The Economic Importance of Niche Markets for a Tourist Economy: The Case of Private Pilots in The Bahamas

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This study examines the economic importance of niche markets, specifically private pilot tourists, on the Bahamian economy. The estimated average private pilot tourist's expenditure is approximately $232 per visitor night and the total economic impact is over $197 million. This niche market accounts for approximately 10 to 20 percent of the tourist market in the Out Islands, and 5 percent in the total tourist market. The forecast of private pilot stopovers coupled with the desire to increase competitiveness highlights the importance of a proactive tourism agenda and marketing campaign to promote these visits.

INTRODUCTION

With over 700 islands, 2,000 small cays, and close proximity to Florida, The Bahamas is a popular destination for many tourists. Nevertheless, despite this popularity, the Bahamas like many Caribbean tourist economies has been classified as a mature destination (Cameron and Gatewood, 2008; Cole, 2011). A mature destination is a destination that is currently encountering problems maintaining a steadily high level of competitiveness. Mature destinations were typically developed in the 1970s and have seen a recent stagnation in competitiveness (Alcover et al., 2011). Given this classification as a mature destination, the necessity to promote new tourism and increase the number of visitors outside of the typical cruise and resort tourists is apparent. Several studies discuss the possible importance of alternative tourist markets and the need to increase tourism. Trunfio et al. (2006) discuss the prospective use of niche tourist markets in an attempt to increase competitiveness. They find that many of alternative tourism markets have become increasingly preferred in comparison to the major tourism market. Bull and Weed (1999) discuss the potential of a niche market, specifically sports tourism, to reinvigorate a small island economy, but fall short of estimating the true importance of the niche market. Therefore, focusing on specific niche tourist markets has the possibility of assisting a mature destination to regain a higher level of competitiveness; however, the research on the measurable economic importance of such niche markets is sparse.

The Bahamas is conveniently located as close as 53 nautical miles from the Floridian coast making it a prime destination for general aviation private pilots. General aviation is defined as all flying excluding commercial and military operations, with the majority of flights being personal or recreational.[1] Private pilot tourists fly privately owned or rented aircraft to their destination, and according to a 2011 survey of the largest pilot association, Aircraft Owners and Pilots Association (AOPA), the average household income of these pilots is approximately $173,000 (Erdos and Morgan, 2011). Additionally, with over 200,000 active general aviation aircraft and 600,000 pilots in the U.S., the large pool of potential tourists is attractive to Bahamian businesses and tourism policymakers alike. Several studies have been conducted

on tourism and aviation. Forsyth (2006) finds that aviation policy liberalization has created a large surge in international tourism. Graham et al. (2010) also discusses the importance of air transport, and finds that it plays a key role in transportation for tourism markets. Deregulation and liberalization have increased the role that air transport plays for travel. Despite this previous research, no known studies exist on estimating the impact that the niche market of private pilot tourism has on an economy. Private pilot tourists share similar spending characteristics with air transport tourists such as lodging, meals, recreation. However, private pilot tourists typically incur additional expenses such as hangar or storage fees and aviation fuel costs that most air transport tourists do not share. Moreover, given the higher average household incomes, private pilot tourism can be considered a lucrative niche market for tourism areas in need of increased stopover visitors and revenue.

This study contributes to the niche market discussion by illustrating the economic importance of a niche market, specifically private pilot tourists, to a tourism economy. The economic impact of private pilot tourists will be estimated for The Bahamas. Then a forecast of private pilot stopover visits is estimated using air traffic data from coastal Floridian airports to better understand the future implications to the tourism market. Finally, a conclusion will discuss implications for tourism policy as well as provide paths for further research.

Private Pilot Tourists' Economic Impact on The Bahamas

The data utilized in this study were reported by The Bahamas Ministry of Tourism. The 2008 Visitor Expenditure Survey (The Bahamas Ministry of Tourism, 2009) data are used to determine the economic impact of private pilot tourism. The Visitor Expenditure Survey is an exit survey of stopover visitors in The Bahamas. The survey data reports visitor expenditures such as accommodations, meals, recreational activities, transportation, and other retail purchases. According to The Bahamas Ministry of Tourism (2009), these stopover expenditures contributed to 93 percent of total tourism expenditures in 2008. The survey respondents totaled 21,085 visitors spending a total of 128,944 visitor nights during their stay. The number of respondents corresponds to 1.4 percent of all stopover visitors and 1.3 percent of stopover visitor nights (Fedler, 2010). The number of stopovers by arrival mode is reported by The Bahamas Ministry of Tourism. The total number of private pilot arrivals is listed by individual islands for the years 2005-2009.

The average private pilot visitor night to each island is displayed in Table 1. The total number of private pilot stopovers as well as visitor nights is reported by the Ministry of Tourism. The average visitor night of a private pilot visitor was calculated by dividing total private pilot visitor nights by the total number of private pilot visitors. This calculation was completed for each island listed. The average visitor night was calculated from the Visitor Expenditure Survey data on total party expenditure per visit and per visitor night. From these two estimates, we can arrive at the average number of nights at each island. Private pilot visitors on average spend fewer nights according to the Visitor Expenditure Survey and Ministry of Tourism data. This result is not the case however, for the islands of Andros, Bimini, and New Providence. Bimini is an increasingly popular destination given the close proximity to the Florida coast, which reduces costs associated with fuel and other aircraft operation expenses. This reduced cost may aid in explaining the higher visitor nights for those islands.

The economic impact of a stopover visitor can be divided into direct and indirect effects. The direct effects are the immediate expenditures on meals, taxes, fuel, lodging, recreational activities, etc. The indirect effects are the increases in economic activity from these direct payments. For example, a merchant receives a payment from the visitor and will then pay other agents that support the merchant (Fedler, 2010). Additionally, there are induced effects of increased spending by locals, which can also be described as a wealth effect. These effects are defined as the multiplier effect of spending by visitors. Many studies utilize measures from comparable island economics, but several studies estimate the multiplier effect for the Bahamas (Fedler, 2010; Horvath and Frechtling, 1999; Loutif et al., 2000). These studies, along with Taylor et al. (1995) will be utilized to obtain an estimate of the multiplier effect. Combined these effects will derive the total economic impact of private pilot tourists on The Bahamian economy.

TABLE 1
AVERAGE NUMBER OF VISITOR NIGHTS FOR PRIVATE PILOT AND AVERAGE VISITORS, 2008

Island	*Private Pilot Visitor*	*Average Visitor*
Abaco	6.04	8.50
Andros	6.06	6.01
Bimini	7.63	5.90
Eleuthera	6.00	7.71
Exuma	5.80	6.21
Grand Bahama	5.54	5.63
Nassau/New Providence	5.70	5.48
San Salvador	6.79	8.65
Other	6.80	7.25
Total	5.75	6.08

Table 2 reports the average expenditure per visit and visitor night for both private pilot and average tourists. This expenditure estimate was calculated by examining the Visitor Expenditure Survey data by selecting private pilot stopovers by island and calculating the expenditures on lodging, food, recreation, airport fees, etc. The average visitor expenditure amounts were similarly calculated. On average, private pilot visitors spend more per night than an average visitor to The Bahamas. This difference is most likely due to the increased expenses of airport services such as tie down fees, fuel, hangar fees, etc. However, total expenditure per visit is slightly less on average due to the lower number of visitor nights of private pilot tourists.

TABLE 2
AVERAGE EXPENDITURE PER VISITOR NIGHT AND PER VISIT, 2008

Island	Private Pilot Visitor		Average Visitor	
	Visitor Night	*Visit*	*Visitor Night*	*Visit*
Abaco	$162	$978	$127	$1,080
Andros	$385	$2,333	$364	$2,188
Bimini	$199	$1,518	$169	$1,138
Eleuthera	$183	$1,098	$158	$1,232
Exuma	$311	$1,804	$285	$1,770
Grand Bahama	$180	$997	$152	$859
Nassau/New Providence	$297	$1,693	$260	$1,425
San Salvador	$283	$1,922	$217	$1,714
Other	$141	$959	$200	$1,156
Total	$232	$1,334	$207	$1,387

Table 3 reports the economic impact of private pilot divided into direct and value added impacts. The total direct expenditures are calculated by multiplying the average expenditure per visit by the total number of visitors. The value added figures are estimated by using the multiplier discussed in the previous section. Taylor et al. (1995) utilizes a detailed input-output analysis to determine the multiplier effect for many areas including tourism. The multiplier estimated, 0.78, is utilized in this study. This estimate is similar in magnitude to comparable island economies (Horvath and Frechtling, 1999; Loutif et al., 2000). A multiplier of 0.78 implies that for every $1 in direct expenditures, we'll see a result of an

additional $0.78 in spending as previously discussed. The total economic impact of private pilot visitors is calculated by summing the direct expenditures and value added expenditures. The economic impact of private pilot visitors is compared to the economic impact of the total tourism industry in Table 4.

TABLE 3
ESTIMATED DIRECT EXPENDITURES AND VALUE ADDED ECONOMIC IMPACT OF PRIVATE PILOTS, 2008

Island	*Direct Expenditures*	*Value Added*	*Total Impact*
Abaco	$18,578,400	$14,491,152	$33,069,552
Andros	$5,688,098	$4,436,716	$10,124,814
Bimini	$8,086,839	$6,307,734	$14,394,573
Eleuthera	$5,790,852	$4,516,865	$10,307,717
Exuma	$10,155,394	$7,921,207	$18,076,601
Grand Bahama	$8,674,643	$6,766,222	$15,440,865
Nassau/New Providence	$43,890,125	$34,234,298	$78,124,423
San Salvador	$908,903	$708,944	$1,617,847
Other	$9,774,007	$7,623,725	$17,397,732
Total	$110,651,298	$87,006,864	$197,658,162

TABLE 4
ESTIMATED ECONOMIC IMPACT OF PRIVATE PILOT VISITORS, 2008

Island	*Private Pilot Total*	*Total Tourism*
Abaco	$33,069,552	$246,844,000
Andros	$10,124,814	$58,782,000
Bimini	$14,394,573	$110,696,000
Eleuthera	$10,307,717	$108,878,000
Exuma	$18,076,601	$156,348,000
Grand Bahama	$15,440,865	$504,798,000
Nassau/New Providence	$78,124,423	$2,922,738,000
San Salvador	$1,617,847	$70,296,000
Other	$17,397,732	$82,820,000
Total	$197,658,162	$4,262,200,000

The total impact of private pilot visitors is estimated to be approximately $197.6 million or 5 percent of total tourism economic impact. The economic impact of private pilot visitors is over 10 percent of the total tourism economic impact in the islands of Abaco, Andros, Bimini, Exuma, and other islands. The economic impact of private pilot visitors to Andros is nearly 20 percent of the total tourism economic impact on that island. These results highlight the great importance of this niche market to The Bahamian economy. The percentage of economic impact is far less in New Providence and Grand Bahamas. This reduced contribution is due to the great popularity of these islands and the large number of visitors. However, the contribution of this niche market should not be diminished given that the additional economic benefit is greater than $15 million for each of those islands.

Forecast of Future Private Pilot Tourist Stopovers and Economic Impact

The data available on private pilot visitors to The Bahamas is limited to the years 2005-2009. During this time period, the global economic recession most likely caused the decrease in tourism in many

Caribbean nations including The Bahamas. Therefore, inference or forecasting based solely upon these data values could lead to a high level of forecasting inaccuracy. Therefore, a suitable proxy of private pilot visitors is required. One such proxy is general aviation intermittent operations at coastal airports in Florida. Given the close proximity, many private pilots flying to The Bahamas utilize these coastal airports either en route or as a staging point. The Bahamas Ministry of Tourism highlights several airports as key coastal airports in Florida. Table 5 lists these coastal airports and their proximity in nautical miles to The Bahamas (specifically South Bimini Airport). The total number of general aviation operations at these airports is compared to the number of private pilot visitors to The Bahamas

TABLE 5
LIST OF COASTAL FLORIDIAN AIRPORTS AND DISTANCE TO THE BAHAMAS*

Ft. Lauderdale Executive Airport (57.2NM)	Witham Field Airport (102.7 NM)
St. Lucie International Airport (123.1 NM)	Palm Beach Airport (74 NM)
Opa-Locka Airport (56.1 NM)	Ft. Lauderdale/Hollywood Airport (52.9 NM)

* Distance in nautical miles (NM)

Augmented Dickey-Fuller tests suggest that stopover visitors and general aviation operations are nonstationary. Further tests suggest the presence of unit roots, and Johansen tests for cointegration suggest the variables are cointegrated. Therefore, an error correction model is utilized to determine the relationship between these coastal general aviation operations and private pilot visitation to The Bahamas. The number of general aviation operations is reported by the Florida Department of Transportation. The number of private pilot stopovers as well as fees and taxes on private aircraft operators in The Bahamas are reported by The Bahamian Ministry of Tourism. The model estimated is given by:

$$\Delta \ln SO_t = \beta_0 + \beta_1 \Delta \ln OPS_t + \beta_2 \Delta \ln Fee_t + \beta_3 z_{t-1} + \varepsilon_t \quad (1)$$

where SO_t is the number of stopovers in The Bahamas at time t, OPS_t is the number of general aviation operations at coastal Floridian airports at time t, Fee_t is a variable for changes in fees or taxes on private aircraft operators in The Bahamas. The variable z_{t-1} is the error correction term that captures the disequilibrium from the previous time period. The symbol Δ implies the first difference of the variables. The results of the analysis are displayed in Table 6. The adjusted R-squared of the model suggests it is a good fit for the data. All variables are found to be statistically significant at the 5 percent level. The model fails to reject the null hypothesis of normality of the residuals, which is a crucial assumption of the error correction model. The coefficient on the number of general aviation operations variable is found to be positive and statistically significant. This result implies that an increase in coastal Floridian airport operations results in an increase in private pilot stopovers in The Bahamas. The coefficient on the fee/tax variable is negative and statistically significant. This implies that an increase in fees or taxes on private aircraft operators in The Bahamas results in a slight decrease in stopovers in The Bahamas. The coefficient on the error correction term suggests that approximately 53 percent of the disequilibrium in the previous period is adjusted in the current period. The data from these airports will be utilized along with the regression results outlined in Table 6 to determine a suitable forecast of private pilot visitors to The Bahamas.

TABLE 6
ERROR CORRECTION MODEL RESULTS

Parameter Estimates		Augmented Dickey Fuller Unit Root Tests	
		Test Stat	P value
Δln(OPS)	0.257** (0.042)	-2.681	0.004
ΔFee	0.011** (0.002)	-2.894	0.010
Z	-0.538** (0.081)	--	--
constant	8.023** (1.120)	--	--
Adj. R-squared	0.892		
LM Test Residual Autocorr. Pvalue	0.198		
Q Test for White Noise Pvalue	0.139		

** Significant at the 5 percent level

Using a dataset of general aviation operations at these airports from 1989-2011, a forecast of future operations at each airport can be assessed. The time series data are analyzed via a Box-Jenkins Autoregressive Integrated Moving Average (ARIMA) model. The ARIMA method of forecasting requires only the historical time series of the forecasted variable (Box and Jenkins, 1970). This method is an extrapolation method that is robust enough to handle any pattern in the data. The procedure involves transforming the variable, identification and estimation of the model, verifying the model, and finally derivation of forecasts (Mandal, 2005; Padhan, 2012).

The stationarity of general aviation operations is tested using the Dickey-Fuller GLS test, given the increased level of power over the Augmented Dickey-Fuller test. The data in levels are found to be nonstationary, so therefore an appropriate transformation is needed to correct for this nonstationarity. The first differences of the data appear to be stationary and trend has no substantive effect in this case. The autoregressive order (p) and moving average order (q) were determined by examining the autocorrelation and partial autocorrelation functions of the data. These functions suggest that the orders of p and q cannot exceed one. Furthermore, the minimum Akaike Information Criterion (AIC) and Baysian Information Criterion (BIC) were utilized to establish the appropriate moving average order as seen in Table 7. The lowest AIC and BIC occur given the ARIMA(1,1,0). Therefore, the model utilized will be the ARIMA(1,1,0).

TABLE 7
AIC AND BIC VALUES

ARIMA(p,d,q)	*AIC*	*BIC*
1,1,0	406.34	411.20
1,1,1	408.18	415.37
1,1,2	411.83	418.96

The ARIMA model estimated is given as follows:

$$Y_t = \beta_0 + Y_{t-1} + \beta_1(Y_{t-1} - Y_{t-2}) + \varepsilon_t \quad (2)$$

where Y_t is the natural log of general aviation operations in year t, and ε_t are the unobserved factors. The results of the estimation are displayed in Table 8. The verification of the model tests the residuals for any removable, by changing the ARIMA model, systematic pattern. Examination of the autocorrelations and partial autocorrelations with various lag lengths suggest that no other correlation is statistically different from zero. Therefore, the next step is forecasting general aviation operations at these coastal Floridian airports.

TABLE 8
ESTIMATES OF ARIMA MODEL

Lags		
	AR1	0.1084**
		(0.031)
Constant		-0.123**
		(0.002)

** Significant at the 5 percent level

The forecast of a variable utilizing the ARIMA model is typically either a sample period forecast or a post-sample forecast. Sample period forecasting is utilized to determine the accuracy of the estimated model. The actual values of the variable are simply used to determine the estimates and the deviation from the actual value. The mean absolute percentage error (MAPE) was computed for general aviation operations to be 5.23 percent, which indicates a very low level of forecasting inaccuracy. Therefore, a post sample forecast can be conducted. Utilizing the estimates of equation (2), we arrive at estimates of future general aviation operations at these coastal airports in Florida. A suitable forecast of private pilot stopover visitors to The Bahamas is derived by utilizing the regression results from model (1). The forecast of stopovers assumes that the relationship estimated from model (1) is constant over the next five years.

We see in Table 9 there is an overall slight decrease in total stopovers in The Bahamas. This coincides with the current decline of U.S. general aviation (National Business Aviation Association, 2009). The number of active general aviation aircraft has steadily decreased due to economic and liability reasons (Nelson and Drews, 2008). However, given the proximity of Bimini and the benefits of this discussed earlier, the observation of increased stopovers in Bimini is reasonable. The forecast of the annual economic impact (direct expenditures and value added) is displayed in Table 10. The annual economic impact assumes that private pilots do not alter the length of stay over the next five years. The Bahamas is forecasted to see a slight decrease in economic impact, except on the island of Bimini. This result can be attributed to the proximity and reduced cost of travel to Bimini for private pilots.

TABLE 9
FORECAST OF ANNUAL NUMBER OF PRIVATE PILOT TOURIST STOPOVERS, 2012-2017

	Island								
Year	*Nassau**	*Grand Bahama*	*Abaco*	*Andros*	*Bimini*	*Eleuthera*	*Exuma*	*San Salvador*	*Total All*
2012	23,231	6,607	18,348	2,181	5,782	4,821	4,035	322	74,774
2013	23,165	6,518	18,323	2,178	5,885	4,791	3,892	316	74,500
2014	23,101	6,431	18,298	2,176	5,986	4,761	3,752	310	74,232
2015	23,037	6,346	18,274	2,173	6,086	4,732	3,615	304	73,968
2016	22,975	6,262	18,250	2,171	6,184	4,703	3,479	298	73,708
2017	22,913	6,180	18,227	2,169	6,280	4,675	3,345	292	73,452

* New Providence Island

TABLE 10
FORECAST OF THE ANNUAL ECONOMIC IMPACT OF PRIVATE PILOT TOURISTS (MILLIONS OF 2008 $), 2012-2017

	Island								
Year	*Nassau*[*]	*Grand Bahama*	*Abaco*	*Andros*	*Bimini*	*Eleuthera*	*Exuma*	*San Salvador*	*Total All*
2012	$80.1	$13.8	$34.5	$9.7	$13.3	$10.2	$14.5	$1.0	$177.4
2013	$79.9	$13.6	$34.4	$9.7	$13.6	$10.1	$14.0	$1.0	$176.6
2014	$79.6	$13.4	$34.4	$9.7	$13.8	$10.1	$13.5	$1.0	$175.8
2015	$79.4	$13.2	$34.3	$9.7	$14.0	$10.0	$13.0	$1.0	$175.0
2016	$79.2	$13.0	$34.3	$9.7	$14.2	$10.0	$12.5	$0.9	$174.2
2017	$79.0	$12.9	$34.3	$9.7	$14.5	$9.9	$12.0	$0.9	$173.4

[*] New Providence Island

CONCLUSION

Tourism is an important component to the economy of The Bahamas. The desire to increase the number of stopover visitors has mainly focused on major areas of the cruise and resort tourist markets (Wood, 2000; Yoon, 1996). However, understanding the importance of a smaller lucrative niche market is essential to improving tourism policy and increasing competitiveness for this mature destination. This study finds the expenditures of a niche market tourist, specifically private pilot tourists, to be comparable and often exceeds that of traditional or typical stopover tourists in the major tourism markets. Private pilot tourists spent more on average per visitor night at all major islands studied. This niche market accounts for approximately 10 to 20 percent of the tourist market in the Out Islands, and 5 percent in the total tourist market. This impact highlights the significance that niche markets make on a tourist economy. In comparison to another tourist niche market, flats fishing, private pilot tourists spend on average more per visitor night on Andros, Grand Bahama, Eleuthera, and Exuma islands (Fedler, 2010). Disappointingly, there appears to be a slight decline in this niche market in the near future. However, blue skies appear to be ahead for several Out Islands. Bimini is forecasted to see an increase in private pilot tourist stopovers given the close proximity to the Floridian coast, and most islands will experience only a slight decline.

Consequently, these forecasts allow tourism policymakers and businesses to focus marketing and other resources appropriately. Promotion of the Out Islands should be increased and the imposition of smaller fees and taxes on private aircraft could spur private pilot tourist stopovers. Given the very important economic contribution of this niche market, the Ministry of Tourism should do more to increase awareness of the many island airport possibilities for private pilots. The Ministry of Tourism's participation at the largest pilot association's aviation summit to promote the Out Islands and fixed base operators is a step in the right direction towards improving competitiveness (Tourism Today, 2009). Beneficial future research could be to obtain micro-level data on private pilot tourists, as well as surveys to better understand the needs and requirements of these pilots. Furthermore, research into the other niche markets could help shape tourism policy to greatly increase competitiveness.

NOTES

1. Each year, general aviation contributes over one percent to U.S. gross domestic product and creates over 1.2 million jobs in the U.S. (Aircraft Owners and Pilots Association, 2010).

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