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Batabyal, Amitrajeet and Yoo, Seung Jick

Rochester Institute of Technology, Sookmyung Women's University

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A Theoretical Analysis of Preference Matching by Tourists and Destination Choice¹

by

AMITRAJEET A. BATABYAL²

and

SEUNG JICK YOO³

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Department of Economics, Rochester Institute of Technology, 92 Lomb Memorial Drive, Rochester, NY 14623-5604, USA. E-mail: aabgsh@rit.edu

³

Corresponding Author. Graduate School of International Service, Sookmyung Women's University, 100 Cheongpa-ro 47-gil, Yongsan-gu, Seoul, Republic of Korea. E-mail: sjyoo@sookmyung.ac.kr

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Abstract

How does the phenomenon of preference matching by tourists affect their choice between two possible destinations? We study this question. It costs less (more) to vacation in destination A (B). Tourists choose to either vacation in A or B . They differ in their incomes. These incomes are uniformly distributed on the unit interval. Our analysis leads to four results. First, when the cost differential parameter satisfies a particular condition, both destinations are visited in the equilibrium. Second, when this parametric condition holds, in any equilibrium in which the mean income of the tourists varies across the two destinations, every tourist vacationing in A has a lower income than every tourist vacationing in B . Third, there exists an income cutoff point and all tourists with lower (higher) incomes choose to vacation in A (B). Finally, in the equilibrium with income sorting, it is possible to make all tourists better off by modifying their destination choices.

Keywords: Destination Choice, Income, Preference Matching, Tourism, Uncertainty

JEL Codes: L83, D81

1. Introduction

1.1. Literature review

Our paper focuses on some key issues that lie at the interface of the trinity of income, tourism, and destination choice. Therefore, before proceeding to the specific objective of this paper, we begin by discussing the existing literature on this trinity in two parts. First, we comment on the nexus between income and tourism. Second, we outline the extant research on the destination choices of tourists.

A lot has now been written about the many connections between income and tourism. Looking at the nature and the extent of tourism within the different states of India, Dutta and Kar (2018) point out that the central government can play a major role in promoting tourism by making appropriate income transfers to the states where there has been local unrest. Nassani *et al.* (2018) empirically analyze sixteen counties that they contend are tourism oriented during the time period 1990-2014. They first construct a “vulnerability index” which depends, in part, on the income inequality in a nation and then show that through this vulnerability index, income inequality affects the demand for international tourism. Gupta and Dutta (2019) utilize a two-sector, two-factor, static general equilibrium model to theoretically study a stylized less developed nation called “South.” Their analysis demonstrates that when capital is perfectly mobile across the two sectors of South and there is only a single traded good, tourism development in South raises national income in this country.

Rivera and Tuazon (2019) use an empirical framework and point out that tourism can be designed to be pro-poor and thereby help improve the lives of low-income people. Kumar *et al.* (2020) use the so called ARDL bounds approach and empirically demonstrate that income has a

non-trivial impact on the demand for international tourism in small Pacific island nations such as the Cook Islands, Fiji, Tonga, and Vanuatu. In addition to the studies that we have just discussed, the work of Crouch (1995), Kim *et al.* (2011), Chang and Chen (2013), and Choudhry and Lew (2013) clearly shows that there exists a *positive* relationship between income and tourism. In this regard, it is worth pointing out that the research of Crouch (1992) demonstrates that discretionary income tends to play a big role in determining the demand for international tourism which, many now believe, is a luxury good.

Moving on to the destination choices of tourists, Nicolau (2010) points out that income certainly impacts the destination choices made by tourists and that this impact is non-linear in nature. Van Loon and Rouwendal (2013) use statistical models and demonstrate that the domestic versus international destination choices of Dutch tourists depend greatly on a tourist's education level and income. Based on a study of survey responses in the Backa region of Serbia, Djeri *et al.* (2014) use multivariate analysis and show that income affects four out of the five phases in decision-making about how individuals make choices about the selection of alternate destinations for the purpose of tourism. Zhuang *et al.* (2019) utilize structural equation modeling to study how what they call "tourism development" influences the choice between visiting either Puri or Varanasi, both of which are prominent destinations for religious tourism in India.

Looking further at this destination choice question, we can ask how wealthy tourists make their destination choices. Here, the work of Buckley and Mossaz (2016) and the reporting of Divirgilio (2013), Jacobs (2018), and Woods (2019) demonstrates that wealthy individuals tend to visit destinations that are also visited by other *wealthy* individuals. Examples of such destinations include but are not limited to Aspen, Colorado, Kauai, Hawaii, and Lake Como, Italy. In other words, rich tourists like to vacation with other *rich* tourists.

The fact that wealthy tourists like to vacation with other wealthy tourists can be thought of as one kind of *preference matching*. This phenomenon tells us that individuals possessing a particular attribute---such as wealth---like to be around other individuals who also possess this same attribute. The reader should note that this is a general phenomenon in economics and regional science in the sense that it applies not only in the context of tourism but also in other areas such as residential and school choices.⁴

Two points are now worth emphasizing. First, even though the existing literature in tourism has recognized this phenomenon of preference matching, to the best of our knowledge, there are *no* theoretical analyses of the impacts of preference matching on either the distribution of tourists or on the choice of destinations in a given economy. Second, even though the literature in regional science has studied several aspects of tourism and, in particular, its impact on regional economic growth and development, this literature too, as best as we can tell, has paid *no* attention to the phenomenon of preference matching.⁵ We are now in a position state our specific objective in this paper.

1.2. Our objective

Given the lacuna in the literature discussed in section 1.1, our primary objective in this paper is to analyze the impact of *preference matching* and *income* on the distribution of tourists in a theoretical model that explicitly accounts for two possible destinations.⁶ Section 2 delineates the

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See Batabyal and Beladi (2019) for a recent analysis of preference matching in the context of residential choices.

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See Stoeckl (2007), Soboll *et al.* (2012), Feshari *et al.* (2016), and Powell *et al.* (2017) for recent examples of the kinds of tourism related questions that the regional science literature has focused on.

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Zhuang *et al.* (2019) also focus on two possible destinations (Puri and Varanasi) but other than this point, there is no similarity between their paper and our paper. That said, we would like to emphasize that we have a particular objective in this paper and that is the objective we have just stated. By pursuing this objective, we intend to contribute to the existing theoretical literature in

theoretical framework that is adapted from the prior work of Batabyal and Beladi (2019). In this framework, it is less expensive to vacation in destination A and more expensive to vacation in destination B . Consistent with the literature discussed in section 1.1, we are using the term “destination” loosely and therefore several interpretations of this term are possible. For instance, when viewed as cities, the two destinations could be Mumbai and New Delhi in India or Los Angeles and San Francisco in California. When viewed as states, the two destinations could be Utah and Wyoming in the United States of America or New South Wales and Victoria in Australia. Finally, when viewed as specific sites, the two destinations could be Grand Canyon National Park and Yellowstone National Park in the United States or the Kiyomizu-dera Buddhist Temple and the Kinkaku-ji Golden Pavilion Temple in Japan.

Tourists choose freely to vacation in either the less expensive destination A or in the more expensive destination B . However, they differ in their incomes and these random or stochastic incomes are assumed to be uniformly distributed on the interval $[0, 1]$.⁷ Section 3 shows that when a parameter in our model satisfies a particular condition (on which more below), both destinations are visited in the equilibrium. Section 4 supposes that the section 3 parametric condition holds and then demonstrates that in any equilibrium in which the mean⁸ income of the tourists varies across the two destinations, every tourist vacationing in the less expensive destination A has a lower income than every tourist vacationing in the more expensive destination B . Section 5 solves for an income cutoff point M^* and then points out that all tourists with incomes lower (higher) than this

tourism by concentrating on a hitherto unstudied problem. That said, we are not saying that the question of choosing between different destinations cannot be analyzed meaningfully using alternate means. The point to note is that as best as we can tell, the phenomenon of preference matching has never been used before to shed light on the choice between alternate destinations by tourists.

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The uniform distribution has been used previously in the literature on tourism. See, for example, Tsitouras (2004).

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We use the three terms “average,” “expected,” and “mean” interchangeably in the remainder of this paper.

cutoff point choose to vacation in destination A (B). Section 6 points out that in the equilibrium with income sorting, it is possible to make every tourist better off by modifying their destination choices. Finally, section 7 summarizes our main results, discusses the five policy implications of our analysis, and then suggests two ways in which the research described in this paper might be extended.

2. The Theoretical Framework

The aggregate economy of interest is made up of two destinations. We index these two destinations with the subscript i where $i = A, B$. The subscript A denotes the less expensive or cheaper destination and the subscript B denotes the more expensive destination. It costs $C_A > 0$ to vacation in the cheaper destination and $C_B = C_A + \zeta$ to vacation in the more expensive destination where $\zeta > 0$. We assume that C_A and C_B are both constant.⁹

Tourists in our aggregate economy differ in terms of their incomes. These incomes, which we denote by M , are assumed to be uniformly distributed on the interval $[0, 1]$. Consistent with the discussion in section 1.1, we emphasize that tourists in our aggregate economy *care* about the incomes of those vacationing in their chosen destination. The mean income of tourists vacationing in destination $i = A, B$ is a function of the average value of M in that destination and we denote this mean by $\widehat{M}_i, i = A, B$.

A tourist with income M who chooses to vacation in destination i with mean income \widehat{M}_i obtains total utility denoted by $U_i = (1 + M)(1 + \widehat{M}_i)$. We know that this same tourist incurs a

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C_A and C_B are straightforward ways of capturing the idea that different destinations cost different amounts of money to visit. That said, we recognize that depending on the mode of transport (airplane, train, automobile) used, a particular destination such as A can cost different amounts of money to visit. One way to account for the idea that it can cost different amounts of money to visit a particular destination would be to think of C_A and C_B as the least expensive way of visiting either destination A or destination B . However, since our fundamental objective here is to study some of the implications of preference matching, we do not dwell any further on this “mode of transport” issue.

cost when vacationing in destination i that is given by C_i . Hence, putting these two pieces of information together, this tourist's net utility function is

$$U_i = (1 + M)(1 + \widehat{M}_i) - C_i. \quad (1)$$

Two points about the net utility function described in equation (1), deserve further comment. First and consistent with our primary objective stated in section 1.2, this function captures the idea that tourists care about the incomes of those who are vacationing with them. Second and more specifically, wealthy tourists place a greater value on vacationing together with other wealthy tourists. These two points together explain how the net utility function in equation (1) displays the phenomenon of preference matching that we first alluded to in section 1.2.

Let us now discuss the above two points in greater detail. Suppose, for concreteness, that the mean income of tourists vacationing in destination A (B) is low (high). Then the preference matching phenomenon captured by equation (1) tells us that a wealthy tourist will prefer to vacation in destination B and *not* A because the mean income in destination B is *higher* than it is in A and this wealthy tourist's utility is an *increasing* function of this higher mean income. Next, let us consider the case of a poor tourist. Will such an individual want to vacation in the destination where the mean income is high? Recall that it already costs more to vacation in the more expensive destination. The answer to the question just posed is *no* and this is what we show in detail in our analysis in sections 3 through 5 below. So, to conclude this discussion, in the equilibrium that we study, there is income sorting and therefore every tourist vacationing in the cheaper destination A has a *lower* income than every tourist vacationing in the more expensive destination B .

The net utility function in equation (1) is defined on income and costs because this description allows us to analyze the impacts of the phenomenon of preference matching that we are interested in, in a parsimonious manner. That said, given a particular study objective or

objectives (also see section 7), it is obviously possible to define the utility function on other variables. Our next task is to analyze a specific situation, involving the parameter ζ , in which tourists vacation in both the destinations in the equilibrium.¹⁰

3. Tourists Vacation in Both Destinations

Assume that all the tourists in our aggregate economy make their destination choices simultaneously. In addition, assume that the difference in the cost of vacationing between the cheaper destination A and the more expensive destination B is neither too high nor too low. We model this last point by specifying that the cost differential parameter lies in a particular interval or, in symbols, $\zeta \in (1/2, 1)$. We now want to analyze the destination choices of all the tourists in an equilibrium that is stable in the sense that no tourist wishes to move from his or her chosen destination given the destination choices of every other tourist in the aggregate economy.

Let us begin the formal analysis by supposing that all the tourists are vacationing in the cheaper destination A . The expected income now is $\widehat{M}_A = 1/2$. The point to recognize is that the *poorest* tourist will now have *no* incentive to vacation in the more expensive destination B . To confirm this point, observe that this tourist's net utility from vacationing in the cheaper destination A is

$$U_A = (1 + 0)(1 + \widehat{M}_A) - C_A = \frac{3}{2} - C_A. \quad (2)$$

¹⁰

We clearly have not taken all the complexities of the destination choice and the related economic impacts into consideration in our theoretical modeling. Given our objective, stated in section 1.2, it is not necessary to do so. Moreover, our position is that a model that accounts for every complexity of the destination choice question will, very likely, be unwieldy and hence very difficult to work with.

In contrast, if this poorest tourist switches his or her destination to the more expensive destination B then the expected income changes to $\widehat{M}_B = 0$. Note that for the time being, we are considering the case in which all tourists are vacationing in the cheaper destination A . So, no tourist is choosing to vacation in destination B and hence there are zero tourists in destination B . Also, the poorest tourist has zero income. Therefore, it follows that when this poorest tourist moves to destination B , the total number of tourists in destination B consists of one individual with zero income. Therefore, the average income in destination B with this single tourist with zero income is also zero and in symbols we have $\widehat{M}_B = 0$. That said, the destination switching tourist's net utility in the more expensive destination B is

$$U_B = (1 + 0)(1 + 0) - C_A - \zeta = 1 - C_A - \zeta, \quad (3)$$

where the right-hand-side (RHS) follows from the fact that $C_B = C_A + \zeta$. Comparing the RHSs of equations (2) and (3), it is clear that the poorest tourist is better off by vacationing in the cheaper destination A .

We can now ask the following question: what about the *wealthiest* tourist? When vacationing in destination A , this tourist's net utility is

$$U_A = (1 + 1)(1 + \widehat{M}_A) - C_A = 3 - C_A \quad (4)$$

since $\widehat{M}_A = 1/2$. In contrast, if this tourist switches and vacations in the more expensive destination B , then his or her net utility is

$$U_B = (1 + 1)(1 + 1) - C_A - \zeta = 4 - C_A - \zeta \quad (5)$$

because $\widehat{M}_B = 1$. When the wealthiest tourist switches destinations from the cheaper destination A to the more expensive destination B , the total number of tourists in destination B increases from zero to one and this one individual is the richest tourist whose income is one. This explains why we have $\widehat{M}_B = 1$. Now, inspecting the RHSs of equations (4) and (5) we see that the net utility

from vacationing in the more expensive destination B exceeds the net utility from vacationing in the cheaper destination A when $\zeta < 1$. This result tells us that the wealthiest tourist in our model *may* have an incentive to vacation in destination B .

Using a line of reasoning that is similar to that employed above in this section, we infer that if all the tourists vacation in the more expensive destination B then the wealthiest tourist will not profit by switching to vacation in the cheaper destination A . In contrast, the poorest tourist will benefit by choosing to vacation in destination A as long as $\zeta > 1/2$. Thus, combining the claims we have made thus far in this section, we are able to prove that the tourists in our aggregate economy will voluntarily choose to vacation in both the destinations under study in equilibrium as long as the cost differential parameter ζ lies in the interval $(1/2, 1)$.

Observe that our arguments thus far have two additional consequences for extreme or boundary values of ζ . First, when $\zeta > 1$, all the tourists in our aggregate economy will choose to vacation in the cheaper destination A *only*. Second, when $\zeta < 1/2$, all the tourists will choose to vacation in the more expensive destination B and destination A will have *no* vacationers. Let us now analyze the attributes of the equilibrium when the condition $\zeta \in (1/2, 1)$ holds and the expected income of the tourists varies across the two destinations under study.

4. Expected Income Varies Across the Two Destinations

Our goal in this section is to demonstrate that when the expected income of all the tourists varies across the two destinations, every tourist vacationing in the less expensive destination A must have a *lesser* income than every tourist vacationing in the more expensive destination B . To establish this result, we continue with a proof by contradiction.¹¹ To this end, assume that a tourist

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Go to <http://cgm.cs.mcgill.ca/~godfried/teaching/dm-reading-assignments/Contradiction-Proofs.pdf> for additional details on this method of proof. Accessed on 25 March 2020.

with high income M_H chooses to vacation in the cheaper destination A and that a tourist with low income M_L chooses to vacation in the more expensive destination B . This means that we have $M_H > M_L$.

If the destination choices assumed in the previous paragraph represent an equilibrium then we must have

$$(1 + M_H)(1 + \widehat{M}_A) - C_A > (1 + M_H)(1 + \widehat{M}_B) - C_A - \zeta, \quad (6)$$

and

$$(1 + M_L)(1 + \widehat{M}_B) - C_A - \zeta > (1 + M_L)(1 + \widehat{M}_A) - C_A. \quad (7)$$

After a few steps of algebra, the inequalities in expressions (6) and (7) can be simplified to

$$\frac{\zeta}{1+M_H} > \widehat{M}_B - \widehat{M}_A \text{ and } \widehat{M}_B - \widehat{M}_A > \frac{\zeta}{1+M_L}. \quad (8)$$

The information conveyed by the two inequalities in expression (8) is that

$$\frac{\zeta}{1+M_H} > \frac{\zeta}{1+M_L}, \quad (9)$$

which is clearly untrue. Hence, our initial assumption that a tourist with high income M_H chooses to vacation in the cheaper destination A and that a tourist with low income M_L chooses to vacation in the more expensive destination B *cannot* constitute an equilibrium.

The above result tells us that when the parameter $\zeta \in (1/2, 1)$ and the expected income of the tourists in our model varies across the two destinations, every tourist choosing to vacation in the cheaper destination A must have a *lower* income than every tourist choosing to vacation in the

more expensive destination B . We now solve for an income cutoff point M^* and then demonstrate that all tourists who have incomes lower (higher) than this cutoff point choose to vacation in destination A (B).

5. The Income Cutoff Point

To recapitulate, thus far we have shown that when the cost differential parameter is such that $\zeta \in (1/2, 1)$, the tourists in our aggregate economy choose to vacation in *both* destinations and that the total number of tourists is *separated* by income. Now assume that the highest income of the tourists vacationing in the cheaper destination A is M^* . Then, it follows that the expected income of all the vacationers in this destination is $(1/2)M^*$. Also, the expected income of all the tourists vacationing in the more expensive destination B now is $(1/2)(1 + M^*)$. Since M^* is the income cutoff point, it is clear that the tourist with this level of income will be indifferent between vacationing in destination A and B . In symbols, this indifference can be expressed as

$$(1 + M^*) \left(1 + \frac{M^*}{2}\right) - C_A = (1 + M^*) \left(1 + \frac{1+M^*}{2}\right) - C_A - \zeta. \quad (10)$$

Solving equation (10) for the income cutoff point M^* , we get

$$M^* = 2\zeta - 1. \quad (11)$$

Combining our findings from sections 3 and 4 with equation (11), we deduce that all the tourists in our aggregate economy who have incomes greater than the cutoff point M^* will choose to vacation in the more expensive destination B and that those who have incomes lesser than this same cutoff point will choose to vacation in the cheaper destination A . Our final job in this paper is to demonstrate that in the equilibrium with income sorting, it is possible to make all the tourists in our aggregate economy better off by modifying their destination choices.

6. Making All Tourists Better Off

Before we proceed further, it is essential to stress that the equilibrium with income sorting¹² that we have been studying thus far *cannot* be bettered by simply moving a single tourist from one destination to the other. Why not? This is because the equilibrium under study is individually rational. This means that no tourist wishes to alter his or her destination choice given the destination choices of all the other tourists in our aggregate economy.

Given the discussion in the preceding paragraph, in order to make everyone better off, it will be necessary to move a *group* of tourists from one destination to the other. To this end, consider the scenario in which we get all the tourists to vacation in the cheaper destination *A*. This change obviously raises the utility of all the tourists presently vacationing in destination *A* because the expected income in this destination rises. But what happens to the utility of tourists who are currently vacationing in the more expensive destination *B*? To find out, observe that our suggested change of destination from *B* to *A* benefits an *arbitrary* tourist vacationing in destination *B*, with income M , as long as the inequality

$$\frac{3(1+M)}{2} - C_A > (1 + M) \left(\frac{3}{2} + \frac{M^*}{2} \right) - C_A - \zeta \quad (12)$$

is satisfied.

From equation (11), it follows that $M^* = 2\zeta - 1$. Utilizing this last value of M^* to simplify the inequality in expression (12), we obtain

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This “income sorting equilibrium” can also be thought of as a “destination choice equilibrium.”

$$\frac{1}{2\zeta-1} > M. \tag{13}$$

Inspecting the inequality in expression (13), we see that the ratio on the left-hand-side (LHS) reaches a minimum value of one when the cost differential parameter ζ equals one. Hence, we infer that this inequality in expression (13) holds for *all* incomes $M \leq 1$. This last finding tells us that getting all the tourists in our aggregate economy to vacation in the cheaper destination A is, in our model, a superior outcome relative to the outcome in which the tourists vacation in both destinations A and B .

To intuitively see why this result holds, note that the decision to pick either destination A or B by the tourists in our aggregate economy depends on the tradeoff between two factors---see equation (1)---that pull in opposite directions. The first factor is the desire to match preferences or vacation with other wealthy tourists and this factor *increases* a tourist's utility. The second factor is the desire to stay away from a high cost destination because this high cost *decreases* a tourist's utility. From the analysis in section 3, we know that when $\zeta > 1$, all the tourists will choose to vacation exclusively in the cheaper destination A and that when $\zeta < 1/2$, all of these same tourists will choose to vacation in the more expensive destination B only.

Putting the above information together, as ζ steadily rises above $1/2$, the second factor begins to dominate the first factor and the cheaper destination A begins to look more attractive to a larger number of tourists. In the limiting case where ζ equals one and beyond, the second factor swamps the first factor and hence *no* tourist wishes to vacation in the more expensive destination B . Put differently, by altering the income cutoff point M^* , it is possible to make all the tourists in our aggregate economy better off by getting them to vacation in the cheaper destination A . This

completes our discussion of the impact of preference matching and income on tourism when there are two potential destinations to contend with.

7. Conclusions

In this paper, we theoretically studied the impact of preference matching and income on the distribution of tourists in an aggregate economy consisting of two potential destinations. It cost less (more) to vacation in destination A (B). Tourists freely chose to vacation in either destination A or B . They differed in their incomes and these incomes were assumed to be uniformly distributed on the unit interval. Our analysis led to four results. First, when the cost differential parameter satisfied a specific condition, both destinations were visited in the equilibrium. Second, when this parametric condition held, in any equilibrium in which the expected income of the tourists varied across the two destinations, every tourist vacationing in destination A had a lower income than every tourist vacationing in destination B . Third, there existed an income cutoff point and all tourists with lower (higher) incomes chose to vacation in destination A (B). Finally, in the equilibrium with income sorting, it was possible to make all tourists better off by modifying their destination choices.

Five policy implications arise from our analysis in this paper and they are as follows. First, when promoting different destinations to tourists, it makes sense for an appropriate authority (AA) to design the promotion materials in a way that emphasize the *distinctive* features of each destination. Second, because the tourists in our aggregate economy display an interest in preference matching, destinations that are more costly to vacation in ought to be marketed by the AA to relatively *wealthy* individuals. Third, if the AA would like all the destinations under his or her jurisdiction to be visited by tourists then this authority needs to take steps to ensure that differences in the cost of vacationing between the different destinations, are *small*. Fourth, if the

cost of vacationing in a particular destination is too high then the AA needs to understand that *no* tourist will want to vacation in such a destination. Finally, the only way in which the AA can improve upon the equilibrium in which tourists are sorted by their incomes involves ensuring that *all* the tourists in the aggregate economy vacation in the cheaper destination. However, this option is unlikely to be feasible from a practical standpoint.

The analysis in this paper can be extended in a number of different directions. Here are two suggestions for extending the theoretical research described here. First, it would be useful to extend our model by explicitly focusing on the case where the key choice confronting tourists is between any one of n destinations where $n > 2$. Second, it would also be helpful to consider the case in which a tourist's utility function depends not only on income and costs but also on a number of destination-specific characteristics. Studies that analyze these aspects of the underlying problem about the vacation choices of tourists will increase our comprehension of the nexuses between a desire to match preferences on the one hand and the touristic appeal of alternate destinations on the other.

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