Distance Matters: The Impact of Physical and Relative Distance on Pleasure Tourists' Length of Stay in Barbados

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Abstract

This paper argues that length of stay is a reflection of the distance between the origin and destination country. Past interpretations of distance premised on spatial aspects. This study extends the dimensional space of distance to include socio-psychological dimensions, climate distance and economic distance. Our empirical analysis utilizes airport data covering over 350,000 pleasure tourists to Barbados from 144 countries. The results suggest that the length of stay of pleasure tourists to Barbados increases with geographic distance, cultural distance and climatic distance, but is inversely related to economic distance. We find no evidence that long-distance relationships (captured by transnational and diasporic relationships) affect tourist length of stay. Implications of these findings are provided.

1. INTRODUCTION

Distance is an important decision criterion in destination choice. Williams and Zelinksky (1970) argue that distance is one of the most important factors affecting travel patterns, which is not surprising given the spatial configuration of tourism consumption (that is, tourism consumption requires movement from one place to another). In recent times, distance is no longer conceived in a purely physical sense, but also in a more relative context. Relative distance is used to describe new kinds of "stretchable" and "shrinkable" spaces (Abler, Adams, & Gould, 1972, p. 72). As Kreisel (2004, p. 167) notes, past interpretations of geographical space premised only on spatial aspects is obsolete and not coincident with "real" space, which includes socio-psychological dimensions of distance as well as spatial elements. Further, people's behaviour in relation to relative space does not possess the metric characteristics of geographic distance (Gatrell, 1983). From a tourism perspective, Hall (2005, p. 69) asserts that the "distribution of travel behaviour in space and time reflects an ordered adjustment to the factor of distance". As a consequence, this adjustment must be accompanied by flexibility in how distance is conceived.

Against this backdrop, we argue that tourism demand is a reflection of both the physical and relative distance between origin and destination. Following recent developments in the literature, the study uses individual length of stay as a proxy for tourism demand instead of the commonly used aggregate tourist arrivals. While macroeconomic approaches to tourism demand provide a global understanding of factors influencing demand (Park, Woo, & Nicolau, 2019), aggregating tourism data removes any individual idiosyncrasies, and so, hides valuable information about the diversity and heterogeneity of tourist behaviours and preferences. Analysing micro-data allows us to study the many facets of length of stay.

Although interest in length of stay studies dates back to the 1970s, there are only a handful of studies on tourist length of stay prior to 2006 (Rodríguez, Martínez-Roget, & Gonzalez-Murias, 2018). Since then, the number has grown substantially. This is not surprising as the length of time a tourist spends at a destination is considered to be one of

the most important components of tourism demand. The length of stay represents the "quantity of holiday" bought by the tourist (Mak & Moncur, 1979), which in turn is directly related to tourism incomes (Wang, Fong, Law, & Fang, 2018). Length of stay also has an impact on tourists' activities and behaviour as well as the intensity of interactions with locals, which in turn impacts satisfaction, attitudes towards and destination attributes (Nicolau, Zach, & Tussyadiah, 2018) . Understanding the determinants of tourists' length of stay is thus an important economic concern and paramount for effective planning and management in tourism (Martinez-Garcia & Ma Raya, 2008)

Previous studies on length of stay suggests that visit duration is related to variables such as tourist profile, trip characteristics and destination attributes (Gössling, Scott, & Michael, 2018). The impact of distance has also been considered. However, studies on length of stay generally focus on the impact of physical distance on length of stay (Nicolau, Zach, & Tussyadiah, 2018). This study contributes to the literature by moving beyond the notion of distance in a physical and avers that distance is a complex multidimensional construct. We argue models of length of stay that rely solely on geographical distance as the sole dimension of distance may be underspecified. This paper instead focuses on the impact of relative measures of distance on individual length of stay, that is, how close or distant the destination and source country are socially/psychologically, economically and climatically. We posit that these relative distance measures play into the attributes of the destination, by extension its attractiveness to individuals, which in turn affects their length of stay.

Another contribution is that by taking a multidimensional approach to distance, the study also allows for the evaluation of how various source country characteristics influence an individual's length of stay behaviour. Much of the analysis on the role of many source country features (such as climate, culture or economic affluence) has been limited to studies on aggregate tourism demand and are rarely included in studies of individual tourism behaviour. Research suggests that average length of stay differs across source countries (Alegre, Mateo, & Pou, 2011; Gokovali, Bahar, & Kozak, 2007; Thrane &

Farstad, 2012). Differences in population compositions are unlikely to be the sole cause of differences in length of stay observed across source-countries. Rather, these observed differences may reflect specific source country features. Contextual effect theory lies at the heart of social sciences and suggests that an individual's behaviour would be affected by the context in which they live (Huckfeldt, 1986). Thus, the study further contributes to the relevant literatures by measuring how source country features, (specifically, their relative distance from the destination country) affect tourists' length of stay.

The empirical analysis is carried out for Barbados, a small English-speaking Caribbean island. The island is just 166 square miles, with a population of 277,821 persons, but received approximately 500, 000 to 600,000 stay-over tourists a year between 2014 and 2018. The island's appeal is its natural resources (Jackman, 2012). There is an abundance of sunshine year-round, with temperatures varying between 20°C and 33°C, and the island is surrounded by soft, warm, white sand beaches. Like many small island states, Barbados faces limitations on import substitution possibilities, small domestic markets and weak inter-industry linkages (Briguglio, 1995). This translates to a high import content relative to its Gross Domestic Product (GDP), making Barbados very dependent on foreign earnings, particularly tourism to pay its large import bills and spur growth (Jackman, 2014). According to the World Travel and Tourism Council's (WTTC) 2018 economic impact report, tourism's total contribution (direct + indirect + induced) to the Barbados's gross domestic product was 34.9 percent (Oxford Economics, 2019), placing Barbados among top 20 most tourism-dependent countries in the world with respect to the sector's total contribution to the national economy. Tourism also directly employs about 11.6 per cent of the labour force and stands as a significant earner of foreign exchange, accounting for over 50 percent of the country's foreign exchange earnings (Oxford Economics, 2019). Taken together Barbados's economic fortunes are intimately intertwined with its tourism industry. For tourism specializing states such Barbados, an understanding of tourism demand is imperative, for business planning, operations of travel and tourism companies, and economic growth strategies.

To investigate the impact of distance on tourism demand, we use data on over 350,000 pleasure tourists to Barbados from 144 countries. We focus on pleasure tourists as (1) the determinants under consideration are less easily applied to business tourists; and (2) Barbados, being a "sun, sea and sand" destination, a majority of tourists stay for pleasure (Jackman & Naitram, 2019). The rest of this paper is organised as follows: Section 2 reviews the literature on the topic, section 3 describes the data and section 4 outlines the methodology. The results are presented in section 5 and finally, section 6 provides some concluding remarks.

2. LITERATURE REVIEW

Over the last few years, there has been a burgeoning body of literature on the determinants of length of stay. To date, length of stay has been linked to a variety of variables, such as age (Alegre, Mateo, & Pou, 2011; Alén, Nicolau, Losada, & Domínguez, 2014), gender (Mortazavi & Cialani, 2017; Santos, Ramos, & Rey-Maquieira, 2015), employment status (Wang, Little, DelHomme-Little, & Ann, 2012; Salmasi, Celidoni, & Procidano, 2012), accommodation form (Alegre & Pou, 2006; Mortazavi & Cialani, 2017; Martinez-Garcia & Ma Raya, 2008), nationality (Gokovali, Bahar, & Kozak, 2007; Thrane & Farstad, 2012), travel purpose (Alén, Nicolau, Losada, & Domínguez, 2014), travel cost (Peypoch, Randriamboarison, Rasoamananjara, & Solonandrasana, 2012), means of transportation (Santos, Ramos, & Rey-Maquieira, 2015), travel party size (Gómez-Déniz & Pérez-Rodríguez, 2019) and travel motivation (Alegre & Pou, 2006). Notwithstanding the myriad of factors assumed to influence length of stay, distance is considered one of the most essential variables (Nicolau, Zach, & Tussyadiah, 2018).

Geographical distance is often perceived to have a negative impact of tourism demand (Lorde, 2014). The notion that tourists prefer to travel to closer destinations is predicated on the generally accepted concept that geographical distance exerts a frictional effect on demand. The act of travelling requires an investment of time, money, or effort, resulting in various trade-offs—for example, between paid work and unpaid travel and leisure.

Because of these trade-offs, demand is expected to decline as distance increases. This expectation underpins the first law of geography that "everything is related to everything else, but near things are more related than distant things" (Tobler, 1970). The law, typically referred to in the tourism literature as the distance decay effect (McKercher 1998, 2008a, 2008b), implies that the association between two locations becomes weaker as the distance between them grows larger. Several empirical studies have found evidence of such decay (Greer and Wall 1979; McKercher 1998; McKercher, Chan and Lam 2008; McKercher and Lew 2003).

The argument that distance always has negative effects on tourism demand is not universally valid. Another strand of research suggests that distance also conveys positive utility to tourists. The journey in its own right, as an element of the tourism product, may provide utility so that occasionally longer distances are preferred (Baxter, 1979). Some authors, like McKercher and Lew (2003), argue that as travel has become more affordable, distance has become a less significant dissuasive factor. It is possible that the attractiveness of the destination may be so great that it outweighs the normal spatial friction of geographic distance (Baxter, 1979; Crouch, 1994; Mayo, Jarvis, & Xander, 1988). Moreover, the journey itself may be the attraction (Hall, 2005); for example, railway holidays or safaris. McKercher (2008a, p. 368) suggests that such tourists may possess larger "time budgets" and have large discretion over how to spend it.

The distance decay effect in tourism is also confounded by market access, which includes obstacles to travel and intervening opportunities offering similar experiences (McKercher 2008a, 2008b). Destinations closer to the origin have a natural competitive advantage over destinations located farther from the source market even if they are offering similar products (Pearce, 1979). Conversely, Mayo, Jarvis and Xander (1988) find that tourist flows to some destinations increase with distance; that is, a distant destination has a special appeal simply because it is distant, so destinations closer to the origin with otherwise similar products hold no advantage, and may in fact be at a comparative disadvantage. The relationship between distance to a destination and the desire to travel to that destination is further distorted by the possibility that perceived rather than actual

distance may be more relevant for travel decision-making (Ankomah & Crompton, 1992; Mayo, Jarvis, & Xander, 1988).

With respect to the length of stay dimension of tourism demand, early works suggest that geographical distance would be positively related to length of stay. Silberman (1985) propose that geographical distance, though representing an expense in terms of both finances and time, is a fixed cost; it does not vary with length of stay. As such, greater utility can be gained by balancing the proportion of fixed costs and varied cost: the greater fixed costs associated with longer travel will encourage the traveller to increase the varied costs incurred by length of stay. Indeed, several works provide evidence of a positive relationship between geographic distance and trip duration (Blaine, Mohammad, & Var, 1993; Mak, Moncur, & Yonamine, 1977; Nicolau et al., 2018; Walsh & Davitt, 1983; E. Wang, Little, & DelHomme-Little, 2012). While the links between geographic distance on length of stay has firmly been established in the literature (Gómez-Déniz & Pérez-Rodríguez, 2019), little is known about the impact of other forms of distance on tourism length of stay. As alluded to in the introduction, distance is no longer considered in only physical terms, but also in relative terms, and these relative measures have been shown to have independent impacts on tourism demand (Lorde, 2014). In this study, we posit that the time spent in a destination would be related to how close or far the destination is from the source country in both an absolute (that is, physical) and relative sense (socio-psychological non-sociological dimensions). The logic here is that relative distance measures play into the attributes of the destination by extension its attractiveness to individuals, which in turn affects the tourist length of stay. This multidimensional perspective of distance should thus yield a more informative and comprehensive picture of the determinants of length of stay form a source to a destination.

2.1 Socio-psychological dimensions of distance: Cultural distance and long-distance relationships

Song, Romilly, and Liu (2000) maintain that apart from the geographic characteristics of

the destination, tourism demand is determined by social and psychological factors of the tourist, among which are cultural backgrounds and personal interests. The most commonly studied dimension of distance is cultural distance. Cultural distance/proximity is related to the extent to which there is a shared a common identity, feelings of belonging to the same group, and the degree of affinity between two countries (Straubhaar, 1991). Culture represents a critical dimension of tourism demand and has been cited as a destination attribute (Lorde, 2014). Given the aforementioned link between destination attributes and length of stay, it is likely that cultural proximity/distance between the destination and source country is likely to affect tourist length of stay. Indeed, cultural distance has been used to explain differences in other types tourist behaviours, however the research to date has been mixed. Some researchers find that some tourists prefer to visit destinations that are more culturally distant (McKercher & du Cros, 2003) while others prefer more culturally proximate destinations (Ng, Lee, & Soutar, 2007).

Another socio-psychological dimension is the connection between and among migrants and their homeland. The connections between and among migrants and their homelands hold significance for their motivation to travel between host and homeland environments. Such long-distance relationships are captured by two variables, transnational and diasporic relationships. Transnationalism can be defined as processes through which immigrants maintain social relations that connect their home country and host society (Basch, Glick-Shiller, & Blanc, 1994). Practices include, among other things, keeping in touch with relatives, sending remittances, and travelling as tourists (Huang, Haller, & Ramshaw, 2013). Meanwhile the term diaspora (as used in this study) denotes migrants of varying ethnicities resident in a host country but who maintain strong sentimental and material connections to their country of origin (Sheffer, 2006). Migrants, first-generation and their descendants, often feel an incessant urge to travel to their ancestral home to reconnect to their roots and culture (McCain & Ray, 2004).

The diasporic and transnationalism relationships are an important dimension of distance, more accurately proximity, and relates how closely or distant some tourists may feel

towards a particular destination, which in turn could influence tourism demand. Surprisingly, the quantitative impact of diasporic and transnational relations on tourism demand has been largely unexplored. One exception has been the work of Law, Genc and Bryant (2013), who examined the effect of migrants (number of New Zealand residents who were born in the various source markets) and diaspora (number of native New Zealanders residing in the various source markets) on tourism demand. The authors find that both variables have a strong positive effect on tourist inflows to, and outflows from New Zealand. Within the context of this study, it is expected that a stronglong-distance relationship between the destination and source country will result in greater tourism demand in the form of longer visit durations.

2.2 Non-socio-psychological dimensions of distance: climate and economic distance

Examples of non-socio-psychological constructs of distance have also been examined in a tourism context, chief among which are climate distance and economic distance. Climate has been identified as an important destination attribute (Hu & Ritchie, 1993), one of the most important determinants of international tourist flows (Boniface & Cooper, 2009), and is frequently the primary tourism resource, for example beach destinations (Kozak et al., 2008). Lorde (2014) and Lorde, Li & Airey (2016) coin the term "climate distance" as the gap between the climate in the source market and the destination and their work suggest that climate distance between the origin and destination country affects tourism demand. Examining the effect of climate distance on tourist arrivals for the Caribbean, Lorde (2014) and Lorde, Li & Airey (2016) found that the larger the climate distance, the greater the demand. This evidence suggests that tourism demand may be driven to seek climatic conditions different from the ones that exist in their home country. It seems logical to assume that climate distance could also affect the length of stay aspect of tourism demand, encouraging tourists to take longer visits to a destination. Consideration of "climate distance" is thus a requisite factor in modelling length of stay.

With respect to economic distance, the impact of economic distance is derived from Linder's (1961) hypothesis. According to Linder, countries with close incomes trade more intensively than those with less similar incomes, assuming that similarity of preferences is associated with a common income level. Economic distance is thus inversely related to the volume of trade flows. Accounting for the degree of economic proximity between countries will permit broad inferences to be drawn regarding the length of stay preferences of tourists from various origins in relation to the destination. For instance, tourists may prefer to visit and stay longer in destinations with similar endowments of infrastructure and services because it reduces their perception of the risk involved in travel to such destinations. Economic closeness can also determine the range of destination countries that tourists consider (Morakabati, Fletcher, & Prideaux, 2012) as well as the time spent in the destination, as economic similarity is indicative of underlying similarity in socioeconomic values and perspectives.

3. DATA

This study employs secondary data to investigate the relationship between length of stay and distance. We use a data attained from the Barbados Immigration Department containing information on persons arriving at the Grantley Adams International Airport (GAIA)—the sole airport in Barbados—in 2012. Upon arrival at GAIA, all individuals are required by law to fill out a disembarkation card, ensuring that immigration officials have information on entries to the island. This form yields information on the entrant's sex, date of birth, country of residence, occupation, proposed accommodation, purpose of visit, and most importantly, expected length of stay. Montaño, Rosselló, & Sansó (2019) recently advocated for the use of airport data in estimating length stay as an alternative to surveys, where flying is the main way to reach the location. Such approaches have been used in Barbados for nearly a decade as indicated by Wright, et al. (2011). Specifically, the Central Bank of Barbados uses the data from the Immigration department along with instructions given in Wright, et al (2011) to obtain prompt estimates of length of stay in Barbados. We follow suit in this paper and use airport data, following the definitions and instructions given by Wright, et al. (2011) to correctly classify the tourists in the database and their length of stay.

As we are primarily concerned with pleasure tourists' length of stay, our analysis only includes tourists that noted that their purpose of holiday was for pleasure. We also limit our analysis to persons 16 years and over. Listwise deletion of missing observations across dependent and independent variables yielded a final sample of 353,328 pleasure visitors from 144 countries. Information on country coverage is given in Table 1.

The dependent and control variables used in our study are based on responses to items on the disembarkation card. The data from the survey are supplemented with a series of country-level data used to calculate the aforementioned measures of distance. Our measures of transnational and diasporic relationships are taken from the *Global Migrant Origin Database* developed by the Development Research Centre on Migration, Globalisation and Poverty at the University of Sussex. Information on geographic distance and the official language of each source country are sourced from the *French Centre d'Etudes Prospectives et d'Informations Internationales* (CEPII). Real GDP per capita are obtained from the World Bank *World Development Indicators* database, while observations on the climate variables came from the NASA *Prediction of Worldwide Energy Resource (POWER) Climatology Resource for Agroclimatology*.

3.1 Measuring distance

This study utilizes five measures of distance: geographic, cultural, long-distance relationships, economic and climate. Geographic distance is the physical distance between the tourist's country of origin and Barbados and is measured using the great circle formula (Mayer & Zignago, 2011), which gives the shortest distance between two points on a sphere. The ideal measure of cultural distance might be one representative of an entire culture or country, and that could be applied to any such context (West & Graham, 2004). However, it has been argued that such a measure could be derived from language. Language has been described as the mirror of culture (Czinkota et al., 2010), as language is strongly associated with both national and cultural boundaries (West & Graham, 2004). As such, cultural distance is proxied by linguistic similarity between Barbados and that of the source country. The cultural variable is thus binary and takes on

a value of 1 if the source country's official language is different from that of Barbados (that is, the official language is not English) and a value of 0 if the source country's official language is English. Long-distance relationships are captured by two variables, transnational and diasporic relationships. Similar to Law, Genc and Bryant (2013), transnational relationships are proxied by the number of persons from source countries who reside in Barbados (in thousands) while diasporic relationships are operationalised as the number of Barbadians residing in the source country (in thousands). Larger values of these variables indicate a stronger long-distance relationship between Barbados and the source country. Meanwhile, following Choi (2002), economic distance is calculated as the absolute value of the difference between real GDP per capita as a ratio of the sum of per capita GDPs, that is:

$$\frac{|Y - Y_j|}{Y + Y_j}$$

where Y is real GDP per capita in Barbados and Y_j is real GDP of source country j. Here, larger values would indicate greater economic distance between Barbados and the source country. Finally, to calculate climate distance, we employ the second-generation Climate Index for Tourism (CIT), derived from the climatic preferences of surveyed individuals, as advanced by de Freitas, Scott and McBoyle (2008). One of the main drawbacks of most studies assessing impact of climate on tourism demand is the sole focus on temperature (de Freitas, Scott, & McBoyle, 2008). The CIT instead is based on thermal sensation (TSN), a function of temperature, humidity and wind speed and is considered a superior index, as it is based on the climatic preferences of tourists. The CIT is calculated as follows:

$$CIT = 6.4 + 0.4TSN - 0.281TSN2$$

where *TSN* = thermal sensation. *TSN* uses the standard 9-point scale of the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE). The CIT is highest when the ASHRAE/TSN score is equal to one and takes lower values with ASHRAE scores associated with greater physiological stress from a thermal perspective. Similar to the measure of income similarity, climatic distance is modelled as

$$\frac{|CIT - CIT_j|}{CIT + CIT_j}$$

where CIT is the Climate Index for Tourism in Barbados and CIT_j is the Climate Index for Tourism in source country j. Larger values of this measure indicate greater climate distance.

3.2 Control Variables

Apart from distance, there are several other variables that influence length of stay. The exclusion of such variables may mask the underlying relationship between distance and length of stay. While our choice of control variables was limited by the variables included in the information from the embarkation card, we were able to control for popular correlates of tourist length of stay such as age, gender, employment status and accommodation type. All control variables are categorical. Specifically, the gender variable is binary, with women serving as the reference category. Age is divided into various categories in an attempt to capture different propensities to travel over the life-cycle. The age group variable consists of 7 categories: 16 to 24 (base); 25 to 34; 35 to 44; 45 to 54; 55 to 64; 65 to 74; over 75. Employment status is also a 7-category variable: those who are employed by others (base); those who are unemployed; retired persons; students; home makers; self-employed; and those who did not give a response. Finally, tourist accommodation is categorized into five groups: hotels (reference category); friends/relatives; a house; villa; and, other.

4. METHODS

Most studies on tourists' length of stay employ duration models (Barros, Butler, & Correia, 2010; Barros & Machado, 2010; Gokovali, Bahar, & Kozak, 2007; Machado, 2010; Martinez-Garcia & Ma Raya, 2008; Peypoch, Randriamboarison, Rasoamananjara, & Solonandrasana, 2012; Santos, Ramos, & Rey-Maquieira, 2015; Wang, Little, DelHomme-Little, & Ann, 2012). However, recent work suggests that duration models may not be approriate for modelling tourism length of stay. Thrane (2012) argues that the data-generating process driving tourists' length of stay is completely different from the processess driving the variables usually associated with duration models. Specifically, the author contends that the duration of time a tourist spends at a destination can hardly be

defined as "risk" process. As such, it makes little sense to model touristm length of stay using duration models.

In this study, we follow recent developments in the literature and use count data models (Alén, Nicolau, Losada, & Domínguez, 2014; Nicolau, Zach, & Tussyadiah, 2018; Prebensen, Altin, & Uysal, 2015; Rodríguez, Martínez-Roget, & Gonzalez-Murias, 2018; Salmasi, Celidoni, & Procidano, 2012). Our choice of count data models is related to the particularities of the length of stay variable, which is measured as the number of days or overnight stays making it a discrete and strictly positive integer variable (Rodríguez, Martínez-Roget, & Gonzalez-Murias, 2018).

The most widely used count data model is the Poisson model. However, the Poisson model is based on the assumption that the conditional mean and variance are equal (also known as the equidispersion property), an assumption that is often described as too restrictive to represent individual behaviours (Nicolau, Zach, & Tussyadiah, 2018). In fact, for count data, the variance usually exceeds the mean (Cameron & Trivedi, 2005), leading to a feature called overdispersion. Overdispersion appears to be a problem for our data: the average length of stay is 12.21 days, whereas the variance is 252.49. As such, a more flexible approach appears to be warranted. The Negative Binomial regression is a generalization of the Poisson regression that loosens the restrictive equidispersion assumption. Under this framework, the probability that an individual i chooses to spend y_i days at a destination is given by

$$\Pr(Y = y_i|\mu_i, \alpha) = \frac{(y_i + \alpha^{-1})}{\Gamma(y_i + 1)\Gamma(\alpha^{-1})}\left(\frac{\alpha^{-1}}{\alpha^{-1} + \mu_i}\right)^{\alpha^{-1}}\left(\frac{\mu_i}{\alpha^{-1} + \mu_i}\right)^{y_i}$$

where $\Gamma(\cdot)$ denotes the gamma integral that specializes to a factorial for an integer argument and α is the dispersion parameter. The Negative Binomial regression model reduces to the Poisson model as $\alpha \to 0$. The Negative Binomial regression lets $\mu_i = \exp(X'\beta)$ where X represents our independent variables, while $\mathrm{Var}(y_i|\mu_i, \alpha) = \mu_i(1 + \alpha u_i)$. A point hitherto unexplored concerns the fact that the length of stay variable is strictly positive. This implies that an additional modification is needed in order to use the Negative Binominal regression model to estimate length of stay. Specifically, it is necessary to truncate the distribution of our dependent variable. The study thus employs

a Zero Truncated Negatively Binomial model. Estimation of the Zero Truncated Negative Binomial model is carried out by maximum likelihood. Its truncated probability mass function is given by:

$$\Pr(y_i|y_i > 0) = \frac{(y_i + \alpha^{-1})}{\Gamma(y_i + 1)\Gamma(\alpha^{-1})}\left(\frac{\alpha^{-1}}{\alpha^{-1} + \mu_i}\right)^{\alpha^{-1}}\left(\frac{\mu_i}{\alpha^{-1} + \mu_i}\right)^{y_i}\left(\frac{1}{1 - (1 + \alpha\mu_i)^{\alpha^{-1}}}\right)$$

Finally, we take into consideration the nested nature of the dataset. As noted earlier. the database used in this paper contains over 350,000 tourists from 144 countries. The nested structure of the data means that individuals are more likely to be similar to their countrymen than individuals from other countries. If these country-effects are not considered, the correlation would present themselves in the residuals, which could lead to biased standard errors. To deal with this, we employ design effect adjusted standard errors that take into account the clustered nature of the data (Huang F. , 2016). We also opt to explicitly measure group-effects that may not be accounted by our distance measures, by introducing a set of dummy variables (fixed effects). As our database is very large, the inclusion of 143 dummies would have negligible effects on our degrees of freedom.

5. RESULTS

5.1 Descriptive Statistics and Correlations

Table 2 provides some descriptive statistics for the variables used in the study and Table 3 presents the correlation between the distance variables. For the qualitative variables, we provide information on the frequency and percentage of observations in each category and for the quantitative variables, estimates of the mean and standard deviation. From the summary statistics we are able to approximate the profile of visitors to Barbados in 2012. The average length of stay was around 12 days and roughly 55 percent of tourists were women. Tourists were typically over 45, with 23 percent of them being 45 to 54 years of age, 19 percent between 55 and 64 years old, and 14 percent being 65 years and

older. The majority of tourists were employed (63 percent) and stayed in hotels for the duration of their visit (54 percent).

The study begins with the premise that distance is a multi-dimensional construct. Hence, as a preliminary step to the empirical analysis, we analyse the correlations between the measures of spatial and relative distance. Generally, there is no evidence of a strong correlation between the distance variables: only weak, moderate or no correlation (that is correlation coefficients ranging from -0.3 to 0.6) could be found. This suggests that distance may not be unidimensional, and that while physical distance may be correlated with other measures of distance, it is unlikely to encompass the impact of other distance variables.

5.2 Truncated negative binomial regression results

The results are provided in Table 4, which suggests that all variables are statistically significant. It is important to point out that the dispersion parameter (α) is also statistically significant at the 1 percent level. The significance of this term implies that the assumption of mean-variance equality of Poisson models is invalid and the errors exhibit overdispersion, thereby justifying the use of the truncated negative binomial model over the standard Poisson model (Cameron & Trivedi, 2005).

In line with a-priori expectations, geographic distance has a positive and statistically significant impact on length of stay; that is, persons travelling from more geographically distant countries tend to stay longer. The coefficients on the cultural distance and climate distance are also positive and significant. Taken at face value, the results imply that (1) that tourists emerging from countries that are culturally distant to Barbados stay for longer periods than those from countries who are culturally similar and (2) greater climate distance between the home and destination country has a strong positive impact on visit duration, supporting findings of Lorde, Li, & Airey (2016). Meanwhile the coefficient on the economic distance variable is negative and significant, which is in line with Linder's hypothesis that proximity in income results in greater demand for the

tourist product. However, we find no evidence to suggest that is the connection between and among migrants and their homeland significantly affect visit duration.

Turning to the control variables, the results suggest that male visitors take shorter visits than females. In line with previous research (Alegre, Mateo, & Pou, 2011; Grigolon, Borgers, Kemperman, & Timmerman, 2014), we find evidence of a non-linear relationship between age and length of stay. Our results hint at a turning point around the age of 54. Tourists between 26 and 54 years generally have shorter visits than those under the age of 25. However, post age 54, the dynamic reverses, with visit duration increasing with age. Meanwhile, tourists in non-working/self-employed categories tend to have longer visits than those who are employed by others, lending credence to the notion that the impact of budgetary constraints may be somewhat mitigated by the greater leisure time that comes with either being unemployed, being outside the labour force or working for oneself. The results also imply that direct per diem costs are inversely related to length of stay in Barbados. Specifically, we find that persons staying in hotels (arguably the most expensive type of accommodation) tend to have the shortest visits and those visiting friends and relatives stay the longest.

6. CONCLUSION

This study conjectures that tourists' length of stay is a reflection of the distance between origin and destination. Our findings offer theoretical insights in understanding the impact of distance on consumer behaviour in the tourism context. As noted in the literature review, studies on the impact of distance on length of stay behaviours have mostly focused on the spatial element of distance (Blaine, Mohammad, & Var, 1993; E. Wang, Little, & DelHomme-Little, 2012; Nicolau et al., 2018). While these studies have no doubt advanced our understanding of the impact of distance on tourist behaviours, people's behaviour in relation to relative space does not possess the metric characteristics of geographic distance and so there must be some flexibility in how distance is conceived. As such, we augment a typical length of stay model with measures of spatial and relative distance. Specifically, the paper focuses on the impact of five measures of distance on individual length of stay: geographic, cultural, long-distance relationships,

economic distance and climate. The empirical analysis was carried using data on over 350,000 pleasure tourists visiting Barbados from 144 countries in 2012.

In line with previous research (Blaine, Mohammad, & Var, 1993; Mak, Moncur, & Yonamine, 1977; Nicolau et al., 2018; Walsh & Davitt, 1983; E. Wang, Little, & DelHomme-Little, 2012), we found evidence of positive relationship between geographic distance and length of stay; that is, the further the source market is from Barbados the longer pleasure tourists stay. Travel costs, typically one of the largest items in the travel budget, are highly correlated with geographic distance (Jorgensen & Preston, 2007). Having to travel longer distances, that is incurring larger travel costs, to reach their destination may induce pleasure tourists to stay longer to feel as they are maximising value for money (costs).

There was also evidence that culturally distant pleasure tourists take longer visits than those culturally proximate. This result is consistent with our finding that more distant tourists to Barbados stay longer. Some studies contend that geographic distance is a component of cultural distance (Arora & Fosfuri, 2000). Similar to other studies, (Cantwell, Dunning, & Lundan, 2010) we found that the two dimensions of distance are correlated: that is, the greater the distance geographically, the greater the distance culturally. However, in this study, the effects of cultural distance are persistent even after controlling for geographic proximity. This suggests that both geographic distance and cultural distance can be separately modelled to estimate their respective influence on tourism demand as was done in the current study. In relation to long-distance relationships, we find no evidence that the diaspora and transnationalism variables are related to length of stay. Finally, our results imply that the greater the climate distance between source countries and Barbados, the longer they stay. Given that Barbados lies in the tropics, while the majority of its tourists arrive from countries with cold or temperate climates, it would be generally expected that the impact of climate would be related to geographic distance as well. However, the finding of significance even after controlling for geographic distance means that climate distance has a distinct impact outside of geographic distance.

The empirical support for significant effects of geographical distance, economic distance, cultural distance and climate distance implies that tourism marketers and policy makers in Barbados should consider the impact of distance on how long tourists are likely to stay when marketing to specific jurisdictions or when choosing which jurisdictions to market to. For decision makers who perceive the need for an increase in the average length of stay, it appears important to consider marketing to geographically, climatic and culturally distant markets. In addition, they may choose to market to countries that are economically similar to Barbados. However, tourism policy makers and marketers should take caution in attempts to increase visitor length of stay. While length of stay is directly related to tourism income, the literature implies that there is the possibility of a saturation effect of extended length of stay, which emerges when a visitor's stay reaches a certain point (Wang, Fong, Law, & Fang, 2018). This has been attributed to the fact that tourists stay for very long periods usually opt to stay outside the central tourist areas or in longer-term rent accommodations, and so, are less likely to engage in typical tourist activities that significantly increases their spending (Wang, Fong, Law, & Fang, 2018). Hence, any policy to increase length of stay in Barbados would first require an understanding of the relationship between tourism spending and length of stay, particularly, if there is indeed a saturation effect for Barbados.

The fact that climate distance has a positive impact on length of stay also has other policy and managerial implications. Since the index used to calculate climate distance, the CIT, assumes a climatic ideal (that is, a range of apparent temperatures ideal for touristic activities), it suggests that under a scenario of global warming brought on by climate change, that in the very long run, the average climate in Barbados could transition to ranges of high thermal stress unappealing for the average tourist, while its source markets could transition to apparent temperatures that are more appealing. Therefore, pleasure tourists motivated to travel to Barbados because of climate distance might choose to spend their holidays elsewhere, even if the existing climate distance were to remain unchanged.

Taken together, the study showcases that tourist length of stay behaviours in Barbados cannot be explained by spatial distance alone and highlights the importance of flexibility in how distance is conceived. An important area for future research would be to analyse how relative distance affects length of stay in different types of destinations, for instance, cultural sites, mountain destinations and urban destinations, which will assistance in confirming/reinforcing the findings of this study. Future work can also utilise other measures of distance concepts such psychic distance and cognitive distance.

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Table 1: Country Coverage

Albania	Denmark	Kuwait	Qatar
Algeria	Dominica	Kyrgyzstan	Russian Federation
Andorra	Dominican Republic	Latvia	St Kitts and Nevis
Angola	Ecuador	Lebanon	St Lucia
Antigua and Barbuda	Egypt	Lesotho	St Vincent and the Grenadines
Argentina	El Salvador	Liberia	Saudi Arabia
Australia	Estonia	Lithuania	Senegal
Austria	Fiji	Luxembourg	Singapore
Azerbaijan	Finland	Macao	Slovakia
Bahamas	France	Macedonia	Slovenia
Bahrain	Gambia	Madagascar	Solomon Islands
Belarus	Georgia	Malawi	South Africa
Belgium	Germany	Malaysia	Spain
Belize	Ghana	Malta	Sri Lanka
Bermuda	Greece	Mauritius	Sudan
Bolivia	Grenada	Mexico	Suriname
Bosnia and Herzegovina	Guatemala	Moldova	Swaziland
Botswana	Guinea	Mongolia	Sweden
Brazil	Guyana	Morocco	Switzerland
Brunei Darussalam	Haiti	Myanmar	Tanzania
Bulgaria	Honduras	Namibia	Thailand
Burkina Faso	Hong Kong	Nepal	Trinidad and Tobago
Cambodia	Hungary	Netherlands	Tunisia
Cameroon	Iceland	New Zealand	Turkey
Canada	India	Nicaragua	Turkmenistan
Cape Verde	Indonesia	Nigeria	Uganda
Chile	Iran	Norway	Ukraine
China	Ireland	Oman	United Arab Emirates
Colombia	Israel	Pakistan	United Kingdom
Congo	Italy	Panama	United States
Costa Rica	Jamaica	Paraguay	Uruguay
Cote d'Ivoire	Japan	Peru	Uzbekistan
Croatia	Jordan	Philippines	Venezuela
Cuba	Kazakhstan	Poland	Viet Nam
Cyprus	Kenya	Portugal	Zambia
Czech Republic	Korea	Puerto Rico	Zimbabwe

Table 2: Descriptive Statistics

Variable	Quantitative variables	Categorical Variables
	Mean (Standard Deviation)	Frequency [%]
Dependent variable		
Length of stay	12.21 (15.89)	n.a.
Level 1 regressors		
Sex		
Women (reference)	n.a.	193,373 [54.73%]
Men	n.a.	159,955 [45.27%]
Age		
16- 24 (reference)	n.a.	30,764 [8.71%]
25-34	n.a.	61,500 [17.41%]
35-44	n.a.	61,936 [17.53%]
45-54	n.a.	80,410 [22.76%]
55-64	n.a.	68,293 [19.33%]
65-74	n.a.	38,974 [11.03%]
75+		11,451 [3.24%]
Employment		
Employed (reference)	n.a.	223, 038 [63.12%]
Unemployed	n.a.	1,808 [0.51%]
Retired	n.a.	43,455 [12.02%]
Student	n.a.	24,112 [6.82%]
Home maker	n.a.	16,564 [4.69%]
Self Employed	n.a.	3,525 [1.00%]
Not Stated	n.a.	41,827 [11.84%]
Accommodation		
Hotel (reference)	n.a.	191,476 [54.19%]
Friends	n.a.	72,850 [20.62%]
House	n.a.	4,064 [1.15%]
Villa	n.a.	77,835 [22.03%]
Other	n.a.	7,103 [2.01%]
Country level variables		
Distance		
Geographic in km (logged)	8.73 (0.95)	n.a.
Cultural (Linguistic)		
English (# of countries)	n.a.	98 (69.06)
Other (# of countries)	n.a.	46 (31.94)
Climate	0.11 (0.19)	n.a.
Diaspora (in thousands)	0.726 (4.989)	n.a.
Transnationalism (in thousands)	0.168 (0.651)	n.a.
Economic	0.27 (0.50)	n.a.

Note: n.a. means not applicable

Table 3: Pairwise Correlation Matrix - Distance Variables

	Geographic	Cultural	Climate	Diaspora	Transnational	Economic
Geographic	1					
Cultural	0.281***	1				
Climate	0.153**	0.381***	1			
Diaspora	-0.067	-0.449***	0.038	1		
Transnational	-0.547***	-0.534***	0.031	0.413***	1	
Economic	0.004	-0.121	-0.249***	-0.202***	-0.039	1

Notes: (1) Correlations between binary and continuous variables calculated using biserial correlations. (2) *** and ** indicates significance at the 1 percent and 5 percent levels respectively.

Table 4: Effects of distance on tourists' length of stay

	Coefficient	Standard error
Men	-0.034***	0.005
Age (ref: 16 to 24)		
25-34	-0.077***	-0.024
35-44	-0.038*	-0.020
44-54	-0.013*	-0.006
55-64	0.101***	0.026
65-74	0.237***	0.032
75+	0.403***	0.022
Employment (ref: Employed)		
Unemployed	0.223***	0.041
Retired	0.316***	0.064
Student	0.105***	0.019
Home maker	0.093***	0.019
Self Employed	0.070***	0.044
Not Stated	-0.077***	0.010
Accommodation (ref: hotel)		
Friends/Relatives	0.760***	0.057
House	0.666***	0.080
Villa	0.364***	0.077
Other	0.390***	0.030
Distance measures		
Geographic (logged)	0.781***	0.066
Cultural	0.921***	0.039
Climate	1.896***	0.059
Diaspora (in thousands)	0.480	0.403
Transnationalism (in thousands)	0.689	0.758
Income	-0.690***	0.022
Dispersion parameter α	0.484***	
Country fixed effects included	Yes	

Notes: (1) ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels of testing; (2) A joint test of significance suggest that the country dummies were jointly significant at the 1 percent level of testing

1 percent and 5 percent levels respectively.