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THE ECONOMIC EFFECTS OF ADVERTISING ON TOURISM DEMAND

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Abstract

In this paper we introduce a dynamic model to study the macroeconomic effects of advertising activities in tourism. The agents of the model are a representative consumer which optimize their intertemporal welfare, a representative firm that produces tourism services, an authority which organizes tourism advertising abroad and foreigner tourists. We show that in the short run, an increase in marketing expenditures raises foreigner's tourism demand, leads to an increase in the relative price of tourism services, makes tourism production more attractive and stimulates capital investment. As time passes, the capital stock increases and tourism production expands, leading to a falling price of tourism. In the long run, the increase in marketing activities results in a higher rate of tourism production, a higher capital stock, a lower relative price of tourism services and a reduction of net foreign assets.

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1. INTRODUCTION

Tourism is one of the most flourishing sectors in many countries and it is considered to be the second largest industry in the world. For some countries the contribution of tourism to economic growth can be substancial (see Dwyer et al (1998 and 2003), Ivanov and Webster (2007) and Zhouet al (1997)). Given the significant contribution of this industry and the highly competitive market of global tourism, many countries invest large amounts of resources into advertising activities to promote their resources in order to increase their market shares. Consumers encounter advertising messages as they watch TV, read magazines, listen to the radio, surf the internet, or simply walk down the street. Little, however, is known about the effects of these large amounts of marketing expenditure on tourism demand. There is a vast literature on tourism demand modelling and forecasting (see Song and Lee (2008)) for a review of recent research in this topic) but few of the various studies published on the demand for tourism incorporates advertising into its analysis. Witt and Martin (1987), Crouch et al (1992), Kulendran and Divisekera (2006 and 2007) are econometric studies measuring the economic impact of tourism marketing expenditure.

As it is well understood, marketing activities may have various effects. There are three views of the economic effects of advertising: persuasive, informative and complementary. The *persuasive* view (or market power model) holds that advertising primarily affects demand by changing tastes. Then the product faces a less elastic demand causing higher prices. According to this, advertising is a means of persuasion, and is postulated to lead to increased product differentiation that decreases perceived substitutability among competing alternatives. Bain (1956) and Comanor and Wilson (1974) offer early empirical support for the persuasive view. The *informative* view is based on the theory of economics of information and holds that advertising primarily affects demand by conveying information. Then the product faces a more elastic demand causing lower prices, an influence which is reinforced when production scale economies are present. The foundation for the informative view is laid by Ozga (1960) and Stigler (1961). In an early empirical effort, Telser (1964) looks across U. S. consumer goods industries and reports evidence that advertising serves mainly to facilitate entry. The informative view suggests that advertising provides information about alternatives and this produces an increase on the price elasticity of demand (see Nelson (1974)). Both of these schools of thought highlight the possible effects of advertising on the demand for goods and services, although the postulated effects are contrary. The empirical evidence on the economics–marketing relationship do no support one specific school. Some authors have found supporting evidence for the view that advertising decreases the price elasticity of demand (see Krishnamurthi and Raj (1985)), and others have found evidence of the contrary (Moriarty (1983). Finally, the *complementary* view (Stigler and Becker (1977); Telser (1964)) holds that advertising primarily affects demand by exerting a complementary influence in the consumer's utility function with the consumption of the advertised product. As an example, it may be that a consumer values "social prestige" and advertising may then serve as an input that enables the consumer to derive more social prestige when the advertised product is consumed. The complementary view is logically distinct from the persuasive view, since the complementary view holds that consumers possess a stable set of preferences into which advertising enters as one argument. The complementary view is also logically distinct from

the informative view, since under the complementary view advertising may affect consumer demand even if it contains no information.

Consumers may be imperfectly informed when there are search costs that are associated with obtaining information as to the location, price and qualities of available products. This is particularly the case for tourism goods given that the decision to purchase a tourism product (for example the choice of a tourism destination) is made in advance. Thus information about the destinations available to the consumer plays a key role in the choice process. In the absence of complete information, it is reasonable to assume that promotional efforts by the destination countries could have significant effects on destination choice, and therefore on demand for a particular destination. Advertising may provide indirect information that the advertised destination is, in fact, a good place. Then, advertising is especially attractive to efficient firms selling high-quality tourism that are especially well suited for tourists that are targeted by the advertising campaign. Advertising may be most effective as an indirect information source for experience goods (which is the case of most tourism products), since sellers of search goods are better able to provide direct information through advertisements.

Marketing activities, by creating desires and wishes and providing information, aim at the change of the demand for the product that is promoted. A change in demand may then translate into a change in the market price, influencing in turn economic decisions of other economic agents. The analysis of these effects can be conducted in a textbook-style partial equilibrium framework. However, the effects of a marketing activity may spill over to other economic sectors, as increases in demand and production may lead to changes elsewhere in the economy. It is therefore important to recognize these indirect effects of the marketing activity. The usual textbook analysis uses a partial equilibrium framework by focusing on one market solely. Depending on the magnitude of spill over effects, such an analysis may be misleading. To take care of the indirect effects of marketing activities, the analysis should be based on a general equilibrium framework.[1] Also, the change in behavior of economic agents and the induced effects on economic key variables affects the evolution of the economy over time. Furthermore, the marketing activity has to be financed, which in turn may change incentives of economic agents. It seems therefore appropriate to conduct a full analysis of the economic effects of marketing activities in an intertemporal general equilibrium framework.[2]

Because of the relevance of marketing in the tourism sector, it is important that their economic effects are to be well understood. Our aim is to provide a simple model for such an analysis. Our approach employs a dynamic general equilibrium model of a semi-small open economy, based on intertemporally optimizing representative agents and perfect competition, which is a variant of Turnovsky's (2000, ch. 11) model.[3] Our model can be viewed as a minimalist model,[4] serving as a starting point for further analysis. For the sake

[1]See, e. g., Blake, Sinclair, and Soria (2006), who argue that general equilibrium models can take account of the interrelationships among tourism and other sectors in the domestic economy.
[2]For the need of dynamic general equilibrium modeling, applied to tourism, see, e. g., Dwyer, Forsyth, and Spurr (2004).
[3]Hazari and Sgro (2004) analyze the consequences of tourism using dynamic models of trade. Their chapter 11 contains a Ramsey-type growth model, based in intertemporal optimization, but in contrast to our analysis, they abstract from current account adjustments.
[4]Our model is analytically tractable. In the literature on the economic effects of tourism, input-output (IO) models and

of simplicity, the model economy we consider completely specializes in producing tourism services, and goods for consumption and investment have to be imported from abroad. Furthermore, the economy is able to influence the relative price of its product, tourism services (and hence the real exchange rate), but is small in the sense that it faces a given price for its imports and a given world interest rate, at which it can lend or borrow at the international financial market, hence the name "semi-small".[5] We would like to stress that this kind of open economy framework refers also to a region within a country and may fit particularly well a region's economic environment. For analytical purposes and as a starting point, we focus on the case that overall labor is supplied in a fixed quantity.

In our analysis, we will highlight the dynamic and the general equilibrium (spill over) effects of the marketing activity. In the short run, an increase in marketing activities, exercised by some "marketing authority", which promotes tourism for the country/region as a whole, results in an increase in tourism demand from abroad and consequently leads to an increase in the relative price of tourism (i. e. to an appreciation of the real exchange rate) to clear the market for domestically produced tourism services. The real appreciation in turn makes investment in the tourism industry more attractive compared to investing in traded bonds, hence investment demand boosts. Because both investment goods and the marketing activity have to be bought from abroad (e. g. a large marketing campaign in foreign journals, television and so on), the economy's current account turns into a deficit. As time passes, the nation accumulates capital and increases thus tourism service production, calling for a gradual fall in the relative price of tourism (a real depreciation) to keep foreign tourism demand in line with tourism supply. Together with falling investment expenditures, this improves the current account. In the long run, compared with the situation before marketing activities where increased, the economy ends up with a larger stock of capital and thus higher tourism production. The real exchange rate shows the overshooting property, that is, after its initial appreciation, it depreciates towards a lower steady-state value than prevailed before the increase in the marketing activity was implemented. The long-run current account is balanced, and the nation ends up with a lower stock of net foreign assets and hence lower net interest income. Because on the one hand income from tourism (in terms of the imported good) may increase, but interest income falls and marketing expenditures are higher, the wealth effect and hence the consequence for consumption is ambiguous. Therefore, it is not clear if an increase in marketing activities is desirable from a welfare point of view.

The rest of the paper is structured as follows. Section 2 sets up the model and describes the economic framework. Section 3 turns then to the discussion of the macroeconomic equilibrium. Section 4 describes the dynamic properties of the equilibrium and discusses the economy's steady-state. The effects of an increase in marketing expenditures are analyzed in detail in section 5. Section 6 summarizes our main findings and briefly discusses possible extensions of our model.

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computational general equilibrium (CGE) models are frequently used. On applications of these models and comparisons between them, see, e. g., Adams and Parmenter (1995), Zhou, Yanagida, Chakravorty and Leung (1997), Blake and Sinclair (2003), Dwyer, Forsyth, and Spurr (2004), Blake, Sinclair, and Soria (2006), and Blake (2007).

[5]We view this to be an important extension of open economy models dealing with tourism, since being able to lend or to borrow at the international financial market has important implications; see, e. g., Turnovsky (1997, ch. 2, 3).

2. THE MODEL

The open economy comprises a large number of households supplying a fixed amount of labor, $l = \bar{l}$, and consuming an imported good, and a large number of firms producing tourism services, y, using capital, k, and labor, l. The imported good can be used for consumption, x, and investment, I, including installation cost. Both households and firms shall be represented by a representative household and a representative firm, respectively. In addition, there is a "marketing authority" collecting lump-sum payments, T, and fees expressed as a fraction of output, τy, from firms, to finance its tourism marketing activities performed abroad.[6] The economy is small in the world financial markets, taking the world interest rate r as given. However, tourism services produced in the economy are different from tourism services supplied elsewhere. Therefore, foreign demand Z for domestically produced tourism services is an increasing function of the real exchange rate σ, defined to be the relative price of the imported good in terms of tourism services.[7] Furthermore, Z depends positively on the level of marketing activities a of the authority. Finally, Z increases with foreign's income, Y^*. Thus, we have

$$Z = Z(\sigma, a, Y^*); \quad Z_\sigma > 0, Z_a > 0, Z_{Y^*} > 0.$$

Since the country is small, it can not influence the rest of the world's income Y^*, but takes is as given and constant. Hence, we can drop Y^* as an argument of the Z-function, which from now on we shall write as $Z(\sigma, a)$.

Without loss of generality we can consolidate households and firms into a representative consumer-producer, called representative agent. The agent accumulates traded foreign bonds (assets), b, denoted in terms of the imported good, that pay the exogenously given world interest rate, r. The agent's flow budget constraint in terms of the foreign (imported) good is thus given by

$$\dot{b} = \frac{1}{\sigma}\left[(1-\tau)F(k) - \sigma x - \sigma C(I) - T + \sigma r b\right] \tag{1a}$$

where $y = F(k)$ denotes the production function for tourism services, which shows the neoclassical standard properties $F' > 0, F'' < 0$,[8] where for ease of notation we dropped constant labor l as an argument of F. Capital formation (investment) is associated with

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[6]Since domestic residents do not consume domestically produced tourism services, advertisement at home would not make sense.

[7]A real depreciation (an increase in σ) indicates that domestically produced tourism services become relatively cheaper.

[8]Where no ambiguity can arise we shall adopt the convention of letting primes denote total derivatives and appropriate subscripts partial derivatives. Thus, we shall let $f'(x) \equiv \frac{df}{dx}; f_i(x_1, \ldots, x_n) \equiv \frac{\partial f}{\partial x_i}, f_{ij} \equiv \frac{\partial^2 f}{\partial x_i \partial x_j}$. Time derivatives will be denoted by dots above the variable concerned, $\dot{x} \equiv \frac{dx}{dt}$.

convex adjustment costs of the Hayashi (1982) type. Since the domestic economy is completely specialized in tourism production, both the consumption good and physical capital must be imported from abroad. C denotes the investment cost function in terms of the foreign good, that is, total expenditure for capital formation (new capital plus installation cost), and has the properties $C' \geq 0, C'' > 0, C'(0) = 1$. Assuming away depreciation, the change in the capital stock and investment are related by

$$\dot{k} = I \tag{1b}$$

The representative agent chooses the level of consumption of the imported good, x, the rates of investment, I, and of bond accumulation, to maximize his intertemporal utility function

$$W \equiv \int_0^\infty U(x) e^{-\beta t} dt, \tag{2}$$

subject to the constraints (1) and the historically given initial stocks of capital $k(0) = k_0$ and traded bonds $b(0) = b_0$. The instantaneous utility function U is assumed to be concave, i. e. , $U' > 0, U'' < 0$. β is the rate of consumer time preference, taken to be constant. The Hamiltonian of the agent's optimization problem can be written as

$$H \equiv U(x) + \frac{\lambda}{\sigma}\left[(1-\tau)F(k) - \sigma x - \sigma C(I) - T + \sigma r b\right] + \gamma I,$$

where λ is the shadow value of wealth in the form of traded foreign bonds and can be interpreted as the marginal utility of wealth in the form of traded bonds, and γ measures the shadow value of capital. Performing the optimization gives rise to the following optimality conditions:

$$U'(x) = \lambda \tag{3a}$$

$$C'(I) = \frac{\gamma}{\lambda} \equiv q \tag{3b}$$

$$\beta - \frac{\dot{\lambda}}{\lambda} = r \tag{3c}$$

$$\frac{(1-\tau)F'(k)}{\sigma q} + \frac{\dot{q}}{q} = r \tag{3d}$$

together with the transversality conditions

$$\lim_{t\to\infty} \lambda b e^{-\beta t} = \lim_{t\to\infty} \gamma k e^{-\beta t} = \lim_{t\to\infty} \lambda q k e^{-\beta t} = 0. \tag{3e}$$

Equation (3a) equates the marginal utility of consumption of the imported good to the marginal utility of wealth in the form of foreign bonds. Equation (3b) gives rise to a Tobin q theory of investment. It equates the marginal cost of investment (new capital) to its market price, both expressed in terms of the foreign good.[9] Equations (3c) and (3d) are dynamic no-arbitrage conditions. The former equates the rate of return on consumption to the rate of return on bonds, i. e. , the interest rate. To obtain an interior solution, we require $\beta = r$, which leads to the zero-root property (see Sen (1994)) $\lambda = \bar{\lambda}$, implying a time-constant marginal utility of wealth, which has important consequences for the dynamics (see Schubert and Turnovsky (2002)), as the long-run equilibrium becomes dependent on initial conditions. The latter equates the rate of return on capital invested in the tourism sector, consisting of a dividend yield $(1-\tau)F'/\sigma q$ and a capital gain $\dot{q}/q$, to the exogenous world interest rate.

The final agent is the marketing authority, playing a simple role. It collects fees from tourism firms $\tau F(k)+T$ to finance its marketing expenditures abroad, σa. The fees itself comprise an income dependent component, $\tau F(k)$, and a lump-sum payment, T. Without loss of generality we assume that the authority runs a balanced budget, i. e.

$$\tau F(k) + T = \sigma a, \tag{4}$$

that is, the authority continuously adjusts lump sum payments T to meet its marketing expenditures σa.

3. MACROECONOMIC EQUILIBRIUM

The macroeconomic equilibrium of this intertemporal general equilibrium model is defined to be a situation in which all the planned supply and demand functions are derived from optimization behavior, the economy is continually in equilibrium, and all anticipated variables are correctly forecasted. We will call this concept a "perfect foresight equilibrium".[10] In particular, macroeconomic equilibrium requires the market for domestically produced tourism services to be continuously cleared, that is

$$F(k) = Z(\sigma, a), \tag{5}$$

what is guaranteed by proper adjustments of the real exchange rate. Together with the consumption and investment optimality conditions (3a) and (3b) we get

$$x = x(\bar{\lambda}), \quad \frac{dx}{d\bar{\lambda}} = \frac{1}{U''} < 0 \tag{6a}$$

[9]Note that q is the ratio of the marginal utility of an additional unit of installed capital, γ, over the the marginal utility of traded bonds, λ, which can also be interpreted as the marginal cost of an additional unit of uninstalled capital.
[10]See, e. g., Brock and Turnovsky (1981), p. 180.

$$I = I(q), \quad \frac{dI}{dq} = \frac{1}{C''} > 0 \tag{6b}$$

$$\sigma = \sigma(k, a), \quad \sigma_k = \frac{F'}{Z_\sigma} > 0, \sigma_a = -\frac{Z_a}{Z_\sigma} < 0. \tag{6c}$$

The interpretation is straightforward: An increase in the marginal utility of wealth leads to an increase in savings and therefore a decrease in consumption expenditure. An increase in the market price of installed capital encourages capital formation and thus investment. A higher capital stock in turn increases production of tourism services and calls, other things equal, for a real depreciation to restore market equilibrium for tourism services. Higher marketing expenditures raise tourism demand, and given tourism production, market equilibrium requires a real appreciation, i. e., an increase in the relative price of tourism services, $1/\sigma$.

Finally, inserting the tourism market clearing condition (5) and the authority's balanced budget (4) into the agent's flow budget constraint (1a), gives the country's current account equation

$$\dot{b} = \left[\frac{Z(\sigma, a)}{\sigma} - x - C(I) - a \right] + rb, \tag{7}$$

where the term in brackets represents the balance on trade and services, and rb denotes (net) interest income from abroad.[11]

4. EQUILIBRIUM DYNAMICS AND STEADY-STATE

Denoting steady-state values with tildes, the *linearized dynamics* for the economy's capital stock and the the market price of installed capital follow from (1b) together with (6b), (6c), and (3d) and are given by

$$\begin{pmatrix} \dot{k} \\ \dot{q} \end{pmatrix} = \begin{pmatrix} 0 & I' \\ -(1-\tau)\dfrac{\tilde{\sigma} F_{kk} - F_k \sigma_k}{\tilde{\sigma}^2} & r \end{pmatrix} \begin{pmatrix} k - \tilde{k} \\ q - \tilde{q} \end{pmatrix} \tag{8}$$

where all derivatives are calculated at steady-state. Because the determinant of the matrix in (8) is negative, the system has one positive and one negative eigenvalue, denoted by $\mu_1 < 0$, and is therefore saddle-path stable. The stable solutions for the capital stock, k, and its market price, q, are:

$$k(t) - \tilde{k} = \left(k_0 - \tilde{k}\right) e^{\mu_1 t} \tag{9a}$$

[11]In case that the economy is a region rather than a country, no official balance of payments statistics may exist. Nonetheless, the economic relationships remain exactly the same as for a country.

$$q(t)-\tilde{q}=\frac{\mu_1}{I'}\left(k_0-\tilde{k}\right)e^{\mu_1 t}. \tag{9b}$$

Combining equations (9a) and (9b) yields the stable saddle-path $q(t)-\tilde{q}=\frac{\mu_1}{I'}(k(t)-\tilde{k})$, which is a negative line in (k,q)-space with slope $\mu_1/I'<0$.

Inserting equations (6a), (6b) and (6c) into (7), and using the stable solutions for k and q (9), the linearized dynamics for the economy's net foreign assets becomes

$$\dot{b}=\Omega(k-\tilde{k})+r(b-\tilde{b}), \tag{10}$$

where

$$\Omega\equiv\frac{\sigma_k}{\tilde{\sigma}}\xi-\mu_1>0,\quad \xi\equiv\frac{\tilde{Z}}{\tilde{\sigma}}(\eta-1),\quad \eta\equiv\frac{Z_\sigma\tilde{\sigma}}{\tilde{Z}}>0.$$

η denotes the price elasticity of tourism demand. Ω captures the influence of capital on the balance of trade and services. First, an increase in k rises the real exchange rate to clear the tourism service market via increased demand Z. If that demand is price elastic, tourism services measured in terms of imports, Z/σ, increase, improving thus the current account. Second, an increase in k lowers investment along the stable adjustment path, reducing thus investment imports and contributing positively to the country's current account, too. Note that $\xi>0$ if and only if $\eta>1$, what we reasonably assume.[12] In that case, automatically $\Omega>0$, hence the current account improves with an increasing capital stock. One can show that $\frac{d\Omega}{da}>0$ if $\eta>1$.[13] In that case, an increase in marketing activities strengthens the dynamic relationship between capital and the current account.

The stable solution for the economy's net foreign asset position can then be found to be

$$b(t)-\tilde{b}=\frac{\Omega}{\mu_1-r}(k(t)-\tilde{k}). \tag{11}$$

Setting $t=0$ in (11) yields the economy's intertemporal budget constraint which ensures that the economy remains intertemporally solvent. In (k,b)-space, the intertemporal budget constraint is a negatively sloped line, becoming steeper as a increases.

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[12]Because there are many tourism destinations, it is natural to assume that tourism demand responds elastically to a change in the country's relative price σ of its particular tourism service. For the sake of simplicity, we shall assume that the price elasticity of tourism demand remains constant.

[13] $\frac{d\Omega}{da}=\frac{\sigma_k}{\tilde{\sigma}}\left[\frac{d\xi}{da}-\frac{\xi\sigma_a}{\tilde{\sigma}}\right]$, and $\frac{d\xi}{da}=(\eta-1)\frac{Z_a\tilde{\sigma}-\tilde{Z}\sigma_a}{\tilde{\sigma}^2}$. Thus, if $\eta>1$, $\frac{d\xi}{da}>0$, and $\frac{d\Omega}{da}>0$.

The economy's *steady-state equilibrium* is reached when $\dot{k} = \dot{q} = \dot{b} = 0$. Hence, we get the steady-state relationships

$$U'(\tilde{x}) = \bar{\lambda} \tag{12a}$$

$$\tilde{I} = 0 \tag{12b}$$

$$\tilde{q} = 1 \tag{12c}$$

$$(1-\tau)F'(\tilde{k}) = \tilde{\sigma} r \tag{12d}$$

$$F(\tilde{k}) = Z(\tilde{\sigma}, a) \tag{12e}$$

$$\frac{Z(\tilde{\sigma}, a)}{\tilde{\sigma}} - \tilde{x} - a + r\tilde{b} = 0 \tag{12f}$$

$$b_0 - \tilde{b} = \frac{\Omega}{\mu_1 - r}\left(k_0 - \tilde{k}\right) \tag{12g}$$

Several aspects of this equilibrium merit comment. First, because of the constant marginal utility of wealth, there is perfect consumption smoothing, as equation (12a) indicates. This is a standard result and due to the fixity of labor supply, see Turnovsky (2000, ch. 8). Second, the steady-state market price of installed capital equals unity (equation (12c)), therefore there is no investment, as (12b) indicates. Third, equations (12d) and (12e) jointly determine the long-run capital stock by requiring equality between the net rates of return on capital and traded bonds, and the the long-run equilibrium real exchange rate. Fourth, equation (12f) is the zero current account condition, and (12g) links the long-run capital stock to steady-state net foreign assets b via the economy's solvency condition, and shows that the steady-state is dependent on the historically given levels of capital and bonds.

5. ANALYSIS OF AN INCREASE IN MARKETING ACTIVITIES

5.1 Steady-state changes

Since our model assumes perfect foresight, the dynamic evolution of the economy and hence the transitional adjustment is determined in part by agents' expectations of the ultimate steady-state. It is therefore convenient to start our analysis with the investigation of the long-run steady-state effects of an increase in marketing expenditures a. These are given by

$$\frac{d\tilde{k}}{da} = \frac{rZ_a}{D} > 0 \tag{13a}$$

$$\frac{d\tilde{b}}{da} = \frac{\Omega}{\mu_1 - r}\frac{d\tilde{k}}{da} < 0 \tag{13b}$$

$$\frac{d\tilde{\sigma}}{da} = \frac{(1-\tau)F''Z_a}{D} < 0 \tag{13c}$$

$$\frac{d\tilde{x}}{da} = \frac{1}{D}\left[\left((1-\tau)F''\frac{Z_\sigma}{\tilde{\sigma}}\left(\tilde{\xi} - Z_\sigma\right)\right) + \frac{Z_a r}{\tilde{\sigma}}\left(\frac{r\Omega\sigma}{\mu_1 - r} + F'\right) + \left((1-\tau)F''Z_\sigma - rF'\right)\right] \tag{13d}$$

$$\frac{d\bar{\lambda}}{da} = U''\frac{d\tilde{x}}{da} \tag{13e}$$

$$D \equiv F'r - Z_\sigma(1-\tau)F'' > 0,$$

Equation (13a) indicates that an increase in marketing activities raises the steady-state capital stock, implying higher long-run tourism services production. However, as (13b) shows, this increase goes hand in hand with a reduction in the nation's net foreign assets. The real exchange rate σ appreciates to clear the tourism market, as (13c) states; that is, tourism services become relatively more expensive. The sign of the response of steady-state consumption of the imported good and of marginal utility is ambiguous. Equation (13d) reveals that opposite forces are at work, as the first and the second term are positive, whereas the third term is negative, steming from the fact that marketing has to be financed. Because of the real appreciation, the value of tourism production in terms of the imported good increases,[14] which - viewed in isolation - exercises a positive wealth effect and stimulates consumption. But higher marketing expenditures, financed by "taxation", and reduced net interest earnings rb both give rise to a negative, consumption reducing wealth effect. Thus, the overall effect on the marginal utility of wealth and thus consumption remains unclear.[15]

5.2 Impact effects

Having described the long-run effects of the increase in marketing expenditures, we turn to the short-run (impact) effects. Since the capital stock k_0 and hence tourism production is historically given, and the marketing activity increases tourism demand, the real exchange rate has to appreciate to clear the tourism service market, which can be formally seen from equation (6c):

$$\frac{d\sigma(0)}{da} = \sigma_a < 0.$$

The real appreciation in turn increases the rate of return on capital in terms of the import

[14]Because steady-state capital stock increases, goods market clearance (12e) implies that $\tilde{Z}$ rises. According to (13c), $\tilde{\sigma}$ drops. Hence, $\tilde{Z}/\tilde{\sigma}$ rises.

[15]To see this, the reader should inspect the long-run zero current account equation (12f).

good and makes capital more attractive then foreign bonds.

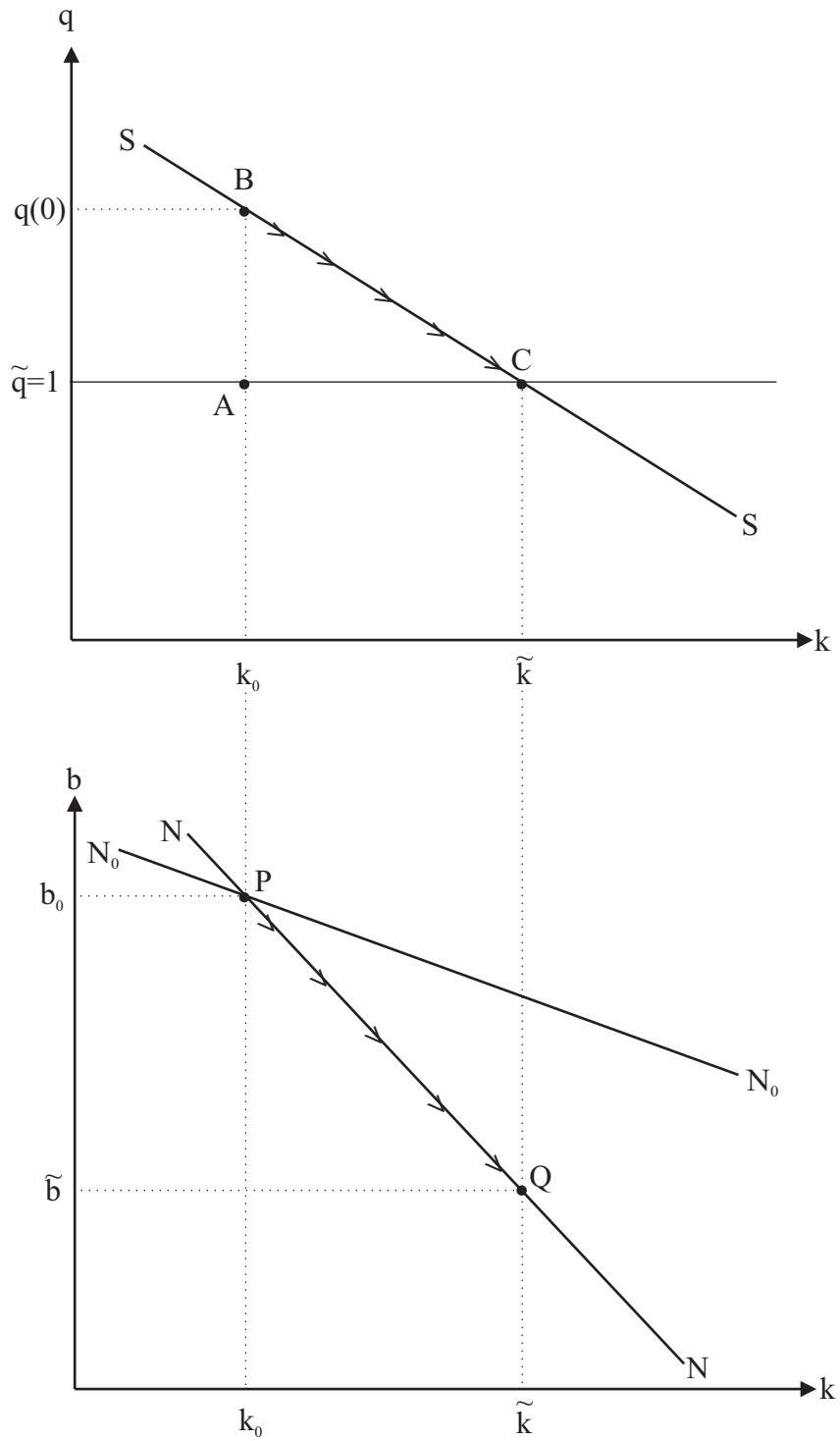

Figure 1. Increase in Marketing Expenditures *a*

Thus, the market price of installed capital increases instantaneously; its increase follows from differentiating equation (9b) at time $t = 0$ and noting that $d\tilde{q}/da = 0$:

$$\frac{dq(0)}{da} = -\frac{\mu_1}{I'}\frac{d\tilde{k}}{da} = -\frac{\mu_1 r Z_a}{I'D} > 0.$$

Note that this initial reaction is entirely forward-looking, as it depends on the steady-state change of the economy's capital stock. This adjustment of q at time $t = 0$ ensures no-arbitrage between capital and traded bonds thereafter. Since q is now above unity, investment $I(0)$ becomes positive, as agents start accumulating physical capital. The initial response of consumption $x(0)$ is triggered by the once-and-for-all change in the marginal utility of wealth $\bar{\lambda}$ (see equation (13e)) and equals its steady-state change reported in equation (13d) and is thus ambiguous. Because labor supply is fixed, there is perfect consumption smoothing.

5.3 Dynamic transition

Given the initial stocks of capital k_0 and net foreign bonds b_0, starting off from an "old" steady-state, denoted by $\tilde{k}_0, \tilde{q}_0, \tilde{b}_0$, the economy jumps from point A to point B, located on the stable saddle-path SS depicted in the upper part of figure 1. The lower part of the figure shows the relationship between the economy's capital stock and its net foreign assets; it is a graphical representation of the intertemporal solvency condition. Before the increase in a is in effect, the budget line is N_0N_0. This negatively sloped line rotates and becomes steeper (in absolute value) as a is increased,[16] it is denoted by NN. From thereon, the economy moves from points B and P towards points C and Q, respectively. The dynamic adjustment is characterized by capital accumulation and thus rising production of tourism services, and a gradual fall in Tobin's q, as time differentiation of equations (9) confirms:

$$\dot{k} = \mu_1(k(t) - \tilde{k}) > 0; \quad \dot{y} = F'\dot{k} > 0; \quad \dot{q} = \mu_1(q(t) - \tilde{q}) < 0,$$

since $k(t) < \tilde{k}$ and $q(t) > \tilde{q}$. As tourism output increases, market equilibrium requires a rising real exchange rate (a fall in the relative price of tourism), as follows from (6c):

$$\dot{\sigma} = \sigma_k \dot{k} = \sigma_k \mu_1 (k(t) - \tilde{k}) > 0.$$

It is interesting to note that the real exchange rate overshoots its long-run reaction on impact. After its initial drop it gradually increases to a level lower that the one prevailed before marketing activities have risen.[17] The stock of net foreign assets b is decumulated along the movement on the locus NN. The nation/region runs a current account deficit during transition. In other words, the income created by tourism and interest $Z/\sigma + rb$ is not sufficient to finance consumption imports x, expenditures for marketing activities a, and investment expenditure including installation cost, $C(I)$. During transition, the

[16]The reason is that Ω increases, as discussed in footnote 13.

[17]To see this, note that $d\sigma(0)/da < 0$, and $d\tilde{\sigma}/da < 0$, but $\dot{\sigma} > 0$.

(negative) current account improves with the accumulation of the capital stock. Note finally that consumption of the import good remains constant during transition. Eventually, the new steady-state is reached, and all adjustments are completed. The economy ends up with a higher stock of capital, increased tourism service production, an appreciated real exchange rate, that is a higher relative price of tourism services, and a lower stock of net foreign assets.

5.4 Welfare effects of the marketing activity

Let us finally address the question if an increase in marketing activities is socially desirable, keeping the simplicity of the model in mind. From the intertemporal welfare function (2) together with constant consumption it follows immediately that

$$W = \frac{U(\tilde{x})}{r}$$

and thus

$$\frac{dW}{da} = \frac{1}{r} U' \frac{d\tilde{x}}{da} \gtreqless 0,$$

depending on the consumption response to marketing activities. The welfare effect is therefore unclear. If marketing activities increase tourism demand sufficiently to enable domestic residents to increase their consumption, domestic welfare will improve. As we discussed, this in turn depends on if the change in steady-state income created by tourism and interest $\tilde{Z}/\tilde{\sigma} + r\tilde{b}$ is higher than the change in marketing expenditures a.

6. CONCLUSION

In this paper we studied the effects of tourism marketing on economic key variables, using a simple "minimalist" dynamic model of an economy that is completely specialized in tourism services. We found that an increase in marketing activities raises the relative price of tourism services in the short run, stimulates investment in capital, resulting in gradually increasing tourism production, accompanied by a current account deficit, as investment goods and marketing have to be bought abroad. The dynamic adjustment goes hand in hand with a depreciating real exchange rate. In the long run, the economy ends up with a lower stock of net foreign assets, a higher capital stock and thus increased production of tourism services, and an appreciated real exchange rate. The effect on domestic agents' consumption and thus the welfare effect of marketing is ambiguous. Before engaging in marketing activities, a careful analysis of the economic structure is therefore necessary.

Of course, the model is very simple. A lot of extensions seem to be appropriate. As a first step, one should introduce some labor flexibility. One could also add more sectors and drop the assumption of perfect specialization. However, it is likely that the resulting model will become too complex to be analytically solved, calling therefore for numerical simulations. Another promising extension could be the introduction of sluggish adjustment of tourism demand to marketing activities due to tourists' habits. Hence, a lot of research in this area can be done in the future.

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