

WHERE IS THE MOST POTENTIAL MARKET FOR DIRECT FLIGHT?

BIG DATA HAS ANSWERS

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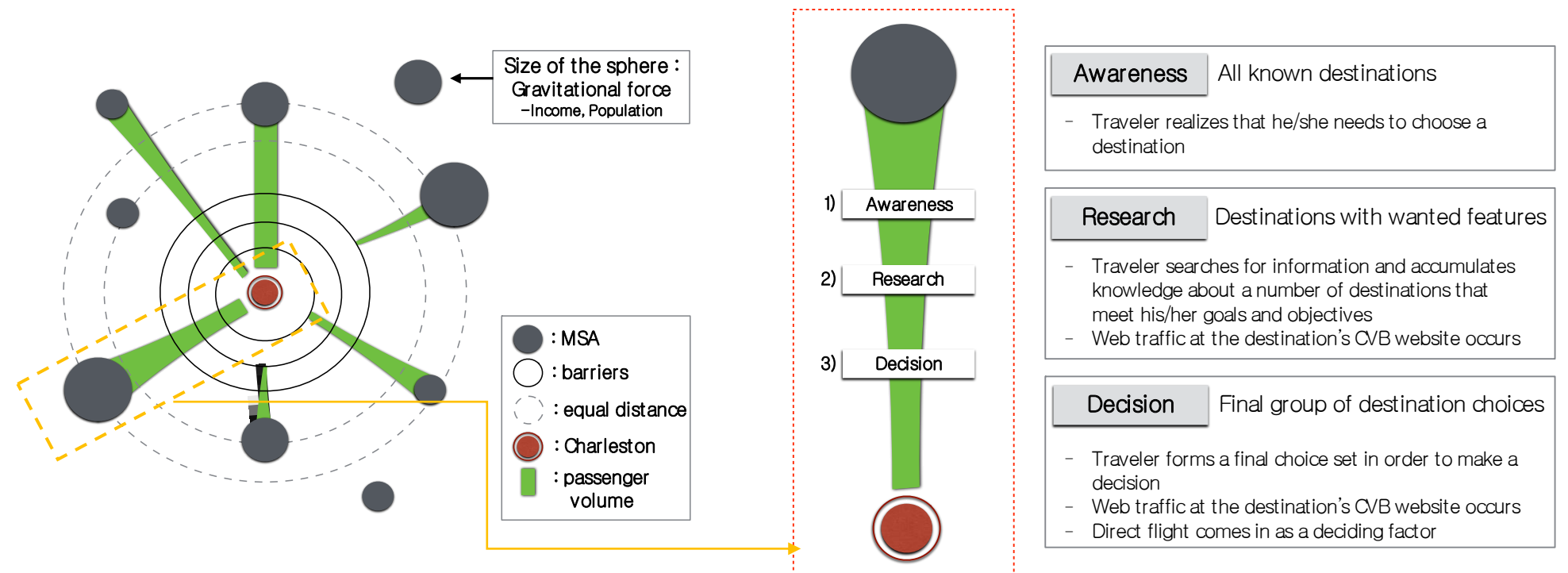
THEORETICAL BACKGROUND

Gravity model

- Gravitational force between the Metropolitan Statistical Areas (MSAs)
- Population, income
- Distance, time, cost, direct flight

Buying funnel theory

- Traveler's product purchase process
- Awareness - Research - Decision - Purchase



RESULTS



TOP 5 POTENTIAL MARKETS

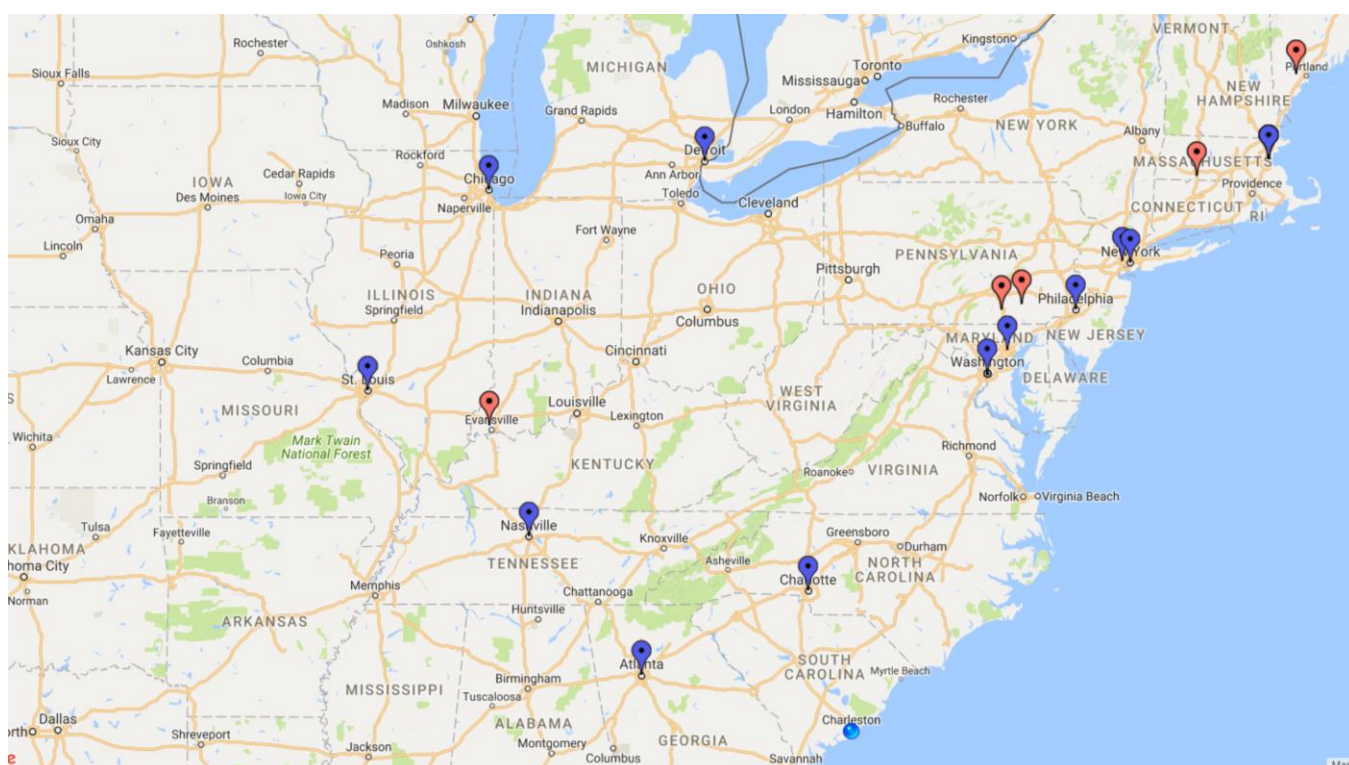
MSA	Population	Income	Driving Time	Current Flight time*	Expected Flight time**	Web traffic	Market potential***
Portland-South Portland, ME	526,295	73,200	16h48	4h09	2h55	8,282	537
York-Hanover, PA	442,867	70,300	10h10	3h11	1h40	6,608	55
Lancaster, PA	536,624	70,000	10h56	3h11	1h40	10,751	45
Evansville, IN-KY	315,693	64,800	10h30	3h21	1h40	5,676	40
Springfield, MA	631,982	67,300	14h25	3h46	2h15	8,385	37

* Shortest available time on June 1st, 2017 on Google Flights. Single stop-over. Does not include driving time to the nearest airport.
 ** Expected flight time when there is direct flight, based on distance.
 *** Market potential represents the expected increase in the number of flight passengers per week.

REGRESSION RESULTS

Variable	Flight passengers	Mobile devices	Hotel guests
Income	0.0139***	0.0223***	0.0149***
Population	0.0010***	0.0013***	0.0010***
Distance	0.0889***	-0.5255***	-0.1642***
Flight Time	-0.3908***	-0.6168***	-0.7282***
Distance* Flight Time	0.0044***	0.0492***	0.0249***
Relative cost	-1.5554***		
Distance* Relative cost	-0.4885***		
Direct Flight	1.0843***	0.1355***	0.4615***
Constant	8.9778***	9.5030***	9.8146***
N	229	224	230
Pseudo R ²	0.7849	0.7228	0.7248

legend: * p<.1; ** p<.05; *** p<.01



DATA

Variable	Data Source
MSA Population	U.S Census Bureau 2015 estimates
MSA Median Family Income	Federal Financial Institutions Examination Council (FFIEC) 2015 estimates
Nearest Airport	http://www.travelmath.com/nearest-airport/
Flight Distance	http://www.webflyer.com/travel/mileage_calculator/
Driving Distance	CDX zipstream (based on Microsoft MapPoint)
Flight Time	http://flights.google.com/
Number of Hotel Guests	Guests' zip code data from 13 hotel management companies in Charleston, SC, 2013-2015
Web Traffic	Average unique visitors from CVB website gleaned from Google Analytics, 2013-2015
Mobile Devices	Four months' mobile devices from AirSage Inc.
Flight Passengers	The average number of annual passengers from Seabury APG, 2013-2014

ABSTRACT

Destination Marketing Organizations (DMOs) strive to increase visitor volume through targeting potential markets and eliminating barriers to travel, such as lack of non-stop flights. This study develops a comprehensive model to identify the next direct flight route for a destination by combining buying funnel theory and gravity model. In addition to the geographical and economic characteristics of each origin market, web traffic at the destination's Convention and Visitors Bureau (CVB) website—a proxy for the market's interest in the destination—is used to determine the cities that would exhibit the most potential to generate visitors if a non-stop flight route was opened. The model estimates each market's potential, using multiple gravity models, and compares it to the market's interest in the destination based on buying funnel theory. The present study then empirically tests the model using the actual data of Charleston, South Carolina, where five potential cities were identified.

CHARELSTON

No. 1 City in the World
No. 1 City in the U.S. and Canada
– *Travel + Leisure* 2016 World's Best Award



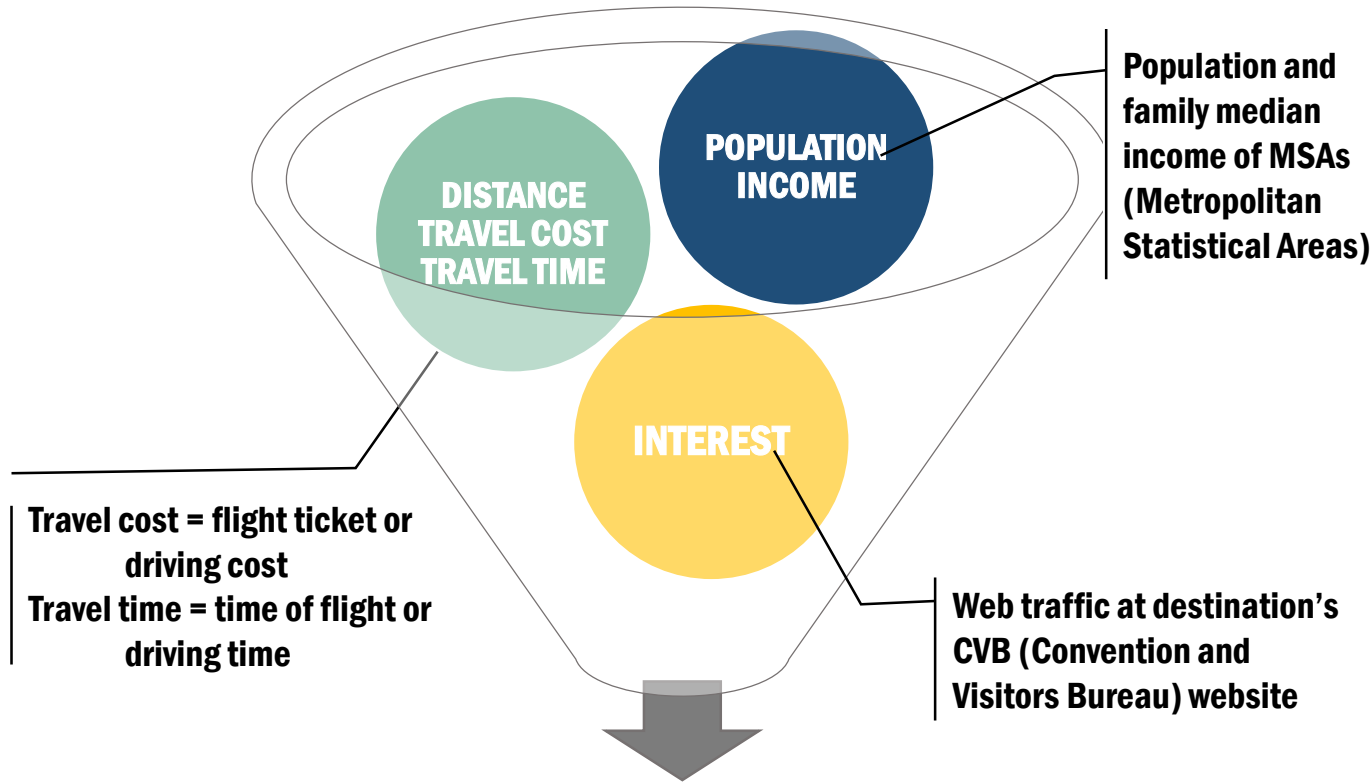
OUR GOAL

IDENTIFY DESTINATION'S NEXT DIRECT FLIGHT ROUTE

FOR THREE DIFFERENT VISITORS:

1. VISITORS VIA AIR
2. OVERNIGHT VISITORS
3. VISITORS w/ MOBILE DEVICES

HOW?



MOST POTENTIAL MARKETS

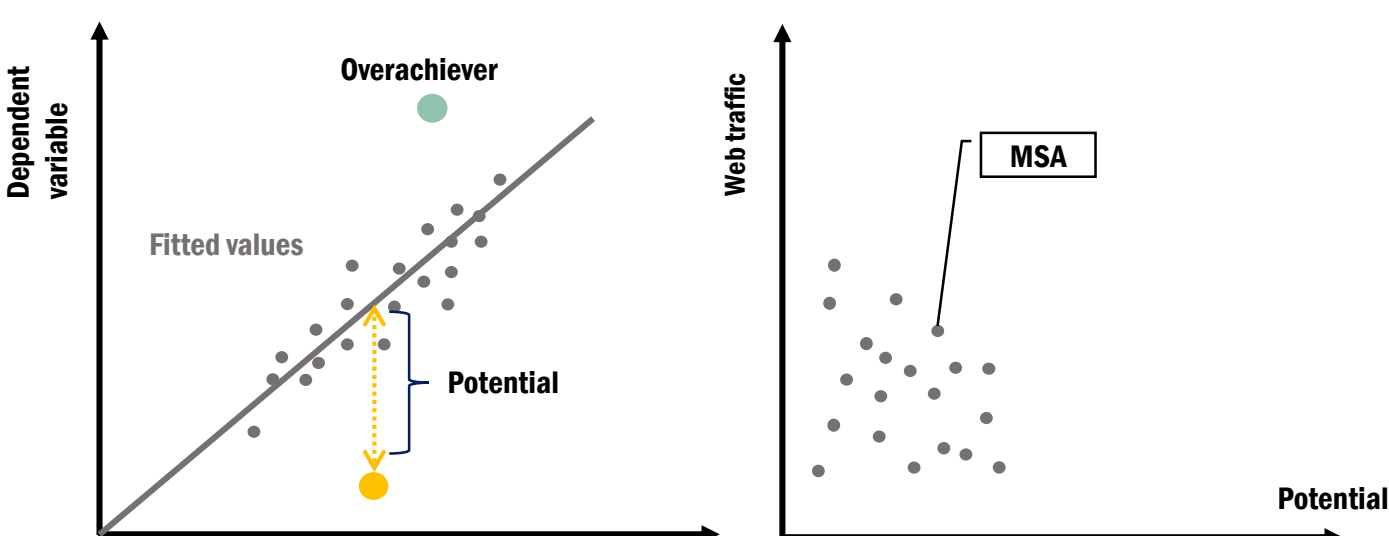
FOR

1. FLIGHT PASSENGERS
2. HOTEL GUESTS
3. MOBILE DEVICE USERS

PROCESS



Model	Dependent Variable	Independent Variables	Potential Market
1	Flight passengers	Income, population, distance, flight time, relative cost of flight, and availability of direct flight	Potential market for airlines
2	Hotel guests	Income, population, distance, flight time, and availability of direct flight	Potential market for the hospitality industry
3	Mobile devices	Income, population, distance, flight time, and availability of direct flight	Potential market for total visitor volume



IMPLICATIONS

1. Method for a destination to target markets with high potential
 - Importance of direct flight
 - Characteristics and interest
2. Multidimensional approach
 - Flight passengers, hotel guests, mobile devices
3. Airlines may disagree
 - Not the current market size, potential to increase
 - Missing network effect and competition information

REGRESSION MODEL

$$\ln(E[V_{ijt}|X]) = \beta_1 Pop_{it} + \beta_2 Pop_{jt} + \beta_3 GDP_{it} + \beta_4 GDP_{jt} + \beta_5 D_{ij} + \beta_6 DF_{ijt} + \beta_7 S_{ijt} + \beta_8 fTime_{ijt} + \beta_9 fTime_{ijt} * D_{ij} + \epsilon_{ijt}$$

Variable	Data	Variable	Data
V_{ijt}	# of visitors	DF_{ijt}	Direct flight
Pop_{it}	Population	S_{ijt}	Relative cost
GDP_{it}	Median family income	$fTime_{ijt}$	Flight time
D_{ij}	Distance		