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NORMATIVE APPROACH OF  
UPSTREAM-DOWNSTREAM RELATIONSHIPS  
IN THE TOURISM SECTOR: IMPLICATION FOR  
THE TOURISM POLICY OF  
THE SOUTH MEDITERRANEAN COUNTRIES

Riadh Ben Jelili, H el ene Djoufelkit-Cottenet  
& Abdelhakim Hammoudi

Working Paper No. 0802

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RELATIONSHIPS IN THE TOURISM SECTOR:  
IMPLICATION FOR THE TOURISM POLICY OF THE  
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Riadh Ben Jelili, H el ene Djoufelkit-Cottenet and Abdelhakim Hammoudi

**Working Paper 0802**

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## Abstract

The paper proposes a model of a vertical relationship between Hotel owners (HOWs) and Tours operators (TOs). In a Benchmark situation, the HOWs and the TOs sell a generic good ("mass" good). The goal of the paper is to evaluate some policies that the government can use to implement the product diversification in the country. The diversification is realized towards a second market associated to a new product with more qualitative specifications. First, if the government imposes a (new) Minimum standard, we show that the fiscal measures play a complementary role, additionally of subsidies, to incite the producers to accept the additional investment in equipment. Moreover, there is an optimal combination that improves the total surplus of the country relatively to the Benchmark (revenues of the local producers minus the total level of subsidies and the cost of fiscal measures). Second, we assume that the government wants simply create an alternative market which may co-exist with the traditional one (the adhesion to the new or to the generic market is free for the HOWs and for the TOs). We show that there exist levels of public interventions (tax reduction, subsidy, and level of minimum requirement for the new product) such as the two markets co-exist. This policy may allow the government to save public fund improving meanwhile the global welfare of the country (leakage reduction relatively to the Benchmark situation).

## ملخص

تقترح هذه الورقة نموذجاً للعلاقة الرأسية بين أصحاب الفنادق ومنظمي الرحلات السياحية. وإذا اردنا أن نسترشد في هذا السياق بعلامة مرجعية ذكرنا ما يفعله أصحاب الفنادق ومنظمي الرحلات السياحية حين يبيعون سلعة عامة (سلعة شعبية). وتهدف الورقة إلى تقييم بعض السياسات التي يمكن أن تستخدمها الحكومة لتنفيذ تنوع المنتجات في الدولة. وهذا التنوع يتحقق من خلال الاتجاه إلى سوق ثانية مرتبطة بمنتج جديد ذو مواصفات نوعية أفضل. أولاً، لو فرضت الحكومة معياراً (جديداً) للحد الأدنى فسوف نوضح أن الإجراءات المالية تلعب دوراً مكملًا بجانب الدعم، في حث المنتجين على قبول استثمار إضافي في المعدات. علاوة على ذلك، هناك تكامل أمثل يحسن الفائض الإجمالي للدولة بالنسبة للعلامة المرجعية (إيرادات المنتجين المحليين مطروح منها المستوى الإجمالي للدعم وتكلفة الإجراءات الضريبية). ثانياً، نفترض أن الحكومة تريد ببساطة إيجاد سوقاً بديلاً من المحتمل أن يتعايش مع السوق التقليدي (أصحاب الفنادق ومنظمي الرحلات السياحية لهم مطلق الحرية في التمسك بالسوق الجديد أو العام). ونوضح أنه يوجد مستويات من التدخلات العامة (خفض الضريبة، والدعم، والحد الأدنى للطلب على المنتج الجديد) مثل تعايش السوقين. ربما تتيح هذه السياسة للحكومة توفير الأموال العامة محسنة في نفس الوقت الرخاء العالمي للدولة (تخفيض التسريب بالنسبة للموقف الإرشادي).

## Introduction

During the past few decades, tourism has emerged as one of the world's major industries, exceeding the importance of many manufacturing and other service industries in terms of sales, employment and foreign earnings. As well as being a major source of revenues and employment for countries worldwide, tourism is also an industry where long-term growth prospects are good.

However, a number of South Mediterranean countries (SMCs) endowed with abundant tourist attractions fail to capitalize on these resources in order to improve their export earnings capabilities. Lack of strategic objectives has been a principal shortcoming in these countries which are the typical sun-sea-sand destinations for visitors coming predominantly from northern countries.

In order to negotiate and open tourism sector to benefit further from the international tourism business sector in the next round of negotiations, SMCs have to think strategically and gear up internally to develop appropriate physical, human resource, and other organizational infrastructure in an integrated manner, which can meet the varied needs of international tourists. Failing this, and if the tourism sector is opened further for the external players, SMCs may become only a minor tool/vector in tourism value creation process worldwide. SMCs should get be prepared for playing the main role, which not only helps in enhancing the value creation, but also captures and controls the value created. The major benefits otherwise would be captured by other international players (leakages) such as European Tour-Operators (TO)<sup>1</sup>.

Indeed, mainstream TO control overwhelmingly the tourism sector development in most of the SMCs simply because of the volume they generate. They might not necessarily be in favor of promoting more up-market holidays. The issue of the value sharing between the vertical chain agents arises in a crucial way for the developing countries<sup>2</sup>. It determines the level of leakages, that is, the total value which stays in the developing countries' economy.

These considerations raise many questions to the developing countries public authorities, especially about the need of regulation in the tourism sector chain of Production /distribution. The arisen issues lag behind in the literature. A first issue concerns the intermediary markets and the supply chain organization. In fact, the main issue which will arise in the near future for developing countries tourism sector is the organization of the market and its effect on the coexistence of several types of offer carried in the target countries. This paper proposes a theoretical analysis of vertical relationship between producers (Hotels) and retailers (TO) in the tourism industry.

Features such as market power, vertical relations and public regulation in a context of developing countries make the tourism sector interesting from an economic perspective. However, there is not, to our knowledge, sound theoretical analysis that closely looks at the tourism sector<sup>3</sup>. Up to now, no formalized analysis has been proposed in order to assess these impacts (which ones?) from private and public points of view and discuss whether or not public regulation can be justified. The goal of this paper is to fill this gap and to propose an original model based on an industrial organization approach.

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<sup>1</sup> Generally it is estimated that over 50% of all tourist spending in generating countries either never reaches or leaks out of developing country destinations (Mowforth and Munt 1998).

<sup>2</sup> See Buhalis (2000) for the precise identification of different conflicts that oppose the HOWs and the TOs in the Mediterranean region.

<sup>3</sup> Most research on this sector is carried out by tourism specialists and focuses generally around estimating and forecasting demand for tourism using aggregate data.

The papers of Calveras (2002) and Sofronis et al. (2003) are the exception. The paper of Calveras focuses on the Hotel incentive to invest in environmental quality within an externality context. The main conclusion of the paper is that the nature of the environment determines the destination's international competitive advantage. The authors show that the incentive depends on whether the Hotel is locally or internationally well established. He shows that the incentive of a local Hotel chain to invest in environmental quality is greater than that of an international chain. The local hotel chain internalizes to a greater extent than an international chain the external impact of its environmental investments. Sofronis et al. (2003) study empirically the difference in hotel ratings when established by the TOs and by the local Government especially in developing countries. The authors show that the ratings provided by the Government are not very accurate quality indicators. Tour operators play a vital role in this market by pooling together information about different holiday destinations and providing their own ratings of accommodations. These differences in facilities can explain a substantial part of price variation. Information supplied by tour operators in brochures conveys additional quality content.

In this paper our goal is precisely to contribute to fill the gap in the literature. We propose a model of a vertical relationship between Hotel owners (HOWs) and Tours operators (TOs)<sup>4</sup>.

In a first step (Benchmark), we consider that the Producers and the TOs sell a generic good. This initial offer represents the traditional tourism specialization of the country. It is characterized by a minimum quality specification requirement (for example mass tourism) which is controlled partially by the TOs and partially by the government.

In a second step, the government wants to encourage the diversification towards a second market associated to a new product with more qualitative specifications. This new market offers a vertically differentiated product subjected to restrictive qualitative constraints, defined and imposed by the government. The emergence of such a product induces an investment for producers to increase the number of their equipment and/or improve its quality. The government decides to encourage the producers to make this investment by subsidizing a fraction of this investment. The analysis raises the following questions: is it in HOWs interest to commit to these new procedures? Does the implementation of a New Market have an effect on spot market prices? How do these prices depend on the standard quality chosen by the government? In order to answer these questions, it is necessary to determine the optimal allocation of the market between the generic products and the new product in relation with the price formation on the intermediary markets, the quality level of the new product, the public instrument used by the government and its effect on the strategic games within the vertical structure.

In the first step of the analysis, we assume that the government imposes a Minimum standard higher than the standard existing in the Benchmark situation. By definition, the new standard policy makes illegal the production and the trading of the traditional product: the generic good is eliminated from the market. However, the government chooses its intervention level within the constraint that all the HOWs and all the TOs are satisfied enough to adopt the new procedure and to sell the new product. The government includes the participation constraint of the set of actors: their profit in the new situation is higher than in the Benchmark.

We show that the subsidy policy is generally not sufficient to at least equal the HOWs' profit in the new situation relatively to the Benchmark. We explore the tax reduction policy which TOs may benefit from to decide to sell the qualitative product<sup>5</sup>.

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<sup>4</sup>The methodology is in the line with standards industrial organization models including the vertical differentiation (Mussa and Rosen representation) and with vertical relationships models. We use in the last section the concept of stability due to the theory of endogenous formation of coalitions.

We show that the fiscal measures play a complementary role (additionally of subsidies) to incite the producers to accept the additional investment in equipment. However they are not needed to create incentives for the TOs to adhere to the new market. The TOs always have the advantage to sell the new product if the producers invest (with appropriate public subsidies) in quality. The problem is that the subsidies policy coupled with a fiscal reduction may be costly for the government. However, we show that there is an optimal combination that improves the total surplus of the country relative to the Benchmark (revenues of the local producers minus the total level of subsidies and the cost of fiscal measures).

In a second step of the analysis we relax the Standard Minimum hypothesis. The government wants simply to create an alternative market which may co-exist with the traditional one. The adhesion to the new or to the generic market is free for the HOWs and for the TOs. The important dimension of the analysis is the trade-off the TOs and the HOWs face when they take their decision to join one of the two possible markets (generic or New). This trade off is induced by the co-existence effects of the two spot markets associated to the specificity of these differentiated products. One can indeed wonder whether the strategic actions raising the quality of the product will be able to emerge and which are the public interventions which would stimulate the incentives to promote these types of strategies. We show that there exist levels of public interventions (tax reduction, subsidy, and level of minimum requirement for the new product) such as the two markets co-exist. This policy may allow the government to save public fund improving meanwhile the global welfare of the country (leakage reduction relatively to the Benchmark situation). We give the strategic interactions in the vertical chain organization. We show how the authorities actions impact both the agent's strategies (producers and TOs), and the intermediary prices which give an idea of the level of leakage.

## 1. Model and Benchmark Analysis

We consider a vertical relationship between  $J$  upstream Hotel owners (HOWs), indexed by  $j$ , and  $R$  downstream Tour Operators (TO), indexed by  $r$  (see figure 1). There is a unique and independent foreign end market for each of the TO. The quality  $k_i$  of the product sold by a hotel  $i$  is a function  $k(e_i)$  of its equipment  $e_i$ ; we assume simply that  $k(e_i) = e_i$ . Initially, that is in the Benchmark situation, all producers have the same level of equipment  $e_0$  and offer an identical product of quality  $k_0 = e_0$  (with  $k_0 > 0$ ) which, for example, corresponds to the minimum quality fixed initially by the public authorities. The Benchmark situation is a vertical relationship where the TOs take as given the exogenous level of the HOW's equipment. In practice, the TOs offer the generic product to foreign tourists (who have a relatively low revenue).

Without loss of generality, all the upstream HOWs pay a zero unit cost of production and have an identical capacity  $q$ . The total quantity  $Q = \sum_{i=1}^J q$  produced by all the producers is sold on a "Generic intermediary spot market" on which the  $R$  TOs buy the quantities they need. This market is supposed to be a competitive and the intermediary price  $\omega_0$  equals supply and demand on this market.

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<sup>5</sup> In practice, the tourism sector is taxed either by taxing the private actors or by taxing the tourists directly. The World Tourism Organisation (WTO, 1998) has identified 40 different types of taxes applied to the tourism sector in both developed and developing countries. 15 are levied on tourism actors (see for more details Gooroochurn and Sinclair (2003)). The most tourist programs of the developing countries integer some subsidies and fiscal reductions measures to promote the sector (see for example the Algerian program for a sustainable tourism 2004-2013 and the morocco program 201-2010).

The demand addressed by each TO on the intermediary market is made to supply its own final foreign market. We consider that each TO is a local monopoly on a foreign market of size  $M_i$ . We assume that  $M_i = M, i = 1, \dots, R$ .

The final demand pattern for the domestic tourist product is as proposed by Mussa and Rosen (1978) for vertically differentiated products. The consumers are characterized by a taste parameter  $\theta$  uniformly distributed on the interval  $[\underline{\theta}, \bar{\theta}]$  whose density is  $f(\bar{\theta}) = \frac{1}{\bar{\theta} - \underline{\theta}}$ .

Without loss of generality, we consider that  $\underline{\theta} = 0$ . The surplus of a consumer of type  $\theta$  who buys the product of quality  $k_0$  at price  $p_0$  is  $S(\theta) = \theta k_0 - p_0$ . Thus, only the consumers who are such as  $S(\theta) > 0$  (i.e.  $\theta > \frac{p_0}{k_0}$ ), buy the good. The demand addressed to each retailer  $r$  on the final market is then:

$$d_r(e_0, p_0, \bar{\theta}) = M \left( \bar{\theta} - \frac{p_0}{e_0} \right) \quad (1)$$

Considering that each TO sells the quantity  $x_r$  on its own market  $M_r$ , the inverse demand is:

$$p_0(x_r, e_0, \bar{\theta}) = \frac{\bar{\theta} e_0}{M} (M - x_r) \quad (2)$$

We consider that the good is taxed at the rate  $t$ , ( $0 \leq t < 1$ ). The retailer's profit is therefore given by:

$$\Pi_r(x_r) = \left[ (1-t)p_0(x_r, e_0, \bar{\theta}) - \omega_0 \right] x_r \quad (3)$$

Using (2) and (3), we obtain the quantity sold on the final market which maximizes the profit of each TO:

$$x_r(\omega_0, e_0, t) = \frac{M}{2} \left( 1 - \frac{\omega_0}{(1-t)e_0\bar{\theta}} \right) \quad (4)$$

We assume that each TO orders this same quantity  $x_r$  on the intermediary spot market. The total demand addressed on the intermediary spot market by all the  $R$  TOs is then:  $Q(\omega_0) = \sum_{r=1}^R x_r$ .

The individual HOW's  $j$  ( $j = 1, \dots, J$ ) profit is:

$$B_j(e_0, q) = \omega_0 q \quad (5)$$

We assume that the total capacity  $Q = Jq$  is offered in the intermediary market (inelastic offer).

The equilibrium intermediary price  $\omega_0^*$  is obtained by equalizing the quantity offered by the HOWs and needed by the retailers. We obtain:

$$\omega_0^*(J, e_0, t) = (1-t) \left( 1 - \frac{2Jq}{MR} \right) e_0 \bar{\theta} \quad (6)$$

In the rest of the paper we note:  $h(J, R) = \frac{Jq}{MR}$  et  $u(t, \bar{\theta}) = (1-t)q\bar{\theta}$



$Jq$  is the total capacity available in the country and  $MR$  is the size of the global foreign market targeted by the  $R$  TOs.  $h(J, R)$  is the ratio of these two characteristics (index of offer capacity/demand potentiality).

$q\bar{\theta}$  is the maximum of receipts which can be withdrawn from transactions in the foreign markets (independently of the level of quality: the reservation price of the foreign consumers is  $\bar{\theta}e_0$ , see (2))

In order to avoid a negative intermediary price, we assume in the rest of the paper that  $h(J, R) < 1/2$ , i.e  $MR > 2Jq$ . The quantity marketed by each TO is  $Q = Jq$ . Using (2), (3), (4) and (6), we obtain the profit obtained by each TO and each HOW in the Benchmark equilibrium:

$$\Pi_0^*(J, e_0, t) = \frac{4Me_0 h^2(J, R) u(t, \bar{\theta})}{q} \quad (8)$$

$$B_0^*(J, e_0, t) = Me_0 u(t, \bar{\theta})(1 - 2h(J, R)) \quad (9)$$

### 3. The Minimum Standard Policy

This section tests the case where Public Authorities impose minimum quality standard for the National product.

#### 3.1. Public Minimum Standard without Public Policies Support.

Government decides that HOWs who want to commercialize their products should invest the amount  $\delta$  to improve the quality of their equipment. Thus, the quality level of the national tourism product (and of the equipment) increases of  $k_1 = e_0 + \delta$

From now, we assume that the quality level is lower or equals what consumers are ready to pay for quality:

$$0 < \delta \leq \delta_{\text{sup}} = \bar{\theta} - e_0$$

Profit for a HOW willing to stay in the market is defined as follows:

$$B_j(e_0, \delta) = \omega_1 q - \delta \quad (10)$$

Two situations associated to two distinct hypotheses can be distinguished:

**Hypothesis H1:** HOWs can continue to sell on the market with a lower profit than in the Benchmark situation.

**Hypothesis H2:** profit obtained in the Benchmark situation is the minimum level required for HOW being authorized to sell on the new market.

Under *H1*, it is easy to assess the impact of quality requirement on the tourism actors' profit. As in the above section, it is just needed to calculate the spot market intermediary price associated to a product of quality  $k_1 = e_0 + \delta$ . The number of TOs and HOWs being unchanged, the intermediary price is here identical as in the Benchmark. The only difference is that the HOW have to invest a fixed amount  $\delta$  in order to improve the quality of their equipment. We sum up this result in the following proposition:

#### *Proposition 1*

Under *H1*, the imposition of a minimum standard higher to  $k_0 = e_0$  induces an increase in TO profit and a decrease in HOW profit relatively to the Benchmark situation.

Let's consider now *H2* situation.

Under H2, le number  $G < J$  of producers remaining in the market is such as:

$$\left| \begin{array}{l} \sum_{r=1}^R x_r(\omega_1, k_1) = Gq \quad (11a) \\ \omega_0 q = \omega_1 q - \delta \quad (11b) \end{array} \right. \quad (11)$$

The equation (11a) links the intermediary price variations to the number of active upstream producers. It gives:

$$\omega_1(G, e_0, t, \delta) = \omega_0^*(J, e_0 + \delta, t) = \frac{(1 - 2h(J, R))(e_0 + \delta) u(t, \bar{\theta})}{q} \quad (12)$$

$\omega_1$  is decreasing with G and the system (11) solution gives:

$$\left| \begin{array}{l} G^{MQS}(J, e_0, t, \delta) = MR \left( \frac{2e_0 h(J, R) u(t, \bar{\theta}) - \delta[1 - u(t, \bar{\theta})]}{2q(\delta + e_0)u(t, \bar{\theta})} \right) \\ \omega_1^{MQS}(J, e_0, t, \delta) = \omega_0^*(J, e_0 + \delta, t) + \frac{\delta}{q} \end{array} \right. \quad (13)$$

*Lemma :*

$$- G > 0 \Leftrightarrow u(t, \bar{\theta}) > 1 \text{ ou } [u(t, \bar{\theta}) < 1 \text{ et } \delta < \hat{\delta} = \frac{2e_0 h(J, R) u(t, \bar{\theta})}{1 - u(t, \bar{\theta})}]$$

$$- \forall e_0, t, \delta > 0, G^{MQS}(J, e_0, t, \delta) < J.$$

The proof of this lemma is trivial.

If the market participation constraint for the HOW is the profit level obtained in the Benchmark situation, some producers will be removed from the market. Moreover, all the producers will be eliminated if the Minimum standard level is set to high.

In the case where only the HOW with a higher profit than in the Benchmark remain, the profit of the TO is given by:

$$\Pi^{MQS} = \frac{M[2e_0 h(J, R) u(t, \bar{\theta}) - \delta(1 - u(t, \bar{\theta}))]^2}{4q(\delta + e_0) u(t, \bar{\theta})} \quad (14)$$

We can then compare this profit with the one obtained by a TO in the Benchmark situation (equation 8).

Let's assume:

$$\left| \begin{array}{l} \tilde{\delta} = \frac{4e_0 h(J, R)[1 - u(t, \bar{\theta})(1 - 2h(J, R))]}{(1 - u(t, \bar{\theta}))^2} \\ \tilde{u} = \frac{1}{1 - 2h(J, R)} \end{array} \right. \quad (15)$$

We can then lay down the following proposition:

*Proposition 2*

Under H2, HOW in activity keep the same profit than in the Benchmark situation TO improve their profit if and only if one of the three following conditions is verified::

$$(i) \quad u(t, \bar{\theta}) > \tilde{u} \text{ et } h(J, R) < 1/2$$

$$(ii) \quad u(t, \bar{\theta}) > \tilde{u}, h(J, R) > \frac{1}{2} \text{ et } \delta > \tilde{\delta}$$

(iii)  $1 < u(t, \bar{\theta}) < \tilde{u}$  et  $\delta > \tilde{\delta}$

Condition (i) means that the size of the foreign market is large compared with the Domestic country's capacities and that the maximum valuation  $\bar{\theta}$  of the domestic capacity on the foreign market is high enough and/or that the tax is small enough.

*Corollary*

If  $u(t, \bar{\theta}) < 1$  TO profit decrease relatively to the initial situation. .

This corollary, derived from proposition 2, tells that if the maximal foreign valuation  $\bar{\theta}$  is low (what is generally the case for most developing countries) and/or if the tax is too high, then TO see their profit decrease in comparison with the situation without minimum standard. This decrease takes place whatever the quality level differential imposed.

It then appears that under such a market type, ( $u(t, \bar{\theta}) < 1$ ) or if one of the conditions (i), (ii) or (iii) is not verified, so the imposition of a Minimum standard higher to,  $k_0 = e_0$  leads either to a decrease in HOW profit (under H1) or to a decrease of TO profit (under H2) relatively to the Benchmark situation.

**3.2. Public Standard and Support Policies.**

Public authorities may support the Minimum Quality Standard (MQS) requirement by implementing incentive or compensation side measures. Thus, the impact of this regulation constraint can be smoothed to avoid a utility lost for the actors relative to the initial situation. In other words, the question is to know under which conditions (related to the instruments used and their level) the strategy consisting in imposing an increase in the national product may be accepted unanimously by all the actors.

Two instruments will be evaluated:

(i) a subsidy  $0 \leq s \leq 1$  given by the authorities to the producers to compensate a part of their investment  $\delta$  in quality,

(ii) a tax remove on the new quality product

The Government objective is to keep all the HOW on the market and to prevent the TO from departing from the National product. Public authorities want assure a consensual transition (which all actors agree with) towards the new MSQ situation.

Let us  $0 \leq z \leq t$  the reduction level possibly decided by the government. At  $z, t, s,$  and  $\delta$  fixed, the demand and the prices are given by:

$$\begin{cases} d_r(.) = M \left( \bar{\theta} - \frac{P_0}{e_0} \right) \\ p(.) = \frac{\bar{\theta}(e_0 + \delta)}{M} (M - x_r) \end{cases} \quad (16)$$

The TO's profit is:

$$\Pi_r(x_r) = [(1 - t + z)p(.) - \omega_1] x_r \quad (17)$$

The quantity which maximizes the profit of each TO:

$$x_r(.) = \frac{M}{2} \left( 1 - \frac{q\omega_1}{(e_0 + \delta)u(t - z, \bar{\theta})} \right) \quad (18)$$

The total demand addressed on the intermediary spot market by all the  $R$  TOs is then  $Q(\cdot) = \sum_{r=1}^R x_r(\cdot)$ .

The individual HOW's  $j$  ( $j=1, \dots, J$ ) profit is:

$$B_j(\cdot) = \omega_1 q - (1-s)\delta \quad (19)$$

Then we can give the expression of the equilibrium intermediary price  $\omega_1^*$ :

$$\omega_1^* = \frac{(1-2h(J, R))(e_0 + \delta)u(t-z, \bar{\theta})}{q} \quad (20)$$

This price has to be positive, and then we assume that the following condition is verified for all the rest of the paper:

$$h(J, R) < \frac{1}{2} \quad (21)$$

At equilibrium, the TOs and the HOWs obtain the following profits:

$$\left| \begin{aligned} B_1^*(s, z, t) &= (1-2h(J, R))u(t-z, \bar{\theta})(e_0 + \delta) - (1-s)\delta \\ \Pi_1^*(s, z, t) &= \frac{Mh^2(J, R)(e_0 + \delta)u(t-z, \bar{\theta})}{q} \end{aligned} \right. \quad (22)$$

One saw in the preceding section that if all HOWs have adopted Standard, TOs systematically improve their profit compared to the initial situation. It is then obvious that the tax reduction and the subsidy accentuate this tendency. Since the adhesion of TOs is guaranteed, the only problem for the government is to ensure a higher profit for the producers.

Let us :

$$\left| \begin{aligned} \hat{\theta}(t, z) &= \frac{1}{(1-t-z)[1-2h(J, R)]q} \\ \hat{s}(t, z) &= 1 - [1-2h(J, R)]u(t-z, \bar{\theta}) \end{aligned} \right. \quad (23)$$

$$\hat{\delta}_{\max}(t, z) = \frac{e_0(1-2h(J, R)u(t-z, \bar{\theta}))}{1-s-(1-2h(J, R)u(t-z, \bar{\theta}))}$$

*Proposition 4:*

Whatever  $z \geq 0$ , if  $\bar{\theta} > \hat{\theta}(t-z)$ , HOWs always obtain a profit at least equal to that of Benchmark.

The proposition treats the case where the National product is sufficiently appreciated abroad (the maximum valuation of quality  $\bar{\theta}$  sufficiently high). If it is the case, the government has no need to support the standard policy: the HOWs obtain higher profits without any support measures. However  $\hat{\theta}(t-z)$  is decreasing in  $z$ . This means that the tax reduction allows the government to compensate for the weakness of maximum disposition to pay the foreign consumer for the domestic product quality.

For the rest of the paper we consider the two opposite policy: maintenance of the taxation  $z=0$  and total reduction ( $z=t$ ).

We can evaluate these two policies by giving the following results.

*Proposition 5:*

(i) If  $z=0$  and  $\bar{\theta} \leq \hat{\theta}(t,0)$  the HOWs obtain a profit at least equal to that of Benchmark if and only if  $s \geq \hat{s}(t,0)$

(ii) If  $z=t$  and  $\bar{\theta} \leq \hat{\theta}(t,t)$  the HOWs obtain a profit at least equal to that of Benchmark if and only if  $[s \geq \hat{s}(t,t)]$  or  $[s < \hat{s}(t,t) \text{ and } 0 \leq \delta \leq \hat{\delta}_{\max}]$

The thresholds  $\hat{\theta}(t,z), \hat{s}(t,z)$  verify:  $\hat{\theta}(t,0) \geq \hat{\theta}(t,t)$  et  $\hat{s}(t,0) \geq \hat{s}(t,t)$ .

The assertion (i) says that if there is no tax reduction, a necessary and sufficient condition to HOWs to find advantage in the new situation is that the subsidy is sufficiently high. Under this condition, all the producers obtain a higher profit whatever the level of the standard (with the constraint  $\delta < \delta_{\text{sup}}$ )

From assertion (ii), when the tax reduction occurs, the government has the choice between:

using the subsidy intensively ( $s \geq \hat{s}(t,t)$ ) (but less than in the no reduction case) if it does not want to fix constraint upon itself relating to the qualitative jump required (the only constraint being  $\delta < \delta_{\text{sup}}$ ).

Reduce the level of the subsidy ( $s < \hat{s}(t,t)$ ) and the level of quality requirement ( $0 \leq \delta \leq \hat{\delta}_{\max}$ ).

To conclude, we can note that in all the cases, the subsidy is always necessary to guarantee a best profit for the HOWs. The level of this subsidy depends on the use or not of tax reduction policy.

In addition, from propositions 4 and 5 let us notice that if  $\bar{\theta} \in [\hat{\theta}(t,t), \hat{\theta}(t,0)]$ , the recourse to the subsidy is not necessary in the case where the reduction tax policy of tax is applied. On the other hand if the policy of tax reduction is not practiced, the subsidy is necessary in this situation of market. Thus, the policy of tax reduction can constitute a means of avoiding the recourse to the subsidy in a broader whole of dispositions to pay consumers.

**Leakages and Domestic Welfare**

The function objective function of the Government is given by<sup>6</sup>:

$$W(z, s, \delta) = J[B_1^*(s, z, t) - s\delta] + R.(t - z)\bar{p}_1(z, s, t)\bar{x}_1(z, s, t)$$

We assume in this section that a total tax reduction is applied:  $z=t$ . This is a “problematic” case where the market is not sufficiently developed abroad that is  $\bar{\theta} \leq \hat{\theta}(t,t)$

If one of the conditions given in the assertion (ii) of the proposition 5 is verified, then the producers and the TOs are satisfied to join the new market. In this case, the Welfare is calculated after replacing the different strategic variables by its values at the equilibrium.

We obtain:

$$\bar{W}(s, \delta) = J[-\delta s + (e_0 + \delta)(1 - 2h(J, R)u(0, \bar{\theta}))]$$

Then, we are able to give the following results.

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<sup>6</sup> The consumers being foreign tourists, we don't take account of the consumers surplus and the entire profit of the TOs for the same reasons.

### Proposition 6

If  $z=t$ , the Welfare  $\bar{W}(s, \delta)$  is maximum for :

- (1) a subsidy null and a low level of standard ( $\delta = \hat{\delta}_{\max}(0)$ ) in the case where  $\bar{\theta} \leq \hat{\theta}(t, t)/2$
- (2) a subsidy  $s_2(t, t)$  and the highest standard level ( $\delta_{\text{sup}} = \bar{\theta} - e_0$ ) in the case where  $\hat{\theta}(t, t)/2 < \bar{\theta} \leq \hat{\theta}(t, t)$

The proof of the proposition is derived from the variations of  $\bar{W}(s, \delta)$  and the conditions given in assertion (ii) of the proposition 5.

The results show that the Government can improve the National Revenue via a subsidy and/or reduction tax policy by creating a new national market with higher qualitative specifications. This policy is socially optimal in spite of the expenditures which are associated. However, the results (2) show that it is not socially optimal to subsidize the qualitative jump when the disposition of foreign consumers to pay for the domestic quality is too small. In this market hypothesis, the social optimality requires a low improvement of the quality specifications of the product.

#### 4. Public Sponsoring of Alternative Spot Market

The Minimum standard policy implies the legal obligation for the agents to conform to the minimal requirements of the standard (that is a prohibition to produce or to market a product which does not satisfy the specifications which are associated there). In this section, we evaluate an alternative public policy which consists of improvement of the quality of the tourist products via the voluntary adhesion of the agents.

The authorities propose to certify a new product which the production requires for the HOWs to conform with specifications requirement. The public certification is used by the TOs for signaling the differentiation of their product abroad. To encourage agents (HOWs and TOs) to adhere in this new market (adhesion is here voluntary), the authorities propose the following supports:

1. The producers who decide to invest to improve their equipment at a level required by the Government is partially subsidized (with a fraction  $s$ ).
2. The TOs who have decided to market this new product gain a total tax reduction ( $z=t$ ).

As the adhesion decision of the agents (HOWs and TOs) is voluntary here, part of them or the totality of them can decide to remain on the traditional market. The Government wants to support the creation of an alternative spot market with a greater quality which may possibly coexist with the old one. The industrial policy relates at the same time on the upstream of the vertical chain (incentive to adhere with subsidies) and to the Downstream of the chain (to ensure the marketing of the new product).

To study formally this question, let us observe the following game:

**Step 0:** The government decide the level of the qualitative jump  $\delta$ , the level of the subsidy  $s$  and announce the (total) tax reduction.

**Step 1:** each TO decide the spot market he will join for its provisioning. The decisions are taken simultaneously.

**Step 2:** The HOWs decide, independently, to invest in equipment (and then either to join the new market) or not (and stay in the generic one).

**Step 3:** the TOs decide the quantities they want to sell and buy and, consequently, the intermediary and the final prices are fixed in the two spot markets.

The game is solved by backward induction.

The above three-stage game is based on the game developed by *D'Aspremont, Gabszewicz & Weymark [1983]* in the theory of *Industrial Organization*. These authors show how this simple non-cooperative game, in which the producers must simultaneously decide to join the cartel, by anticipating the profits of the competition in the industry, leads to stability properties of a cartel (for the details of this theory see the above fundamental paper).

At stage 1 of the game, the TO decide to enter in the new market or not. In stage 2, the number of TOs that has entered is known per the HOWs. In the stage 2, the producers decide whether to adapt their equipment or not. Their decision depends on its anticipating profit, function on the result of the stage 3. The outcome of the stage 3 depends on the relative number of HOWs and TOs in each of the two markets and on the characteristics of the foreign final markets.

Formally, consider a TO  $r$  ( $r=1, \dots, R$ ) that has entered an intermediary market of standard  $e_s$  ( $e_s = e_0$  or  $e_s = e_1$ ). Given the quantities  $q$  and  $x_r$  ( $r=1, \dots, R$ ) supplied on the intermediary and end markets, and given the prices  $\omega$  ( $\omega = \omega_0$  or  $\omega = \omega_1$ ) and  $p$ , the expected profit  $B_j$  of producer  $j$  ( $j=1, \dots, J$ ) and the expected profit  $\pi_r$  of retailer  $r$  ( $r=1, \dots, R$ ) are given by :

$$\Pi_r(x_r, e_s) = \begin{cases} [(1-t)p(\cdot) - \omega_0]x_r & \text{if } e_s = e_0 \\ (p(\cdot) - \omega_1)x_r & \text{if } e_s = e_1 = e_0 + \delta \end{cases} \quad (24)$$

$$B_j(e_s) = \begin{cases} \omega_0 q & \text{if } e_s = e_0 \\ \omega_1 q - (1-s)\delta & \text{if } e_s = e_1 \end{cases} \quad (25)$$

The quantity which maximizes the profit of the TO that has decided to join the generic market is given by:

$$x_r^0(\cdot) = \frac{M}{2} \left( 1 - \frac{q\omega_0}{e_0 u(t, \bar{\theta})} \right) \quad (26)$$

The quantity which maximizes the profit of the TO that has decided to join the new market is given by:

$$x_r^1(\cdot) = \frac{M}{2} \left( 1 - \frac{q\omega_1}{(\delta + e_0)u(0, \bar{\theta})} \right) \quad (27)$$

Assume that  $n$  TOs (indexed by  $1, \dots, n$ ) have joined the generic market and  $m$  have joined the new product market ( $n+1, \dots, R$ ). Then  $n = R-m$ .

The total demand addressed on the generic spot market is  $Q_0(\cdot) = \sum_{r=1}^n x_r^0(\cdot)$ , and the total

demand addressed on the new spot market is then  $Q_1(\cdot) = \sum_{r=n+1}^R x_r^1(\cdot)$

Assume in this step that a number  $G$  of HOWs have decided to invest in the additional equipment in order to be agreed by the public authorities. Then these  $G$  HOWs offer their capacity in the generic spot market and  $J-G$  HOWs offer their capacity in the new spot market. Then the total capacity  $(J-G)q$  is offered in the first market and  $Gq$  in the second market.

The equilibrium intermediary prices  $\bar{\omega}_0$  and  $\bar{\omega}_1$  are obtained by equalizing simultaneously the quantity offered by the HOWs and needed by the TOs in each spot market. We obtain:

$$\left\{ \begin{aligned} \omega_0(G) &= \frac{e_0 u(t, \bar{\theta})}{(R-m)q} [R(1-2h(J, R)) - m(1-2h(G, m))] \\ \omega_1(G) &= \frac{(\delta + e_0)(1-2h(G, m)) \cdot u(0, \bar{\theta})}{q} \end{aligned} \right. \quad (28)$$

The intermediary price is non negative if:

$$h(J, R) < h(G, m) < \frac{1}{2} \quad (29)$$

The intermediary prices are directly influenced by the number of producers who join the new spot market. Moreover, the producers (HOWs) are the price taker. Then the move of these producers toward the new spot market stops when the level of their profit  $B_j(G) = \omega_0(G)q$  in the generic market is equal to the profit  $B_j(G) = \omega_1(G)q - (1-s)\delta$  observed in the new spot market.

We can easily verify that the solution of this equation is:

$$G(m, \delta, s) = \frac{mM \cdot (2(1-t)e_0 h(J, R) + (R-m)[e_0 t - \delta(1-s - u(0, \bar{\theta}))])}{2q[\delta(R-m) + e_0(R-mt)]} \quad (30)$$

$G(m, \delta, s)$  define the stable size of HOWs who has decided to join the new spot market, when the number of Tos in these market is  $m$ .

One can verify that the increase of the subsidy increases the number of producers who agree to invest in equipment ( $G(m, \delta, s)$  is increasing in  $s$ ). In addition, it appears that  $G(m, \delta, s)$  is decreasing in  $\delta$  for a low fixed subsidy and increasing for high subsidies. In addition a high initial tax (thus a strong tax reduction) encourages the investment of an increasing number of producers ( $G(m, \delta, s)$  increasing in  $t$ ). The variation of  $G(m, \delta, s)$  in  $m$  are more ambiguous and depend on the various values of the parameters. On a large set of values of the parameters, it appears that  $G(m, \delta, s)$  is increasing in  $m$ . The explication is the following: the adhesion of an increased number of TOs at the new market encourages an increasing number of HOWs to invest in this market because the increasing of the ratio numbers of TO/numbers raises the intermediate prices on this market.

When we replace  $G$  by  $G(m, \delta, s)$  in the equations (28), we obtain:

$$\left\{ \begin{aligned} \bar{\omega}_0(m, s, \delta) &= \frac{(1-t)e_0 (-\delta m(1-s) + (e_0 + \delta)R [1-2h(J, R)] u(0, \bar{\theta}))}{q[\delta(R-m) + e_0(R-mt)]} \\ \bar{\omega}_1(m, s, \delta) &= \frac{(\delta + e_0) (\delta(R-m)(1-s) + e_0 R [1-2h(J, R)] u(t, \bar{\theta}))}{q[\delta(R-m) + e_0(R-mt)]} \end{aligned} \right. \quad (31)$$

At fixed  $m$ , the intermediate price on the new market spot is higher than the price set in the traditional spot market. The intermediate price of the new market spot remunerates the investment of the HOWs which offer this product. In addition, this price is increasing in  $s$ , *contrary to* the price on the generic spot market. This variation is explained by the effect (positive) of  $s$  on the flow of producers in the new market spot.

The HOWs profits and the TOs profits are equal to whatever the market to which they belong. This is because  $G(m, \delta, s)$  emerge when this equality is verified (stability condition of the HOWs flow).

The profit of the HOWs is simply given by:



$$\bar{B}_i(m, s, \delta) = \frac{\bar{\omega}_0(m, s, \delta)}{q}, i = 0, 1$$

Via the derivation of  $\bar{B}_i(m, s, \delta)$  in  $m$ , we obtain the following result:

*Proposition 7*

$$\bar{B}_i(m, s, \delta) \text{ is increasing in } m \text{ if and only if } \bar{\theta} \leq \tilde{\theta}(s, \delta, t), \text{ with: } \tilde{\theta}(s, \delta, t) = \frac{\delta(1-s)}{(1-2h(J, R))(\delta - e_0 t)}$$

We can verify (replacing  $m$  by 0) that the proposition give also the condition for which the profit of the HOWs in the markets co-existence structure (co-existence of the new and the generic spot markets) is higher than the profit obtained at the Benchmark situation<sup>7</sup>.

The final prices of generic and new products in the foreign markets are given by.

Relation (32):

$$\left| \begin{aligned} \bar{p}_0(m, s, \delta) &= \frac{e_0(2(e_0 + \delta)R[1-h(J, R)]u(0, \bar{\theta}) - (te_0 + \delta)mu(0, \bar{\theta}) - \delta m(1-s))}{2q[\delta(R-m) + e_0(R-mt)]} \\ \bar{p}_1(m, s, \delta) &= \frac{(e_0 + \delta)(\delta(R-m)(1-s + u(t, \bar{\theta})) + e_0 [2(1-h(J, R))R - mt - tR(1-2h(J, R))])}{q[\delta(R-m) + e_0(R-mt)]} \end{aligned} \right. \quad (32)$$

The quantities sell in the two end markets (generic and new) are given by:

Relation (33):

$$\left| \begin{aligned} \bar{x}_0(m, s, \delta) &= M \cdot \frac{(e_0 + \delta)h(J, R)Ru(0, \bar{\theta}) - m(e_0 t + \delta)u(0, \bar{\theta}) + m\delta(1-s)}{2u(0, \bar{\theta})[\delta(R-m) + e_0(R-mt)]} \\ \bar{x}_1(m, s, \delta) &= M \cdot \frac{e_0 u(0, \bar{\theta})[2(1-t)h(J, R)R + (R-m)t] - \delta(R-m)(1-s - u(0, \bar{\theta}))}{2u(0, \bar{\theta})[\delta(R-m) + e_0(R-mt)]} \end{aligned} \right.$$

Replacing the expressions (31) and (32) in the relations (26) and (27), we obtain the quantities sell in the end markets and then we can deduced the profit obtained by the TOs in function of  $m$ . We obtain:

Relation (34):

$$\left| \begin{aligned} \bar{\pi}_0(m, s, \delta) &= \frac{(1-t)e_0 u(0, \bar{\theta})}{Mq} \bar{x}_0^2(m, s, \delta) \\ \bar{\pi}_1(m, s, \delta) &= \frac{(e_0 + \delta)u(0, \bar{\theta})}{Mq} \bar{x}_1^2(m, s, \delta) \end{aligned} \right.$$

The profit  $\bar{\pi}_1(m, s, \delta)$  is increasing in  $s$  and  $\bar{\pi}_0(m, s, \delta)$  is decreasing in  $s$ . The subsidy is indirectly profitable for all the TOs.

At the first step of the game, the TOs anticipate these profits and decide whether or not to join the new market. The outcome of this strategic behavior leads to a Nash Equilibrium where the decisions are binary: 0 if the TO join this market, 1 if not. The property of this

<sup>7</sup> Let us note here that because of the stability condition of flow of the producers between the two markets, it may arise that at equilibrium (one of the cases described by this proposition), the producers are distributed in the two markets whereas they obtain a lower profit than the Benchmark. This phenomenon results from the traditional conflict between collective rationality and individual rationality (prisoner dilemma phenomena).

Equilibrium (by definition of the Nash Equilibrium Concept) is that a TO has no advantage to deviate unilaterally from its decision if the decision of others is fixed.

The properties of this equilibrium define the concepts of internal and external stability borrowed from cartels theory in industrial organization. These concepts have been originally introduced by *D'Aspremont, Gabszewicz & Weymark [1983]* in order to analyze the conditions of the endogenous constitution of cartels in a context of industrial organization. The authors propose a simple non cooperative game in which the firms must decide simultaneously to join the cartel or not. The equilibrium of such a game leads to a cartel where the characteristics of which (stability properties) guarantee its viability in the sense that no broadening or desegregation is possible.

The set of TO who has decided to sell the new product is called a “Stable Coalition”. We obtain the size of this set by solving the equation  $\Delta(m) = 0$  where:

$$\Delta(m) = \bar{\pi}_1(m) - \bar{\pi}_0(m-1) \quad (35)$$

When  $\Delta(m) < 0$ , then it is profitable to a TOs belonging to the New Market to unilaterally leave this market for the generic one. As long as  $\Delta(m) < 0$ , the “coalition” of the  $m$  TOs (belonging to the new market) is “internally unstable”, in the sense of *D'Aspremont, Gabszewicz & Weymark [1983]*. Inversely, as long as  $\Delta(m) > 0$ , a TO who is initially in the generic market has an incentive to join the new market. The “coalition” of the  $m$  TOs (belonging to the new market) is “externally unstable”, in the sense of *D'Aspremont, Gabszewicz & Weymark [1983]*.

The stable coalition of size  $m$  is obtained by solving the equation  $\Delta(m) = 0$

The analytic resolution of this equation is complex. However we can use different simulations to visualize the solution of  $\Delta(m) = 0$  and to obtain the main results of the following propositions<sup>8</sup>.

*Proposition 8*

For appropriate values of parameters, there exists a stable partial coalition of TOs that joins the New Market.

The proposition says that situations exist (function of the parameters) that the two spot markets co-exist. Moreover, the total national revenue is improved relatively to the Benchmark. That is, the total profit of HOWs minus the public expenditure is higher than the total profit of HOWs in the Benchmark situation where the Government don't intervene.

Under the condition of co-existence of the two markets, the social welfare is given by:

$$\bar{W}(m, \delta, s) = G(m, \delta, s) \bar{B}_1(m, s, \delta) - G(m, \delta, s) \cdot s\delta + [J - G(m, \delta, s)] \bar{B}_0(m, s, \delta)$$

From simulations we may give some results they are interesting in the point of view of the economic policy of the government. We summarize these results in following assertions:

1. If  $\bar{\theta}$  is sufficiently high, it may socially profitable for the Public authorities to practice a Minimum Standard Policy than a Alternative spot Market policy. The public cost (subsidies and lack of fiscal revenue) of the first policy is lower than the second. The profits of the producers are higher.
2. If  $\bar{\theta}$  is low, the Alternative spot Market policy is generally socially more profitable than the Minimum Standard Policy. The co-existence of two spot markets induced a

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<sup>8</sup> The propositions follows are essentially obtained using mathematics.

lower social cost than the policy which targeted to eliminate the generic market with public sponsoring.

### **Conclusion**

The tourism is a sector in which atomicity of upstream producers and concentration of the TOs in the downstream of the chain remains strong. A general consensus has been that leakages are higher if integrated Northern TO are involved, given the fact that integrated companies frequently own the main elements of the package holiday, that is, transport and accommodation<sup>9</sup>. Consequently, for many SMCs alienating only one of the main tour operators would have severe consequences on export earnings, employment and GDP generated through tourism (Bah and Goodwin, 2003). The leakages are dependant on the nature of organization of the market and the type of vertical relations between producers and retailers.

The contribution of our paper is two fold. First, the paper deals with the link between market allocation and supply chain organization. Second, it considers product differentiation when analyzing the interaction between two spot market prices. We present a normative approach to evaluate some actions which the government can undertake to avoid the trap of an unsatisfactory tourist specialization. The government use subsidies and fiscal reduction to convince the agents (HOWs and TOs) to produce and sell the new product.

We took account in our analysis of the reality of the Mediterranean context where the government is not likely to cause (by its action) the exit of TOs from the national market. The paper gives the conditions so that this intervention does not discourage the TOs to continue to market the national product. That it is through the policy of minimum standard or the more flexible policy of creation of a second market, the authorities are to take into account constraints of participation of all the agents.

We gave the conditions for which the improvement of the quality of the tourist product is desirable from the point of view of the interest of the receiving countries. We discuss the effects of these interventions regarding capacity, entry regulation and organization of the intermediary market. We have evaluated how the intervention of the authorities, in particular on the levels of the standards of minimum quality influences the characteristics of the market (prices, profit, surplus) and if this intervention is collectively desirable.

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<sup>9</sup> In this paper we don't study the question of the effect of vertical integration on the persistence of a sufficient competition for tourism products. This question is very relevant and our model may allow analysis of this point. The framework of this paper is already too large to include this question, but this point deserves to be studied in a future extension of this paper.

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Figure 1 : Vertical Relationships between HOs and TOs in the Benchmark Case

