0.0200)
Indicator for Top Third of					-0.0671***	-0.0627***
Destinations					(0.0161)	(0.0155)
Year Fixed Effects	✓	✓	✓	✓	✓	✓
Origin Fixed Effects	✗	✓	✗	✓	✗	✓
Observations	1,218	1,218	5,519	5,519	5,519	5,519
R-Squared	0.006	0.595	0.134	0.211	0.141	0.218
Number of Origin Clusters	28	28	30	30	30	30

Notes: See Section 3.3 for discussion. Regressions in columns 1 and 2 are based on EuroStat data that provide us with accommodation shares in tourist expenditures from a given European origin country across different European destination countries for the years 2012, 2013 and 2014 and for 30 European countries. Accommodation shares are relative to local tourist expenditures at the destination (excluding travel costs to get there). Regressions in columns 3-6 are based on Eurostat data on the share of hotel nights for professional travel from a given European origin country across 30 different European destination countries for the years 1999-2015. On the right hand side in all regressions, we use the Eurostat data on the share of total hotel nights spent by non-residents in a destination country that are located in coastal NUTS 2 regions within the destination country relative to non-coastal NUTS 2 regions. Standard errors are clustered at the level of origin countries. * 10%, ** 5%, *** 1% significance levels.
Discussion: We investigate to what extent measurement error in the relationship between hotel sales and total tourist expenditures could be systematically related to the instruments. In particular, we would over-estimate (under-estimate) the true causal effect of tourism on local economic outcomes if accommodation constituted a smaller (larger) fraction of tourist expenditure in places with islands, nicer beaches or archaeological sites, since the IVs would be positively (negatively) correlated with measurement error in the residual term. Related to this, it would be natural to assume that the share of professional travelers in local hotel revenues is lower among attractive beach destinations. To the extent that local expenditures of professional travelers should not be counted as tourism expenditure on the right-hand side of specification (1), this could lead to under-estimating the true causal effect of tourist expenses on local economic outcomes. Since our analysis is mainly based on comparing beach destinations along the coastline, rather than comparing e.g. Mexico City to Cancun, the latter concern would seem somewhat less likely.

To further assess these questions, we use available data on the composition of tourist expenses and the share of hotel nights booked for professional vs leisure travel across different destinations that we obtain from EuroStat. Related to the first question, we find that the accommodation share of tourist expenditures does not systematically differ across destinations with higher or lower fractions of coastal tourism (positive point estimate close to zero). Related to the second question, we find that destinations with higher shares of coastal tourism have significantly lower shares of professional travel, as expected. We also confirm that this relationship becomes insignificant with a point estimate close to zero after we include a dummy for predominantly coastal destinations (defined as destinations with three quarters of coastal tourism or more (40% of sample)). Taken together, these results suggest that the use of hotel sales as a measure of local tourism activity is unlikely to give rise to measurement error that is also systematically related to the three types of IVs we exploit.

Table A.11: Tourism's Effect on Municipality Employment and Population: Not Using IHS Transformation

Dependent variables:	Log Municipality Employment 2000, 2010			Log Municipality Population 2000, 2010		
	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline Specification (IHS Transformation) Three IVs	Log Hotel Sales (+1 for Zeroes) Three IVs	Log Hotel Sales (Ignore Zeroes) Three IVs	Baseline Specification (IHS Transformation) Three IVs	Log Hotel Sales (+1 for Zeroes) Three IVs	Log Hotel Sales (Ignore Zeroes) Three IVs
Log Hotel Sales	0.245***	0.254***	0.263***	0.200***	0.208***	0.214***
	(0.0406)	(0.0413)	(0.0574)	(0.0416)	(0.0426)	(0.0624)
Log Distance to US Border	-0.0163	-0.0185	0.0630	0.0341	0.0324	0.0920
	(0.0438)	(0.0432)	(0.0535)	(0.0460)	(0.0456)	(0.0573)
Log Distance to Mexico City	-0.549***	-0.562***	-0.449***	-0.591***	-0.602***	-0.480***
	(0.0526)	(0.0499)	(0.0446)	(0.0539)	(0.0514)	(0.0482)
Log Municipality Area	0.318***	0.335***	0.253***	0.370***	0.383***	0.284***
	(0.0525)	(0.0489)	(0.0291)	(0.0540)	(0.0505)	(0.0315)
State Capital Dummy	0.689***	0.666***	0.759***	0.627**	0.607**	0.683**
	(0.242)	(0.241)	(0.256)	(0.256)	(0.256)	(0.277)
Old City Dummy	0.924***	0.925***	0.961***	0.920***	0.920***	0.911***
	(0.268)	(0.265)	(0.257)	(0.285)	(0.282)	(0.278)
Colonial Port Dummy	0.597***	0.558***	0.688***	0.671***	0.639***	0.776***
	(0.205)	(0.209)	(0.246)	(0.216)	(0.218)	(0.273)
Log Average Precipitation	0.258***	0.266***	0.106**	0.245***	0.251***	0.101*
	(0.0409)	(0.0404)	(0.0519)	(0.0415)	(0.0412)	(0.0541)
Log Average Temperature	0.223**	0.222**	0.195	0.282***	0.281***	0.210
	(0.107)	(0.107)	(0.131)	(0.106)	(0.105)	(0.134)
Year-By-Coast FX	✓	✓	✓	✓	✓	✓
Observations	4,889	4,889	2,613	4,889	4,889	2,613
Number of Municipalities	2455	2455	1489	2455	2455	1489
First Stage F-Stat	15.13	15.46	14.86	15.13	15.46	14.86
Over-ID Test P-Value	0.662	0.731	0.843	0.699	0.749	0.813

Notes: See Section 3.3 for discussion. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.12: Tourism's Effect on Municipality Employment and Population: Using Number of Tourists

Dependent variables:	Log Municipality Employment 2000, 2010		Log Municipality Population 2000, 2010	
	(1)	(2)	(3)	(4)
	Baseline	Log Number Tourists	Baseline	Log Number Tourists
	Three IVs	Three IVs	Three IVs	Three IVs
Log Hotel Sales	0.245***		0.200***	
	(0.0406)		(0.0416)	
Log Number of Tourists		0.276***		0.227***
		(0.0737)		(0.0656)
Log Distance to US Border	-0.0163	-0.231***	0.0341	-0.142**
	(0.0438)	(0.0576)	(0.0460)	(0.0563)
Log Distance to Mexico City	-0.549***	-0.876***	-0.591***	-0.859***
	(0.0526)	(0.0381)	(0.0539)	(0.0365)
Log Municipality Area	0.318***	0.516***	0.370***	0.530***
	(0.0525)	(0.0335)	(0.0540)	(0.0308)
State Capital Dummy	0.689***	0.110	0.627**	0.144
	(0.242)	(0.476)	(0.256)	(0.423)
Old City Dummy	0.924***	0.777**	0.920***	0.793**
	(0.268)	(0.396)	(0.285)	(0.358)
Colonial Port Dummy	0.597***	-1.318*	0.671***	-0.910
	(0.205)	(0.799)	(0.216)	(0.707)
Log Average Precipitation	0.258***	0.394***	0.245***	0.356***
	(0.0409)	(0.0579)	(0.0415)	(0.0550)
Log Average Temperature	0.223**	0.680***	0.282***	0.657***
	(0.107)	(0.164)	(0.106)	(0.153)
Year-By-Coast FX	✓	✓	✓	✓
Observations	4,889	4,889	4,889	4,889
Number of Municipalities	2455	2455	2455	2455
First Stage F-Stat	15.13	4.730	15.13	4.730
Over-ID Test P-Value	0.662	0.959	0.699	0.960

Notes: See Section 3.3 for discussion. Both log hotel revenues and log number of tourists are computed with the inverse hyperbolic sine transformation. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.13: Tourism's Effect on Municipality Population: Using 100% Census Samples

Dependent variable:	Log Census Population 2000 and 2010			
	(1)	(2)	(3)	(4)
	10% Sample Data (IPUMS)		100% Sample Data (INEGI)	
	OLS	Three IVs	OLS	Three IVs
Log Hotel Sales	0.200***	0.200***	0.200***	0.202***
	(0.00564)	(0.0416)	(0.00563)	(0.0413)
Log Distance to US Border	0.0341	0.0341	0.0300	0.0310
	(0.0427)	(0.0460)	(0.0425)	(0.0457)
Log Distance to Mexico City	-0.592***	-0.591***	-0.590***	-0.588***
	(0.0284)	(0.0539)	(0.0283)	(0.0537)
Log Municipality Area	0.370***	0.370***	0.369***	0.367***
	(0.0171)	(0.0540)	(0.0170)	(0.0537)
State Capital Dummy	0.627***	0.627**	0.632***	0.624**
	(0.195)	(0.256)	(0.195)	(0.255)
Old City Dummy	0.920***	0.920***	0.920***	0.912***
	(0.233)	(0.285)	(0.233)	(0.283)
Colonial Port Dummy	0.672***	0.671***	0.673***	0.665***
	(0.143)	(0.216)	(0.143)	(0.214)
Log Average Precipitation	0.245***	0.245***	0.246***	0.245***
	(0.0407)	(0.0415)	(0.0407)	(0.0414)
Log Average Temperature	0.282***	0.282***	0.280***	0.279***
	(0.104)	(0.106)	(0.104)	(0.106)
Year-By-Coast FX	✓	✓	✓	✓
Observations	4,889	4,889	4,889	4,889
Number of Municipalities	2455	2455	2455	2455
First Stage F-Stat		15.13		15.13
Over-ID Test P-Value		0.699		0.701

Notes: See Section 3.3 for discussion. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.14: Coastal vs Inland Variation

Dependent variable:	Log Municipality Employment 2000, 2010			Log Municipality Population 2000, 2010		
	(1)	(2)	(3)	(4)	(5)	(6)
	All Municipalities	Coastal Municipalities Only	Interacted Controls	All Municipalities	Coastal Municipalities Only	Interacted Controls
	Island and Beach IVs	Island and Beach IVs	Island and Beach IVs	Island and Beach IVs	Island and Beach IVs	Island and Beach IVs
Log Hotel Sales	0.279***	0.279***	0.257***	0.241***	0.241***	0.218***
	(0.0493)	(0.0493)	(0.0661)	(0.0514)	(0.0514)	(0.0706)
Year-By-Coast FX	✓	✓	✓	✓	✓	✓
Full Set of Controls Interacted with Coast FX			✓			✓
Observations	4,889	297	4,889	4,889	297	4,889
Number of Municipalities	2455	150	2455	2455	150	2455
First Stage F-Stat	15.72	15.48	10.63	15.72	15.48	10.63
Over-ID Test P-Value	0.178	0.178	0.469	0.178	0.178	0.469

Notes: See Section 3.3 for discussion. Island IV is a dummy indicating whether an offshore island is within 5 km of the municipalities' coastline. Beach IV is the fraction of municipality area within 100 m of the coastline covered by white sand pixels that lie within the wavelength ranges of the 8 top-ranked Mexican beaches. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.15: Tourism's Effect on Municipality Employment and Population: 2SLS vs LIML

Dependent variable:	Log Municipality Employment 2000, 2010		Log Municipality Population 2000, 2010	
	(1)	(2)	(3)	(4)
	2SLS	LIML	2SLS	LIML
	Three IVs	Three IVs	Three IVs	Three IVs
Log Hotel Sales	0.24497***	0.24570***	0.19978***	0.19978***
	(0.04059)	(0.04169)	(0.04156)	(0.04273)
Log Distance to US Border	-0.01629	-0.01594	0.03410	0.03410
	(0.04385)	(0.04402)	(0.04598)	(0.04618)
Log Distance to Mexico City	-0.54851***	-0.54770***	-0.59145***	-0.59144***
	(0.05261)	(0.05364)	(0.05393)	(0.05503)
Log Municipality Area	0.31818***	0.31728***	0.36955***	0.36954***
	(0.05253)	(0.05383)	(0.05397)	(0.05534)
State Capital Dummy	0.68907***	0.68614***	0.62698**	0.62697**
	(0.24213)	(0.24492)	(0.25613)	(0.25920)
Old City Dummy	0.92440***	0.92156***	0.91992***	0.91991***
	(0.26803)	(0.27030)	(0.28497)	(0.28758)
Colonial Port Dummy	0.59672***	0.59392***	0.67134***	0.67133***
	(0.20499)	(0.20822)	(0.21552)	(0.21892)
Log Average Precipitation	0.25810***	0.25797***	0.24461***	0.24461***
	(0.04088)	(0.04093)	(0.04148)	(0.04153)
Log Average Temperature	0.22324**	0.22296**	0.28170***	0.28170***
	(0.10748)	(0.10756)	(0.10585)	(0.10592)
Year-By-Coast FX	✓	✓	✓	✓
Observations	4,889	4,889	4,889	4,889
Number of Municipalities	2455	2455	2455	2455

Notes: See Section 3.3 for discussion. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.16: Excluding or Controlling for Planned Tourism Centers

	Population Census 2000, 2010						Censos Economicos 1998, 2008					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variables:	Log Employment			Log Population			Log GDP			Log Manu GDP		
	(Baseline)			(Baseline)			(Baseline)			(Baseline)		
Log Hotel Sales	0.245***	0.265***	0.238***	0.200***	0.222***	0.193***	0.404***	0.416***	0.354***	0.394***	0.484***	0.411***
	(0.0406)	(0.0508)	(0.0533)	(0.0416)	(0.0510)	(0.0533)	(0.0713)	(0.0895)	(0.0936)	(0.0939)	(0.127)	(0.134)
Year-By-Coast FX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full Set of Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Add Controls for Planned Centers and Distance		✓			✓			✓			✓	
Drop Planned Centers			✓			✓			✓			✓
Observations	4,889	4,889	4,875	4,889	4,889	4,875	4,889	4,889	4,875	4,889	4,889	4,875
Number of Municipalities	2455	2455	2448	2455	2455	2448	2455	2455	2448	2455	2455	2448
First Stage F-Stat	15.13	8.899	7.956	15.13	8.899	7.956	15.13	8.899	7.956	15.13	8.899	7.956
Over-ID Test P-Value	0.662	0.160	0.323	0.699	0.194	0.294	0.302	0.540	0.859	0.457	0.861	0.747

Notes: See Section 3.3 for discussion. The table presents second-stage IV point estimates using the three IVs combined. The first column for each outcome variable presents the baseline estimate. The second column presents the estimate after controlling for the location of FONATUR's planned tourism centers (dummy variable) as well as the log municipality distance to nearest of them (using the IHS transformation to deal with 0 distances). The third column drops planned tourism centers. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.17: Tourism's Effect on Traded Sector Production By Degree of Input Intensity

	(1)	(2)	(3)	(4)
Dependent variable: Log Manufacturing GDP	Below Median Input Intensity (10 Sectors)	Above Median Input Intensity (11 Sectors)	Sectors Not in Tourism Satellite Use Table (16 Sectors)	Sectors in Tourism Satellite Use Table (5 Sectors)
	Three IVs	Three IVs	Three IVs	Three IVs
Panel A: Left Hand Side with IHS Transformation				
Log Hotel Sales	0.497***	0.529***	0.448***	0.672***
	(0.0984)	(0.102)	(0.0930)	(0.113)
Year-By-Coast-By-Sector FX	✓	✓	✓	✓
Full Set of Controls	✓	✓	✓	✓
Observations	53,779	48,890	73,335	29,334
Number of Municipalities	2455	2455	2455	2455
First Stage F-Stat	15.16	15.16	15.16	15.15
Over-ID Test P-Value	0.323	0.502	0.387	0.493
Panel B: Left Hand Side with Log(Zero+1)				
Log Hotel Sales	0.466***	0.491***	0.418***	0.629***
	(0.0929)	(0.0962)	(0.0873)	(0.107)
Year-By-Coast-By-Sector FX	✓	✓	✓	✓
Full Set of Controls	✓	✓	✓	✓
Observations	53,779	48,890	73,335	29,334
Number of Municipalities	2455	2455	2455	2455
First Stage F-Stat	15.16	15.16	15.16	15.15
Over-ID Test P-Value	0.315	0.483	0.374	0.481
Panel C: Left Hand Side with Simple Logs (Dropping Zeroes)				
Log Hotel Sales	0.359***	0.457***	0.388***	0.431***
	(0.0721)	(0.0714)	(0.0619)	(0.0944)
Year-By-Coast-By-Sector FX	✓	✓	✓	✓
Full Set of Controls	✓	✓	✓	✓
Observations	19,637	13,516	21,184	11,969
Number of Municipalities	2224	2057	2161	2203
First Stage F-Stat	14.83	14.57	16.33	12.45
Over-ID Test P-Value	0.460	0.739	0.552	0.771

Notes: See Section 3.3 for discussion. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.18: Checking Effect of IVs in 2000 vs 2010

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variables:		Employment			Population			GDP			Manufacturing GDP	
Nearby Island Dummy	0.526**			0.435**			0.329			0.193		
	(0.222)			(0.222)			(0.374)			(0.417)		
Island x 2010	-0.0401			0.0227			0.0794			0.0810		
	(0.0381)			(0.0318)			(0.0979)			(0.134)		
Onshore Fraction of White Beach		9.215***			6.627*			21.27***			18.13***	
		(3.354)			(3.684)			(4.691)			(4.016)	
Beach x 2010		0.969			1.551***			-1.849			-3.506	
		(0.709)			(0.545)			(1.368)			(3.423)	
Pre-Hispanic Ruins Dummy			0.391***			0.291***			0.689***			0.824***
			(0.115)			(0.109)			(0.239)			(0.294)
Ruins x 2010			-0.0492			0.0170			-0.0755			-0.0944
			(0.0502)			(0.0221)			(0.0888)			(0.136)
Year-By-Coast FX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Full Set of Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	4,889	4,889	4,889	4,889	4,889	4,889	4,889	4,889	4,889	4,889	4,889	4,889
R-squared	0.478	0.478	0.478	0.475	0.475	0.475	0.380	0.381	0.381	0.272	0.273	0.274
Number of Municipalities	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455	2455

Notes: Nearby Island Dummy is an indicator whether an offshore island is within 5 km of the municipalities' coastline. Onshore Fraction of White Beach is the fraction of municipality area within 100 m of the coastline covered by white sand pixels that lie within the wavelength ranges of the 8 top-ranked Mexican beaches. Pre-Hispanic Ruins Dummy is an indicator of the presence of archaeological ruins. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.19: Checking Correlations of Tourism Shifters with IVs and Hotel Sales

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variables:	Log(Ãn)	Log(Ãn)	Log(Ãn)	Log Hotel Sales	Log(An)	Log(An)	Log(An)	Log Hotel Sales
Nearby Island Dummy	1.328***				1.242***			
	(0.411)				(0.414)			
Onshore Fraction of White Beach		22.45*				20.86*		
		(10.81)				(10.39)		
Pre-Hispanic Ruins Dummy			0.963*				0.924*	
			(0.485)				(0.482)	
Log(Ãn)				0.974***				
				(0.0512)				
Log(An)								0.984***
								(0.0523)
Full Set of Controls	✓	✓	✓	✓	✓	✓	✓	✓
Number of Regions	150	150	300	300	150	150	300	300
R-Squared	0.359	0.363	0.227	0.804	0.349	0.353	0.226	0.793

Notes: See Section 5.2 for discussion. Nearby Island Dummy is an indicator whether an offshore island is within 5 km of the municipalities' coastline. Onshore Fraction of White Beach is the fraction of municipality area within 100 m of the coastline covered by white sand pixels that lie within the wavelength ranges of the 8 top-ranked Mexican beaches. Pre-Hispanic Ruins Dummy is an indicator of the presence of archaeological ruins. Standard errors are clustered at the level of Mexican states. * 10%, ** 5%, *** 1% significance levels.

Table A.20: Within-Country Tourism Flows

Reported Top 5 Domestic Tourist Origin States Visiting Ciudad de Mexico	Predicted Rank of Origins to Ciudad de Mexico in Calibrated Model	Reported Top 5 Domestic Tourist Origin States Visiting Veracruz	Predicted Rank of Origins to Veracruz in Calibrated Model	Reported Top 5 Domestic Tourist Origin States Visiting Quintana Roo	Predicted Rank ofOrigins to Quinatana Roo in Calibrated Model
Mexico State	1	Ciudad de Mexico	1	Ciudad de Mexico	1
Puebla	2	Mexico State	2	Mexico State	2
Veracruz	4	Jalisco	4	Veracruz	4
Michoacan	8	Michoacan	10	Michoacan	13
Guerrero	10	Guerrero	12	Guerrero	15

Notes: See Section 5.1 for discussion.

Table A.21: Spatial Labor Supply Elasticity

Dependent Variable:	Log Municipality Employment 2000, 2010			
	(1)	(2)	(3)	(4)
	OLS	Three IVs	OLS	Three IVs
Log Nominal Wage	1.163***	5.150**		
	(0.262)	(2.362)		
Log Real Wage			1.910***	6.353**
			(0.348)	(2.608)
Log Distance to US Border	0.0325	0.441	0.0584	0.396
	(0.0986)	(0.308)	(0.0926)	(0.259)
Log Distance to Mexico City	-0.0291	0.0640	0.0554	0.315
	(0.142)	(0.144)	(0.130)	(0.224)
Log Municipality Area	0.297***	0.202**	0.302***	0.248***
	(0.105)	(0.0905)	(0.0963)	(0.0801)
State Capital Dummy	0.916***	-0.308	0.716**	-0.579
	(0.312)	(0.784)	(0.296)	(0.805)
Old City Dummy	-0.321	-1.041	-0.367	-0.961*
	(0.479)	(0.640)	(0.450)	(0.544)
Colonial Port Dummy	2.906***	2.481***	2.702***	1.940***
	(0.298)	(0.417)	(0.282)	(0.545)
Log Average Precipitation	0.375*	0.680*	0.350	0.500
	(0.211)	(0.393)	(0.210)	(0.343)
Log Average Temperature	-0.313	0.311	-0.250	0.321
	(0.897)	(0.986)	(0.866)	(0.905)
Coast FX	✓	✓	✓	✓
Observations	300	300	300	300
Number of Clusters	32	32	32	32
First Stage F-Stat		3.723		3.594
Over-ID Test P-Value		0.890		0.856

Notes: See Section 5.1 and Appendix 4 for discussion. Standard errors are clustered at the level of Mexican states. * 10%, ** 5%, *** 1% significance levels.

Table A.22: Tourism's Trade Elasticity

Dependent Variables:	Log Tourism Exports from Origin to Destination						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Same Year	Same Year	1-Year Lag	2-Year Lag	3-Year Lag	4-Year Lag	5-Year Lag
	OLS	IV	IV	IV	IV	IV	IV
Panel A: All Destinations							
Log Inverse Consumption PPP	-0.140***	-0.201	-0.419*	-0.550**	-0.715**	-0.710**	-0.351
	(0.0402)	(0.205)	(0.227)	(0.222)	(0.281)	(0.301)	(0.227)
Log Destination GDP	0.438***	0.410***	0.238**	0.0699	-0.104	-0.102	0.0216
	(0.0492)	(0.103)	(0.121)	(0.121)	(0.152)	(0.165)	(0.129)
Origin-by-Destination FX	✓	✓	✓	✓	✓	✓	✓
Origin-by-Period FX	✓	✓	✓	✓	✓	✓	✓
Observations	25,089	25,089	20,935	18,328	16,084	14,361	12,497
Number of Orig-Dest Pairs	2899	2899	2596	2513	2265	2169	2098
First Stage F-Stat		171.5	159.9	136.4	72.74	76.19	102.5
Panel B: Touristic Destinations Only							
Log Inverse Consumption PPP	-0.114***	-0.298	-0.488**	-0.571**	-0.656**	-0.616*	-0.361
	(0.0442)	(0.204)	(0.249)	(0.251)	(0.311)	(0.339)	(0.293)
Log Destination GDP	0.402***	0.312***	0.132	-0.00375	-0.141	-0.159	-0.109
	(0.0631)	(0.110)	(0.138)	(0.137)	(0.162)	(0.182)	(0.162)
Origin-by-Destination FX	✓	✓	✓	✓	✓	✓	✓
Origin-by-Period FX	✓	✓	✓	✓	✓	✓	✓
Observations	17,165	17,165	14,294	12,535	11,052	9,874	8,603
Number of Orig-Dest Pairs	1981	1981	1771	1710	1511	1474	1428
First Stage F-Stat		138.0	119.4	125.4	62.48	65.19	69.67

Notes: See Appendix 4 for discussion. Standard errors are clustered at the level of origin-by-destination pairs. * 10%, ** 5%, *** 1% significance levels.

Table A.23: The Gains from Tourism Across Alternative Parameter Combinations

		σ = ρ = 1.5	σ = ρ = 2.0	σ = ρ = 2.5	σ = ρ = 3.0	σ = ρ = 3.5	σ = ρ = 4.0	σ = ρ = 4.5	σ = ρ = 1.5	σ = ρ = 2.0	σ = ρ = 2.5	σ = ρ = 3.0	σ = ρ = 3.5	σ = ρ = 4.0	σ = ρ = 4.5
κ/(1-κε) = 6.35	γs = 0	4.23	2.96	2.58	2.44	2.39	2.39	2.42	0.90	0.90	0.90	0.89	0.86	0.83	0.79
	γs = 0.027	4.98	3.70	3.31	3.15	3.09	3.09	3.11	1.44	1.42	1.38	1.33	1.27	1.20	1.11
	γs = 0.057	5.76	4.44	4.03	3.86	3.79	3.77	3.79	1.90	1.84	1.78	1.69	1.59	1.48	1.35
	γs = 0.087	6.43	5.09	4.64	4.44	4.35	4.31	4.30	1.99	1.92	1.83	1.72	1.61	1.48	1.34
κ/(1-κε) = 4.35	γs = 0	4.24	3.00	2.64	2.50	2.45	2.46	2.50	1.00	1.00	0.99	0.97	0.95	0.91	0.86
	γs = 0.027	5.02	3.76	3.39	3.25	3.20	3.20	3.23	1.60	1.57	1.54	1.48	1.41	1.33	1.22
	γs = 0.057	5.84	4.56	4.17	4.02	3.96	3.96	3.99	2.19	2.14	2.06	1.97	1.86	1.72	1.56
	γs = 0.087	6.58	5.27	4.86	4.70	4.64	4.63	4.65	2.66	2.57	2.46	2.33	2.18	2.00	1.81
κ/(1-κε) = 2.35	γs = 0	4.30	3.08	2.73	2.60	2.56	2.58	2.62	1.14	1.13	1.12	1.10	1.07	1.02	0.95
	γs = 0.027	5.12	3.89	3.54	3.40	3.36	3.38	3.42	1.81	1.78	1.73	1.67	1.59	1.49	1.37
	γs = 0.057	6.01	4.77	4.40	4.27	4.23	4.24	4.28	2.53	2.46	2.38	2.27	2.14	1.98	1.80
	γs = 0.087	6.86	5.60	5.24	5.10	5.05	5.06	5.10	3.20	3.10	2.98	2.82	2.64	2.43	2.18

Notes: See Section 5.2 and Appendix 4 for discussion. The left panel reports the gains from tourism, and the right panel from international tourism. The highlighted cells indicate the model's best-fitting parameter calibration given the data.

Table A.24: The Gains from Tourism Across Alternative Parameter Combinations

		$\sigma=\rho$ = 1.5	$\sigma=\rho$ = 2.0	$\sigma=\rho$ = 2.5	$\sigma=\rho$ = 3.0	$\sigma=\rho$ = 3.5	$\sigma=\rho$ = 4.0	$\sigma=\rho$ = 4.5	$\sigma=\rho$ = 1.5	$\sigma=\rho$ = 2.0	$\sigma=\rho$ = 2.5	$\sigma=\rho$ = 3.0	$\sigma=\rho$ = 3.5	$\sigma=\rho$ = 4.0	$\sigma=\rho$ = 4.5
$\kappa/(1-\kappa\varepsilon) = 6.35$	$\gamma_M = 0$	7.85	6.57	6.18	6.03	5.97	5.97	5.99	3.91	3.78	3.63	3.45	3.23	2.97	2.69
	$\gamma_M = 0.024$	7.28	5.98	5.57	5.41	5.34	5.33	5.35	3.26	3.16	3.02	2.87	2.68	2.47	2.23
	$\gamma_M = 0.044$	6.84	5.51	5.08	4.91	4.83	4.81	4.82	2.68	2.59	2.48	2.34	2.19	2.02	1.82
	$\gamma_M = 0.064$	6.43	5.09	4.64	4.44	4.35	4.31	4.30	1.99	1.92	1.83	1.72	1.61	1.48	1.34
$\kappa/(1-\kappa\varepsilon) = 4.35$	$\gamma_M = 0$	8.12	6.86	6.49	6.34	6.29	6.29	6.32	4.27	4.13	3.96	3.76	3.51	3.23	2.91
	$\gamma_M = 0.024$	7.52	6.25	5.87	5.72	5.67	5.66	5.69	3.67	3.55	3.41	3.23	3.02	2.78	2.50
	$\gamma_M = 0.044$	7.04	5.75	5.36	5.20	5.15	5.14	5.17	3.17	3.07	2.94	2.79	2.60	2.40	2.16
	$\gamma_M = 0.064$	6.58	5.27	4.86	4.70	4.64	4.63	4.65	2.66	2.57	2.46	2.33	2.18	2.00	1.81
$\kappa/(1-\kappa\varepsilon) = 2.35$	$\gamma_M = 0$	8.58	7.34	6.97	6.84	6.80	6.81	6.85	4.78	4.62	4.43	4.19	3.90	3.57	3.19
	$\gamma_M = 0.024$	7.93	6.68	6.32	6.18	6.14	6.15	6.19	4.19	4.05	3.89	3.68	3.43	3.14	2.82
	$\gamma_M = 0.044$	7.39	6.14	5.78	5.64	5.60	5.61	5.64	3.69	3.58	3.43	3.25	3.04	2.79	2.50
	$\gamma_M = 0.064$	6.86	5.60	5.24	5.10	5.05	5.06	5.10	3.20	3.10	2.98	2.82	2.64	2.43	2.18

Notes: See Section 5.2 and Appendix 4 for discussion. The left panel reports the gains from tourism, and the right panel from international tourism. The highlighted cells indicate the model's best-fitting parameter calibration given the data.

Table A.25: The Gains from Tourism Allowing for Non-Homotheticity

	Baseline Counterfactual	Allowing for Increase in Tourism Due to Higher Incomes
Gains from Tourism	4.64%	4.55%

Notes: See Section 5.2 for discussion.

Table A.26: IV Point Estimates of Endogenous Reduction in Trade Costs

	(1)	(2)	(3)
Dependent Variables:	Log Transport Time (Simple Average)	Log Transport Time (Population-Weighted Average)	Log Transport Time (GDP-Weighted Average)
Log Hotel Sales	-0.0276***	-0.0282***	-0.0360***
	(0.00586)	(0.0104)	(0.0138)
Year-By-Coast FX	✓	✓	✓
Full Set of Controls	✓	✓	✓
Observations	4,889	4,889	4,889
Number of Municipalities	2455	2455	2455
First Stage F-Stat	15.13	15.13	15.13

Notes: See Sections 3.3 and 5.2 for discussion. The table reports second-stage IV estimates using the island, beach and ruins instruments. "Transport Time" refers to the mean (or weighted mean as indicated) of municipality travel times to other municipalities and border crossings on the full terrestrial Mexican transport network. Standard errors are clustered at the level of municipalities. * 10%, ** 5%, *** 1% significance levels.

Table A.27: The Gains from Tourism Before and After Allowing for Endogenous Transport Cost Reductions

	Baseline Counterfactual	Allowing for Highway Connections to State Capitals	Allowing for 50 Percent Reduction in Transport Costs	Allowing for Estimated Reduction in Transport Costs (Elasticity 0.036)
Gains from Tourism	4.64	4.66	4.61	5.23
γ_S Estimate	0.087	0.086	0.08	0.086
γ_M Estimate	0.064	0.086	0.08	0.07

Notes: See Section 5.2 for discussion.

Table A.28: The Local Gains from Tourism Without Labor Mobility

Dependent variable:	Counterfactual Change in Log Local Worker Utility	
	(1)	(2)
Counterfactual Parameters	All Tourism κ = 0 Three IVs	International Tourism κ = 0 Three IVs
Counterfactual Change in Log Tourism GDP	0.237***	0.235***
	(0.0718)	(0.0715)
Full Set of Controls	✓	✓
Coast FX	✓	✓
Observations	300	300
Number of Clusters	32	32
First Stage F-Stat	3.533	3.515
OverID P-Value	0.178	0.180

Notes: See Appendix 4.6 for discussion. The point estimates are from an IV regression using the island, beach and ruins instruments. Standard errors are clustered at the level of Mexican states. * 10%, ** 5%, *** 1% significance levels.

Table A.29: The Gains from Tourism Accounting for Imperfect Competition and FDI

Fraction of Gains from Tourism if 35 Percent of Profits Are Repatriated (Relative to All Profits Remaining in Mexico)	0.772

Notes: See Appendix 4.6 for discussion.

Table A.30: The Gains from Tourism With Different Numbers of Regions

	300 Mexican Regions	2455 Mexican Regions
Gains from All Tourism	4.64%	4.78%
Gains from International Tourism	1.82%	1.78%

Notes: See Appendix 4.6 for discussion.

Table A.31: The Regional Implications of Tourism With Different Numbers of Regions

Dependent variable:	Counterfactual Change in Log Total GDP	
	(1)	(2)
	300 Mexican Regions	2455 Mexican Regions
Log Tourism GDP	0.409***	0.403***
	(0.0900)	(0.0996)
Coast FX	✓	✓
Full Set of Controls	✓	✓
Observations	300	2455
Welfare Gains	**0.0464**	**0.0478**
Number of Clusters	32	32

Notes: See Appendix 4.6 for discussion. The point estimates are from an IV regression using the island, beach and ruins instruments. Standard errors are clustered at the level of Mexican states. * 10%, ** 5%, *** 1% significance levels.

Appendix 2: Data

Hotel Revenues and Local Production Every five years the Mexican statistical institute INEGI undertakes a census of all economic establishments located in municipalities with more than 2500 inhabitants, and covers a representative sample of establishments in rural locations with less than 2500 inhabitants. In our analysis, we use the municipality-level data of the Censos Economicos 1999 and 2009, which contain information about economic activity in 1998 and 2008 respectively. The timing of these two datasets closely coincides with the two most recent national population censuses in Mexico in 2000 and 2010 that we describe below.

Our main explanatory variable of interest is municipality-level sales of hotels and other temporary accommodation (e.g. hostels). In our specifications, we label this variable as hotel sales. They are covered as part of the Censos Economicos Comerciales y de Servicios, from which we obtain two cross-sections of municipality hotel revenues for 1998 and 2008. We combine this information on hotel sales with data from the Censos Economicos for the same years on total municipality GDP, total municipality wage bill, and GDP broken up by sector of activity (e.g. manufacturing, mining, agriculture).

In the analysis, we interpret differences in log hotel sales across municipalities as effectively capturing proportional differences in total local tourism expenditures. The reason is that the available data for other tourist expenditures, such as restaurants, do not distinguish between sales to local residents vs visiting non-residents. The underlying assumption is that hotel sales are a constant share of tourist expenditure. As we discuss in Section 3, we also examine this assumption using available data over time and across destinations (see appendix Tables A.2 and A.10).

Finally, we obtain data on the number of foreign tourist arrivals in Mexico over time from the Mexican Secretariat for Tourism (Sectur), and data on the average airfares in constant US Dollars faced by US travelers from the US Transportation Statistics Database at the Bureau of Labor Statistics. As we discuss in Section 3, we use these data to corroborate the cross-sectional results with panel variation.

Population Census Data We use IPUMS microdata from the Mexican Population Census in 2000 and 2010 to construct municipality-level total population and employment, as well as individual-level wages including information on gender, education, age and ethnicity. The IPUMS microdata provide us with 10 percent random census samples in addition to population weights that are linked to each observation.

To construct municipality population, we sum up the number of people surveyed and weight the summation by population weights. To construct total municipality-level employment, we make use of the fact that the Mexican population censuses in 2000 and 2010 asked people in which municipality they work, and sum up the number of people (again weighted by population weights) that work in a given municipality.[1]

In order to construct wages, we first divide monthly incomes by hours worked in the census data. We then construct Mincerized wage residuals from a regression of log wages on dummies for gender and ethnicity in addition to the cubic polynomials of years of education and years of age as well as census year fixed effects. We weight these regressions by population weights. The final step is to take the population weighted average of the log wage residuals by year and municipality in the data.

In addition to the two most recent census rounds, we use historical Mexican population census data for the years 1921, 1930, 1940 and 1950 in order to estimate a set of placebo falsification tests. To that end, we use INEGI's database Archivo Historico de Localidades to construct spatial units for the year 2010 that we can trace back consistently to 1921. In particular, we extract the history of each census tract that existed in each of the 10 national population censuses conducted between 1921-2010. For example if municipality boundaries changed over time, or a census tract was split or merged, these instances are reported and traceable.[2] The historical census database provides us with municipality populations, but not employment.

GIS and Satellite Data We use GIS and satellite data to build various measures of the attractiveness for beach tourism. As discussed in the next section, we use these measures to build a set of instrumental variables that influence local tourism demand. To this end, we use the earliest high-resolution satellite data that we could obtain.[3] The data source is the Global Land Survey (GLS) 1990 dataset that is based on the raw data from the LandSat 4-5 Thematic Mapper (TM). The GLS dataset provides a consolidation of the best quality LandSat imagery that were taken during the period of 1987-1997 over the coast of Mexico. We obtained these data at the original resolution of 30x30 meter pixels for six different wavelength bands.[4] When restricted to a 2 km buffer around the Mexican shoreline, these satellite data provide us with six raster data layers that each have approximately 52 million 30x30 meter pixels. Figure 1 provides an illustration of the satellite data when illustrated with all six bands using the GLS data tiles that intersect with the Mexican coastline. The satellite data also provide us with detailed information on coastal elevation and relief at the same level of spatial resolution, that we use for a robustness test as discussed below.

We combine these satellite data with a number of GIS data layers that we obtain from the Mex-

[1]To verify that the 10 percent samples from IPUMS do not give rise to concerns about sparseness at the municipality level, we also report robustness checks using municipality-level population data that is computed from 100 percent samples at INEGI. While the 100 percent sample data are available for total population, we do not have access to the microdata, which we require to compute Mincerized wages as well as employment.

[2]Using this information, we construct population numbers over time for consistent municipality units that are as close as possible to the units we observe in 2010. Given the richness of the database at the census tract level, the only (rare) case when boundaries change relative to 2010 is when a census tract splits over time and some of the splitted units change municipality boundaries while others not.

[3]We are interested in historical satellite coverage to limit the potential concern that some municipalities invest more to maintain high quality beaches (e.g. efforts against coastal erosion). As we discuss in the empirical section, we also present a number of additional robustness checks against such concerns (e.g. reporting results before and after including controls, and verifying to what extent the island IV yields similar point estimates).

[4]Band 1 covers 0.45-0.52, Band 2 covers 0.52-0.60, Band 3 covers 0.63-0.69, Band 4 covers 0.76-0.90, Band 5 covers 1.55-1.75, and Band 6 covers 2.08-2.35. We do not make use of a seventh band covering thermal infrared (10.40-12.50) that was only recorded at a resolution of 120 instead of 30 m pixels.

ican statistical institute INEGI. These geo-coded data layers include the administrative shape file of municipality boundaries for the 2010 population census, the position of the Mexican coastline, the Mexican transport network for the year 2009 (airports, seaports, paved roads and railways), and the coordinates for each island feature within the Mexican maritime territory from the Mexican census of maritime land territory. The second panel in Figure 1 depicts the position of islands within 5 km of the Mexican coast. Finally, the geo-statistics division at INEGI provided us with the location of pre-Hispanic archaeological sites in Mexico that we also depict in Figure 1.

We also obtain GIS data from additional sources. The first is a measure of monthly temperature and precipitation at the level of 30 arc seconds (roughly 1km) for the period 1950-2000 from the WorldClim database. We take annual means of precipitation and temperature from the monthly data and collapse the grid cells to the municipality-level mean values of these two variables. The second is a measure of primary ocean productivity at the level of 0.1 degree cells from the Nasa Earth Observation (NEO) program. Primary productivity indicates the amount of biomass created from photosynthesis (measured by chlorophyll concentrations), which is an important determinant of the density of fish populations that can be sustained. We use these data to measure the mean primary ocean productivity within 50 km of the coastline among coastal municipalities for the year 2005.

Municipality Information on Public Investment in Tourism We obtain information on public investments in local tourism development at the municipality level from INEGI's department for public finances (Estadística de Finanzas Públicas Estatales y Municipales (EFIPEM)). This database is the most detailed available account of public finances for both federal, state-level and local spending at the municipality-level covering the period 1989-2010. We define tourism investment as public investments in tourism development (see below) and local cultural institutions (e.g. museums). For earlier years, we complement this database with records that we obtain from Mexico's Fondo Nacional de Fomento al Turismo (FONATUR) that provide us with information on public investments in tourism going back to the beginning of the 1960s.

Public investments in tourism mainly take one of two forms. The first are investments in public capital and local infrastructure that are specific to the development of the tourism sector, such as building museums, tourist information centers, developing the marina, restoring historical buildings and monuments as well as investing in tourism promotion and advertising campaigns for local tourism. The second are investments in transport infrastructure, such as roads and airports, that historically have been mainly targeted at the seven government-planned tourism centers (until 2010) and implemented through federal funding by FONATUR and its predecessors.

To construct a measure of the stock of public capital invested in tourism development across municipalities for 1998 and 2008, we need two additional pieces of information. First, we convert all listed investments over time, that are reported in current Mexican Pesos at the time, into constant 1998 or 2008 Mexican Pesos (adjusted for inflation), using data on annual inflation rates over time from INEGI. Second, past investments in tourism-related capital depreciate over time, so that more recent investments should receive a higher weight relative to investments over past decades. To adjust for this in computing today's capital stock, we use an estimate of capital depreciation from the Bureau of Economic Analysis (BEA, 2010), that report capital deprecation rates separately for different types of public and private capital investments. We use the upper range of the reported estimates of capital depreciation for non-defense government investments at 12 percent per year. This is conservative in our setting as some of largest past investments by FONATUR are reported in the current market valuation of these investments, rather than values in the past. As a result, using a higher rate of depreciation implies a larger level of annualized public investment in the model calibration compared to using a lower estimate of capital depreciation (see Appendix

4.1).[5] Using this approach we estimate a value of the stock of public government investment in tourism development at 26.48 billion USD as of 2008. Appendix 4.1 provides further details on the model calibration.

Bilateral Tourism Exports 1990-2011 To estimate the tourism trade elasticity, we use data on bilateral tourism exports from the World Bank WITS database on trade in services. We link these data to information from the IMF on PPP rates for final consumption goods across countries in order to empirically capture the relative price of local consumption for origin-destination country pairs over time. The database spans the years 1990-2011 and includes 115 origin and destination countries.

Appendix 3: Model

Solving for Counterfactual Changes

As discussed in section 4.3, we consider counterfactual changes where (i) public investment changes, and/or (ii) travel frictions to tourism change. Variables in the counterfactual equilibrium are noted with a prime, and changes compared to the current equilibrium are noted: $\hat{x} = \frac{x'}{x}$.

Given the expression for the prices indexes (10) and (8), the expression for trade and tourism shares, (9) and (7), and the expression of manufacturing productivity (11) and tourism unit costs (6), changes in trade shares and prices between two equilibria are simple functions of changes in wages, public investment, and local populations working in the services or the manufacturing sector:

$$\widehat{\pi_{ni}} = \frac{\widehat{c_{M,i}}^{-\theta}\widehat{M_i}^{\theta}}{\widehat{P_{M,n}}^{-\theta}} \tag{A.1}$$

$$\widehat{P_{M,n}}^{-\theta} = \sum_j \pi_{nj}\widehat{c_{M,j}}^{-\theta}\widehat{M_j}^{\theta} \tag{A.2}$$

$$\widehat{c_{M,i}} = (\widehat{w}_n)^{\nu_M^L} \prod_{s\in M,N} \widehat{P}_{s,n}^{\nu_M^s} \tag{A.3}$$

$$\widehat{M_i} = \widehat{L_{M,i}}^{\gamma_M}\widehat{L_{ST,i}}^{\gamma_S} \tag{A.4}$$

$$\widehat{\lambda_{ni}} = \frac{\widehat{c_{T,i}}^{-\beta}\widehat{t_{ni}}^{-\beta}}{\widehat{P_{T,n}}^{-\beta}} \tag{A.5}$$

$$\widehat{P_{T,n}}^{-\beta} = \sum_j \lambda_{nj}\widehat{t_{nj}}^{-\beta}\widehat{c_{T,j}}^{-\beta} \tag{A.6}$$

$$\widehat{c_{T,i}} = \widehat{G}_i^{-\alpha_G}(\widehat{w}_n)^{\nu_T^L} \prod_{s\in M,N} \widehat{P}_{s,n}^{\nu_T^s} \tag{A.7}$$

$$\widehat{\chi_n} = \frac{\widehat{P_{M,n}}^{1-\rho}}{\widehat{P_{MT,n}}^{1-\rho}} \tag{A.8}$$

$$\widehat{P_{MT,n}}^{1-\rho} = \left((1-\chi_n)\widehat{P_{T,n}}^{1-\rho} + \chi_n\widehat{P_{M,n}}^{1-\rho}\right), \tag{A.9}$$

We assume that public investment remains in constant proportion to what is observed in the current equilibrium, but varies in level in response to the level of tax such that the government

[5] We confirm this conjecture by alternatively using a rate of depreciation at 2.5 percent, which yields estimates of the gains from tourism of 5.1 percent instead of the 4.6 percent we report in our baseline approach.

budget constraint holds, i.e.:

$$\frac{G_n}{\sum_{\mathcal{M}} G_n} = \frac{G'_n}{\sum_{\mathcal{M}} G'_n} \tag{A.10}$$

$$\sum_{\mathcal{M}} G'_n = \sum_{\mathcal{M}} \iota' L'_n w'_n \tag{A.11}$$

Changes in local population levels within Mexico are determined by the location choice equation (12) together with the maintained assumption that total population is unchanged in the counterfactual equilibrium, i.e. $\sum_{n\in\mathcal{M}} L'_n = L_{\mathcal{M}}$:

$$\widehat{L_n} = \frac{\left(\widehat{w_n}^{\alpha_{MT}}\left(\widehat{P}_{MT,n}\right)^{-\alpha_{MT}}\right)^{\tilde{\kappa}}}{\sum \frac{L_i}{L_{\mathcal{M}}}\left(\widehat{w}_i^{\alpha_{MT}}\left(\widehat{P}_{MT,i}\right)^{-\alpha_{MT}}\right)^{\tilde{\kappa}}} \ \forall n \in \mathcal{M}. \tag{A.12}$$

Finally, the system is closed by the market clearing conditions in each sector, that is, equations (13)-(15) expressed in the counterfactual equilibrium, together with:

$$L'_i = L'_{M,i} + L'_{T,i} + L'_{S,i} \tag{A.13}$$

$$L'_{ST,i} = L'_{T,i} + L'_{S,i} \tag{A.14}$$

Finally, welfare change $\widehat{U_{\mathcal{M}}}$ is equalized across all regions between two equilibria:

$$\widehat{U_{\mathcal{M}}} = \left(\frac{1-\iota'}{1-\iota}\right)\left(\frac{\widehat{w_n}}{\hat{P}_{MT,n}}\right)^{\alpha_{MT}} \widehat{L_n}^{-\frac{1}{\tilde{\kappa}}}, \text{ for all } n \in \mathcal{M}.$$

Appendix 4: Calibration and Quantification

4.1 Data and Calibration

Calibration of Rest of the World We calibrate the wage in RoW as the trade-weighted average wage of Mexico's trading partners (measured as GDP per capita), and adjust population of RoW so that the ratio of GDP of Mexico to the GDP of RoW in the quantified model matches the one in the data. The shares of workers in the manufacturing and tourism industries for RoW are calibrated to the share of world GDP in each sector.

Share of Workers in Non-Traded Services We first estimate the relative size of tourism in the traded sector in each region: $\xi_n \equiv L_{T,n}/(L_{T,n} + L_{M,n})$ using local manufacturing GDP and local hotel sales data that we scale up by a constant scale factor so that aggregate values match the data. The share of workers in the non-traded services sector is then estimated, accounting for the fact that local non traded services are used both for final consumption, as well as for the production of tourism and manufacturing (see input-output coefficients in Appendix 4.2 below). The share of workers in the non-traded services sector is then derived from the local market clearing condition in the non-traded services sector, which leads to:

$$\frac{L_{S,n}}{L_n} = \frac{\alpha_S(1-\iota) + \xi_n \frac{\nu_T^S}{\nu_T^L} + \frac{\nu_M^S}{\nu_M^L}(1-\xi_n)}{1 + \xi_n \frac{\nu_T^S}{\nu_T^L} + \frac{\nu_M^S}{\nu_M^L}(1-\xi_n)}.$$

Stock of Public Investment in Tourism Development We use the Mexican database on public investments described in the Appendix 2 to construct the stock of public investments in tourism development across municipalities K_n. To convert this into the local investment in tourism infrastructure G_n in a unit consistent with the model, we compute an annualized flow based on K_n. We do this using the depreciation rate discussed above, assuming that our model corresponds to one period in the steady-state. That is, to maintain a capital stock K_n, yearly investments have to be G_n where $K_n = \sum_{t=0}^{\infty} G_n (1-d)^t$ and d is the depreciation rate of investment. We express this measure of yearly investment relative to Mexico's GDP, and use this measure in the calibration. As discussed below (Section 4.2), we calibrate the share α_G from equation (5) using the ratio of government investment over total tourism GDP, which leads to $\alpha_G = 0.036$. This is close to related elasticities estimated in e.g. Fajgelbaum et al. (2015).

4.2 Elasticity Estimates

Input Shares We calibrate the input-output shares of the model using total requirement coefficients for services and manufacturing inputs of the 2003 Mexican input-output table. The remaining value added is attributed to a single factor labor. The corresponding input shares are:

	Tourism	Manufacturing
ν_j^L	0.63	0.40
ν_j^M	0.20	0.45
ν_j^S	0.17	0.15

Parameter α_G The parameter α_G controls the impact of government investment on tourism productivity. Recall that the production function for tourism services is:

$$q_{T,n} = Z_{T,n}^{o\,1-\alpha_G} G_n^{\alpha_G} \prod_{j \in L,M,S} m_{j,n}^{T\;\nu_T^j}.$$

To calibrate α_G, we compare government investment to tourism GDP. If the government is investing in tourism infrastructure in an optimal way, then its spending in tourism infrastructure should be equal to a constant fraction $\frac{\alpha_G}{\alpha_G + \nu_T^L}$ of tourism GDP. We assume that this holds, which leads to a calibrated value of $\alpha_G = 0.036$. To benchmark this value, we compare it to results in Fajgelbaum et al. (2015). They calibrate a related parameter that governs how much productivity increases with government spending using US tax data. Their preferred estimate is 0.05, which is in the same order of magnitude of what we find here.

Consumption Shares We calibrate α_S using the following accounting equality, which comes from the market clearing condition for the local non traded services sector in each region (equation 15) aggregated at the national level:

$$\alpha_S = \left[\left(1 + \frac{\nu_M^S}{\nu_M^L}\right) \frac{GDP_S}{GDP} - \left(\frac{\nu_T^S}{\nu_T^L} - \frac{\nu_M^S}{\nu_M^L}\right) \frac{GDP_T}{GDP} - \frac{\nu_M^S}{\nu_M^L} \right] \frac{1}{(1-\iota)},$$

where $\frac{GDP_S}{GDP}$ and $\frac{GDP_T}{GDP}$ measure the relative size of tourism and services in aggregate GDP. This equation relates aggregate value added shares to both consumption shares and input shares. In turn, $\alpha_{MT} = 1 - \alpha_S$.

Tourism Trade Elasticity To estimate the elasticity β, we use the panel data on country-level bilateral tourism exports. Equation (7) leads to the following estimation equation:

$$log E_{nkt} = \delta_{nt} + \zeta_{nk} - \beta \, log \, w_{kt} + \xi_{nkt}, \quad (A.15)$$

where E_{nkt} is the spending of country n on tourism in country k at period t, δ_{nt} is an origin-by-time fixed effect (e.g. capturing productivity shocks), ζ_{nk} is an origin-by-destination fixed effect (e.g.

capturing distances or cultural proximity), $ln\, w_{kt}$ is the relative consumption price of tourism services across destinations, and ξ_{nkt} is a mean zero error term. To empirically measure $log\, w_{kt}$, we use country-level PPP rates for final consumption goods that the International Price Comparison (ICP) program computes for all 115 countries over the period 1990-2011 in our database. The ICP constructs this measure, PPP_{kt} as the number of units of a country k's currency required to buy the same basket of goods and services in k's domestic market as one US Dollar would buy in the United States. To measure $log\, w_{kt}$, we take the log of $(1/PPP_{kt})$. Given the inclusion of origin-by-period and origin-by-destination fixed effects, this measure effectively captures (with some error) relative consumption price changes across different destination countries from the point of view of a given origin-by-time cell.

The main concern for the identification of β is that changes in consumption prices across destinations are correlated with other factors that may increase or decrease bilateral tourism flows in the error term. For example, if prices in a destination increase at the same time that travelers at the origin become more likely to travel to the destination for other reasons (e.g. due to business travel or attractiveness), this would lead to an upward biased estimate of $-\beta$ (towards zero).

The first step we take to address this concern is to condition on a basic control for time changing economic conditions in the destination countries, by including the log of country GDP as a control. Second, to address remaining concerns, in addition to the very likely concern of measurement error in our measure of $log\, w_{kt}$, we use nominal exchange rate changes across destination countries with respect to the US Dollar, $log\, e_{kt}$, as an instrumental variable for $log\,(1/PPP_{kt})$. The exchange rates are used as part of the PPP rate construction by the ICP, so that we can expect a strong first stage. The exclusion restriction is that differential exchange rate changes across different destination markets to not affect bilateral tourism expenditure except through relative price changes of tourism services, conditional on the included fixed effects and destination-specific changes in log GDP.

To further assess the validity of this assumption, we also estimate specification (A.15) after restricting attention to what we label touristic destinations: i.e. destinations for which more than 80 percent of total travel inflows are due to leisure rather than business travel. Finally, to allow for tourist flows to respond to relative price information across destination markets with some time lag, we also estimate specifications in which we lag the independent variable by 1-5 years.

Appendix table A.22 presents the estimation results. We find a negative and statistically significant tourism trade elasticity that reaches $\beta = .7$ when we lag the relative destination price changes by 3-4 year (1.5 with lesser lags). These results are confirmed with a slightly lower point estimate of .6 once we restrict attention to destinations with more than 80 of travel inflows driven by leisure rather than business purposes. These results indicate that the tourism trade elasticity appears to be significantly lower than common estimates of the trade elasticity for flows of goods. To be conservative in our quantification of the gains from tourism, we compute the upper end of the 95% confidence intervals supported by the point estimates in Table A.22 as $\beta + 1 = 2.5$. In a similar vein, we choose the value of $\rho = \beta + 1 = 2.5$. As discussed above, we also report results of the counterfactual analysis across a range of different parameterizations in Section 5.2.

4.3 Indirect Inference Procedure

The procedure relies on solving for a counterfactual equilibrium with no tourism, for a range of possible values for (γ_M, γ_S). To do so, we model a shut down of all public investment to tourism infrastructure. This brings the tourism shifter $\widetilde{A_i}$ down to 0 in every location in Mexico, corresponding to a counterfactual equilibrium with no tourism. For any candidate value of the agglomeration parameters (γ_M, γ_S), we use the system of equations (A.1)-(A.14) to compute numerically the corresponding vector of exogenous manufacturing productivities, $M_n^o(\gamma_M, \gamma_S)$, as well as the counterfactual distribution of population under no tourism, $L^o_n(\gamma_M, \gamma_S)$, while holding all other exogenous parameters constant.[6] We then compute the correlation of these vectors with our set of instrumental variables, conditional on the full set of controls used in Section 3. Specifically, we estimate the following regressions within the model across alternative parameter combinations of (γ_M, γ_S):

$$log\,(y_{nc}) = \alpha^{(j)}_c + \beta^{(j)}_y z^{(j)}_{nc} + \alpha^{(j)\prime} X_{nc} + u^{(j)}_{nc}, \tag{A.16}$$

for each of the instruments $j \in 1...3$, and for $y = L^o_n(\gamma_M, \gamma_S)$ and $y = M^o_n(\gamma_M, \gamma_S)$ respectively. The vector X_{nc} is the full vector of pre-determined controls described in specification (1). The indirect inference procedure finds the combination of spillover parameters such that:

$$(\widehat{\gamma_M}, \widehat{\gamma_S}) = argmin\, \boldsymbol{\beta}(\gamma_M, \gamma_S)' \boldsymbol{W} \boldsymbol{\beta}(\gamma_M, \gamma_S),$$

where $\boldsymbol{\beta}(\gamma_M, \gamma_S)$ is the vector of $\beta^{(j)}_y(\gamma_M, \gamma_S)$ for j=1...3 and $y = \{L^o_n, M^o_n\}$, and $\mathbf{W}$ is a weighting matrix for which we use the inverse of the variance of the point estimates of each $\beta^{(j)}_y$ in equation (A.16).

The results of this procedure are reported graphically in Figure 2, where the loss function is given by $\mathcal{L} = \boldsymbol{\beta}(\gamma_M, \gamma_S)' \boldsymbol{W} \boldsymbol{\beta}(\gamma_M, \gamma_S)$. To minimize computing power requirements, we look for the parameter combination that delivers the best fit over a grid of possible values for γ_M and γ_S ranging from 0 to .2 in both parameters. After inspection of Figure 2, it is clear that the best-fitting parameter combination is insensitive to extending the grid space to larger (less realistic) values. To get the standard errors we bootstrap the procedure accounting for sampling error as discussed in Appendix 4.4. In line with the estimated standard errors, the function is flatter in the direction of γ_M than it is in the direction of γ_S: the cross-sectoral spillover parameter is more precisely identified by the procedure, whereas the within-sector parameter has somewhat wider confidence intervals.

4.4 Confidence Intervals / Bootstrap

To obtain confidence intervals, we bootstrap the quantification exercise 200 times. In each bootstrap, we draw the parameters for both the trade and tourism trade elasticities θ and β from a normal distribution with a mean equal to the point estimate and a standard deviation equal to the standard error of the estimate. And as discussed above, for each draw of β, we also adjust $\rho = \beta + 1$. The standard error associated to the point estimate 6.1 of the trade-in-goods elasticity is 1.046 as reported in Table 1 of Adao et al. (2015). The standard error for the point estimate of the tourism trade elasticity is reported in appendix Table A.22.

In addition, we also allow for the possibility that the regional data we feed into the model's calibration as part of Section 5.1 in the text are reported with measurement error. In particular, we treat each of the raw data moments (regional employment, wages, manufacturing and tourism GDP) as if each region's reported number was not a data point, but instead a point estimate subject to a signal-to-noise ratio of 80-20. The implied standard error for each of the regional data points are consistent with a point estimate that has a t-statistic (ratio of reported regional number over standard error) equal to 5, reflecting the 80-20 assumption. This implies that we are drawing each

[6] As discussed above, there is the potential for multiple equilibria in the model in the presence of spillovers. We implement the following equilibrium selection rule. We solve for the closest counterfactual equilibrium compared to the baseline. That is, we use the values of the endogenous variables from the current equilibrium as a starting point for the counterfactual equilibrium. The procedure then updates the candidate value of endogenous variables in the counterfactual equilibrium based on a weighted average of this initial guess and the new values that come out of solving the model. The procedure is iterated until new values and initial values converge.

regional moments from a distribution whose mean is the reported number with a 95% confidence interval of +/- 40% of the reported regional value.

This procedure follows a parametric bootstrap (e.g. Horowitz (2001)) that implicitly assumes errors are uncorrelated across datasets. Finally, the bootstrap confidence intervals do not take into account 9 cases of degenerate equilibria where in excess of half of Mexico's total population concentrates in just one region in the no-tourism equilibrium. For reference, the largest regional share of population in today's observed equilibrium with 300 regions is less than 5 percent.

4.5 Counterfactuals With Less Aggregated Interior Regions

In this appendix we provide additional results to investigate the sensitivity of the welfare quantifications with respect to more or less regional aggregation for the interior regions of Mexico. As we discuss in Section 5.1, the 2455 regions case pushes the limits of the computational requirements when it comes to our indirect inference approach (involving a grid of parameter combinations) as well as for the bootstrapping of the computation of counterfactual equilibria several hundreds of times.

To this end, we document the welfare gains from tourism as well as the regional effects of tourism across regions when running counterfactuals based on the disaggregated 2455 regions case compared to the baseline 300 regions case that we work with in the main text. In particular, we use the same model parameter values as in our preferred counterfactuals, but solve the model for counterfactual no-tourism equilibria in both the more and less aggregated scenarios.

Appendix tables A.30 and A.31 report the quantification results back-to-back. Reassuringly, we find very similar estimates of the welfare gains from tourism and international-only tourism, and we also find that the regional implications of tourism are remarkably similar across the two levels of regional aggregation. As discussed in the main text, these results are as expected, because the key source of variation that we use to inform the calibration of the model and its parameters stems from coastal municipalities. The aggregation of interior municipalities into larger regions that are centered around the 150 largest economic centers –while keeping the coastal geography as in the regression analysis– is thus greatly convenient for computational power, but largely inconsequential for the estimated results.

4.6 Model Extensions and Robustness

Alternative Parameter Values

Appendix table A.23 reports the estimated gains from tourism as well as from international-only tourism across different parameter combinations for the trade elasticity of tourism (β), the spatial labor supply elasticity ($\widetilde{\kappa}$) and the cross-sector co-agglomeration force γ_S. All other parameters are held constant at their values of our baseline calibration discussed above.

First, the tourism trade elasticity (β) directly affects the magnitude of the estimated neoclassical gains from lower frictions to tourism trade. In particular, a larger tourism trade elasticity implies a lower gain from trade in tourism for a given set of empirical moments. This is analogous to the role of the trade-in-goods elasticity in the recent quantitative literature on the gains from trade (Arkolakis et al., 2012). Intuitively, moving from the observed level of tourism consumption to tourism autarky implies a larger loss in welfare if the demand elasticity of tourism consumption is lower (less elastic). As reported in Table A.23, the gains from tourism are about 8 percent lower (4.3 vs 4.6) if the tourism trade elasticity were to increase to 4.5 relative to the upper bound of the point estimate of 2.5 that we estimate in the data.[7]

[7]Note that a very similar logic applies to the elasticity of substitution between tourism and manufacturing consumption (ρ). A lower value magnifies the gains from tourism because the less substitutable tourism becomes relative to other consumption, the more will an increase in the frictions to tourism trade deprive consumers from the

Second, we explore the sensitivity of the gains from tourism with respect to different assumptions about the spatial labor supply elasticity. As noted in Section 5.1, our preferred estimate of $\widetilde{\kappa} = 6.35$ is significantly larger than many of the estimates in the existing literature that have exploited shorter-term variation over time, rather than cross-sectional estimates. Table A.23 thus reports the gains from tourism across three alternative parameterizations for $\widetilde{\kappa} = 6.35$, $\widetilde{\kappa} = 4.35$ and $\widetilde{\kappa} = 2.35$, with the first one equal to our empirical estimate from the data. Interestingly, our welfare quantification appears to be quite robust to different assumptions about the spatial labor supply elasticity. Holding all other parameters constant, the gains from tourism range between 4.64 and 5.23 percent across the different rows, and the gains from international-only tourism range between 1.82 and 2.97 percent.

Finally, we explore to what extent lower values of the estimated cross-sector spillover parameter affect the welfare results. As we have discussed in the previous section, the services-to-manufacturing externality matters directly for the extent of net gains or losses in traded goods production in the aggregate due to the development of tourism. This is also apparent in Table A.23: holding other parameter values at their baseline, the estimated gains from tourism range between 4.64 and 2.58 percent as we move from the baseline calibration of $\gamma_S = 0.087$ to 0.057, 0.027 and finally 0. In turn, the gains from international tourism range between 1.82 percent in the baseline calibration to 0.89 percent in the absence of co-agglomeration forces.

For completeness, the table also reports the full cross of these parameter ranges. In particular, moving towards the lower left of each panel tends to increase the estimated gains from tourism (reducing β and $\widetilde{\kappa}$, and increasing γ_S). Conversely, moving toward the upper right of each panel tends to lower the estimated gains from tourism (increasing β and $\widetilde{\kappa}$, and reducing γ_S).

Finally, appendix Table A.24 also reports the identical exercises depicted in Table A.23, but instead of varying the parameter of the cross-sector agglomeration force, we instead vary the value of the within-manufacturing spillover, γ_M, in the same way, while holding γ_S constant. In line with the discussion of the role of the spillover parameters at the end of Section 4, we find that, for every given parameter combination of β and $\widetilde{\kappa}$, the estimated gains from both domestic and international tourism increase as we reduce the strength of the within-manufacturing agglomeration externality.

Local Gains from Tourism Without Migration

What would the local welfare effect of tourism be in absence of a long-term spatial equilibrium with labor mobility. To address this question, we first solve for the counterfactual spatial equilibrium with prohibitive frictions to both domestic and international tourism in Mexico. Starting from this initial equilibrium, we then simulate the new equilibrium that arises when lowering the tourism travel frictions to today's level for either both domestic and international or international-only tourism, but now under the assumption that labor is immobile across regions within Mexico. We thus effectively shut down the economic geography dimension of the model, and evaluate the local welfare implications of tourism in a world with trade in goods and tourism-related services. All other forces in the model, such as input-output linkages and agglomeration economies, are held constant at their baseline parameters, but the model no longer allows workers to choose their region of residence, so that expected real incomes are no longer equalized across regions.

Appendix table A.28 reports the counterfactual effect of regional variation in tourism activity on local worker welfare. In particular, the table replaces the left-hand side in specification (21) by the log change in worker utility when moving from the no-tourism equilibrium to the current level of tourism trade frictions. We regress this variable on the counterfactual change in local tourism GDP (which in specification (21) was equal to today's level of tourism GDP, but this is no longer

benefits of tourism consumption. In the limit of $\rho = 1$ (Cobb-Douglas) this leads to infinite gains from tourism.

the case in absence of mobility) in addition to the full set of controls. As in the previous subsection, we instrument for the change in local tourism activity with our island and beach IVs.

We find that a 10 percent increase in local tourism activity causes a 2.37 percent increase in local worker welfare in the absence of immigration. When focusing on international-only tourism, we find almost the same point estimate (0.235 with standard error of 0.0715). In principle, there are several factors that could lead to differences in the local welfare elasticity with respect to international and domestic tourism activity. As we have discussed above, international and domestic tourism are concentrated in different regions of Mexico. For example, the initial sectoral composition of the local economies could differ when hit by the tourism shock, and this could lead to heterogeneous local welfare effects due to the presence of both within and cross-sector agglomeration forces. In practice, however, the local welfare effects of the two counterfactuals turn out to be very similar in terms of proportional changes.

In summary, we estimate large and significant local welfare gains of tourism that would have occurred in the absence of regional migration. These local welfare gains are the model-based counterpart of the strong migration responses to local variation in tourism that we have documented in the regression analysis in Section 3.

Profits in the Tourism Sector

Model We describe here an extension where the tourism sector is imperfectly competitive. All other dimensions of the model are unchanged. Demand for tourism services is nested CES, with the upper-nest driving demand for different regions to which we add a lower nest for demand for various tourism services (henceforth, "hotels") provided in a given region:

$$Q_{T,n} = \left[\sum_{i\neq n} A_i^{\frac{1}{\beta+1}} q_{T,i}^{\frac{\beta}{\beta+1}}\right]^{\frac{\beta+1}{\beta}} \quad ; \quad q_{T,i} = \left[\int_{\omega\in H(i)} q(\omega)^{\frac{\sigma_H-1}{\sigma_H}} d\omega\right]^{\frac{\sigma_H}{\sigma_H-1}}$$

There is a continuum of hotels $\omega \in H(i)$ in each region. The mass of hotels in each region NH_i is taken as exogenous. Hotels produce tourism services combining labor and manufacturing input according to $q(\omega) = \ell(\omega)^{\nu_T} m(\omega)^{1-\nu_T}$. Hotels are small and take the price index of tourism in their region as given. They compete according to monopolistic competition. Therefore, a hotel ω, located in region n, prices at a constant markup over its marginal cost: $p(\omega) = \frac{\sigma_H}{\sigma_H-1} c_{T,n}$. As in the main text, $c_{T,n} = \Psi_T w_n^{\nu_T} P_{M,n}^{1-\nu_T}$. It follows that the price index of tourism services sold in region n is:

$$P_{T,n} = \frac{\sigma_H}{\sigma_H - 1} \left(\sum_{i\neq n} \widetilde{A_i} (c_{T,n} t_{ni})^{-\beta}\right)^{-\frac{1}{\beta}},$$

where we have defined $\widetilde{A_i} \equiv A_i\, NH_i^{\frac{-\beta}{1-\sigma_M}}$. The taste shifter for region i, A_i, is not separably identified from the variety effect of the range of tourism services and hotels offered in this region, governed by NH_i. Expenditures shares in tourism take the same form as in the baseline model, that is, the share spent by region $n$on tourism services in region i is:

$$\lambda_{ni} = \frac{\widetilde{A}_i \left(t_{ni} c_{T,i}\right)^{-\beta}}{\sum_{k\neq n} \widetilde{A}_k \left(t_{nk} c_{T,k}\right)^{-\beta}}. \quad \text{(A.17)}$$

Finally, to close the model, write I_n the income of workers in region n. The market clearing condition are:

$$\frac{w_i L_{i,M}}{\nu_M} = \sum_{n=1}^{N} \pi_{ni} \left(\alpha_T \chi_n I_n + \frac{1-\nu_T}{\nu_T} w_n L_{n,T} + \frac{1-\nu_M}{\nu_M} w_n L_{n,M} \right), \quad \text{for } n \in (1..N). \quad \text{(A.18)}$$

$$\frac{w_i L_{i,T}}{\nu_T} = \frac{\sigma_H - 1}{\sigma_H} \left[\sum_{n=1}^{N} \lambda_{ni} \left(\alpha_T (1\text{-}\chi_n) I_n \right) \right], \quad \text{for } n \in (1..N). \quad \text{(A.19)}$$

$$w_i L_{i,S} = \alpha_S I_i, \quad \text{for } i \in (1..N). \quad \text{(A.20)}$$

Income of workers in region n is their labor income plus a share $\tilde{\Pi}_i$ of the profits made in the tourism industry, that is,

$$I_n = w_n L_n + \Gamma \tilde{\Pi}_n. \quad \text{(A.21)}$$

The parameter Γ governs the ownership structure of firms in the tourism sector in Mexico: a share Γ in local, and (1-Γ) is foreign-owned (FDI). We assume that there is no Mexican FDI abroad, i.e. that firms operating in RoW are all owned by RoW. Within Mexico, we assume that profits are allocated proportionally to local GDP. The share of profits distributed in region $n \in \mathcal{M}$ is therefore:

$$\tilde{\Pi}_n = \Gamma \frac{w_n L_n}{GDP_{\mathcal{M}}} \Pi_{\mathcal{M}} \quad \text{(A.22)}$$

where $\Pi_{\mathcal{M}}$ is the profit of the tourism industry in Mexico, which can be expressed as a function of the wage bill in the Mexican tourism sector: $\Pi_{\mathcal{M}} = \frac{1}{\sigma_H - 1} \frac{1}{\nu_T} \sum_{n=1}^{M} w_n L_{n,T}$. Profits distributed to RoW are $\tilde{\Pi}_N = \Pi_{\mathcal{M}}(1-\Gamma) + \Pi_N$, where Π_N are profits realized by the tourism industry in RoW. Equations (A.17)-(A.22), together with the ones that govern the manufacturing sector, the non-tradable services sector and labor mobility, unchanged from the main text, define an equilibrium of this economy.

Calibration We calibrate the new parameters of the model Γ and σ_H so as to match the share of profits over revenues and the share of FDI over total investments made in the Mexican hotel sector (37.5 and 35 percent respectively, source: FONATUR (2011)). We then redo step 1 of the calibration presented in the main text, with this extended version of the model. The new calibration of A_n, M_n, t_{border} and τ_{border} ensures that equations (A.17)-(A.22) hold. All other elasticities remain unchanged.

Table A.29 reports the results of the welfare quantification in the extended model. We find that the welfare gains from tourism are 23 percent lower when 35 percent of tourism profits are captured by foreigners compared to the case where all profits made in Mexico stay within Mexico. Note, however, that the levels of the gains from tourism become higher in the calibrated model with profits (with or without repatriation) compared to our baseline estimate under perfect competition. The reason is that the models with and without profits are calibrated to the same data –in particular the same trade and tourism shares. Compared to a case where the tourism sector prices at its cost, the case where the tourism sector prices at a markup corresponds to a calibration with higher productivity/demand shifters for tourism relative to manufacturing. These ensure that the same consumption patterns can be rationalized despite a higher price of tourism. Therefore, touristic regions are revealed in the calibration with profits to have an even stronger comparative advantage in tourism than in the baseline calibration. This stronger comparative advantage mechanically leads to higher gains from tourism integration (gains of 8 percent in Mexico under 35 percent repatriation of profits relative to our baseline estimate of 4.82 percent).

Alternative Cases of the Tourism Production Function

Setup In our baseline model, we assume in (5) that public investment in infrastructure is a Cobb-Douglas complement to other types of infrastructure in the production of tourism. The implication is that government investment is necessary for tourism to develop. Alternatively, we consider here a more general production function for tourism that nests our baseline specification (5). In particular, let public investment improve the local productivity of tourism services according to a constant elasticity function:

$$Z_{T,n} = \left[(1 - \alpha_G) \left(Z^o_{T,n} \right)^{\sigma_P} + \alpha_G \left(G_n \right)^{\sigma_P} \right]^{\frac{1}{\sigma_P}}, \tag{A.23}$$

where $\alpha_G \in (0, 1)$ and $\sigma_P \leq 1$ is governs the degree of substitution between public investment in tourism infrastructure G_n and other sources of tourism infrastructure (private investment, or natural resources) summarized by $Z^o_{T,n}$. When $\sigma_P = 0$, (A.23) corresponds to our baseline Cobb-Douglas formulation with a unitary elasticity of substitution (as in equation 5). If $\sigma_P > 0$, government investment is a substitute for other forms of local tourism infrastructure, so that if government investment is shut down, tourism is still present and has a non-zero productivity. On the other hand, if $\sigma_P < 0$, government investment and other local tourism infrastructure are complements, so that again, as in our baseline case, a counterfactual without government investment would feature zero tourism.

In this section, we investigate how our results would change if government investment and other sources of local tourism infrastructure were substitutes ($\sigma_P > 0$), and shed light on how much of the gains from tourism could be traced back, in this case, to public investment. Given the lack of robust empirical results on this topic, there is no natural point estimate for $\sigma_P > 0$ for us to use in this exercise. Therefore, we explore this question across a range of values for σ_P. [8]

Exploring Cases with $\sigma_P > 0$ The first thing to note is that assuming $\sigma_P > 0$ does not change our estimate of the spillover parameters γ_M and γ_S. The estimation and identification of these parameters relies on comparing the observed current-day equilibrium in the data to a counterfactual equilibrium without any tourism activity (e.g. due to prohibitive travel frictions or other shocks shutting down tourism). The second point to note is that the calibration of our model delivers a vector of local tourism shifters $\widetilde{A_n}$, as described in Section 5.1. This calibrated value does not depend on equation (A.23). That is, whether $\sigma_P \leq 0$ or $\sigma_P > 0$ does not impact $\widetilde{A_n}$. Armed with estimates of $\widetilde{A_n}$, we then decompose it into its various components, $\widetilde{A_i} = A_i Z^{\beta}_{T,i}$, where $Z_{T,i}$ is defined according to (A.23). Only this second step is modified in the alternative specifications of the role of government compared to our baseline specification.

With this alternative model in mind, we can write the equations that define a counterfactual equilibrium without government investment, and solve for the corresponding welfare changes. In particular, this exercise allows us to quantify how much of the welfare gains from tourism can be traced back to government investments subject to different parameterizations of σ_P. We can thus compare the total welfare gains from tourism relative to the welfare gains from tourism due to government investments in tourism alone.

Given the structure of the model, we use the data on local public investment in tourism, to-

[8] A natural benchmark for σ_P would be the elasticity of substitution between public and private investment. Empirical evidence on this elasticity is scarce. Existing work in the macro-development literature tend to assume and estimate a Cobb-Douglas combination of private and public investment, i.e. $\sigma_P = 0$ (see e.g. Aschauer (1989), Baxter & King (1993) or Leduc & Wilson (2013) for a more recent review). The empirical literature that has tried to estimate whether public investment crowds in or crowds out private investment has led to a variety of estimates, though studies in developing countries tend to find that, if anything, the evidence is more often consistent with complementarity between public and private investment (for a review of this literature, see Romp & De Haan (2007)).

gether with a value for the elasticity σ_P, to solve for a counterfactual equilibrium without government intervention. We assume that the non-public local tourism infrastructure $Z^o_{T,n}$ is exogenously given, and proportional to the stock of public investment with a constant share s_G across regions. We then investigate a counterfactual where $G'_n = 0$. Given (A.23), we get that the counterfactual change in productivity of tourism is:

$$\widehat{Z_{T,n}} = [(1 - s_G)]^{\frac{1}{\sigma_P}},$$

where hats indicate proportional changes compared to the current-day equilibrium.[9]

The other equations that pin down the new equilibrium are unchanged compared to our baseline model in Section 4. That is, equations (A.1) to (A.14) still hold, except that (A.7) is replaced by $\widehat{c_{T,i}} = \widehat{Z_{T,n}} \left(\widehat{w}_n\right)^{\nu^L_T} \prod_{s \in M,N} \widehat{P}^{\nu^s_T}_{s,n}$. These equations allow us to solve for the welfare changes between the current equilibrium and one without public investment in tourism across different parameterizations of σ_P. As we do in the main text, we compute the inverse of these gains and report them here as the gains from government investment in tourism (as a percentage of total gains from tourism). We report this analysis across a range of alternative values for both σ_P and s_G.

In Figure A.3, we plot the importance of the gains from government investment in tourism as a share of the total gains from tourism on the y-axis. As is intuitive, how much of the gains from tourism are lost without public intervention depends on the elasticity σ_P. The more government investment is a substitute to other types of tourism infrastructure, the lower are the relative welfare gains from government intervention. As the figure shows, in the baseline Cobb-Douglas case, the gains from tourism due to government investments are equal to the gains from tourism on the whole. At the other end of the spectrum (the case of perfect substitutes), the role of government intervention is more limited, and close to proportional to its fraction of the tourism infrastructure stock.

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[9] The general expression for a change in local productivity of tourism as a function of changes in government investment $\hat{G}_n$ is $\widehat{Z_{T,n}} = \left[s_{G,n}\hat{G}_n^{\sigma_P} + (1 - s_{G,n})\left(\widehat{Z^o_{T,n}}\right)^{\sigma_P}\right]^{\frac{1}{\sigma_P}}$, where $s_{G,n}$ is the share of government investment in the local stock of tourism infrastructure.

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