The efficiency of government promotion of the tourism industry

Hui Shi†

Abstract

As promotion of tourism changes preferences, and hence the utility function, the usual comparative static analysis is not appropriate. A comparison of utility levels with, and without, promotion has to be conducted with the same utility function. The choice of the utility function depends on whether the promotion provides any utility-enhancing information or simply induces consumption switching (from non-tourism goods to tourism goods). With a series of simulations, it is shown that in the case of information enhancement, tax funded promotion of tourism may be efficient. In addition, it may also overcome the inefficiency associated with imperfect competition if the tourism industry produces under a higher degree of increasing returns than the non-tourism industry. If the reverse is true, and in the absence of information enhancement, promotion of tourism will reduce social welfare in accordance to the original preference.

JEL Classification: D43, D50, D61, H21

Keywords: preference, increasing returns, promotion

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Address for correspondence: Department of Economics, Monash University, Victoria 3800, Australia. Phone: +61 (0)3 99055448. Email: hui.shi@buseco.monash.edu.au.

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1 Introduction

In many countries, it is very common for the government to assist the tourism industry. Governments traditionally provide significant support for tourism activities in the form of promotion or provision and maintenance of infrastructure. This kind of assistance helps to attract and maintain tourists.

The demand for the goods and services provided by the tourism industry is determined by several factors such as disposable income, leisure time, population, and prices of related goods. These factors are very difficult to change. The easiest way to change demand is to change people’s preferences through outside impacts such as promotional campaigns. Many studies have been done to incorporate promotion or advertising into the analysis of tourism demand (Crouch et al., 1992; Divisekera and Kulendran, 2006).

Promotion works well to attract more tourists because it provides information on destination characteristics and influences consumer preferences psychologically, which plays an important role in purchase decision making over a long time. Although promotion provides information about alternatives and may increase the price elasticities of demand for most goods, it may not be true for tourism goods as tourism goods and services from different places in the same country have their own characteristics and some are even unique. For example, the Opera House can only be seen in Sydney and the Great Reef Barrier can only be viewed around Cairns. Therefore, promotion for one type of tourism good is exclusive to other kinds of tourism goods. The effectiveness of promotional campaigns reinforces the market power for one type of tourism good by affecting purchase decision making over time. In this sense, it may increase product differentiation and decrease the price elasticity of demand.

This paper explores the effect of the promotion of tourism in a model with increasing returns and monopolistic competition. An important feature of the tourism industry is that some tourism goods are produced with increasing returns due to big fixed-cost components (the exploitation of natural scenery, the construction of infrastructure in places of interests). Before full capacity, many facilities related to tourism, such as theaters, playgrounds, hotels and transportation infrastructure, can be utilized at fairly low marginal costs. There is no exclusion for the additional use of these facilities. The existence of fixed
costs is very important to the welfare analysis as it contributes to imperfectly competitive market structures and therefore to non-competitive pricing (Spence, 1976).

With high fixed costs, the average cost curve is downward sloping over the relevant range. A perfectly-competitive firm will expand output until increasing returns no longer apply. Thus we usually have monopolistic competition with price above marginal cost, which leads to under-production compared with perfect competition. Free entry and exit leading to the equality between price and average cost is assumed in the long-run equilibria. Even with average-cost pricing, the industries with increasing returns still under-produce relative to those industries with constant returns. The reason for this inefficiency is caused by ignoring the implications of increasing returns. Each consumer takes the price as given at whatever level and they will not consume more. In fact, if consumers buy more of this good, the fixed cost of producing this good will be spread over a larger number of units, which results in a lower average cost and hence lower price for every consumer. But if the effect of increasing returns is not taken into account by consumers, then the industry will produce less than the socially desirable level. Therefore, subsidizing an industry operating with increasing returns in the form of promotion will attract more consumption of that good, which may increase efficiency.

On the other hand, if a government runs a promotional campaign funded by a tax on consumers or other industries to keep a balanced budget, we must consider the effects of the tax. From the perspective of the whole economy, it is difficult to say whether the promotion of tourism has net positive or negative effects on welfare. In economies with imperfect competition, taxation affects the number of firms and output per firm. When the non-tourism industry also exhibits increasing returns, the cost of taxation may be high. This involves a comparison of degrees of increasing returns in the two industries. By comparing the situation with promotion and the situation without promotion, we will examine if a change in preferences induced by promotion of tourism has any impact on welfare.

However, welfare can only be compared based on given preferences. Promotion changes preferences and hence the utility function. Thus it is difficult to find a criterion to see if promotion is desirable. The welfare effects depend on whether promotion provides information or if it is a pure shift of demand from non-tourism to tourism goods. If it is
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The former case, the new utility function with an increased preference parameter is the true utility function. If the latter is the case, the original utility function should be true utility function as consumers may not really prefer more tourism goods despite the fact that they buy more. By classifying these two cases, utility levels at different equilibria can be compared to find out if promotion improves welfare.

2 The model without promotion

We will begin the analysis without promotion. The model in this paper is developed from the Dixit-Stiglitz model (Dixit and Stiglitz, 1977) of monopolistic competition to examine the market solution between the tourism industry and the non-tourism industry.

2.1 Model specification

Considering an economy with \(M\) identical consumers, each of them has the following decision problem for tourism and non-tourism consumption. These two industries have different degrees of elasticity of substitution and different degrees of increasing returns.

\[
Max U = \left[ \sum_{i=1}^{m} x_i^{\rho_1} \right]^{\alpha/\rho_1} \left[ \sum_{j=1}^{n} y_j^{\rho_2} \right]^{(1-\alpha)/\rho_2} \quad \text{(utility function)}
\]

\[
s.t. \sum_{i=1}^{m} p_i x_i + \sum_{j=1}^{n} p_j y_j = w \quad \text{(budget function)}
\]

where \(\alpha \in (0, 1)\) and \(\rho_1, \rho_2 \in (0, 1)\). \(\alpha\) is the preference parameter. \(\rho_1\) and \(\rho_2\) indicate the parameters of elasticity of substitution between each pair of consumption goods in the tourism and non-tourism industry. \(p_i\) and \(p_j\) are the prices of tourism goods \(x_i\) and non-tourism goods \(y_j\). \(w\) is individual’s income. \(m\) and \(n\) represent the number of tourism and non-tourism goods respectively. We assume that one firm only produces one type of good under the condition of increasing returns, so \(m\) and \(n\) also indicate the number of firms in the tourism and non-tourism industries respectively. Each consumer is a price taker and her decision variables are \(m\), \(n\), \(x_i\) and \(y_j\). We simplify this problem by assuming that it is a symmetric function. As we consider the problem under the condition of different degrees of increasing returns, we can model scale economies by assuming some fixed cost.
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and constant marginal cost to allow average cost to be falling over a relevant range. The fixed cost of tourism production is set as $a_1$ and non-tourism production is set to be $a_2$, all commodities in the two industries have constant marginal cost $b_1$ and $b_2$.

The solution to the optimization problem for individuals is

$$
x_i = \frac{a \omega}{p_i^{1-\rho_1}} \left( \sum_{k=1}^{m} \rho_1 p_k^{\rho_1-1} \right)
$$

$$
y_j = \frac{(1-\alpha) \omega}{p_j^{1-\rho_2}} \left( \sum_{r=1}^{n} \rho_2 p_r^{\rho_2-1} \right)
$$

(2)

By symmetry, it is easy to solve the optimization problem for the utility function

$$
x_i = \frac{\alpha \omega}{m p_i} \quad y_j = \frac{(1-\alpha) \omega}{n p_j}
$$

(3)

As the tourism industry and the non-tourism industry are both imperfectly competitive, the firm’s decision problems in the two industries are similar. First, we consider the individual firm’s decision problem in the tourism industry. In order to acquire the general equilibrium values for a firm’s decision variables, we have to consider three conditions. The first-order condition for the monopolist to maximize profit with respect to output level or price is

$$
MR = p_i (1 + 1 / (\partial \ln x_i / \partial \ln p_i)) = MC = b_1
$$

(4)

The own price elasticity of demand for good $x_i$ is implied as

$$
\frac{\partial \ln x_i}{\partial \ln p_i} = \frac{\rho_1 - m}{m(1 - \rho_1)}
$$

(5)

It is called the Yang-Heijdra formula (Yang and Heijdra, 1993). Substituting it into Equation (4), we get

$$
p_i = \frac{b_1 (m - \rho_1)}{\rho_1 (m - 1)}
$$

(6)

In addition, free entry is allowed into the industry, which will drive the profit of all firms
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\[ p_i X_i = a_1 + b_1 X_i \]  

(7)

\( X_i \) is the supply of the \( i \)-th tourism good. As market goods are assumed to be symmetric, we have \( X_i = X, x_i = x \) and \( p_i = p \) for \( i = 1, 2, \ldots, n \). And the market clearing condition is

\[ M x = X \]  

(8)

All the above conditions also exist for non-tourism production.

## 2.2 General equilibrium and comparative statics

Walras’ law says that in an economy with \( G \) commodities, equilibrium in any \( G-1 \) markets implies equilibrium in all markets. Thus, for numerous markets, as long as the relative prices between all goods in a given set of commodities remain unchanged, we may lump all the commodities into two composite commodities — tourism goods and non-tourism goods, according to the Hicks composite commodity theorem. Those goods consumed by tourists are lumped together as tourism goods, the rest are lumped into non-tourism goods. We may make a general equilibrium analysis on any one of the two composite commodities (see Ng, 2004, p. 236–7). Combined with the market clearing condition, we get the general equilibrium values of variables as follows since all the market goods in one group are symmetric.

\[ x = \frac{a_1 \rho_1 (Maw - a_1)}{b_1 \left[ a_1 \rho_1 + Maw (1 - \rho_1) \right] M} \]

\[ y = \frac{a_2 \rho_2 \left[ M \left( 1 - a \right) w - a_2 \right]}{b_2 \left[ a_2 \rho_2 + M \left( 1 - a \right) w (1 - \rho_2) \right] M} \]

\[ p_x = \frac{b_1 Maw}{\rho_1 (Maw - a_1)} \]

\[ p_y = \frac{b_2 M \left( 1 - a \right) w}{\rho_2 \left[ M \left( 1 - a \right) w - a_2 \right]} \]

\[ m = \rho_1 + \frac{Maw \left( 1 - \rho_1 \right)}{a_1} \]

\[ n = \rho_2 + \frac{M \left( 1 - a \right) w \left( 1 - \rho_2 \right)}{a_2} \]  

(9)
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After obtaining the explicit solutions for general equilibrium values of various variables, we may next examine the comparative statics by examining the effects of a change of parameters on the decision variables, which are given as below:

\[
\frac{\partial m}{\partial \rho_1} = 1 - \frac{Maw}{a_1} < 0
\]

\[
\frac{\partial m}{\partial a_1} = -\frac{Maw(1 - \rho_1)}{a_1^2} < 0
\]

\[
\frac{\partial m}{\partial a} = \frac{M(1 - \rho_1)w}{a_1} > 0
\]

\[
\frac{\partial m}{\partial M} = \frac{aw(1 - \rho_1)}{a_1} > 0
\]

\[
\frac{\partial n}{\partial \rho_2} = 1 - \frac{a_2}{M(1 - a)w} < 0
\]

\[
\frac{\partial n}{\partial a_2} = -\frac{M(1 - a)w(1 - \rho_2)}{a_2^2} < 0
\]

\[
\frac{\partial n}{\partial a} = -\frac{M(1 - \rho_2)w}{a_2} < 0
\]

\[
\frac{\partial n}{\partial M} = \frac{(1 - a)w(1 - \rho_2)}{a_2} > 0
\]

From the above derivatives, it can be seen that the signs of the above results are easy to ascertain except for \(\frac{\partial m}{\partial \rho_1}\) and \(\frac{\partial n}{\partial \rho_2}\). We must keep the values of \(x\) and \(y\) in Equation (9) positive. Since the denominators in the equation for \(x\) and \(y\) are positive, the numerator must also be positive for \(x\) and \(y\) to be positive. That means we have \(a_1 < Maw\) and \(a_2 < M(1 - a)w\). Economically, the fixed cost must be less than the value of the preference parameters for all consumers in an economy. Otherwise, a general value of preference is not sufficient to provide a viable economy if the size of the fixed cost of market production is too large, as production with very large fixed cost is not feasible. Hence, \(\frac{\partial m}{\partial \rho_1}\) and \(\frac{\partial n}{\partial \rho_2}\) are in fact unambiguously negative.

Parameters \(\rho_1\) and \(\rho_2\) represent the elasticity of substitution between different goods in the same sector. An increase of \(\rho_1\) and \(\rho_2\) means that it becomes easier to substitute one good for another in one sector, and the variety of goods is less important for consumers. Thus the number of market goods in the sector decreases. An increase in fixed costs \((a_1\) and \(a_2\)) reduces the number of market goods, as it deters more firms from entering this industry. A higher preference parameter to the tourism product \((\alpha)\) will increase
the number of goods in this market, and decrease the number of non-tourism goods. In addition, a larger population increases the number of market goods. More goods, or more variety of goods, can be afforded as the fixed cost of each good is shared by more people.

Inserting the general equilibrium values into the utility function in (1), we have the utility without promotion as

\[ U_e^* = \frac{a}{\rho_1} n \frac{1-a}{\rho_2} x^a y^{1-a} = M^{-1} \rho_1 a \rho_2^{1-a} a_1^{(1-a)(1-\frac{1}{\rho_1})} a_2^{(1-a)(1-\frac{1}{\rho_2})} b_1^{-a} b_2^{-a} (M \omega w - a_1)^a [M(1-\alpha)w - a_2]^{1-a} \]

(11)

\[ \times [a_1 \rho_1 + M \omega w(1-\rho_1)]^{a(\frac{1}{\rho_1}-1)} \times [a_2 \rho_2 + M(1-\alpha)w(1-\rho_2)]^{(1-a)(\frac{1}{\rho_2}-1)} \]

### 3 The model with promotion

#### 3.1 Optimal output in the short run

To analyze the situation with promotion, we introduce government into the model, and let it impose an income tax on consumers and subsidize the promotion of tourism. The promotion financed by a lump-sum tax will raise the consumers’ preferences towards tourism products. Since we are considering a change in preferences for tourism goods, we assume that the preference parameter to tourism products increases by a proportion of \( \gamma \), from \( \alpha \) to \( \alpha(1+\gamma) \). The preference parameter for non-tourism goods \( 1-\alpha \) may not change, but the relative preferences between the two goods have changed. \( t \) is the tax rate imposed on individuals. \( \gamma \) is an increasing function of \( t \), e.g. \( \gamma = A \ln(1+t) \). The parameter \( A \) represents the effectiveness of promotion, measuring how quickly \( \gamma \) changes with \( t \). This function implies that there is no change in consumer preferences if no tax is imposed, and the preference parameter increases more with a higher tax but at a diminishing rate.

In the short run, it is possible for firms to make profit, we let \( \pi_x, \pi_y \) imply profits made by tourism and non-tourism firms respectively. Since consumers can be seen as the owner of firms’ profit, tax and profit have some effects on the consumers’ utility, so they are
The efficiency of government promotion of the tourism industry included in the budget constraint.

\[
\begin{align*}
\text{Max} U &= \left[ \sum_{i=1}^{m} x_i^{\rho_1} \right]^{(1+\gamma)/\rho_1} \left[ \sum_{j=1}^{n} y_j^{\rho_2} \right]^{(1-\alpha)/\rho_2} \\
\text{s.t.} \sum_{i=1}^{m} p_i x_i + \sum_{j=1}^{n} p_j y_j &= w(1-t) + \frac{(m\pi_x + n\pi_y)}{M} \\
\end{align*}
\]

(utility function)

The solution to the optimization problem for individuals is

\[
\begin{align*}
x_i &= \frac{\alpha(1+\gamma)}{p_i^{\frac{1}{\rho_1}} \left( \sum_{k=1}^{m} p_k^{\frac{\rho_1}{\rho_1-1}} \right) (1 + \alpha\gamma)} \\
y_j &= \frac{(1-\alpha)}{p_j^{\frac{1}{\rho_2}} \left( \sum_{r=1}^{n} p_r^{\frac{\rho_2}{\rho_2-1}} \right) (1 + \alpha\gamma)} \\
\end{align*}
\]

(13)

Using the profit maximization rule \( MR = MC \), market clearing condition and substituting profits of the tourism and non-tourism firms, \( \pi_x = p_x (a_1 + b_1 X) \) and \( \pi_y = p_y (a_2 + b_2 Y) \), into the constraint, we get the general equilibrium values of variables for tourism production and non-tourism production as

\[
\begin{align*}
x &= \frac{\alpha(1+\gamma)}{[\alpha(1+\gamma)b_1 p_y + (1-\alpha)b_2 p_x]m} \\
y &= \frac{(1-\alpha)}{[\alpha(1+\gamma)b_1 p_y + (1-\alpha)b_2 p_x]n} \\
x &= \frac{b_1 Maw}{\rho_1(Maw - a_1)} \\
y &= \frac{b_2 M(1-\alpha)w}{\rho_2[M(1-\alpha)w - a_2]} \\
m &= \rho_1 + \frac{a_1 M(1-\rho_1)aw}{a_2} \\
n &= \rho_2 + \frac{M(1-\rho_2)(1-\alpha)w}{a_2} \\
\end{align*}
\]

(14)

where \( \gamma = A\ln(1+t) \).

We find that, compared with the original equilibrium, the output per firm in the tourism
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and non-tourism industry have changed while the price and the number of firms remain unchanged. It is taken that the number of firms is fixed in the short run, and when demand for tourism goods and services increase, the output of individual firms increases. From the Yang-Heijdra formula, the price for tourism goods is determined by the number of firms and the elasticity of substitution. Since both variables do not change, the price will not change either. According to Ng (1986), in terms of the isoelastic shift in demand, there is no change in the price elasticity at any given price. With a horizontal and unchanged marginal cost, we have no change in price, as profit maximization requires \( p(1 + \frac{1}{\epsilon}) = MC \).

Inserting the equilibrium values of various variables into the short-run utility function in (12), we have

\[
U_s = \frac{n^a(1+\gamma)/\rho_1 M^{(1-a)/\rho_2} x^{a(1+\gamma)}}{y^{1-a}} \\
= a_1^{(1+\gamma)} \left(1 - \frac{1}{\rho_1}\right) \left(1 - \frac{1}{\rho_2}\right) b_1^{a(1+\gamma)} b_2^{a-1} \rho_1^{a-1} \rho_2^{-a(1+\gamma)} (1 + \gamma)^{a(1+\gamma)} \\
\times \left[w(1-t) - \frac{ma_1 + na_2}{M}\right]^{1+a} (Maw - a_1)^{a-1} \left[M(1-a)w - a_2\right]^{-a(1+\gamma)} \\
\times \left[a_1 \rho_1 + Maw(1 - \rho_1)\right]^{-a(1+\gamma)} \left(\frac{1}{\rho_1 - 1}\right) \\
\times \left[a_2 \rho_2 + M(1 - a)w(1 - \rho_2)\right]^{(1-a)} \left(\frac{1}{\rho_2 - 1}\right) \\
\times \left[\frac{1 + \gamma}{\rho_2 \left[M(1-a)w - a_2\right]} + \frac{1}{\rho_1 (Maw - a_1)}\right]^{-(1+a\gamma)} \\
\tag{15}
\]

3.2 Optimal output in the long run

Now, let us examine the situation with promotion in the long run. If there is no government intervention, the monopoly power coming from increasing returns will not last long. Positive profit made by firms will attract potential firms to enter and negative profit will force current firms to exit. Free entry and exit drives the profit of a marginal firm to zero in the long run. The demand for individual firms is not clear, depending on the extent of increased demand and the number of incumbent firms in the industry. The budget
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constraint changes with zero profit. The utility function is the same as in the short run.

\[
\max U = \left[ \sum_{i=1}^{m} x_i^{\rho_1} \right]^{a(1+\gamma)/\rho_1} \left[ \sum_{j=1}^{n} y_j^{\rho_2} \right]^{(1-a)/\rho_2}
\]  
(utility function)  

\[
s.t. \sum_{i=1}^{m} p_i x_i + \sum_{j=1}^{n} p_j y_j = w(1-t)
\]  
(budget constraint)  

The solution to the optimization problem for individuals is

\[
x_i = \frac{a(1+\gamma)w(1-t)}{p_i^{1-\rho_1} \left( \sum_{k=1}^{m} p_k^{\rho_1-1} \right) (1+\alpha\gamma)}
\]

\[
y_j = \frac{a_2(1+\gamma)w(1-t)}{p_j^{1-\rho_2} \left( \sum_{r=1}^{n} p_r^{\rho_2-1} \right) (1+\alpha\gamma)}
\]  
(17)

Using the conditions of zero profit, profit maximization \( MR = MC \) and market clearing, we can get the general equilibrium values for the two markets as

\[
x = \frac{a_1\rho_1 \left[ Ma(1+\gamma)w(1-t) - a_1(1+\alpha\gamma) \right]}{b_1 \left[ Ma(1+\gamma)w(1-t)(1-\rho_1) + a_1\rho_1(1+\alpha\gamma) \right] M}
\]

\[
y = \frac{a_2\rho_2 \left[ M(1-a)w(1-t) - a_2(1+\alpha\gamma) \right]}{b_2 \left[ M(1-a)w(1-t)(1-\rho_2) + a_2\rho_2(1+\alpha\gamma) \right] M}
\]

\[
p_x = \frac{\rho_1 \left[ Ma(1+\gamma)w(1-t) - a_1(1+\alpha\gamma) \right]}{b_2 M(1-a)w(1-t)}
\]

\[
p_y = \frac{\rho_2 \left[ M(1-a)w(1-t) - a_2(1+\alpha\gamma) \right]}{b_1 M(1-a)w(1-t)}
\]

\[
m = \rho_1 + \frac{Ma(1+\gamma)w(1-t)(1-\rho_1)}{a_1(1+\alpha\gamma)}
\]

\[
n = \rho_2 + \frac{M(1-a)w(1-t)(1-\rho_2)}{a_2(1+\alpha\gamma)}
\]  
(18)

where \( \gamma = A\ln(1+t) \).

Compared with the original equilibrium and the short-run equilibrium, all the decision variables have changed. As free entry and exit is allowed in the long run, the number of firms will change, which will affect the output per firm. Prices of products are decided by the forces of changed demand and supply. These changes will move the economy to a new equilibrium. Inserting the general equilibrium values of variables into the utility
function in (16), we have

\[ U_i = m^{\alpha(1+\gamma)/\rho_1} n^{(1-a)/\rho_2} x^{\alpha(1+\gamma)} y^{1-a} \]

\[ = M^{-1-a\gamma} a^{\alpha(1+\gamma)} b^{1-a} a_1^{-a(1+\gamma)} b_1^{1-a(1+\gamma)} b_2^{a-1} \]

\[ \times (1 + a\gamma) \left[Ma(1+\gamma)w(1-t) - a_1(1 + a\gamma)\right]^{a(1+\gamma)} \]

\[ \times [M(1 - a)w(1-t) - a_2(1 + a\gamma)]^{-a} \]

\[ \times [a_1 \rho_1(1 + a\gamma) + Ma(1+\gamma)w(1-t)(1-\rho_1)]^{a(1+\gamma)} \left(\frac{1}{\rho_1} - 1\right) \]

\[ \times [a_2 \rho_2(1 + a\gamma) + M(1 - a)w(1-t)(1-\rho_2)]^{(1-a)} \left(\frac{1}{\rho_2} - 1\right) \]

\[ (19) \]

4 Simulation

Promotion may shift individuals’ preferences. Once preferences change, it is difficult to find a criterion to see if promotion is desirable. There are two cases to be considered for welfare effects of the promotion of tourism. If the promotion provides some information on destination choices to individuals and attracts some tourists, those tourists enjoy beautiful scenery. But individuals do not realize that consuming more tourism goods and services may improve their welfare, without complete information. In other words, the increased preference parameter in the new utility function is not realized by individuals who instead maximize the original utility function. In fact, they should maximize the new utility function with the increased preference parameter. On the other hand, if promotion only switches consumption from non-tourism to tourism goods, tourists may be tempted by advertising to travel to some places even though they do not really want to go. In this case, welfare should be evaluated in accordance with original preferences. Next, we will analysis welfare effects based on the two cases individually.

4.1 Welfare analysis based on information provision

With real information, individuals receive benefit from traveling that would not take place otherwise. In this case, the new utility function with an increased preference parameter is the true utility function. Utility at different equilibrium levels can be compared to find out the welfare effects of the promotion of tourism.
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We will give specific values to the variables in the utility function, according to their economic meaning. We assume that $\alpha = 0.5$, which means consumers have the same preference to tourism and non-tourism goods before promotion. As some studies measuring the effectiveness of government promotion of tourism have found that promotion is successful in bringing tourists to a country (Webster, 2000; Webster and Ivanov, 2006), we assume that $A = 5$. This is to guarantee that tax is effective at least initially in promoting the tourism industry, given that the promotional effect has diminishing marginal returns. With a tax rate $t = 0.01$, $\gamma = A\ln(1 + t) \approx 0.05$. This means that imposing a 1% tax can change a consumer’s preference parameter to tourism goods by 5%, and it may cause a positive profit for tourism firms in the short run. Tax must not be too high, otherwise the cost of promotion will be too big.

The economy is assumed to have a population with $M = 10,000,000$. Too small or too big a population may make the economy not viable. We also assume that marginal costs in the two industries are the same, $b_1 = b_2 = 0.001$. Fixed costs $a_1$ and $a_2$ must be large enough to form barriers for entry to keep monopolistic power for incumbent firms and make $x > 1$, as long as $a_1 < M\alpha w$ or $a_2 < M(1 - \alpha)w$. With other things unchanged, only if $x > 1$, will utility increase with preferences; otherwise, utility decreases with an increase in preferences. The relative difference between fixed cost and marginal cost imply the decreasing extent of average total cost. We assume the elasticities of substitution between each pair of goods in the two industries are equal, $\rho_1 = \rho_2 = 0.5$. Hence, the difference in the degrees of increasing returns in the tourism industry and the non-tourism industry depends on a comparison of variables $a_1$ and $a_2$. Given other variables, the higher the fixed cost, the larger is the cost to be diffused over the units of output. Therefore, the average cost of producing one unit of good decreases more when the production increases, leading to a higher degree of increasing returns.

We substitute values of variables into different utility functions, $a_1 = 1,000,000$, $a_2 = 500,000$, $\rho_1 = \rho_2 = 0.5$ and $b_1 = b_2 = 0.01$, $\alpha = 0.5$, $A = 5$, $t = 0.01$. And the following results are obtained.
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<tr>
<th>Variables</th>
<th>$p_x$</th>
<th>$p_y$</th>
<th>$x$</th>
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The above simulation results are obtained at different equilibrium levels. If the parameter $A$ is big enough for a small tax to promote the tourism industry effectively, the demand curve for tourism goods will shift to the right by $x\%$ to intersect with the downward-sloping average cost curve in the short run. Demand curve $d'$ becomes more elastic.

When marginal cost is horizontal and remains unchanged, the new profit maximizing equilibrium will involve a higher output and the same price, which is consistent with equilibrium values in (14). With no change in price, individual firms may make a positive profit (shaded area in Figure 1). As the number of firms is fixed, the output for individual firms will increase with higher demand for tourism goods. This is a big incentive for lobbying government to promote the tourism industry. However, given the value of other variables, a smaller $A$ is not effective in bringing positive profits to tourism firms.

In the long run, potential firms will enter into the tourism industry seeing the huge profit earned by incumbent firms until all firms break even. The demand curve for individual firms will shift left again to $d''$, which becomes more elastic as there are more firms in the tourism market and consumers have more choices. This new demand curve will be tangent to the lower point of the average cost curve, resulting in a lower price and higher output at point $B$ compared with point $A$. This is shown in the simulation results.
However, the non-tourism industry is affected by income tax. With decreasing demand for non-tourism goods, the demand curve which was tangent to the downward-sloping average cost curve shifts to the left, and the firm makes a loss. This will lead to an exit of firms, and demand faced by individual firms will increase, leading to a right shift of the demand curve. But less competition in this industry makes the demand curve less elastic and the demand curve will be tangent to the average cost curve at a higher point with higher price and lower output.

Although tax on consumers will make the output and number of firms in the non-tourism industry decrease, and the price for non-tourism goods increase, the negative effect of the tax is overbalanced by the huge promotional effect on the tourism industry due to a lower degree of increasing returns in the non-tourism industry. When the promotion of tourism provides information of destination choices, an increasing demand for tourism goods overcomes under-production in the tourism market. With tax imposed, consumers will reduce their demand for non-tourism goods and services, releasing the labour input from existing goods, which gives potential firms incentives to enter into the tourism market.
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Hence, the number of firms in the tourism market increases, consumers can get more variety of tourism goods. Hence, the welfare level rises. This is what Doi and Futagami (2004) show; namely, introducing specific taxes increases social welfare.

Next, we will look at how the tax rate affects welfare with promotion given the value of other variables. The efficiency of promotion is influenced by the parameter $A$ and tax rate $t$. A higher $A$ and tax rate lead promotion to be more effective in improving welfare, but the marginal effect is decreasing. It is obvious that a higher $A$ for any given level of tax rate changes preferences to a larger extent and improves welfare more. Tax is levied to promote the tourism industry. For a fixed $A$, welfare first increases with the tax rate and then decreases. The tax rate cannot be too low, otherwise it will not generate enough promotional effect. The tax rate cannot be too high either, otherwise, it will discourage the non-tourism industry. Therefore, there must be an optimal tax rate for welfare to be maximised. Otherwise, the negative effects supercede the positive effects, leading to a decrease of welfare. To see the changing tendency more clearly, we take the log of the utility function. In the following 3-D figure, when parameter $A$ is small, the optimal tax rate is lower. But with a higher level of $A$, the optimal tax rate is higher, which means effective promotion can largely overcome the cost of income tax.

![Figure 2: Optimal tax rate](image)

Figure 2: Optimal tax rate
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In addition, we examine how the change in variables affects the welfare level in the case that promotion provides information. Through a series of simulations, we find that at a given level of the tax rate, when the degree of increasing returns in the tourism industry becomes increasingly higher than that in the non-tourism industry, welfare with promotion will be larger than welfare without promotion. It is not the case with a very low tax rate. The tendency can be explained in this way. In Figure 3, when fixed cost $a_2$ of non-tourism production decreases and fixed cost of tourism production $a_1$ remains unchanged, the gap of degrees of increasing returns in the two industries is widening. The smaller the $a_2$ and the higher the tax rate, then the larger the welfare difference. This is because a decrease of $a_2$ means a lower degree of increasing returns in the non-tourism industry. The cost of taxation is lower with a lower degree of increasing returns. Then the benefit of promotion will be much larger than the cost of taxation.

![Figure 3: Welfare change with change in $a_2$ and $t$](image)

Based on the above results, we can acquire an important proposition.

**Proposition 1** In the case with the provision of real information to consumers, the promotion of tourism financed by income tax may improve welfare both in the short run and long run, especially if the tourism industry has a higher degree of increasing returns than the non-tourism industry.
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The equilibrium with promotion which provides real information is a Pareto improvement compared with the equilibrium without promotion. This improvement is due to the implications of increasing returns. At the equilibrium without promotion, the market goods produced by tourism firms are priced at average cost. Under the condition of increasing returns to scale, average cost pricing may result in some inefficiency and under-production. Each consumer takes the price of each good as given, and assumes that no matter how much they buy, the price will not be affected. Hence, the effect of increasing returns is not taken into account. In fact, if all consumers buy more tourism goods, the fixed-cost component of producing this good will be spread over a larger number of units, resulting in a lower average cost and hence lower price for every consumer. When the gap in the degrees of increasing returns for the two industries enlarges, it is more efficient to promote the industry with a higher degree of increasing returns to move the market outcome closer to the social optimum. Myles (1987, 1989), Doi and Futagami (2004) and Ng and Zhang (2007) also support a subsidy to a sector with a higher degree of increasing returns to improve welfare.

4.2 Welfare analysis based on a pure shift of demand

In the previous section, the welfare effects of promotion of tourism are analyzed in accordance with the new utility function, assuming that promotion provides real information. The simulation results show that promotion may improve individuals’ welfare. However, promotion may simply shift individuals’ preferences, hence it is arbitrary to acquire the conclusion that welfare increases with promotion. In traditional economic analysis, two indifference curves do not cross. A higher indifference curve represents higher utility, which is based on the same relative preferences. However, when relative preferences change, this rule will not be satisfied. It is possible for two indifference curves to cross, and a higher point does not mean a higher utility. Thus changes in utility do not give a valid comparison. Through consumption of more tourism goods and less non-tourism goods, we still cannot decide if the new combination leads to a higher level of welfare.

In Figure 4, point A is the combination of tourism and non-tourism goods on indifference curve $I_1$ without promotion. With a change in preferences, the new indifference curve crosses with $I_1$. The new combination caused by promotion can be at B, C, and D, but they...
The efficiency of government promotion of the tourism industry cannot be compared with point A, as they are not on the same set of indifference curves. We can draw subsidiary indifference curves going through these points, which have the same relative preferences with $I_1$. Any point on a higher indifference curve will have a higher utility. Evaluated with original preferences, welfare with promotion may increase, decrease or even be equal depending on the position of a new combination of tourism and non-tourism goods.

![Figure 4: Change in relative preferences](image)

Figure 4: Change in relative preferences

To make a valid comparison, we will substitute the equilibrium value of variables acquired from the utility function with promotion into the utility function without promotion to see the difference. Figure 5 shows that welfare with promotion is lower than welfare without promotion given the specific value of variables. The new combination of two kinds of goods is more likely at point B in Figure 4. In terms of original preferences, the promotion of tourism reduces welfare. When the degree of increasing returns in the tourism industry becomes relatively larger than that in the non-tourism industry, a higher tax will lead to a bigger distortion in terms of original preferences. The negative effect on the non-tourism industry will become much larger than the positive effect of promotion on the tourism industry. This implies residents consume more tourism goods and services with promotion, but they may not really prefer to in accordance to their intrinsic preferences. The distorted consumption not only makes the non-tourism industry deteriorate, but also influences consumers’ welfare. Therefore, from the standpoint of
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a whole society, promotion of tourism is not socially desirable evaluated with original preferences, as it distorts consumers’ behavior and moves the result away from the social optimum.

![Figure 5: Welfare change in terms of original preferences with change in $a_2$ and $t$](image)

We have Proposition 2 following the analysis:

**Proposition 2** If the promotion of tourism results in a pure shift of demand, social welfare in accordance with the original preferences is reduced.

5 Conclusion

This paper analyzes the efficiency of publicly-funded promotion of the tourism industry. Through a comparison of utility levels with and without promotion, we have shown that a tax-funded promotion of tourism may overcome the inefficiency associated with imperfect competition, provided that the tourism industry produces under a higher degree of increasing returns than the non-tourism industry. In a market with monopolistic competition, monopolistic firms may produce less than social optimum and charge a
higher price for their products to maximize profit. Government promotion may overcome the problem of underproduction and move closer to the social optimum by utilizing the implications of increasing returns. However, from the perspective of the whole economy, this intervention may not be beneficial. Although promotion is very useful in increasing demand for tourism goods, the government has to impose a tax on consumers to keep the budget balanced, which causes a reduction of non-tourism output and pushes the price of non-tourism goods higher. The total effects depend on the comparison of degrees of increasing returns in the two industries. If the tourism industry has a higher degree of increasing returns than the non-tourism industry, then the benefit of promotion of tourism is more likely to exceed the negative effect, improving welfare. Otherwise, the negative effect may exceed the benefit, and the promotion of tourism may lower welfare.

An important point to notice is that welfare comparison should be based on a given preference structure. Once promotion changes consumers’ preferences, changes in utility may not provide a valid comparison of welfare. Here promotion changes relative preferences between tourism and non-tourism goods. The result for welfare-improving is acquired under the assumption that promotion provides real information. The new utility function with promotion is maximized as consumers may not realize the benefit of traveling without complete information. A higher utility means that tourists will receive more benefit after enjoying the beautiful scenery. If promotion is a pure shift of demand from tourism to non-tourism goods, a comparison of different equilibrium in terms of original preferences has to be made. Measured with reference to the original preferences, we find that promotion of tourism reduces social welfare, unless the tourism sector has a higher degree … From this perspective, the promotion of tourism may not be socially desirable.

Clearly, it is difficult for a government to measure which industry has a higher degree of increasing returns. In some cases with information asymmetry, the promotion policy on an industry with a high degree of increasing returns will open up a flood-gate of rent-seeking activities that are likely to waste more resources of the society. The benefit of promotion may be overbalanced by the cost of taxation and the resources spent on rent seeking. In fact, it is not easy to greatly change preferences by promotion alone and it is more difficult to control the variable to a range that is exactly what we desire, for example, to decide the
optimal tax rate to finance the promotion of tourism. However, due to huge profit brought by promotion in the short run, there is a high incentive for tourism firms to require more subsidies from the government. Although promotion may bring prosperity to the tourism industry, we must recognize that increasing the demand for tourism goods and services needs some sacrifice from other industries. Therefore, promotion has double-sided effects on social welfare. Government cannot blindly take action to finance promotion in the interest of only some groups. It is necessary to justify the applicability of promotion policy to the economy as a whole before taking any policy actions.

References


