International Leisure Travelers to the United States: Why do Visitors Who Need a Visa Stay Longer?

Maksim Belenkiy[1]

International Trade Administration

U.S. Department of Commerce

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Abstract

Using individual traveler responses from the 2009 Survey of International Air Travelers, we find that the average duration of leisure trips for visa-required international travelers is nearly 3 nights longer than those for visa-free travelers. We present a theoretical model in which a country's visa requirement is a pre-trip non-zero fixed cost. The model predicts that visa-required travelers stay longer on average compared to visa-free travelers, because the former type of travelers values the leisure trip to the United States more than the latter. We then estimate the parameters of the model. The empirical results confirm the predictions of the theoretical model. Using the econometric estimates, we calculate the average travel expenditure for each type of traveler. Finally, we discuss the implications of the econometric results in the design of travel marketing strategies and the expansion of U.S. exports of international travel services.

Keywords: leisure travel demand; travel visa; services exports; count model

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INTRODUCTION

Travel and tourism is the largest U.S. services industry. The value of overseas travel receipts in 2010 exceeded $130 billion. This value represented 25 percent of total U.S. exports of private services. The travel receipts are a combination of the purchases of travel services and passenger fares of approximately 60 million international travelers who visited the United States. Among these travelers, near 18 million were overseas international leisure travelers, and 32 percent of them required a visa to enter the United States.[2] This group of travelers accounted for 46 percent of leisure travel expenditures on U.S. travel services in 2009. Given the large proportion of leisure travel expenditures represented by this group, we investigate some of the key aspects of their expenditures. The focus of this study is on the duration of leisure trips.[3] The average leisure trip duration in 2009 was 12.5 nights in the United States. In this paper, we examine the differences in average trip duration between visitors who need a visa and those that do not.

From the individual traveler responses in the 2009 Survey of International Air Travelers (SIAT), the average duration of leisure trips to the United States by visitors entering on a visa is longer than the trips of visa-free travelers. We explain this survey result by extending Morley's (1992) tour utility model where trip benefit is a function of trip duration and traveler's trip preferences. A traveler incurs pre-trip fixed cost that can reduce the net benefit of a trip below zero and make it not worthwhile. In this model, a traveler chooses whether to make the trip, and length of stay that maximizes his or her net trip benefit.

[2] Count of overseas international travelers excludes visitors from Canada and cross-border crossings from Mexico.
[3] U.S. Department of Commerce, Office of Travel and Tourism Industries reports average duration of stay of visitors by the travel purpose, but not by visa requirement, in its annual *Profile of Overseas Travelers to the United States*.

The modeling approach is related to the recent international trade models with heterogeneous firms pioneered by Melitz (2003). In these trade models, a firm's type, a producer that only serves domestic market or a producer that also exports, is determined according to its productivity. In this model, a traveler's type is determined according to his or her trip preferences. We assume that travel visa requirement has a pre-trip fixed cost and derive pre-trip cutoffs for visa-required and visa-free travelers. Thus, in our model the visa requirement determines the range of the average type of travelers entering the United States up to these cutoffs. This range is endogenously determined by the total visitor-nights, which are the product of number of leisure travelers entering the United States and their trip duration.

Since visa-free travelers do not face a cost of obtaining a visa, the total visitor-nights of visa-free travelers is larger than the total visitor-nights of visa-required travelers. However, the visa cost raises the valuation of the trip for visa-required travelers above the trip valuation of visa-free travelers. Hence, the average trip duration of visa-required travelers exceeds that of visa-free travelers, particularly for the first-time visitors. Our theoretical model, therefore, highlights two offsetting effects imposed on leisure travelers by the need of some travelers to obtain a visa to enter the United States. If the visa requirement is relaxed the traveler volume rises, but their duration of stay falls.

The predictions of this theory can be tested in two stages. First, given the set of destination choices with certain attributes including visa-requirements, overseas travelers select the United States as their leisure destination choice. The selection choice determines the total number of visitors. Second, after selecting the United States as their destination choice, each of these travelers decide on the trip length. Dividing the trip length of each traveler by the total number of travelers gives the average trip duration of visa-required and visa-free travelers.

Ideally, to assess the impact of a visa entry requirement would necessitate data with a choice set of all possible destinations for inbound travelers. Unfortunately, such data is not available from the SIAT. We only observe travelers who have already entered the United States. Therefore, we focus on testing the predictions of our theory for changes in visa requirements on the average trip duration of travelers by applying a negative binomial count model to the individual traveler data. The model generates an estimate of how trip duration varies with visa requirements. We control for various travel characteristics such as airfare and cost per night. Finally, we use the model to calculate the effect of visa requirements on the average dollar value of international travel expenditure.

RELATED LITERATURE

This analysis contributes to the travel economics literature that explores the role of travel constraints on individuals' desire for leisure travel. Nyaupane and Andereck (2007) discuss the following forms of travel constraints: trade in tourism, distance to the destination, climate and seasonality, lack of transportation and accommodation, safety and security and lack of tourism promotion. A visa requirement is the "trade in tourism" constraint that is most relevant to our study. Surprisingly, there is only small number of studies that assess the impact of visa requirements on travel volume and exports in travel services. To the best of our knowledge, this paper is the first to formally model and estimate the relationship between visa requirements and the average trip duration of travelers based on survey data of individual international travelers.

Edgell (1988) classifies the requirement to obtain a visa as a "non-monetary" travel constraint that precludes potential travelers from visiting the United States. He argues that eliminating visa requirements through legislation may substantially increase the number of potential travelers. However, he does not specifically quantify this benefit. Neiman and Swagel

(2009) assess the impact of visa requirements on the volume of international travelers to the United States. They find that following the 9/11 attacks, stricter visa requirements in the United States led to a larger reduction in U.S. entries among visa-free travelers. While the authors conclude that there was no significant change in the net volume of visa-required travelers following the attacks, they do not consider how stricter visa requirements affect the average length of stay of visa-required travelers. As we show in this paper, this overstates the effect of visa requirements, since it does not account for partially offsetting increase in length of stay. Based on the predictions of our theory and econometric estimates, stricter visa requirements increase the duration of stay of visa-required travelers, and as a result, their travel expenditures. On the other hand, relaxed visa requirements result in more visitors, but their stay is shorter. Consequently, in both cases total visitor-nights increase.

DATA

We focus on the trip duration of visa-required and visa-free leisure travelers in the United States. We use individual responses of inbound international travelers to the United States from the 2009 Survey of International Air Travelers. The survey asks respondents to state their country of residence and citizenship. Using these responses, we classify each leisure traveler as either visa-free or visa-required.[4] Visa-free travelers are either citizens of the United States or Canada or citizens of countries that participate in the Visa Waiver Program and stay fewer than 90 days.[5] We assume that citizens from all other countries obtained a visa prior to visiting the United States.

[4] Visa-required travelers are those who needed a visa to enter the United States in 2009 regardless of whether the visa was issued in 2009 or earlier.
[5] Details on the Visa Waiver Program can be found at http://travel.state.gov/visa/temp/without/without_1990.html.

As reported in Table 1, the average duration of trips of all leisure travelers in 2009 was 12.5 nights. Trip duration for visa-required leisure travelers exceeded that of visa-free travelers by 4.7 nights. Among top five visited states, visa-required travelers stayed longer than visa-free travelers by 5.6 and 5.2 nights in New York and California, respectively. In both of these states, the trip duration of visa-required travelers exceeded national average.

In Table 2, we report the average duration of leisure trips for visa-required and visa-free travelers who entered the United States for the first time. We compare these durations with those of repeat visa-required and visa-free travelers. The average length of trips duration of first-time visa-required travelers exceeded that of visa-free travelers by nearly 14 days. For repeat visa-required and visa-free, this difference is only 2.3 days. Among the top five visited states, the difference between average lengths of trips duration for first-time visa-required and visa-free travelers was largest for New York and smallest for Nevada.

Table 3 summarizes the characteristics of the respondents in the 2009 SIAT. After applying the visa requirement distinction to our sample, we find that among all international leisure travelers to the United States 22 percent of travelers were visa-required and 78 percent were visa-free. Among the top three states by number of visitors, the largest fractions of visa-required travelers were in New York (24 percent) and California (22 percent). Florida had the lowest fraction of the visa-required travelers of 16 percent and the highest fraction of the visa-free travelers (84 percent).

We report shares of visa-required and visa-free travelers by various travel characteristics. In our sample, the largest share of both visa-required and visa-free travelers is between 22 and 34 years old. However, the share of visa-required travelers is larger than share of visa-free travelers for young and middle-age travelers and it is lower for older travelers. Older travelers are more

likely to travel visa-free.[6] The difference in average age between these two groups has an implication for the choice of travel activities among visa-required and visa-free travelers. Visa-required travelers consume smaller share of shopping and dining services, but larger share of these travelers prefer visiting amusement parks and sightseeing.

The expenditure on airfares and travel services vary among visa-required and visa-free travelers and state of visitation. Overall, in 2009 visa-required travelers spent on average less on airfares, but more on travel services compared to the visa-free travelers. The latter indicates longer average trip duration by visa-required travelers. Among top three states by number of visitors, California was the most expensive state to visit for both visa-required and visa-free travelers. It exceeded the national average airfare and travel service expenditure by $616 and $588 for visa-required travelers, respectively.

In the next section, we present an economic model of international leisure trips duration that explains two characteristics that we find in the data. First, the number of visa-required leisure travelers is smaller than the number of leisure visa-free travelers. Second, the average trip duration of visa-required leisure travelers exceeds those of visa-free travelers. Empirically, we are only able to test our economic model on the latter, as we only observe travelers who already entered the United States.

MODEL OF INTERNATIONAL LEISURE TRIPS DURATION

We derive an economic model of international leisure trips duration that follows Morley (1992) in assuming that a traveler i's benefit from a leisure trip to the United States is generated by the individual travel benefits function $z_i(t_i)$, where t_i time length of visitor's i trip. Let γ_i be

[6] The correlation between age of travelers and the visa requirement is significantly negative.

the pre-trip preference parameter that defines the type of a traveler i (e.g. first time or repeat traveler). The individual travel benefits function $z_i(t_i)$ is given in (1).

$$z_i(t_i, \gamma_i) = \frac{(t_i)^{\theta}}{\gamma_i} \tag{1}$$

In the individual production function $z_i(t_i)$, $0 < \theta < 1$ is the "trip satisfaction" elasticity that measures the extent to which the trip benefit changes in response to the change in time that is spent on travel activities.

A leisure traveler i incurs a variable cost of travel services c_i per length of stay and fixed pre-trip cost f_i. The fixed pre-trip cost f_i is independent of the trip duration such as airfare, visa fees (for travelers that need a visa to enter the United States) and so on. A leisure traveler i chooses the length of her U.S. trip t_i that maximizes trip value (TV_i) function in (2).

$$TV_i(t_i, c_i, f_i, \gamma_i) = z(t_i, \gamma_i) - c_i t_i - f_i. \tag{2}$$

The maximization of (2) yields the optimal trip duration of a trip t_i conditional on $TV_i > 0$

$$t_i = \left(\frac{\theta}{c_i \gamma_i}\right)^{\frac{1}{1-\theta}} \tag{3}$$

The optimal length of trip t_i falls both with the cost of travel services c_i ,and with the trip preference γ_i, which is a disutility of travel ($\frac{\partial t_i}{\partial c_i} < 0$; $\frac{\partial t_i}{\partial \gamma_i} < 0$). It does not depend on the fixed travel cost f_i. Substituting (3) into (2), we obtain the maximized trip value function TV_i in (4).

$$TV_i = \gamma_i^{-\frac{1}{1-\vartheta}} \left[\left(\frac{\theta}{c_i}\right)^{\frac{\vartheta}{1-\theta}} - c_i \left(\frac{\theta}{c_i}\right)^{\frac{1}{1-\vartheta}}\right] - f_i \tag{4}$$

By setting $TV_i = 0$, we obtain "zero trip value" (ZTV) condition in $TV_i(c_i, f_i, \gamma_i{}^*)$ (5). This condition determines the leisure pre-trip cutoff $\gamma_i{}^*$ such that the benefit of a leisure trip that is determined by the optimal length of stay $t_i{}^*$ is equal to the fixed trip cost f_i

$$\gamma_i{}^* = f_i{}^{(\theta-1)} \left[\left(\frac{\theta}{c_i}\right)^{\frac{\vartheta}{1-\theta}} - c_i \left(\frac{\theta}{c_i}\right)^{\frac{1}{1-\vartheta}} \right]^{1-\theta} \tag{5}$$

The leisure pre-trip planning cutoff $\gamma_i{}^*$ falls with increase in fixed pre-trip cost f_i $\left(\frac{\partial \gamma_i{}^*}{\partial f_i} < 0\right)$.

Let v_i denote pre-trip visa cost and a_i denote the pre-trip cost of airfare. The fixed pre-trip cost for visa-required travelers is greater than that for visa-free travelers ($f_{visa} = v_i + a_i > f_{no-visa} = a_i$). This implies that pre-trip planning cutoff for visa-required travelers is lower than for visa-free travelers ($\gamma_{visa}{}^* < \gamma_{novisa}{}^*$). Consequently, there are going to be fewer visa-required travelers undertaking leisure trips to the United States ($\frac{\partial \gamma_i{}^*}{\partial f_{visa}} < \frac{\partial \gamma_i{}^*}{\partial f_{novisa}} < 0$).

We assume that pre-trip preferences γ are drawn from a common distribution function $g(\gamma)$; $g(\gamma)$ has a continuous cumulative distribution function $G(\gamma)$. Using expression for the optimal trip duration t_i (3), we obtain the average duration of leisure trips to the United States (i.e., leisure travelers with $\gamma \leq \gamma^*$) in (6).

$$\bar{t} = \frac{\int_0^{\gamma^*} \left(\frac{\theta}{c\gamma}\right)^{\frac{1}{1-\theta}} g(\gamma) d\gamma}{G(\gamma^*)} \tag{6}$$

Since $\frac{\partial \bar{t}}{\partial \gamma} < 0$ and $\gamma_{visa}{}^* < \gamma_{novisa}{}^*$, it follows that the average trips duration of visa-required travelers is greater than those for visa-free travelers ($\bar{t}_{visa} > \bar{t}_{novisa}$).[7] This result is illustrated in Figure 1. Intuitively, since the fixed pre-trip costs for visa-required travelers is higher than those

[7] The signs of the derivate is as shown if and only if $\theta < 1$, which can be empirically tested.

for visa-free travelers, visa-required travelers place higher value on the leisure trip by staying more nights in the United States, on average. Also, $\frac{\partial \bar{t}}{\partial c} < 0$, the average trip duration falls with per-night travel cost c.

We close our theoretical model by calculating the total visitor-nights for visa-required (T_{visa}) and visa-free travelers (T_{novisa}) in (7a) and (7b), respectively.

$$T_{visa} = \int_0^{\gamma^*_{visa}} t_{visa}(\gamma) g(\gamma) d\gamma = N_{visa} * \bar{t}_{visa} \qquad (7a)$$

$$T_{novisa} = \int_0^{\gamma^*_{novisa}} t_{novisa}(\gamma) g(\gamma) d\gamma = N_{novisa} * \bar{t}_{novisa} \qquad (7b)$$

In expressions (7a) and (7b), N_{visa} and N_{novisa} are the total number of visa-required and visa-free travelers whose trip benefit $TV > 0$, respectively. Furthermore, $\frac{dT}{d\gamma^*} > 0$, number of visitor-nights rises with the pre-trip cutoff.

Suppose that visa requirements are relaxed such that $v'_i < v_i$. In this case $\gamma^*_{visa} < \gamma^*_{visa}{}'$, and, while the average trip duration falls $\bar{t}_{visa} > \bar{t}_{visa}{}'$, the number of visitors increases by *more* than the decrease in average trip duration as long as $\theta < 1$. This implies that relaxing visa requirements raises total visitor-nights ($T_{visa}{}'$) for visa-required travelers.[8] Conversely, the tightening of visa requirements leads to fall in total visitor-nights, but by *less* than decrease in number of visa-required travelers because each arriving visa-required traveler will stay longer,

[8] In the Appendix, we test this implication by randomly relaxing visa requirements for a simulated fraction of visa-required travelers. We compare the results from this counter-factual experiment with an actual estimate of how trip duration varies with a visa entry requirement.

on average. In both cases, the total visitor-nights increase. Thus, the total visitor-nights for travelers entering the United States visa-free (T_{novisa}) is necessarily greater than (T_{visa}).

EMPIRICAL METHODOLOGY

Our economic model has several empirical predictions. First, the average leisure trip duration of visa-required travelers exceed that for visa-free travelers because the former group of travelers faces higher pre-trip cost (obtaining a visa), and as a result, values the trip to the United States more than the latter group of travelers. Second, the trip duration for all travelers falls with higher per-night cost of travel services. Third, since the airfare is also a pre-trip cost, the duration of leisure trips increases with more expensive airfares that reflect the cost of distance of getting to the United States. Fourth, relaxing visa requirements leads to lower average duration of stay, but higher total visitor-nights of visa-required travelers. In this section, we develop an econometric specification to test these predictions.

By substituting (5) into (3) and taking the log-linear approximation, we can express the trip duration for visa-required and visa-free travelers as a composition between per-night travel cost c_i, pre-trip planning cost of airfare a_i, and visa cost v_i.

$$\ln\left(t_i{}^{visa}\right) = \left[\frac{1}{1-\theta} + (1-\theta)\right]\ln\theta - \frac{1}{1-\theta}\ln c_i + (1-\theta)\ln a_i + (1-\theta)\ln\ v_i \qquad (8a)$$

$$\ln\left(t_i{}^{no\ visa}\right) = \left[\frac{1}{1-\theta} + (1-\theta)\right]\ln\theta - \frac{1}{1-\theta}\ln c_i + (1-\theta)\ln a_i \qquad (8b)$$

In the empirical specification the dependent variable t_i is counting duration of trips in nights, and therefore only takes positive values. To determine the appropriate distribution we plot the fraction of leisure travelers as a function of their trip duration in Figure 2. It is evident that the

fraction of travelers and their variance falls with an increase in trip duration. Also, since the distribution is positively skewed the heteroskedasticity is strongly asymmetric, since it is not bounded on the right.

Figure 3 highlights the differences in trip duration between visa-required and visa-free groups of travelers. For example, about 5 percent of visa-required travelers and 18 percent of visa-free travelers stay for 15 nights, respectively. This implies that the effects of the travel costs are greater for visa-free travelers who stay for 15 nights. Conversely, these effects are greater for visa-required travelers who stay for 10 nights. For both visa-required and visa-free groups of travelers the magnitude of these effects falls non-linearly as the duration of trips increase.

Given the properties of the dependent variable, we cannot apply ordinary least squares (OLS) to estimate the specifications in (8a) and (8b). As discussed by King (1987), applying OLS to estimate models with count data yields biased and inconsistent estimates for two reasons. First, since OLS assumes linear conditional expectation of $E(t|TRV)$, predicted counts of nights can be less than zero. Second, the effects of travel characteristics on the trip duration are the same (linear) regardless whether trips duration is 5 or 20 nights.

Based on these considerations, we assume that duration of trips in nights t has negative binomial distribution such that $t \sim NB\left(\lambda, \lambda + {\lambda}/{r^2}\right)$, where λ is the rate parameter and r is the dispersion parameter. The negative binomial is generalization of the Poisson distribution that does not assume equality of the mean the variance. It is more appropriate than Poisson distribution for our data because as reported in Table 1, the standard deviation of number of nights exceeds its sample mean. Since the mean of the negative binomial is λ, we model λ as a function of all travel costs in 8(a) and 8(b) and assume that $t = \lambda(c, a, v)$.

In our data we do not directly observe pre-trip visa costs, but we can classify each traveler as visa-required or visa-free based on traveler's country of citizenship. Let V_i be an indicator variable that takes value of one if a traveler i requires a visa and zero otherwise. Then our main estimating specification is the negative binomial regression (9).[9]

$$\ln(t_i) = \beta_1 + \beta_2 V_i + \beta_3 \ln(c_i) + \beta_4 \ln(a_i) + \zeta_s + \xi_m + \epsilon_i \quad (9)$$

In specification (9) the trip duration of any leisure traveler i is explained by an indicator for visa requirements (V_i), the per-night cost of travel services(c), and the cost of the airfare (a). The error term of the regression is ϵ_i. We also include state (ζ_s) and month (ξ_m) fixed effects to account for unobservable state specific characteristics that may extend trip duration in one state as compared to the other, and for the unobservable seasonal variation in travel patterns. For example, a traveler may choose to stay longer in California because of its many tourist-oriented attractions.

It is common to report the estimates from the negative binomial regression using incident rate ratio (IRR). For example, the estimate of IRR that compares trips duration of the visa-required to the visa-free travelers holding other covariates constant can be calculated using (10).

$$IRR = \exp(\hat{\beta}_2) = \frac{\hat{\lambda}(1)}{\hat{\lambda}(0)} \quad (10)$$

In expression (10), $\hat{\lambda}(1)$ is an estimate of the rate parameter λ for travelers who required a visa, and $\hat{\lambda}(0)$ is an estimate of the rate parameter λ for travelers who are visa free. The

[9] We estimated (9) using zero-truncated variant of the negative binomial regression, since our dependent variable never has a count of zero.

predicted average trips duration of visa required travelers to the United States given the sample average of trip costs can be calculated using (11).

$$\hat{t}_{visa} = \exp(\hat{\beta}_1 + \hat{\beta}_2 \bar{V} + \hat{\beta}_3 \, \bar{c} + \hat{\beta}_4 \, \bar{a}) \quad (11)$$

The advantage of applying the count model to predict the trip duration for visa-required and visa-free travelers is that this estimate takes into account travel cost of these travelers. We use the predicted trip durations to calculate and compare per-trip travel expenditures of visa-required travelers and visa-free travelers.

ESTIMATION RESULTS

We estimated parameters in (9) using the individual responses of international leisure travelers to the United States in 2009. Our economic model predicts the magnitudes of incidence rate ratios (IRRs) for the estimated parameters in (9). First, the longer average trip duration of visa-required travelers relative to the visa-free travelers implies that the IRR of $\hat{\beta}_2$ is predicted to be greater than one. Second, higher per-night travel expenditure lowers average trip duration implies that the IRR of $\hat{\beta}_3$ is predicted to be less than one. Third, higher airfare costs increase the average trips duration implies that the IRR of $\hat{\beta}_4$ is predicted to be greater than one. To control for a variety of state and seasonal variation in trip characteristics, we estimated (9) with state and month fixed effects.

Table 4 reports the negative binomial IRR estimates of the parameters of the model in (9). The over-dispersion parameter (α) is significant and less than one, which indicates that trip duration counts are over-dispersed, with the conditional variance exceeding the conditional

mean. This implies that the negative binomial model is more appropriate than the Poisson model for fitting trip duration counts.

The estimates for the parameters in (9) are reported in column 1 of Table 4. Confirming the prediction of our economic model, the effect of visa requirement on the trip duration is significantly greater than one. The IRR estimate of β_2 indicates that U.S. trips are on average 26 percent longer for visa required travelers as compared to visa-free travelers.[10] The IRR estimate of β_3 is significant and less than one. This estimate indicates that increase in per-night travel expenditure of 1 percent reduces the average the length of trips duration by around 31 percent, holding other covariates constant. The IRR estimate of β_4 is significant and greater than one. This estimate indicates that an increase in airfare cost of 1 percent increases the average the length of trip duration by about 17 percent, holding other covariates constant.

Next, we test whether our model appropriately matches large sample difference in the average length of trip duration between first-time visa-required and visa-free travelers by estimating (12).

$$\ln(t_i) = \beta_1 + \beta_2 V_i + \beta_3 V_i * FT_i + \beta_4 \ln(c_i) + \beta_5 \ln(a_i) + \zeta_s + \xi_m + \epsilon_i \qquad (12)$$

The estimating specification (12) extends the specification (9) by adding an interaction term between visa requirement and an indicator variable FT_i that equals to one if a traveler i is a first-time U.S. visitor and zero otherwise. We expect that the effect of visa requirement is significantly larger for first-time visitors relative to the repeat visa-required travelers because the former group incurs pre-trip visa cost in the same year of visit ($\widehat{\beta_3} > \widehat{\beta_2}$).

[10] IRR can be interpreted as percentage change in one unit change in the independent variable by multiplying $100 * \exp(\hat{\gamma} - 1)$.

The reported estimates in column 2 of Table 4 confirm our prediction. We find that the effect of visa requirement on the average length of trip duration for first-time travelers exceeds that for the visa-required repeat travelers by 11 percent. Comparing the estimates of β_2 in columns 1 with estimates of β_2 and β_3 in column 2, we observe that the former estimate is about the average of the latter two. Since the fraction of repeat visa-required travelers (33.9 percent) is larger than the fraction of first-time visa-required travelers (23.6 percent), we base our further discussion on the estimate of β_2 that is obtained from the pooled sample of first-time and repeated visa-required visitors.

For a robustness check, in columns 3 and 4 of Table 4, we report the parameter estimates in (9) after adding controls for traveler's personal characteristics and travel activities. For example, our descriptive statistics indicate that in 2009 there were three percent more of visa-required then visa-free travelers who visited amusements parks. Omitting travel activities from our regression may bias the estimate of β_2 upwards, because any travel activity affects the trip duration and its share varies by visa-required and visa-free groups of travelers. Conversely, omitting traveler's income from our regression may bias the estimate of β_2 downwards, because traveler's income is positively correlated with the trip duration but it is negatively correlated with the visa requirement.

We find that travelers, who like visiting amusement parks, are estimated to lengthen their trips by 10 percent longer relative to travelers preferring not to visit amusement parks. Interestingly, among the top four travel activities, only the desire to attend amusements parks lengthens the duration of stay. Among personal travel characteristics only age has a small, but statistically significant effect on the average length of trip duration. Adding these characteristics has very little effect on the magnitude of visa requirements, per-night travel cost, and airfare. It

appears that differences in trip duration between visa-required and visa-free travelers are well captured by per-night travel cost and airfares.

In Table 5, we determine the fit of our model by testing the significance of the difference between the sample mean and the mean of number of nights during the U.S. trip predicted by the empirical model (9). We find that there is no statistical significant difference in sample and predicted means for the whole sample as well as for visa-required and visa-free travelers. This result indicates that our model fits the data well.[11]

In Table 6 we report the predicted duration of trips in nights for visa-required and visa-free travelers conditional on the available average travelers' characteristics using equation (11). We find that in the United States visa-required travelers on average stay 2.8 nights longer than travelers who are visa free. We broke down the trip duration by the state of visitation. For the top five states by the volume of travelers, we find that visa-required travelers stay 3.2 nights longer in California, 3.2 nights in Florida, 1.4 nights longer in Hawaii, 2.4 nights longer in Nevada and 1.8 nights longer in New York than visa-free travelers.

Finally, from the estimation results we calculate the average trip expenditure for visa-required and visa-free travelers. To do this, we multiply the predicted number of nights by the per-night average travel expenditure for these travelers.[12] Table 7 reports the average per-trip expenditure for visa-required and visa-free travelers. We find that visa-required travelers on average spend almost $2,000 more on their leisure trip then visa-free travelers. The difference in per-trip expenditure between visa-required and visa-free groups of travelers varies by top five

[11] Since not every traveler reports all travel characteristics that we use to estimate specification (8), the sample average of trips duration that is based on all available data is slightly lower than sample average of trips duration without any travel characteristics.

[12] In our sample the average per-night travel expenditure in the United States by visa-required travelers and visa-free travelers in 2009 was $392 and $310, respectively.

visited states. For example, visa-required travelers spend $3,527 more than visa-free travelers in Florida and $1,264 more in California. However, despite this variation, visa-required travelers spend more on travel services then visa-free travelers in every state.

CONCLUSION AND IMPLICATIONS OF THE MODEL

While statistics on average trip duration is publicly available, very little is known about the difference between visa-required and visa-free visitors to the United States. By utilizing SIAT responses of international leisure travelers to the United States, we are able to indentify each traveler as either visa-required or visa-free and calculate the average trip duration for these two groups of travelers. The data indicate that the average trip duration of visa-required travelers exceeds that of visa-free travelers. To explain this survey result, we derived and estimated a model of leisure trip duration with a visa requirement. In the model, we consider the visa requirement to be a pre-trip fixed cost. While trip duration is among many possible measures of the tourism utility, using this measure we have shown how travel behavior of visa-required and visa-free travelers differs when we control for various travel characteristics.

Understanding factors influencing trip duration could be important in designing successful marketing strategies for tourist destinations as it allows appropriate selection of travel activities and attractions that will maximize the satisfaction from a trip. We have found that international travelers who like amusement parks, for example, stay in the United States 10 percent longer than travelers who do not. Among visa-required travelers and visa-free travelers who like amusement parks, we estimated that trip duration of visa-required travelers is around two days longer than for visa-free travelers. Thus, a marketing strategy of travel activities may differ based on these two groups of travelers. For example, travel agents can recommend U.S.

destinations with well known amusement parks to increase the length trips for visa-required travelers.

Our analysis also provides important implications of the effect of visa requirement on exports in travel services. Increases in the export of travel services can be achieved both by higher volume of visitors and by longer trip duration of travelers. Although the model predicts that relaxing visa requirements leads to shorter trips, it also predicts an increase in the number of visitors, and thus, an increase in total-visitor nights and total dollars spent. In this case, exports in travel services would increase as result of a larger volume of visa-required travelers. However, it may not be possible to relax visa requirements for all travelers from all countries, but exports of travel services from visa-required countries may still increase due to longer trip duration. Thus, significant efforts in expanding visas that is paired with travel marketing strategies taking into account the preferences of visa-required travelers may substantially increase exports of U.S. travel services.

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Table 1 - Sample Statistics of the U.S. Trips Duration

	All Travelers		Visa		No Visa	
Region/State	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
United States	12.50	18.29	16.20	27.85	11.48	14.40
California	14.03	19.15	18.09	31.08	12.87	13.91
Florida	14.23	13.88	12.42	19.47	14.60	12.42
Hawaii	7.25	5.48	7.04	5.29	7.26	5.49
Nevada	9.16	5.93	10.28	6.08	8.90	5.89
New York	9.63	15.66	14.05	25.08	8.20	10.63

Table 2 - U.S. Trips Duration of First Time and Repeat Visitors

	Visa		No Visa	
Region/State	First Time	Repeat	First Time	Repeat
United States	24.38	14.15	10.56	11.87
California	25.71	15.98	13.44	12.63
Florida	9.98	12.92	13.55	14.89
Hawaii	15.67	5.81	7.19	7.27
Nevada	12.75	9.76	8.86	8.91
New York	21.68	12.14	8.19	8.21

Table 3 - Selected Characteristics of the Sample International Leisure Travelers to the United States in 2009

	United States		California		Florida		New York	
Selected Categories	Visa	No Visa	Visa	No Visa	Visa	No Visa	Visa	No Visa
Age (Shares in %)								
< 21	5.7	4.8	4.0	5.2	3.7	3.4	5.6	4.7
22-34	34.2	30.1	33.6	31.0	33.0	21.4	35.7	39.8
35-44	25.1	23.8	30.5	18.8	29.9	30.1	25.3	22.7
45-54	17.7	19.5	17.3	20.5	16.2	24.2	17.4	15.9
55-64	9.9	12.4	9.3	13.1	10.0	12.5	9.4	9.4
65 >	3.4	4.9	2.2	5.4	3.1	4.5	3.1	2.5
Income (Shares in %)								
< 20k	17.3	5.4	15.3	5.7	16.4	4.1	17.5	6.2
20k - 39k	18.1	12.8	21.9	11.4	19.4	11.3	16.1	14.8
40k-59k	13.4	16.5	14.8	13.5	15.1	17.8	13.1	17.4
60k-79k	13.5	16.8	13.3	15.4	13.7	19.3	13.4	15.4
80k-99k	9.2	13.7	13.8	12.9	8.6	14.9	9.4	13.0
100K-119K	7.4	9.7	3.1	8.3	9.4	10.1	7.5	9.2
Gender (Shares in %)								
Female	48.7	51.7	50.0	48.0	51.6	54.5	48.5	52.8
First Time (Shares in %)	23.6	33.9	25.9	33.5	20.3	24.5	23.6	47.1
Activities (Share in %)								
Shopping	86.1	89.5	86.3	87.2	87.4	89.6	86.7	90.9
Dining	73.9	84.4	77.9	81.2	71.0	88.6	74.7	82.5
Amusement Park	37.8	34.9	46.5	41.2	48.6	70.3	32.0	13.0
Historical Sites	48.3	42.9	42.5	44.3	20.8	16.0	63.7	63.7
Sightseeing of Cities	42.6	49.9	50.0	62.8	27.2	20.5	48.6	66.3
Expenditure (Mean in $)								
Airfare	$1,847	$1,910	$1,531	$2,463	$2,023	$2,181	$1,458	$1,455
Services	$3,322	$2,912	$3,061	$3,810	$3,516	$3,446	$3,215	$2,508
Total	1,973	7,128	226	796	438	2,161	947	2,926

Table 4 - Negative Binomial Estimates of Trips Duration

Variables	(1) IRR	(2) IRR	(3) IRR	(4) IRR
Visa Requirement	1.255***	1.170***	1.244***	1.223***
	(0.044)	(0.047)	(0.048)	(0.039)
Visa Requirement x First Time		1.280***		
		(0.114)		
ln(Per-night Travel Expenditures)	0.690***	0.647***	0.640***	0.670***
	(0.011)	(0.011)	(0.012)	(0.013)
ln(Airfare)	1.223***	1.225***	1.203***	1.167***
	(0.023)	(0.023)	(0.024)	(0.036)
Age			1.000	1.003
			(0.001)	(0.001)
Female			0.973	0.992
			(0.027)	(0.024)
Income $60,000 - $79,000			1.094	1.093
			(0.079)	(0.062)
Shopping				1.093*
				(0.053)
Dining				1.012
				(0.038)
Amusement Park				1.191***
				(0.033)
State Fixed Effects	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes
Over dispersion (α)	0.317***	0.300***	0.300***	0.230***
Observations	3,940	3,940	3,940	3,940

Notes: Dependent variable Trip Duration (in nights);
Top three travel activities (by share of participation) and most frequent income group, relative to income of <$20,000 shown;
Robust standard errors in parentheses *** p<0.01, ** p<0.05 * p<0.1

Table 5 – Mean Differences in Trips Duration

	Sample		Model		
Traveler's Type	Mean	95 % Interval	Mean	95 % Interval	Mean Difference
All	12.28	[11.73 - 12.84]	12.07	[11.84 - 12.30]	0.21
	(0.284)		(0.059)		(0.252)
Visa- Required	15.04	[13.18 -16.91]	14.17	[13.5 - 15.0]	0.87
	(0.950)		(0.132)		(0.839)
Visa-Free	11.45	[11.00 - 11.90]	11.43	[11.1 - 11.9]	0.02
	(0.229)		(0.118)		(0.209)

Notes: Standard Errors are in parenthesis

Table 6 - Predicted Average Trips Duration by Visa Requirement

	Trip Duration in Nights				
Region / State	Visa	95 % Interval	No Visa	95 % Interval	Difference
United States	14.2	[13.5 - 15.0]	11.4	[11.1 - 11.9]	2.8
California	16.9	[12.3 - 21.6]	13.7	[10.0 - 17.6]	3.2
Florida	17.1	[14.6 - 19.6]	13.9	[11.9 - 15.9]	3.2
Hawaii	7.2	[5.7 - 8.6]	5.8	[4.7 - 6.9]	1.4
Nevada	12.7	[11.7 - 13.7]	10.4	[9.8 - 10.9]	2.4
New York	9.3	[5.8 - 12.7]	7.5	[4.8 - 10.3]	1.8

Table 7 - Predicted Average Leisure Travel Expenditure Per Traveler by Visa Type

Region/State	Visa	No Visa	Difference
United States	$5,527	$3,565	$1,962
California	$5,662	$4,398	$1,264
Florida	$6,891	$3,364	$3,527
Hawaii	$2,945	$2,268	$677
Nevada	$5,486	$3,744	$1,742
New York	$4,111	$2,655	$1,456

Figure 1 – Average Trips Duration for Visa-Required and Visa-Free Travelers

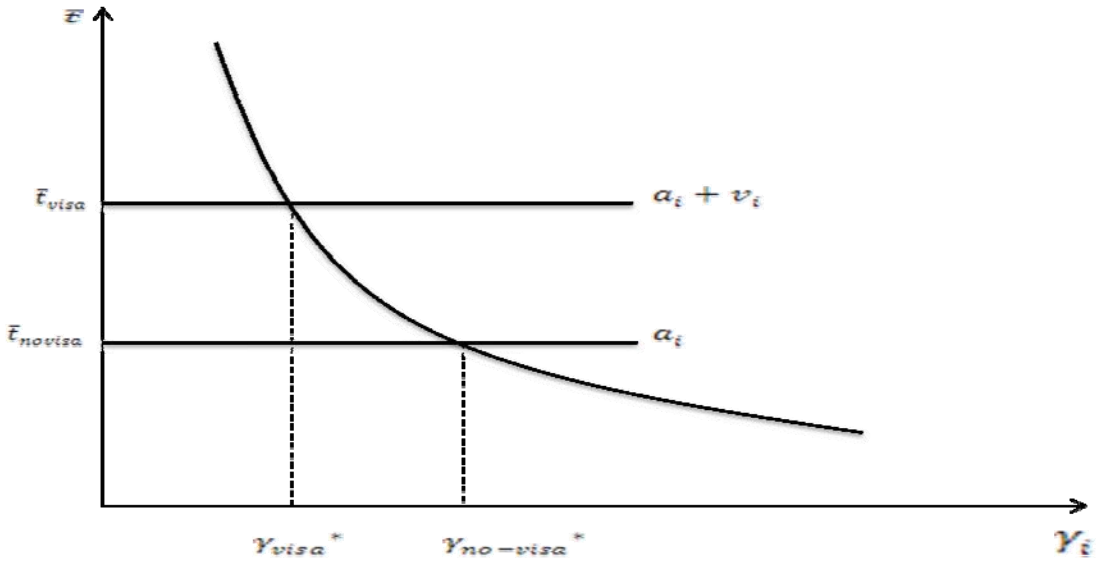
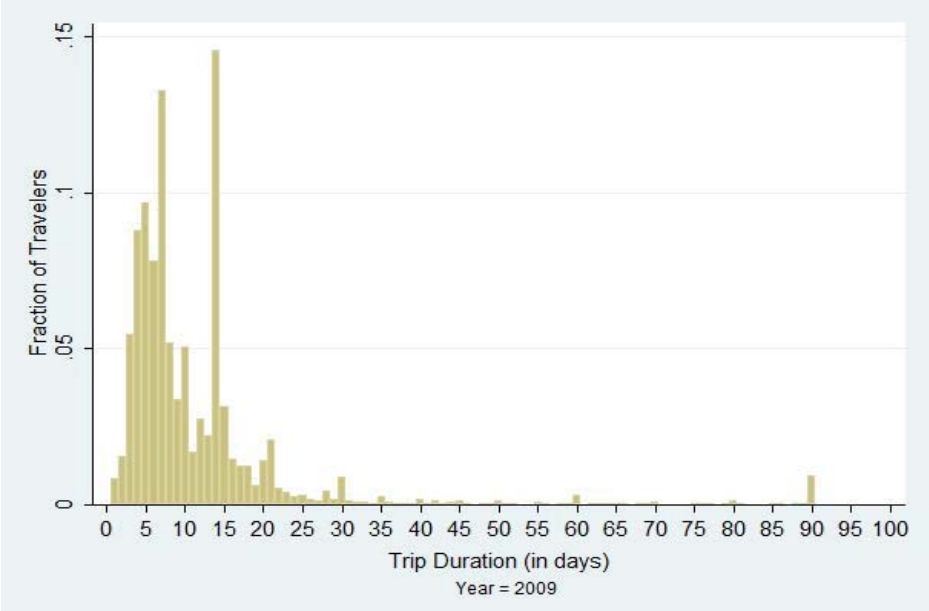
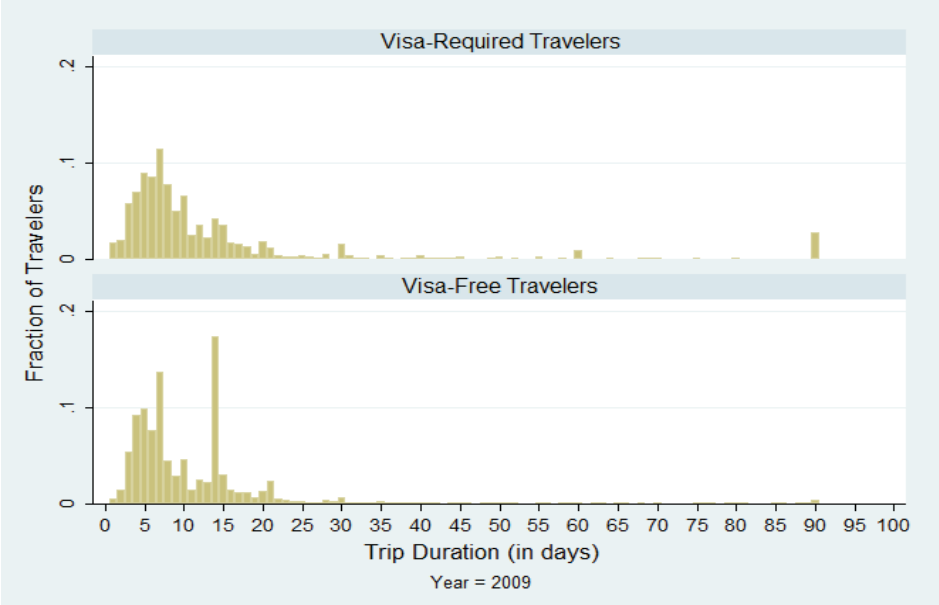


Figure 2 – Probability Distribution of the Trip Durations



Source: Author's Calculations

Figure 3 – Probability Distribution of the Trip Durations by Visa Requirement



Source: Author's Calculations