ÁLVARO MATIAS
PETER NIJKAMP
PAULO NETO
Editors

Advances in Modern Tourism Research

Economic Perspectives

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Álvaro Matias · Peter Nijkamp
Paulo Neto (Eds.)

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Economic Perspectives

With 26 Figures and 65 Tables

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Editorial Preface

Many trips by car or train are nowadays leisure trips. And most passengers on board of an airplane are tourists. Indeed, we enter an age of large-scale tourism, for the time being in the industrialized part of the world, but soon to be followed by mass tourism trends in emerging economies. Consequently, tourism will become a major factor of economic growth in the future.

In the past decades, we have witnessed an increasing volume of publications on tourist-economic issues, sometimes of a case study nature, sometimes of a statistically-modelling nature and sometimes of a conceptual or methodological nature. It turns out that tourism research is on a rising edge, and it is likely that this trend will continue in the future.

The present volume follows this trend and offers a collection of systematically selected and original research papers on new economic perspectives on tourism research and policy. Most papers were initially presented at an international conference on tourism-economic research in Evora, Portugal in 2005. After a careful screening and revision process, this has led to the current volume with contributions by authors from various parts of the world.

The editors recognize the support for this volume by ITP and Deloitte. Their enthusiastic role is highly appreciated.

May 2007

Álvaro Matias
Paulo Neto
Peter Nijkamp

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Trends in Tourism Research: Prefatory Remarks

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Tourism will most likely be one of the fastest growing economic sectors in our century. This holds for both domestic and international tourism. For example, since World War II the volume of international tourism has increased with a factor 30 (see UN WTO 2006). And domestic tourism has even risen more. Tourism is also a source of economic growth resulting from expenditures on travel, accommodation, entertainment etc.

A variety of background factors may explain this unprecedented growth in tourism: improvement in transport systems and infrastructure, new information technology and logistics, increase in wealth and disposable income in large parts of our world, new lifestyles and more leisure time, and international openness and globalization (see Prosser 1994, Urry 2002). Clearly, the rapid growth in long-haul tourism has also its shadow sides in the form of environmental externalities and threats to sustainable development (see e.g. Cooper and Lockwood 1994, Lindberg et al. 2001, and Sharpley 2000).

Tourism is often regarded as a luxury good with a high price elasticity, so that it is sensitive to price differences and economic fluctuations. Consequently, we observe an increasing competition among tourist destinations. Supply and demand conditions form a complex force field and call for solid applied research. Amelung (2006) presents a consistent analytical and explanatory framework for tourism and distinguishes six background factors: demography (e.g. population growth and migrant flows), culture (e.g. leisure, fashion, hedonism), economy (e.g. discretionary income), technology (e.g. ICT, high-speed transport systems), environment (e.g. nature and climate), and institutions and politics (e.g. liberalization, global tourist operators).

The economic impacts of tourism – both inbound and outbound – are formidable and ought to be traced systematically. They range from macro-economic effects (such as the balance of payment, taxes or employment) to micro-economic effects (such as the economic position of local shopkeepers or diversification of the local economy). In addition, the economic impacts have to be confronted with environmental impacts (such as emission of pollutants, sewage, biodiversity or landscape destruction) and socio-cultural impacts (such as local identity etc). In addition, the temporal and spatial impacts of tourism as a largely seasonal activity concentrated in a limited number of places has to be recognized. Consequently, there is a need for a solid and multi-faceted analysis of the drivers and impacts of tourism at various scales (from micro to macro). And fortunately, we have witnessed a significant progress in tourism research in the past decades, ranging from modeling economic growth arising from tourism to the design of tourist satellite accounts. The research field of the economics of tourism is still in full motion and rapidly developing.

The research agenda of tourism is vast (see e.g. Crouch 1994, Eilat and Einev 2004, Eugenio-Martin 2003, Giaoutzi and Nijkamp 2006, or Smeral and Weber 2000). It covers many items, ranging from macro- (or meso-)economic research on the importance of the tourist sector or ecological sustainability threats to local or global quality of life to micro-behavioral research on motives or spending patterns of tourists (see also Alegre and Pou 2004, Eymann and Ronning 1997, Giaoutzi and Nijkamp 2006, Smith and Krannick 1998, Swarbrooke 2002). There is thus a need for statistical information on the volumes, the transport patterns and modal choices, or the destination choices and expenditures of tourists, as well as on the supply of accommodations, the tourist infrastructure and the nature of tourist products (ranging from nature or beaches to cultural heritage or festivals). There is also a need for strategic insights into structural changes in the tourist sector, such as the rise of low cost carriers, changes in the tour operators' branch, the impacts of changing life styles (e.g. multiple short holidays), or the threats for sustainable tourism development.

In light of the previous observations, the present volume on *'Advances In Tourism Research – Economic Perspectives'* aims to highlight and to map out new research challenges and trends in the rapidly growing field of tourism economics and management. This volume finds its origin in an international conference on new pathways in the economics of tourism, held at the University of Evora in May 2005. After a careful screening and judgment of the wealth of contributions, the editors decided to include a series of selected promising papers in book format, after a careful review process. This selection led to the present edited volume which comprises mainly revised papers which were received after the conference.

This volume is organized in the following manner. The first part of this volume addresses the need for appropriate new analytical frameworks for economic research on tourism. We will briefly summarize the various contributions in this part of the book. *Jennings* focuses attention on theoretical paradigms and accountability in modern tourism research and management, in particular paradigmatic and methodological research on e.g. mixed qualitative-quantitative issues, interdisciplinary and stakeholders approaches, cross-cultural capacity building and local-regional development. Next, *Fischer* presents a theoretical framework on the role of immigration and international tourism on the import demand for consumer goods, in which changes in consumers' preferences are linked to demographic shifts and international mobility of tourists. The complexity of the tourism market is next investigated by *Castellani* and *Mussoni*, who analyze tourism contracts regulating the business linkages between tourist operators and hotels (in particular, allotment and free sale contracts). In a subsequent chapter, *Giannoni* and *Maupertuis* offer a cyclical perspective on sustainable tourism development in small isolated economics, by designing a dynamic tourist model in which the intertemporal trade-off between tourism-intensive investments and environmental quality preservation in the long run is studied. A final contribution in this part is provided by *Barros* and *Matias* who analyze the technical efficiency of the hotel sector on the basis of a Cobb-Douglas production frontier model. The above collection of new analytical contributions demonstrates the wealth of new research endeavours on the economics of tourism.

The second part of the present publication is devoted to a presentation of new operational tools in modern tourism research. First, *Ruhanen* studies the competitiveness among tourist destinations by paying attention to sustainability conditions on the basis of strategic visioning. In the next article, *Neves Sequeira* and *Campos* address economic growth in relation to international tourism by deploying a panel data approach, in which also R&D intensity and scale economies are incorporated. The differences in tourism management performances are next analyzed by *Bosetti*, *Cassinelli* and *Lanza* on the basis of a benchmarking approach connected with a data envelopment analysis model. Tourist behaviour is an important element in tourism research and this issue is studied by *Alegre* and *Pou*, with the help of a discrete microeconomic model in which the duration of stay is explained from the tourist's socio-demographic profile and the holiday characteristics. *De Montis*, *Deplano* and *Nijkamp* offer then an operational multicriteria evaluation model to support local environment planning for sustainable tourism. And finally, *Neto* presents an original analysis of territorial images and attractability factors in the tourism sector. This part demonstrates convincingly that the development of new research tools in tourism research is booming and creates the conditions for advanced applied work.

The third and final part of the volume is dealing with applied country and regional studies with a strong analytical basis. The first contribution here is offered by *VanBlarcom* and *Backman* who present the results of an input-output model to assess the economic impacts of tourism expenditures in Kings County, Nova Scotia, Canada. Another study on input-output analysis is provided by *Castanon* and *Pereira* who study the economic effects of incoming tourism in Galicia. Next, *Peypoch* and *Solonandrasana* investigate the implications of ICT on the attractiveness profiles (the 'e-attraction') of the Languedoc-Roussillon region in France. Internet as a strategic tool in the tourism sector (in particular, the hospitality sector) has gained much popularity, and *Vich-i-Martorell* and *Pou* analyze the use of internet in the hotel sector on the Balearic Islands. A subsequent empirical study is offered by *Cracolici*, *Nijkamp* and *Cuffaro*, who made an extensive analysis of the efficiency and productivity of Italian tourist destinations using various frontier methods. Finally, *Wanhill* provides an interesting economic analysis of the opera sector, with a particular view on the Savonlinna

Opera Festival. At the end of this part, it is also evident that the mix of advanced methods and case studies leads to promising perspectives for future research in the economics of the tourism sector.

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Part I

New Analysis Frameworks in Tourism Economics

Advances in Tourism Research: Theoretical Paradigms and Accountability

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1 Introduction

The purpose of this paper is to reflect on advances in tourism research and related accountability issues for tourism economics and management. In particular, the paper focuses on a range of theoretical paradigms that may inform research in the areas of tourism economics and management in a twenty first century environment. The thesis of this paper, is that research in tourism economics and management has been predicated to western-based epistemologies as well as a positivistic and postpositivistic hegemony and that such epistemologies and hegemony no longer represent an accountable tourism research agenda in a twenty-first century world of flux and unpredictability. In pursuing this thesis, the paper is divided into seven sections: an overview of tourism economics and management regarding paradigmatic and methodological research; reflections on the status of paradigmatic and epistemological research; consideration of theoretical paradigms that may inform research in tourism economics and management; a discussion of the action research and heuristic methods used to prepare this paper; an example of an accountable research agenda which promotes advances in research in tourism economics and management; the proposal of a generic research strategy to advance tourism economics and management in an accountable manner; as well as concluding remarks.

2 Overview of Tourism Economics and Management Regarding Paradigmatic and Methodological Research

Traditionally, tourism economics and management research has applied western based epistemologies to examine the various patterns, components, sectors, activities, experiences, and peoples involved in the phenomenon of tourism from a positivistic or postpositivistic theoretical paradigm, particularly, the tradition of critical realism. Riley and Love (2000) report that quantitative based research (rooted in positivistic and postpositivistic paradigms) is the dominant form of research published in travel and tourism journals; a view also purported earlier by Cohen (1988) and Walle (1997). Such publications then serve as models and demonstrations of 'acceptable' (accountable) research and the paradigms are reified as orthodoxy for the travel and tourism industry, tourism academia, as well as related industries, associations and bodies. Subsequently, this orthodoxy makes them the hegemonic (dominant) paradigms against which all other travel and tourism research is benchmarked. To exemplify this statement, most travel and tourism journals and conference calls reinforce the positivistic and postpositivistic hegemony by nature of the headings researchers must address in reporting of research: introduction, background, literature review, methods, findings, results and recommendations. These headings are predicated on the 'hard' sciences report writing genre emanating from positivistic and postpositivistic theoretical paradigms. A genre also associated with the related business journals in which tourism researchers may publish (see Sheldon (1990), and reflective of the disciplines in which a number of tourism researchers were initially grounded (see Dann, Nash, Pearce, 1988, e.g. of these). Other theoretical paradigms utilise different genres such as the narrative for reporting research. However, researchers utilising paradigms drawn from outside the hegemonic ones are generally required to comply with the orthodox genre.

An investigation of basic research textbooks, which are used in western-based tourism and related business disciplines research training and education systems, further demonstrates this reification, specifically, in regard to positivism and postpositivism and the subsequent emphasis on a quantitative methodology. Compare for example the quantitative emphasis in the following tourism textbooks: Ritchie and Goeldner (1994), Smith (1995), Veal (1997), Finn (2000) to the publications by Jennings (2001), Goodson and Phillimore (2004) and to a lesser extent Ritchie, Burns and Palmer (2005). Again, compare the quantitative emphasis located in related business research texts: Marcoulides (1998), Davis (2000), Ticehurst and Veal (2000), Cavanna, Delahaye, and Sekaran (2001), Malhorta, Hall, Shaw and Oppenheim (2002), Cooper and Schindler (2003), Hair, Babin, Money and Samouel (2003), Sekaran (2003) and Zikmund (2003), and the attempts at balance in Robson (2002), Remenyi, Williams, Money and Swartz (1998), Collis and Hussey (2003) with the qualitative leanings in the works of Belkaoui (1987) and especially, Gummesson (1999). Essentially, the research curriculum in tourism (see Tribe, 2001) and business related disciplines eschew qualitative and indigenous methodologies.

Furthermore, representation of the use of a qualitative methodology in core tourism and business research textbooks tends to be somewhat pejorative and/or dismissive in regard to the nature of its potential contribution to research enterprises. For example, Malhotra (2001) contains a chapter entitled *"Exploratory research design: qualitative research".* The accompanying promotional blurb reads *"A whole chapter is dedicated to qualitative research."*; that is, one chapter of nineteen. Another viewpoint promulgated is Ernest Rutherford's alleged claim that *"Qualitative is poor quantitative"* (Stewart, 1997, p. 205). Consequently, travel and tourism journals, conference calls and basic tourism research and related business textbooks replicate and perpetuate the orthodoxy of the hegemonic paradigms and work to constrain use of creative and innovative research methods to understand travel and tourism phenomena.

3 Reflections on the Status of Paradigmatic and Epistemological Research in Tourism Economics and Management

As already noted, travel and tourism research is grounded in an historical research background of positivistic or post-positivistic research paradigms. Subsequently, it is also predicated to a quantitative research methodology (Riley and Love 2000) due to the contributing disciplines and their paradigmatic biases. Furthermore, this historical context and associated influences have resulted in criticism of tourism research for mono-disciplinary and/or fragmented research enterprises using multidisciplinary rather than interdisciplinary approaches (refer to Jafari 1977; Leiper 1981; Stear 1981; Przeclawski 1993; Echtner

& Jamal, 1997; Tribe 1997 for debates regarding this issue). This is not to say that other paradigms, methodologies, or interdisciplinary approaches are not utilised [see e.g. Hollinshead (1996); Jamal and Hollinshead (2001)], rather they are not part of the dominant hegemonic practices in travel and tourism research. Additionally, travel and tourism research has been viewed through primarily western-based epistemologies which have tended to marginalise or silence alternate epistemological viewpoints.

How accountable is such an approach which continues to privilege one worldview over others within an ever-changing and unpredictable world environment? Moreover, is the representation of tourism phenomena using dualist – either or principles, linear-causal relationships between phenomena or statistically determined formulae enough? No, it is the premise of this paper that tourism is a complex and multiple phenomena and so needs to be considered in a more holistic way rather than in segmented and controlled contexts and experiments. Tourism is a socially constructed and determined phenomena that is constantly being reframed and reinterpreted and reconstructed. It is in a constant state of processing and flux with ongoing meaning making/sense making and reframing within and between a variety of cultural contexts. Subsequently, along with the predominance of positivistically informed research; the dominance of western-centric epistemologies needs also to be challenged.

Why, because travel and tourism in the twenty first century is markedly different from travel and tourism in the second half of the twentieth century. While it is a world context that continues to be influenced by the dominant themes from the 1980s, particularly, the impacts of globalisation, internationalisation, and participation in the knowledge economy; it is also influenced by the impacts of an increasing number of unexpected events resulting from natural and human influences. Still further, and as already noted, the current world context in which the travel and tourism industry now operates is one of rapid change, instability and unpredictability. In a world of such uncertainty, reliance on past (hegemonic/dominant) practices and historical patterns is proving problematic for explaining current and future tourism patterns and phenomena. New and different methodologies and methods need to be used to provide (flexible, insightful and at times rapid) responses to travel and tourism issues to better serve the industry, theory development, the understanding the phenomena of travel and tourism across multiple cultural sites and settings as well as epistemological viewpoints.

Thus, this paper argues that it is not accountable for the current and future world of global interconnectivity and situatedness to privilege positivism and postpositivism and western-centric paradigms and epistemologies. In taking this stance, the paper examines this argument in more detail. To reiterate, the purpose of this paper is to consider advances in research in the fields of tourism economics and management and related accountability issues, particularly the relevance of perpetuating a hegemonic research discourse predicated on western-centric viewing lenses and positivistic and postpositivistic paradigms, which marginalise other paradigms. Having provided background context, the paper will now overview a suite of paradigms that might be used to inform tourism and travel research.

4 Consideration of Theoretical Paradigms that May Inform Research in Tourism Economics and Management

This section focuses on seven theoretical paradigms from which a researcher may select when undertaking tourism economics and management research (Jennings, 2001): a positivist/postpositivistic approach, a chaos theory/complexity theory orientation, an interpretive social sciences approach, participatory paradigm, critical theory approach, feminist perspectives, or a postmodern approach. The tenets of each paradigm (see Guba 1990), specifically, the ontology (world view), epistemology (relationship between the knower and the known), methodology (quantitative or qualitative) (Guba and Lincoln, 1994) and axiology (values and ethics) (Lincoln and Guba, 2000), are briefly described in the following subsections and overviewed in Table 1: Overview of paradigms that may inform tourism economics and management research.

Positivism, as a means to study the social world, is a paradigm grounded in the physical sciences. It was founded by the French philosopher, Auguste Comte (1798–1857), who also coined the term positivism. What is the intent of positivism:

> "In the final, positive state, the mind... applies itself to the study of... laws, -that is their invariable relations of succession

and resemblance. Reasoning and observation, duly combined, are the means of this knowledge. What is now understood when we speak of an explanation of facts is simply the establishment of a connection between single phenomena and some general facts, ...” (Comte, 2000, p. 28)

More particularly and ontologically, the natural and social world is governed by ‘universal’ laws. The real world is a closed system, which is stable and patterned, that is, reality may be determined and subsequently, behaviour and events may be predicted. Epistemologically, positivism is objective and utilises quantitative methodologies. Axiologically, positivism is intrinsic, propositional and value neutral.

Over time, the deterministic stance of positivism has been critiqued and as a response to that critique the paradigm of postpositivism developed. Like positivism, postpositivism also considers that there is a ‘reality’ though postpositivists acknowledge that this is imperfectly and probabilistically determined (Robson, 2002). The epistemological position is objective, however, postpositivists also acknowledge that the knowledge and experiences of the researcher may influence results despite attempts at objectivity and such biases are acknowledged. Methodologically, postpositivism is primarily predicated on quantitative methods; however, mixed methods are utilized with a continuing emphasis on internal and external validity as well as reliability. As was the case with positivism, the axiology of postpositivism is propositional, intrinsic and objective although, as already noted, the influence of researchers and any subsequent bias in research design is acknowledged. A related tradition of postpositivism is critical realism, which is based on the work of Bhasker (1978, 1982, 1990) and Harré (1981, 1986). Bhasker (1986) purports that critical realism should have an emancipatory role (axiology). Such a role differs from positivism. Whilst I have positioned critical realism under the banner of postpositivism, I note that Byrne (1998) does not consider it as either positivist (or by association reductionist) or phenomenological. I will, however, locate critical realism within postpositivism Jennings (2004).

The Chaos Theory/Complexity Theory Paradigm emerged from the works of Edward Lorenz, Michel Hénon, Robert May, Benoit Mandelbrot, Mitchell Feigenbaum (Gleick, 1987). Chaos and complexity are related to realism and so have connections with postpositivism (Byrne, 1998). Chaos theory views the world as non-linear and dynamic in nature (ontology). A world, in which, small changes can generate large-scale outcomes. Scientific inquiry is based on descriptive algorithms as well as non-linear and non-integral systems although some social sciences utilize chaos theory in a metaphoric sense. The epistemological position of chaos theory essays for objectivity while methodologically, the paradigm moves between quantitative (algorithms) to qualitative (use of chaos as a metaphor) methodologies. McKercher (1999) provides a commentary on the use of chaos theory as a tool to understand the tourism system. Related to chaos theory is complexity theory. Complexity theory has an ontological position that portrays the world as constituted of complex systems that move rapidly from chaos to order through self-organising processes (Rubinstein and Firstenberg, 1999). Axiologically, chaos and complexity are intrinsically and interactionally situated. Both attempt to engage with:

> "... a past of conflicting certitudes, be they related to science, ethics or social systems, to a present of considerable questioning, including questioning about the intrinsic possibility of certainties.... the end of a type of rationality that is no longer appropriate to our time.... [to an accent] on the complex, the temporal and the unstable, which corresponds to a transdisciplinary movement ..." (Gulbenkian Commission 1996, p. 79).

The Interpretive Social Sciences Paradigm (ISS) is associated with social constructionism, social phenomenology and social constructivism (Jennings 2004). The roots of constructionism are associated with William Thomas (1863–1947), social phenomenology with Alfred Schutz (1899–1959), who drew upon the philosophical phenomenology of Edmund Husserl (1859–1938). Peter Berger (1925–) and Thomas Luckmann (1927–), both students of Schutz, developed social constructivism while the interpretive social science paradigm is associated with the work of Max Weber (1864–1920) and Wilhem Dilthey (1833–1911). The interpretive social sciences paradigm and related approaches reflect that:

> ... [h]uman beings do not find or discover knowledge so much as we construct or make it. We invent concepts, models, and schemes to make sense of experience, and we continually test and modify these constructions in the light of new experience. Furthermore, there is an inevitable historical and sociocultural dimension to this construction. We do not construct our interpretations in isolation but against a backdrop of shared understandings, practices, language, and so forth. (Schwandt, 2000, p. 197)

Relatedly, ISS has an ontological position which acknowledges the multiple realities of the people (sometimes called actors) participating in the research. Consequently, the ontological position of interpretive social scientists with its multiple realities is oppositional to postpositivists who perceive a 'reality'. The epistemological position of ISS is a subjective and value-laden one. Moreover, researchers utilize primarily a qualitative methodology and engage in an intrinsic, instrumental and transactional axiology. A variety of traditions are associated with the interpretive social sciences approach, such as, phenomenology, ethnomethodology, ethnology, symbolic interactionism, and ethnography.

The Participatory Paradigm is grounded in *"liberation theology and neo-Marxist approaches to community development"* as well as *"human rights activism"* (Kemmis and McTaggart, 2000, p. 568). The term action research was coined by Lewin (1948).

> "Three particular attributes are often used to distinguish [participatory research, PR] PR from conventional research: shared ownership of research projects, community-based analysis of social problems, and an orientation toward community action." (Kemmis and McTaggart, 2000, p. 568).

The participatory paradigm maintains an ontological perspective that reality is individually and collectively known (Reason 1994), an epistemology in which experiential learning arises from participation and self-reflexive directed actions, and a methodology that is essentially qualitative although mixed methods may be used (Jennings 2001). Its axiological position is intrinsic, interactional, emancipatory and cooperative in nature. A number of types of action research exist, such as, cooperative inquiry, participatory action research, action inquiry, appreciative inquiry (Jennings, 2004).

The Critical Theory Paradigm is based upon the works of Karl Marx (1818–1883). It adopts an ontological position that the social world is constrained by rules, although these rules can be changed. In particular:

> "Critical forms of research call current ideology into question, and initiate action, in the cause of social justice. In the type of inquiry spawned by the critical spirit, researchers find themselves interrogating commonly held values and assumptions, challenging conventional social structures, and engaging in social action. Fuelling this enterprise is an abiding concern with issues of power and oppression. Critical inquiry keeps the

> spotlight on power relationships within society so as to expose the forces of hegemony and injustice. It is at all times alive to the contribution that false consciousness makes to oppression and manipulation and invites researchers and participants (ideally one and the same) to discard false consciousness, open themselves to new ways of understanding, and take effective action for change." (Crotty, 1998)

Its epistemological perspective is half-way between subjectivism and objectivism. Axiologically, critical theory should lead to transformational change as the aim of research in this paradigm is to alter the social circumstances of those being studied. In general, a qualitative research methodology is applied.

The Feminist Perspectives Paradigm from a western perspective is vested in three waves of feminism (Hill n.d.). The first wave (circa the nineteenth century) was associated with resolving social and legal inequalities experienced by women. The second wave (circa the late 1960s) signifies women's responses to anti-discrimination via activities strategies, such as protests, demonstrations, strikes, and the formation of women's groups. The third wave occurred in the 1990s and was a response by young women (15–30) to use using different mechanisms to address discrimination and to be women in different ways to their Second Wave counterparts. However:

> "[t]his is a good place to note that the term "feminism" is itself a contested zone not only within feminism but also between feminism and its critics." (p. 6) . . .
>
> "If androcentric and Eurocentric beliefs and practices are part of the evidence for one hypothesis over another (inadvertently or not), then as part of scientific practice we must learn how to detect and eliminate them." (Harding, 1991, p. 15)

The feminist perspectives paradigm aims to highlight the lived experiences of women and to challenge or break down the dominant patriarchal hegemonic view of the world (ontology). This paradigm has linkages with the interpretive, critical theory and postmodern paradigms. There is some debate regarding feminist perspectives being a paradigm in their own right or solely a perspective of the previous two paradigms. In the main, qualitative methodologies are adopted and the researcher and the researched are subjects together resulting in an epistemology which is subjective, and an axiology that is propositional, transactional, instrumental and of intrinsic value. There

Table 1. Overview of paradigms that may inform tourism economics and management research

Paradigm Descriptors	Positivism	Post-Positivism	Critical Realism	Critical Theory	Social Constructivism	Feminist Perspectives	Postmodern	Participatory
Synonyms and/or related terms	Empiricism Realism Naïve realism Objectivism, Foundationalism Representationalism	New realism (Note: Developed as a response to critique of positivism.)	Described as a midpoint between realism and relativism.	A number of types: Marxist/Socialist Postpositivist Postmodern critical theorists.	Phenomenology Interpretivism Constructivism Constructionism	A number of types: Marxist/Socialist Liberal Postmodern Poststructural Critical Feminist empiricism Standpoint theorists	Ludic postmodernism Oppositional postmodernism Critical postmodernism	Cooperative inquiry Participatory action research Action inquiry Appreciative Inquiry
Ontology	Truths and laws are universal	Truths are fallible and a product of historical and social contexts.	Truths are fallible and a product of historical and social contexts.	Socio-historical multiple realities. Realities reflective of power relations.	Multiple perspectives/realities	Multiple realities mediated by gendered constructs	Multiple realities. No privileging of position. Skepticism towards 'truth' and '-isms'	Multiple realities collectively constructed via interactions.

Epistemology	Objective	Objective - Acknowledges potential for researcher bias	Objective - acknowledges potential for researcher bias	Subjective unless postpositivist critical theory (objective)	Subjective	Subjective Co-researchers (Participants and researcher/s)	Intersubjectivity	Subjective - Objective
Methodology	Quantitative	Quantitative (Use of mixed methods)	Quantitative Inclusion of mixed methods	Qualitative Some quantitative	Qualitative	Qualitative (Predominantly)	Qualitative	Qualitative Quantitative Mixed Method
Axiology	Value free Extrinsic purpose of research project.	Essays to be value free Extrinsic purpose of research project.	Essays to be value free Extrinsic purpose of research project. Consideration of emancipatory role of research.	Value laden. Intrinsic focus of research projects. Political agendas. Emancipatory. Transformative.	Value laden. Intrinsic focus of the research project.	Value laden. Intrinsic focus of research projects. Political Emancipatory Transformative Educational	Sceptical of emancipation and transformation. Continuous deconstruction process.	Value laden. Transformation.

Source: Adapted from Jennings, G.R. (2004) Business Research, Examples of Theoretical paradigms that inform, *Encyclopedia of Social Measurement*, San Diego, CA: Academic Press, pp. 211–217.

are a variety of feminist approaches, such as, radical feminism, liberal feminism, socialist/Marxist feminism, poststructuralist feminism, postmodern feminism.

The Postmodern Paradigm is associated with the works of Jean-François Lyotard (1924–1998) and Jean Baudrillard (1929–) as well as Jacques Lacan (1901–81), Roland Barthes (1915–80), Michel Foucault (1926–84), and Jacques Derrida (1930–2004).

Frequently misunderstood, reviled, or faddishly embraced (Best and Kellner 1991), postmodernism offers an idiom for characterizing lived experience that challenges, if not subverts, traditional forms of empirical description.

Paradoxically, the lack of unity within postmodernism reflects one of its most widely shared tenets: the possibility of certainty must be regarded skeptically, if not rejected outright. This reverberates throughout the social sciences as a challenge to comprehensive or veridical descriptions of experience. Postmodernism casts doubt on the possibility of any totalizing or exhaustive theories or explanations (Gubrium and Holstein, 2003, p. 4).

Postmodern researchers dispute grand theory and views the world (its ontological perspective) as being constructed of multiple realities and that no one reality has favour over another. A central tenet is the deconstruction of the surface features of phenomena in order to expose the underlying core realities. A variety of methods are used, which are generically derived from a qualitative methodology. Axiologically, the 'postmodern' paradigm is propositional, transactional, instrumental, and intrinsic in its values and ethical stance. There are a variety of approaches such as, ludic postmodernism oppositional postmodernism and critical postmodernism.

5 Methods

The premise of this paper is informed by action research from 1995 to the present while I have been actively engaged in tourism economics and management research and training. Throughout this period, I engaged in repetitive cycles of action research: planning, implementing, monitoring and reflecting (Kemmis and McTaggart 1988) on the theoretical paradigms used in tourism research projects. Heuristic research (Moustakas, 1990) was also used. Heuristic research (Moustakas 1990) is associated with empirical material (data) collection of experiences and literature, self-reflection and interpretation (analysis) then synthesis of key components of the phenomenon being studied (in this case, tourism economics and management research). Specifically, heuristics involves *"initial engagement, immersion in the topic and question, incubation, illumination, explication and culmination of the research in a creative synthesis"* (Moustakas 1990, p. 27). This may be rephrased as empirical material collection, self-reflection, interpretation and synthesis (note the synergy with action research). For the purposes of this paper, 'initial engagement' with the topic of theoretical paradigms that inform tourism economics and management research occurred when I was a student, an educator and a researcher. 'Immersion' resulted through my participation in tourism economics and management research using the various paradigms. 'Incubation' regarding a hegemonic paradigm of tourism economics and management research and the marginalisation of other theoretical paradigms and epistemologies happened during both teaching research methods and engaging in research. 'Explication' occurred during the last eight years of teaching research classes. 'Creative synthesis' took place in the process of writing this paper and other publications.

6 An Example of an Accountable Research Agenda to Promote Advances in Research in Tourism Economics and Management

In this paper, seven theoretical paradigms have been highlighted. These represent a suite of paradigms from which a tourism economics and management researcher may select when undertaking tourism economics and management research: a positivist/postpositivist approach, chaos/complexity theory orientation, an interpretive social sciences approach, participatory paradigm, critical theory approach, feminist perspectives, and a postmodern approach. To exemplify a multiparadigmatic as well as interdisciplinary study, the Bali Bombing, 12 October 2002 incident is used as the focus for reflecting upon such an agenda. Each of the aforementioned paradigms will be overviewed in turn along with suggested methods, a rationale for inclusion and anticipated outcomes that might be achieved. It must be emphasised that the following overviews represent possible proposals founded on lived experiences (Van Manen, 1990) and heuristics. As such they are a (re)presentation rather than a definitive and complete agenda since the projects have not been dialogued with interested stakeholders to co-construct them or to identify other areas of interest and need. Nor do they incorporate any indigenous methodologies or epistemologies at this point, although I do indicate where this might be included in order to represent a starting point for dialogue.

Positivism/Postpositivism (Critical Realism)

Project Title: Telephone survey of attitudes of Australian residents regarding travel to Bali.

Methods: Interviewer completed questionnaire using computer assisted telephone interviewing (CATI) technology. Team building capacities and cross-cultural communication capacity building, monitoring and responding to power dynamics with regard to the research team. Multi-genre outputs.

Rationale for Use: Establish baseline data, monitor over time as a longitudinal study.

Outcome: Knowledge of information sources and decision making by Australians, a key originating market for Bali. Outcomes useful to tourism authorities and interested stakeholders.

Chaos Theory and Complexity Theory (Complexity Theory)

Project Title: Study of the self-organising practices of Balinese groups post the bombing.

Methods: Participant observation and interviews. Researcher in-country learning and training – language and cultural understanding and mores, the development and use of indigenous epistemologies and methodologies, team building capacities, monitoring and responding to power dynamics. Multi-genre outputs.

Rationale for Use: Use of a paradigm that matches the study focus and resultant synergy in research design and findings.

Outcome: Mapping of the actions and processes of Balinese groups and the resulting effects or changes to everyday life and tourism.

Interpretive Social Sciences

Project Title: Bali post-bombing: the lived experiences of travellers.

Methods: Ethnography, participant observation, semi-structured in-depth interviews, questionnaires. Empirical material interpretation using *"grounded theory analysis"* of qualitative materials and descriptive statistics for quantitative data. Researcher in-country learning and training – language and cultural understanding and mores, the development of indigenous epistemologies and methodologies, team building capacities and monitoring and responding to power dynamics. Multi-genre outputs.

Rationale for Use: Understanding of lived experience and development of emic (insider) understandings.

Outcome: Understanding of travel experiences. Use of information for promotion and marketing, service delivery, market knowledge, as well as information provision to intending travellers regarding safety and risk management practices.

Participatory Paradigm

Project Title: Development of training and skilling in e-marketing, internet based-cum-desktop research.

Methods: Action research involving the cycle of planning, implementing, monitoring and reflecting in conjunction with researcher in-country learning and training – language and cultural understanding and mores, the development of indigenous epistemologies and methodologies, team building capacities and monitoring and responding to power dynamics. Multi-genre outputs.

Rationale for Use: Improvement of knowledge and practice in relation to tourism e-research skills by interested stakeholders.

Outcome: Increased knowledge and awareness of competitors, and development of research skills.

Critical Theory Paradigm

Project Title: Bali post the bombing: perspectives of tourism industry workers.

Methods: Ethnography, participant observation, semi-structured in-depth interviews. Researcher in-country learning and training – language and cultural understanding and mores in conjunction with the development of indigenous epistemologies and methodologies, team building capacities and monitoring and responding to power dynamics. Multi-genre outputs.

Rationale for Use: Gaining an in-depth understanding of tourism industry workers' perspectives in order to highlight their lived experiences from multiple perspectives and effect change which would improve their lives.

Outcome: Understanding of social, cultural, economic and technological changes for use in policy and planning.

Feminist Perspectives

Project Title: Impacts of the bombing on Balinese women and their entrepreneurial activities.

Methods: Participant observation and semi-structured interviews, questionnaire for some demographic information. Interpretation involves successive approximation and analysis via basic descriptive statistics. Use of cross-cultural communication, trusted other, translator and interpreter of lived experiences. Researcher in-country learning and training – language and cultural understanding and mores. Development of indigenous epistemologies and methodologies, team building capacities, and monitoring and responding to power dynamics.

Rationale for Use: To achieve an emic (insider's perspective) and to foreground women's experiences as being different to men's experiences, especially, in regard to the processes associated with entrepreneurial activities and impacts on women's work post the bombing.

Outcome: In depth understanding of Balinese women's experiences in tourism ventures and development of a typology of Balinese tourism entrepreneurial ventures.

Postmodern Paradigm

Project Title: An examination of post-Bali bombing discourses in the media and how the discourses served to influence tourist destination decision-making in Australia.

Methods: Discourse analysis and semi-structured interviews. Team building, cross-cultural communication capacity building, as well as monitoring and responding to power dynamics. Multi-genre outputs.

Rationale for Use: To understand how texts influence decision-making and how the media constructs and mediates 'reality' for Australians. The latter, whom constitute a primary market source for Balinese tourism.

Outcome: Textual deconstruction and reconstruction to determine the impacts of media text selection and the power of the same to influence decision-making by potential Australian tourists.

Each of these potential research projects utilises a different theoretical paradigm in order to exemplify an integrated research project to gain more holistic insight into the effects of the Bali bombing. In each instance, the most relevant rather than the hegemonic paradigm was utilised in order to achieve the best match between research purpose and research design.

7 A Generic Research Proposal to Advance Tourism Economics and Management in an Accountable Manner

Having discussed the variety of paradigms which might be used to increase theoretical advances in tourism economics and management as well as an example of an integrated research agenda; the paper will now return to its key focus. Specifically, that research in tourism economics and management has been predicated to western-based epistemological lenses and a positivist/postpositivist hegemony. A hegemony, which this paper proposes is no longer an accountable research agenda in a twenty-first century world of flux and unpredictability. However, first, we need to revisit the current temporal world to further contextualise the latter statement. On the threshold of the twenty-first century, Potter and López (2001, p. 4) commented that:

> "It is the best of times. It is the worst of times. It is a time for the celebration of diversity. It is a time of fear of the Other who is different. It is a time of technological marvel and a time of fear and distrust of science. It is a time of unprecedented affluence and a time of the direst poverty. It is a time of nostalgia for the old and enthusiasm for the new. It is a time of optimism and hope for humanity's possibilities of freedom and happiness and yet grim pessimism and fear about our future.
>
> It is a time of great intellectual achievement and also of the keenest awareness of the severe limitations inherent in the conditions of intellectual and scientific production."

It is a time not dissimilar to the closing decades of the twentieth century, a time, to which Naisbitt (1982) earlier referred as this 'time of parenthesis' – this time of great uncertainty and unpredictability. It has been and is a time in which travel and tourism researchers need to have diverse knowledge and skills in different research paradigms, in quantitative and qualitative methodologies and their supporting methods as well as in mixed methods, and in knowledge and skills of differing epistemologies and cultural standpoints. Why such an agenda to advance research in tourism economics and management? Because as Urry (1996, p. 369) commented much of social research in the twentieth century was devoid of consideration of space and time and that *"social structures were viewed as consistent across space"* and societies were not perceived as being constructed of *"different social times"*. Like Urry, I would argue that scant attention has been and is significantly paid to ethnicity, cultural identities, and gender and that our researcher gazes have been firmly entrenched in phallocentric, western-centric, positivistic frameworks. I realise that such a view may not be shared by others, however:

> "A dominant group, inevitably, has the greatest influence in determining a culture's overall outlook – its philosophy, morality, social theory and even its science. The dominant group, thus legitimises the unequal relationships and incorporates it into society's guiding concepts . . .
>
> Inevitably that dominant group is the model for 'normal human relationships'. It then becomes 'normal' to treat others destructively and to derogate them, . . . In short, if one's identification is with the dominant group, it is 'normal' to continue in this pattern." (Miller, 1976, pp. 6–8).

Western epistemologies have constructed research agendas which have ignored tourism phenomena outside of our understanding of social and cultural constructions (Bernd 1996; Urry, 1996). More broadly, Scheurich (1997), Stanfield II (1994), Bourke (1995), Ivanitz (1999), and Foley (2003) have criticised western epistemologies and research paradigms for similar biases. Additionally, Bourdieu (1990) and Laclau (1990) critique western-based research as imperialist or colonialist. As a consequence, and as Smith (1999, p. 15) argues there is a need for indigenous methodologies, since:

> "Indigenous methodologies tend to approach cultural protocols, values and behaviours as an integral part of methodology. They are factors to be built in to research explicitly, to be thought about reflexively, to be declared openly as part of the research design, to be discussed as part of the final results of a study and

> to be disseminated back to the people in culturally appropriate ways and in a language that can be understood.
>
> Relatedly, tourism researchers need to provide multi-genre outputs from research to cater for a diversity of stakeholder audiences."

Further, tourist behaviours and patterns need to be contextualised from both individual and group behaviours. Micro-macro applications are required (Jamal and Lee, 2003) emphasise the need to understand both the micro world of the tourist and the macro-home social setting in order to understand the tourist, especially to understand the role of the social construction of knowledge, because as Harding has commented *"all scientific knowledge is always, in every respect, socially situated"* (Harding, 1991, p. 10).

Moreover, in order to advance tourism research in tourism economics and management, travel and tourism researchers need to understand the paradigms of positivism or postpositivism, a chaos theory/complexity theory orientation, interpretive social sciences, critical theory, feminist perspective, and post-modern approaches. Travel and tourism researchers need to also understand that the theoretical paradigm that informs the research process will subsequently influence the methodology that is selected due to each theoretical paradigm's ontological, epistemological and axiological viewpoints. Researchers may select from either qualitative, quantitative or mixed method methodologies.

Whilst Riley and Love (2000) note that most research in travel and tourism utilises a quantitative methodology, qualitative methodologically informed research can also contribute to understanding the phenomena of tourism. For travel and tourism researchers, decisions should not be based on which is the better methodology, but which methodology is the best to understand the tourism phenomena under study and this in turn links back to understanding of theoretical paradigms (Jennings, 2001).

In choosing between a qualitative or quantitative approach (or a mixing of methods), travel and tourism researchers need to consider which of the following (or some combination if using mixed method) are more appropriate to the research study about to be undertaken:

- the use of a deductive (quantitative) or an inductive (qualitative) approach;
- causal relationships (quantitative) or multiple realities (qualitative);

- objective relationship (quantitative) or subjective relationship (qualitative) between researcher and researched;
- etic (outsider/quantitative) or emic (insider/qualitative) perspective;
- random (quantitative) or non-random (qualitative) sampling;
- numerical units of data (quantitative) or textual units (qualitative);
- statistical representations (quantitative) or key themes/motifs identified (qualitative);
- third person passive voice (quantitative) or narrative, first person active voice (qualitative) report writing;
- findings inferred to population (quantitative) or representation of a slice of life (qualitative) (Jennings, 2001).

A short note regarding mixed methods needs to be made. Some researchers would dispute mixing methods because of the incommensurability of the paradigmatic ontologies (see Jennings, 2004). That being said, the mixing of methodologies is usually associated with different phases of research designs, specifically, before, after and sometimes concurrent implementations (see Brannen, 1992; Tashakkori and Teddlie, 1998; Creswell, 2003 for further information).

While it is acknowledged in travel and tourism research training courses that tourism economics and management researchers need to develop a repertoire of skills in and understanding of quantitative data collection methods, such as, *"questionnaires and structured interviews, longitudinal studies, case studies, documentary method, modelling, observation, as well as impact assessment methods"* (Jennings, 2001); other skills are needed. Quantitative skills need to be supplemented by skills in and knowledge of qualitative methods, such as, *"in-depth interviews, semi-structured interviews, participant observation, focus groups, longitudinal studies, Delphic method, case studies, action research methods and documentary research"* (Jennings, 2001, p. 378). Again, whilst most tourism economics and management researchers are skilled in descriptive and inferential statistics, there is a need for these researchers to develop skills in and knowledge of qualitative empirical materials, interpretation such as, *"content analysis, constant comparative analysis, matrix building, mapping, successive approximation, domain analysis, taxonomy building, ideal type identification, event-structure building and modelling"* (Jennings, 2001, p. 378). As a result of travel and tourism researchers having knowledge and expertise in both quantitative and qualitative methodologies (and mixed methods):

- the best match between research purpose and research design will be achieved;
- researchers will be accountable for ensuring diversity in their research activities; and
- researchers will be able to engage in critiques and reviews of research using paradigms outside of their sphere of familiarity (Jennings, 2003).

Additionally, to address the criticism of tourism economics and management research for its mono-disciplinary and/or fragmented tourism enterprises using multidisciplinary rather than interdisciplinary approaches; and for tourism economics and management research to be more effective in the current and future world context, researchers need to develop and improve their competencies to be effective team players in interdisciplinary research projects. In regard to this capacity building, learning and training needs to incorporate team roles, cross-cultural communication, and understanding of power dynamics. Moreover, researchers need to participate in research foci that cross local, regional, national and international 'boundaries'. This is important as meanings of 'space and place' both contract and widen due to globalisation, internationalisation, and participation in the knowledge economy as well as in response to constant change. Tourism researchers require the aforementioned knowledge and skills if tourism researchers hope to remain relevant and accountable through their research activities in order to advance:

- information for planning and management decision making, policy development;
- understanding the social, environmental and economic impacts of tourism;
- insights into motivations, needs, expectations and satisfaction levels of tourists;
- identification of education and training requirements;
- development of databases for use in comparative studies over time;
- facilitation of industry requirements for product development;
- monitoring and evaluating of tourism activities across the tourism industry and within stakeholder groups (Jennings, 2001, 2003).

Moreover, tourism researchers need to choose theoretical paradigms from a suite of options rather than just the hegemonic paradigm. Tourism researchers also need to re-examine the continued replication and dominance of western-centric perspectives in theoretical, epistemological, methodological and axiological aspects of travel and tourism research projects. Such ethnocentric perspectives do not enable researchers to 'truly' take into account the experiences of those with different views, standpoints and experiences.

8 Conclusion

In concluding this paper, I am again mindful of the writing of Miller (1976):

> "... dominant groups generally do not like to be told about or even quietly reminded of the existence of inequality. 'Normally' they can avoid awareness because their explanation of the relationship becomes so well integrated in other terms; they can even believe that they and the subordinate group share the same interests and, to some extent, a common experience ..." (Miller, 1976, 6–8).

That being said, it remains my belief that to advance tourism research and to be accountable in the twenty first century as well as to effectively account for tourism economics and management phenomena, travel and tourism research needs to draw on:

- a suite of research paradigms;
- a variety of epistemologies;
- quantitative and qualitative methodologies and mixed methods approaches as well as indigenous methodologies;
- interdisciplinary research projects (and multidisciplinary approaches);
- team skilled projects (team roles, cross-cultural communication, power dynamics, trust and reciprocity);
- studies in local, regional, and international spaces;
- collaborations between communities, organizations, institutions and interested stakeholders both nationally and internationally;
- multi-genre research outputs to serve a diversity of stakeholder audiences.

In adopting such a research agenda, tourism economics and management research will provide a holistic and full account of the travel and tourism phenomenon under study within a glocal/global context in an ever changing world. Subsequently, this will serve to advance knowledge in tourism economics and management through tourism research which is accountable and cognisant of the varying ways that the world may be viewed paradigmatically through the specific consideration, incorporation and development of differing ontological, epistemological, methodological and axiological viewpoints.

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The Influence of Immigration and International Tourism on the Import Demand for Consumer Goods – A Theoretical Model

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1 Introduction

International migration and tourism (i.e. from the point of view of a single economy, inward and outward flows of people) have grown strongly during the last decades. In almost all OECD countries, immigrant levels have risen significantly during the period from 1986 to 2001. For example, while in Austria, Greece, the Netherlands, Sweden, the United States, Canada and New Zealand the percentage of foreign-born population in 2001 surpassed 10% of total population, Australia and Luxembourg each had already more than 20% (OECD, 2004). Growth in world tourism has been even stronger with almost 700 million worldwide tourist trips in 2000, as compared to about 25 million in 1950. Measured in relative terms, at 120 trips per thousand of world population in 2000, tourism activity has increased more than ten-fold during this period (World Tourism Organisation, various issues). At the same time, international merchandise trade has grown significantly during the last decades. However, while official statistics of the overall world trade of consumer goods[1] (in contrast to industrial goods)

[1] Statistics Canada (online) defines consumer goods as "new goods acquired by households for their own consumption. Comprise three categories: a) Durable goods, which can be used repeatedly or continuously for more than one year, such as motor vehicles and major appliances; b) Semi-durable goods, which can be used on multiple occasions and have an expected lifetime of one year or somewhat more, such as clothing, footwear and linens; c) Non-durable goods, which can be used only once, such as food, gasoline, alcoholic beverages and tobacco; in practice, the latter also include a few goods of little value used more than once, such as household supplies".

are unavailable, e.g. world food exports grew from current $221 billion in 1980 to $540 billion in 2003, representing 13.7% of world merchandise trade in that year (UNCTAD, 2005). Consumer-processed food and drink products made up more than 60% of world food trade in 1997 and was the segment which grew fastest between 1980 and 1997 (Gehlhar & Coyle, 2001). Thus, while there seems to be correlation between the flows of people and (certain) goods the question is whether there is also causality?

International trade of good and services has been shown to be influenced by many factors of either push or pull character. Equally, the potential effects of migration and tourism on international trade can occur on both the supply and the demand side. That is, movements of people can contribute to generate exports, but they may also stimulate imports. Immigrants can bring specialised knowledge with them, such as business connections, language and cultural skills, which potentially contribute to lower transaction costs for the trade between the host and the source countries[2] of the migrants and thus facilitate export development (Ethier, 1996). International tourism, on the other hand, can promote cross-border exports by initiating entrepreneurial activities as a result of learning about new business opportunities while travelling. There is a growing body of empirical studies, e.g. Aradhyula & Tronstad (2003), Shan & Wilson (2001), Kulendran & Wilson (2000), Easton (1998) on the effects of international travel, and Gould (1994), Rod & Webster (1995) or Aislabie et al. (1994) for those of immigration, which confirm the positive influence of immigration and international tourism on exports. However, the more direct links between movements of people and goods at the demand side have been analysed – theoretically as well as empirically – to a much lesser extent so far. First, immigrants may prefer consuming their home-country products while living in the host country, thus stimulating imports of certain goods. Second, demand for new products may be created as a consequence of learning about them during foreign travel. Empirical results confirming these hypotheses are scarce (see, however, Fischer (2004) for a

[2] In the following, the terms *source* country and *home* country are used as synonyms, both representing the country from which the immigrant population/tourists originate. In contrast, the country where these people currently live (to which these people travel) is called *host* country. (In the literature, the terms "generating" and "receiving" country are also used instead of source and host country, respectively).

quantification of these effects for food imports for the case of Germany), although statements that illustrate the connections can be found in the literature, e.g. RIRDC (1994, pp. 2–3). This chapter deals with the latter phenomenon only. It aims at analysing theoretically the potential of people movements to alter existing aggregate consumer preferences in favour of certain foreign consumer goods, thus leading to increased imports of these.[3]

Developing a preference for a product typically implies using existing information about the attributes of a product in order to compare these with an existing value structure. If these attributes are, or at least if they are believed to be, similar with our ideas of how a product should be, then we will develop a positive attitude (i.e. a preference) for it (Schaffner et al. 1998). Obtaining information about a product is a crucial first step for the development of a taste. For example, for foreign food products, information is typically transferred through migration, international travel and media (Carter, 1997; Gordon, 1998). The effect of media on the formation of aggregate preferences in general is difficult to measure and will not be investigated hereafter.

While the existence of the promotional effect of immigration on the merchandise trade is widely acknowledged, its strength, however, may depend on the goods' type. For example, Gould (1994, p. 303) argues that *"Immigrant links to the home country have a strong positive impact on exports and imports, with the greatest effects on consumer manufactured exports. These effects tend to increase at a decreasing rate as the size of the immigrant community grows, and they also depend crucially on the type of goods traded".*

As for international travel, Reed (1994) shows for example that tourism has a positive and significant effect on exports of processed food products but not on those of agricultural raw commodities and intermediate goods. This, too, suggests that the closer a product is to consumers, the stronger the effects of immigration and international tourism on its cross-country trade.

The organisation of this chapter is as follows: first, after a discussion of some necessary assumptions, the connection between immigration and international tourism and the demand for consumer goods imported from the immigrants' country of origin and/or the tourist destination country is analysed algebraically. Then, a geometrical model

[3] In contrast to my article (Fischer, 2004), I will focus here on a generalised, and extended, theoretical analysis of the influence of immigration and international tourism on import demand.

is presented. The last section summarises the findings and discusses avenues for further research.

2 Assumptions

The following assumptions refer to exogenous conditions (i.e. those which are beyond anyone's control) and serve as a platform on which the endogenous cause-effect relationships between the different levels of the model will occur. While these assumptions limit the universality of the proposed model, they define its context and thus determine its practical applicability.

(1) In general, and ceteris paribus, it is assumed that immigrant tastes are biased against (at least some of) their source-country goods. That is, all other things being equal, they would prefer buying the imported goods over the locally-manufactured ones.
(2) A population group must be prone to engage in trading. Some nationalities may like to engage more in small-scale trade businesses than others.
(3) As for tourists, it is assumed that, at least some of them, develop a preference for foreign goods during their travel, and would be willing to buy these goods (i.e. to prefer them over their locally-produced ones) when back home.
(4) Consumer goods, in particular culturally-bound ones such as certain food products, selected cloths, but perhaps also durable ones such as cars or television sets etc. are expected to be more likely to follow people flows than industrial goods such as raw commodities or intermediate products.
(5) Goods may only be expected to follow people flows if people value these goods highly enough to compensate for the efforts, and the financial costs, that are needed to establish trade connections. That is, there must not be close substitutes for source-country goods available in the host country.
(6) The source-country goods must be allowed to be imported into the host country – i.e. they must follow local safety rules and morality standards. Especially for food products this condition may not always be fulfilled, and trade may be blocked despite sufficient potential demand.[4]

[4] Take raw milk cheese as an example: a product some types of which are not allowed to be imported into certain countries, such as the US or Australia, due to food safety concerns.

3 Algebraic Model

The connection between migration and tourism and trade flows of certain consumer goods can theoretically be established as follows. Demand q_i for a consumer good i in a country is generally defined as a function of income I of the country's consumers, the product's own price p_i, the prices of close substitutes (vector $\mathbf{p}^S$), and consumer preferences z (Young & Burton, 1997). That is,

$$q_i = \mathrm{f}(I, p_i, \mathbf{p}^S, z) . \tag{1}$$

In traditional consumer theory and demand analysis, consumer preferences are usually not directly included in theoretical and empirical investigations due to difficulties in the identification and specification of appropriate indicator variables (von Alvensleben, 1997). However, for the analysis of aggregate foreign consumer good demand, immigration and tourism may be regarded as suitable instruments for revealing existing preferences, as it is shown in the following.

Total demand Q for a certain consumer good in a particular host country h can be split first into the individual demands of different population groups – i.e. into demand for the good of the host population q^H and demand for it of the foreign (or immigrant) population q^F. Second, demand of both population groups can be further divided according to the origin of the goods: for host-country produced goods q_p and imported consumer goods q_m. Hence, total demand for consumer goods is equal to

$$Q = q_p^H + q_p^F + q_m^H + q_m^F . \tag{2}$$

Import demand can be further differentiated according to the country of origin j of the consumer good – i.e. $q_m = \sum_{j=0}^{n} q_{m_j}$ with n supplying countries. In the following, the focus is on the demand for a particular consumer good from one particular source country j (q_{m_j}):

$$q_{m_j} = q_{m_j}^{T-J} + q_{m_j}^{J} . \tag{3}$$

Equation (3) states that q_{m_j} is the sum of the demands for country's j goods of the immigrant group J originating from this country and the rest of the host country's population – i.e. the total population T minus J. It is assumed that $T - J \equiv H$. That is, all other immigrant groups are believed to behave similar to host population H. Equations (3) and (1) can now be combined to

$$q_{m_j} = q^H_{m_j}(I^H, p_h, p_j, z^H) + q^J_{m_j}(I^J, p_h, p_j, z^J) , \tag{4}$$

which states that q_{m_j} depends on the incomes of the host, I^H, and the immigrant population, I^J; the prices of host-country produced goods (including imports not originating from j: p_h), and goods, p_j, imported from country j (seen here as close substitutes); and the – assumed as different – preferences of the host, z^H, and the immigrant population, z^J, originating from country j.

Since the influence of income and prices on the demand for most basic consumer goods (such as food products) in industrialised societies, however, has diminished over the last decades (von Alvensleben, 1997), it may be justified to abstract from possible differences in incomes between the host and the immigrant population and price differences between locally- and foreign-manufactured goods, which in most cases at least can be assumed to be small. It can then be shown that $q_{m_j} = \mathrm{f}(S^J)$, with $\mathrm{f}' = \partial q_{m_j}/\partial S^J > 0$ – i.e. consumer good imports from country j are an increasing function of the share of immigrants, S^J, originating from that country in the total population of host country h.

The overall share A_j of country j's goods in country h's total demand of these goods can be defined as

$$A_j = \frac{q_{m_j}}{Q} . \tag{5}$$

Let's assume host-country inhabitants have a lower share $\alpha^H = \frac{q^H_{m_j}}{q^H}$ of these goods consumed which are imported from country j than the one of immigrant population J originating from that country, $\alpha^J = \frac{q^J_{m_j}}{q^J}$. That is, $\alpha^H < \alpha^J$. Now, A_j can be calculated as $A_j = \alpha^H \cdot S^H + \alpha^J \cdot S^J$, or since the share of the host population S^H in total population equals $1 - S^J$:

$$A_j = \alpha^H + (\alpha^J - \alpha^H) \cdot S^J . \tag{6}$$

Given that $\alpha^J > \alpha^H$, and assuming both shares are positive constants, it is therefore clear that A_j rises with higher immigrant shares in the host country and so does q_{m_j}, provided the total demand Q of the goods does not change. However, it may also be possible that the shares α^J and α^H are not constant, but depend themselves on other factors.

A positive relationship between the consumption habits of the host population and the level of immigration, such as $\alpha^H = \mathrm{f}(S^J)$, with $\mathrm{f}' = \partial\alpha^H/\partial S^J > 0$, may be possible. It can be assumed that whenever an immigrant group brings with it its retail outlets, stalls on local produce markets, ethnic restaurants, etc., it will not only supply to its own ethnic group but the host population may also start to consume some of the new goods offered (see, e.g. Köhler, 1994). Therefore, the consumption habits of the host population may alter in the long run, provided that the 'new' goods offer some advantages (in terms of functionality, design, quality, taste, health perception, price, etc.) over the traditional, locally-produced goods. That is, this effect will enforce the positive relationship $q_{m_j} = \mathrm{f}(S^J)$, with $\mathrm{f}' = \partial q_{m_j}/\partial S^J > 0$, between immigrant levels and good imports. In fact, it seems possible that also on the demand side the stimulating influence of immigration on trade flows diminishes with rising immigration levels (i.e. $\mathrm{f}'' = \partial^2 q_{m_j}/\partial S^{J\,2} < 0$), similar to the immigrant effect on export promotion as suggested by Gould (1994). Since it is likely that the change in consumption habits of the host population will only be partial, and once the interested host population has sufficient access to the newly imported goods, more immigrants will not bring further changes. However, more immigrants in general result in increased aggregate demand for a certain good, and assuming that they have a preference for their source-country goods, imports will rise proportionally to immigrant numbers. That is, $\mathrm{f}'' = \partial^2 q_{m_j}/\partial S^{J\,2} = 0$. Thus, it depends on the size of the two individual effects whether their combined effect is actually decreasing or constant.

Furthermore, it may also be possible that α^J changes over time t, since it can be assumed that the immigrant population adopts at least some of the local consumption habits, and thus prefers consuming the locally-produced goods. That is, $\alpha^J = \mathrm{f}(t)$, with $\mathrm{f}' = \partial\alpha^J/\partial t < 0$.

Rising international tourism activity may have a similar potential to alter existing preferences in the host country population. Thus, imports of certain consumer goods can also be seen as a rising function of tourism, or $q_{m_j} = \mathrm{f}(T^H)$, with T being the share of country h tourists to country j in total country's h population, and with $\mathrm{f}' = \partial q_{m_j}/\partial T^H > 0$. Very likely, this would only be true for part of the tourists and only for some countries and certain goods, but the effect might be strong enough to be measured at the aggregate market level. Thus, with rising international tourism to certain countries, country's h aggregate preferences may be altered in favour of certain foreign consumer goods, resulting in a rise of imports of these.

In summary, the import demand function of a country h for certain consumer goods originating from country j may be specified as

$$q_{m_j} = q_{m_j}(\overset{+}{I^H}, \overset{+}{I^J}, \overset{-}{p_j}, \overset{+}{p_h}, \overset{+}{S^J}, \overset{+}{T^H}) \; . \tag{7}$$

Import demand is assumed to increase in the incomes of host country's population and country's j immigrants and in prices for host-country produced goods, but to decrease in those for imported goods from country j. In addition, import demand increases in the share of country j's immigrants in total host country's population and in the share of country h's tourists in its population travelling to country j. Depending on the good and the analysed country and immigrant group, the latter effects may be expected to be larger than those of the former variables.

4 Graphical Model

In this section, the results which have been derived algebraically will be visualised in a two-goods, one-country graphical model. Thus, Fig. 1 provides an approach to illustrate the effects of rising immigrant levels and international travel of the host-country population to country j on consumer good imports from that country.

The different CC' lines represent aggregate consumption possibility lines for the host country, immigrant and total population (superscripts H, J and T respectively). Those population groups are thought to face the choice for a certain consumer good of either manufactured at the host country h (ordinate) or imported from country j (abscissa).

${C^H}_0{C^H}_0{}'$ describes the consumption choice of the host population. H can choose between either consuming only home-produced goods, goods imported from country j, or every combination of these two options. In the first case, the consumed (demanded) amount (q_p) would be where ${C^H}_0{C^H}_0{}'$ intersects the ordinate. In the second case, the demanded amount (q_{mj}) would be were ${C^H}_0{C^H}_0{}'$ intersects the abscissa. Since we assume here that the tastes of the host population in general are biased against their locally-produced goods, a situation as described by ${q_p}^H{}_0$ and ${q_{mj}}^H{}_0$ seems most realistic.

${C^J}_0{C^J}_0{}'$ describes the consumption choice of the immigrant population originating from source country j. Since the immigrant population

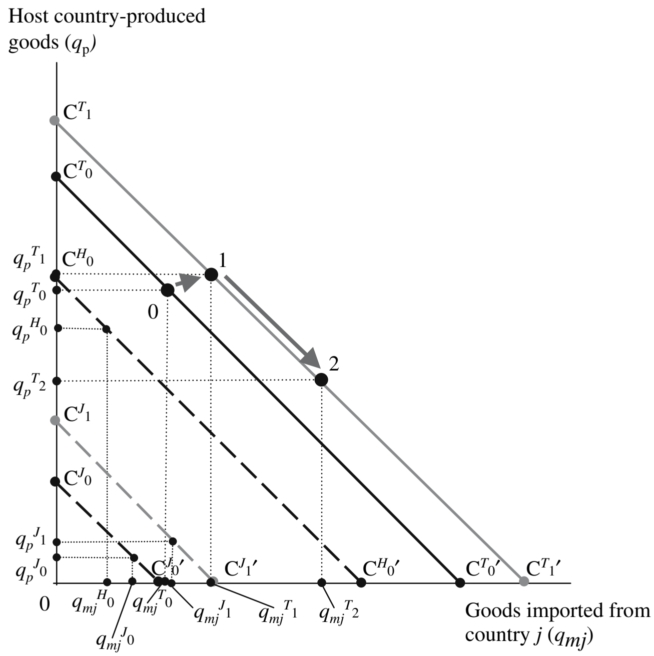

Fig. 1. The influence of immigration and international tourism on import demand

is smaller is size than the host population and therefore the former's demand for the analysed consumer good is smaller, $C^J{}_0C^J{}_0{}'$ is more to the left than $C^H{}_0C^H{}_0{}'$. Assuming the immigrant group's tastes are biased against the goods imported from j, a typical aggregate consumption preference may be described by $q_p{}^J{}_0$ and $q_{mj}{}^J{}_0$.

$C^T{}_0C^T{}_0{}'$ depicts the total (aggregate) demand situation for the analysed good in the host country. It has been constructed by adding $C^J{}_0C^J{}_0{}'$ and $C^H{}_0C^H{}_0{}'$. Respectively, $q_p{}^T{}_0$ and $q_{mj}{}^T{}_0$, which are the sums of $q_p{}^H{}_0$ and $q_p{}^J{}_0$, $q_{mj}{}^H{}_0$ and $q_{mj}{}^J{}_0$ respectively, determine the current overall consumption preference in country h.

The overall share A_j of country j's goods in h's total demand of these goods has been defined (see (5)) as $A_{j0} = \frac{q_{m_j}}{Q}$. Following the terminology of the graphical model, this is equivalent to $\frac{q_{mj}{}_0^T}{0C_0^{T\prime}}$.

With an increase of the immigrant population in country h, total population in general will grow too and the share of the immigrant group rises. A growing immigrant population implies a higher demand for the analysed consumer good, resulting into a shift of ${C^J}_0{C^J}_0{}'$ towards the right. This new situation is depicted in Fig. 1 by the new immigrant consumption possibility line ${C^J}_1{C^J}_1{}'$. There is no change in the host country population's consumption possibility line ${C^H}_0{C^H}_0{}'$, but the consumption possibility line of the total population would also shift to the right, as it is shown in Fig. 1 with ${C^T}_1{C^T}_1{}'$. As indicated in the figure by the move from point 0 to point 1, the increased total demand for the analysed good is mainly supplied through imports and only by little through locally-produced goods. Of course, the ratio depends on the preferences of the newly arrived population. In total, the new share of imported goods in total demand is given by $A_{j1} = q_{mj}{}^T_1 \big/ \overline{OC_1^{T\prime}}$. A_{j1} is larger than A_{j0} as proven in (6).

The second effect of rising immigrant levels may be the change in consumption habits of the host population. As argued above, the imported consumer goods may be perceived by the host population (or at least by a part of it) as beneficial since these goods may offer, apart from simply signifying more variety in the overall spectrum of available goods, an advantage in terms of quality, design, taste, healthiness etc. over the locally-produced goods. Given the assumptions outlined before, the aggregate preferences in country h may then change in favour of the imported goods, which is illustrated in Fig. 1 by the shift from point *1* to point *2*. This new equilibrium is characterised by a much higher share $A_{j2} = q_{mj}{}^T_2 \big/ \overline{OC_1^{T\prime}}$ (as compared to A_{j0}) of imported goods in overall consumed goods due to the substitution of locally-manufactured goods by imported goods in the host population.

Rising international tourism activity may have a similar potential to alter existing preferences in the host population. Tourists who learn about new goods during their travel may develop a taste for them and later on may want to consume these goods when back at home. That is, imports of foreign goods may also rise as a result of international travel. Of course, and as already stressed, this may only be true for a part of the tourists and only for some countries and some goods, however, the effect might be strong enough in order to be observed at the aggregate market level. The "mechanics" is in fact similar to the second effect of immigration described in Fig. 1. Thus, with rising international tourism to certain countries, the aggregate preferences may be altered in favour of foreign goods, resulting into increased imports of these.

5 Conclusions

This analysis has attempted to shed some light on demand side causes of international trade of consumer goods. The proposed model suggests that the movement of people, in the form of immigration and international tourism, may alter aggregate preferences in a country in favour of goods imported from an immigrant group's source country or from the tourists receiving nation. This is so, because people who move gain access to information on new goods, and given a resulting new choice situation, people may prefer consuming those goods which they perceive as 'better'. In this chapter it has, implicitly, been assumed that goods imported from country j are perceived as 'better', by both the immigrants originating from this country and the tourists travelling to j, resulting into increased imports of these goods. However, this may not be the case that both groups necessarily come to the same conclusion. In fact, the preferences of both population groups are probably completely independent from each other. It is of course also possible, that, e.g. immigrants learn about host country-produced goods and perceive them as superior to their source-country ones and start exporting them back home. In this case, immigration would promote exports. Also, it may be that tourists while being on their holidays would like to consume the goods from their home country (such as certain foods or media articles), and exports start to develop and follow tourist flows. Hence, in theory, everything is possible. The only way to find out which goods and which population groups tend to which particular behaviour would be possible by detailed empirical research.

Empirical results for food products and the case of Germany (Fischer, 2004) show, e.g. that, for aggregate food imports from India and China, and for imports of wine, cheese and processed/preserved vegetables from France and Italy, it may be concluded that migration to Germany and international travel activities of Germans to these destinations have indeed contributed to rising food product imports from these countries. The tourism elasticities for individual food products have been found to lie between one and two in absolute terms. Also, consistent with *a priori* expectations, they are below unity for aggregate food imports from the analysed Asian countries. As expected, the estimates of the immigration elasticities are higher than those for international tourism activities. In some cases, as for the imports of drinking wine from France, and of cheese and processing wine from Italy, the immigration elasticities have been estimated as being well above two in absolute terms. Although these empirical results seem to confirm theoretical considerations, there is scope for more work.

Further research would use a more systematic empirical approach, starting with a large database of imports of different consumer goods, and would attempt to cluster these goods according to their association with international tourism and immigration flows. Then this analysis would look for similar patterns in different countries in order to arrive at conclusions of whether some population groups are more likely to engage in activities that make their source countries' goods available in their current host countries, or whether tourists from some countries are more likely to buy goods imported from their favourite holiday destinations. Also, it would be possible to identify those goods whose trade flows generally are more likely to be affected by the flows of people.

Such extended research results would be useful for both international marketing professionals and public policy makers. Export managers of consumer good companies would have effective information about possible crucial target groups for their market entry strategies. Regional development officials may learn that, e.g. promoting tourism into an area could prove to be an effective means for enhancing the export success of local manufacturing industries.

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An Economic Analysis of Tourism Contracts: Allotment and Free Sale*

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1 Introduction

In the tourism sector it is very difficult to find "complete contracts". The typically incomplete tourism contracts regulating the business relationship between Tour Operators and Hotels are Free Sale and Allotment contracts. In this work we analyze these incomplete contracts from a microeconomic perspective and within an "optimal contract design" approach.[3] In particular through "optimal contract design" and "incomplete contract" approaches it is possible to analyze the design and efficiency consequences of imperfections resulting from contractual incompleteness.[4]

We shall compare the observed stylized facts (the actual business relationships and the contracts) with the results from our theoretical models, in order to verify that the economic analysis applied to contracts can be used to look for solutions to some of the typical tourism economic problems. Three questions are specifically addressed within our setting: (i) how do Tour Operators and Hotels choose the optimal contract terms (quantity and price), given the initial conditions;

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[3] For more details on "optimal contract design", see Shavell S. (1984), Hart O.D. and B. Holmstrom (1987), Holmstrom B. and J. Tirole (1989), Werin L. and H. Wijkander (1992), Tirole J. (1994), Masten S.E. (1988) and (1999).

[4] See Holmstrom B. and J. Tirole (1989), Tirole J. (1994), Masten S.E. (1999).

(ii) which is the "optimal risk sharing" rule for the Allotment contract; (iii) which is the "optimal risk allocation" rule for the Free Sale contract?

The work is structured as follows: in Sect. 2 we present the main stylized facts of the tourism sector and the assumptions for our model. Next, in Sect. 3 we analyze Free Sale and Allotment contracts within a framework of "law and economics", while in Sect. 4 we set up the models of the two contracts (Allotment and Free Sale) and we obtain their analytical solutions. Then, in Sect. 5 we show the results of a numerical simulation of the two models. Finally, a comparative analysis between the two models in terms of "optimal contract design" concludes our work.

2 Stylized Facts and Assumptions

There are some stylized facts in the tourism sector that are very remarkable when the contractual relationship between Tour Operators and Hotels has to be analyzed.

One peculiarity of the tourism sector is that the market demand is subject to seasonality and uncertainty. The tourism market demand is stochastic because it depends on stochastic and exogenous variables, e.g. natural resources, institutional aspects, social and cultural elements, economic and political conditions, psychological influence. Further uncertainty is due to the time that passes from the "purchase" (booking) to the "consumption" of a tourism-industry product (time consuming). Additionally, goods in this industry are typical experience goods and the consumption is time intensive. For these reasons in this work we assume that demand, reservation price, frequency and holidays duration are all stochastic variables.

Another stylized fact in the tourism sector is that the tourism product is a non-storable good.[5] In fact, the final product supplied to the customer is not a physical good, but an immaterial service-good. For this reason – and given the seasonality and uncertainty of market demand – Tour Operators and Hotels are subject to many economic risks in carrying out their activity.[6]

[5] For example, an empty hotel room is a service which is "produced" but not sold.

[6] It should be stressed that we are speaking of "economic risks" and not of "technical risks", related for example to the safety of person, transport or baggages. In these latter cases, nothing is different from the normal insurance contracts.

Since Tour Operators are exposed to an economic risk due to the risk of market demand changes and Hotels are subject to the economic risk due to the possibility that some rooms remain empty (unsold), Free Sale and Allotment contracts can be of help in managing these risks.[7] Therefore in this work we assume that Tour Operators operate only in the future market, while Hotels can sell their services (free rooms) both to Tour Operators on the futures market and directly to tourists on the spot market.[8]

For some tourism firms we observe the existence of a high degree of monopoly power. In fact, often both Tour Operators and Hotels act in market structures which can be described by monopolistic competition or oligopoly models. Hotels tourism services are extremely differentiated with respect to the location, to the typology of customers, to the typology and quality of services supplied, to the facility dimension and the ownership. It is therefore reasonable to assume a high degree of monopoly power. Since the main service supplied by Tour Operators in the "package tour" is the Hotel accommodation, the analogous market structure can be assumed for Tour Operators. For this reason it is reasonable to assume that the method used by Tour Operators to charge the supply price (or "posted price") is based on mark-up percentage.[9]

Another feature of the tourism market is that the "tourism facility"[10] is characterized by a certain degree of rigidity. This rigidity means that the facility dimension can be changed by the firms only in the long run through investment decisions. For the purpose of this research, it is sufficient to analyze the firm's decisions only in the short run, without taking into account fixed costs imputation and investment decisions.[11]

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[7] Another way to manage the risk is the "overbooking" technique. See Candela G. and P. Figini (2005).

[8] In fact, the available rooms can be sold by Hotels either (i) on the future market, i.e. to Tour Operators through the Free Sale or the Allotment contract (indirect distribution), or (ii) on the spot market, i.e. directly to consumers-tourists (direct distribution). If the quantity of rooms booked in advance by Tour Operators is not sufficient to satisfy the market demand, then Hotels have the possibility to sell these additional rooms demanded by the tourists at the spot market price.

[9] In our model we assume this percentage as an exogenous parameter.

[10] For Hotels the "tourist facility" consists of the number of available rooms (capacity), while for Tour Operators of the maximum number of persons for whom the "package tour" is planned.

[11] In our model, we will formalize this Hotels supply rigidity through the introduction of a capacity constraint.

In tourism markets we observe two main typologies of consumer-tourists: (i) "independent tourists", who buy single tourism services directly from tourism firms; (ii) "common tourists", who usually buy bundled tourism services ("package tours") in advance on the future market only from Tour Operators (or Travel Agencies), while they buy them directly from Hotels only on the spot market.[12] In our model we study only the second typology of consumer-tourists and the corresponding tourism market, i.e. we assume that the future market of tourism services is open only to the Tour Operators.

These issues correspond to five important assumptions of our model, as we shall formally present in Sect. 4: (i) a monopoly power, often existing both for Tour Operators and Hotels[13]; (ii) a stochastic tourism market demand and thereafter a framework of choices under uncertainty; (iii) tourism products are non-storable services; (iv) a short run temporal horizon for firm's decisions and accordingly a capacity constraint for Hotels; (v) future market is closed to the consumers-tourists.

3 Free Sale and Allotment Contracts

Free Sale and Allotment contracts are accommodation contracts, in which the exchange consists of "cash for rooms", where the Hotel rooms are filled-in at a later stage Therefore, they are contingent and future contracts, in which the main problem is to overcome the negative effects of uncertainty caused by deferred exchanges.[14] Such contracts are proposed by Tour Operators to Hotels in order to share (Allotment contract) or to cover (Free Sale contract) the economic risk due to a potential low or high market demand (unsold or overbooking rooms), that could limit the realization of the exchange. The exchange and the level

[12] In fact, since Tour Operators sign in advance the agreements with their suppliers, they are then capable to manage accommodation and transportation services and moreover they can guarantee a certain level of safety, quality and price for the holiday.

[13] It should be stressed that most of the phenomena analyzed in this paper could be studied even in perfect or imperfect competition. See Tirole J. (1988).

[14] See Masten S.E. (1999), p. 29: "Sophisticated but boundedly rational transactors will omit contingencies when the costs of anticipating, devising optimal responses to, and drafting provisions for improbable events outweigh the expected gains in efficiency from doing so. Departures from the Arrow-Debreu ideal may thus arise in incomplete contract theory from failures of the contracting parties to foresee and provide for contingencies in formulating their agreement, instead of or in addition to the inability of courts to verify performance."

of the two main variables involved, i.e. price and quantity of booked rooms, depend therefore on the following aspects: the two agents risk-aversion degrees; the probability they assign to the different stochastic events (high or low market demand) and their bargaining power.

In particular, the Free Sale contract can be regarded as a sort of insurance contract regulating a "risk-transfer" transaction, through which Tour Operators assume all of the economic risk (insurance level) by booking a fixed number of rooms (contractual quantity) in advance. Hotels then give a discount (insurance premium), in return, on the booking price (contractual price). Through this contract the Tour Operator purchases the agreed number of rooms (accommodations) related to a certain limited period of time and commits itself to pay the entire agreed price before the actual demand is known, i.e. independent from the future actual room occupancy. For this reason this contract is known in the literature as a "fixed quantity commitment" contract[15] and the reservation of a fixed number of rooms in advance leaves Tour Operators with a high risk due to market demand uncertainty.

On the contrary, the Allotment contract is a typical "risk-sharing" agreement, which represents a mechanism of sharing the risk between both parties and is known in the literature as a "quantity flexibility" contract.[16] In this case, a number of rooms (contractual quantity) is available for sale by Tour Operators for a limited period of time, and Tour Operators commit themselves to confirm the actual room occupancy to the Hotels within an agreed deadline (the "release date"). Tour Operators pay for this right to confirm or not confirm the actual room occupancy with an "option exercise price" which is equal to a percentage of the accommodation value (contractual price). Tour Operators exercise this option (called "call option") at the release date (European call), or within the release date (American call), by confirming or releasing the rooms. On the contrary, if the confirmation of room occupancy is not exercised within the agreed deadline or in accordance with the contractual clauses, Hotels can sell the empty rooms directly to tourists on the spot market.

According to economic theory, we could say that both Free Sale and Allotment contracts belong to the following typologies of contracts: (i) contingent contracts and (ii) future contracts. The main difference

[15] See Anupindi R. and Y. Bassok (1998), and Araman V.F., J. Kleinknecht and R. Akella (2003).

[16] See Li C. and P. Kouvelis (1999), Tsay A. (1999) and Barnes-Schuster D., Y. Bassok and R. Anupindi (2000).

between them is that the Free Sale contract is an insurance contract, or a risk-transfer transaction, whose function is to shift the economic risk to the least risk-averse agent, while the Allotment contract is an options contract, or a risk-sharing agreement, whose function is to share the economic risk between the two risk-averse agents.[17]

4 The Models

From the "stylized facts" of the tourism sector and the economic features of the two accommodation contracts described in the previous Sections, we derive the economic insights that allow us to build our models of the two contracts.

Let us present some common characteristics of the two models. Both for Hotels and Tour Operators, the risk is increased by the seasonality and uncertainty of market demand. It is therefore very important for these firms to foresee market demand, in order to maximize firm profit. The two economic decisions to be taken are: (i) the number of rooms (for Hotels) and thereby the number of "package tours" (for Tour Operators) to be sold on the market; (ii) how to charge the selling price.

Therefore in our models the two decision variables are, respectively, the contractual quantity (number of rooms booked in advance by Tour Operators up to the Hotel capacity constraint) and the contractual price (purchase price for Tour Operators which includes a discount given by Hotels or an option price paid to Hotels with respect to the spot market price). On the contrary, we shall assume as exogenous parameters the other economic variables involved (in particular, Tour Operator mark-up and Hotel production costs).

In Sect. 2 we have presented the topic assumptions of a seasonal and uncertain market demand and of a monopoly market both for Tour Operators and Hotels. In our models, the market is therefore composed of two monopolistic tourism firms, the Tour Operator and the Hotel, and the consumers-tourists. Now we add the further assumption that the two firms have symmetric information such that they can have the same expectations about future market demand.[18]

Usually the different "states of nature", on which stochastic demand is conditioned, represent a continuous set of events but here, for

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[17] See Cheung Steven N.S. (1969) and Stiglitz J. (1974).

[18] This is a reasonable assumption since they can have access to the same information regarding the future behavior of market demand.

simplicity, we consider only a discrete case. Let us therefore assume the states of nature are only two: D^L (low market demand) and D^H (high market demand)[19] and the corresponding probabilities assigned both by the Tour Operator and the Hotel are equal to α^L and α^H. This implies that the tourism market demand is a random variable:

$$D = \left[D^L;\, D^H\right] \text{ with probabilities } \alpha^L \text{ and } \alpha^H\ , \tag{1}$$

where $\alpha^L + \alpha^H = 1$ (therefore $\alpha^L = 1 - \alpha^H$) .

4.1 The Allotment Model

The choice of the optimal decision under conditions of uncertainty depends substantially on the risk attitude. According to this point of view, the basic assumption that justifies the existence of the Allotment contract is that both Tour Operators and Hotels are risk-averse agents. In fact, the occurrence of two risk-averse agents is a necessary condition for a risk-sharing agreement, but not a sufficient condition for a Pareto Optimal contract in a framework of "choices under uncertainty".

We can specify the Allotment contract clauses in the following way. The contractual price is different depending on the Tour Operator's choice to confirm, and therefore to buy, or to release the rooms. In these two cases the Tour Operator will pay: $P^a = \overline{P} + o$ for confirmed rooms and $P^a = o$ for released rooms (or $P^a = \overline{P}$ for confirmed rooms and $P^a = o$ for all booked rooms), where P^a is the "contractual price".[20] While $\overline{P}$ represents the given price on the spot market, $0 \leq o \leq 1$ is the option price paid by the Tour Operator to the Hotel, and E is Hotel supply, i.e. the "contractual quantity" (rooms booked in advance).

We assume the following capacity constraint for the Hotel[21]: $E \leq \overline{K}$ where $\overline{K}$ is the maximum number of rooms that the Hotel can supply

[19] Note that a stochastic market demand could be introduced in the model by assuming "price uncertainty", instead of "quantity uncertainty". The case with "price uncertainty" is anyway symmetric with respect to our model, while the more complex case in which both uncertainties are assumed and analyzed simultaneously could represent an interesting improvement of this model.

[20] To insure the economic significance of the price P^a, we introduce the positivity constraint (positive price condition) $P^a = \overline{P} + o \geq 0$ and therefore $\overline{P} \geq -o$.

[21] We recall from Sect. 2 that the assumption of a short run temporal horizon for firm's decisions implies the introduction of a capacity constraint for the Hotel. Moreover, it implies the choice of not taking into account fixed costs imputation and investment decisions.

in the short run.[22] Therefore the available rooms can be sold by the Hotel: either on the future market, i.e. to the Tour Operator through the Allotment contract (indirect distribution) or on the spot market, i.e. directly to the consumers-tourists (direct distribution).

In this way the Tour Operator and the Hotel share the risk of unsold rooms, through the mechanism of an option price o paid by the Tour Operator to the Hotel. If the rooms E booked in advance are partially released by the Tour Operator, or are all confirmed but still not sufficient to satisfy market demand, then the Hotel has the possibility to sell these additional rooms directly to the tourists at the spot market price $\overline{P}$.

From the Allotment contractual clauses, we observe that the option price o paid by the Tour Operator for the right to confirm or release the actual rooms (which in our model is the endogenous component of "contractual price" P^a) is equal to a percentage of the accommodation value. The two decision variables of the Allotment model, for which we want to find out an optimal decision rule, are: E, number of rooms booked in advance by the Tour Operator (contractual quantity) and o, unit option price paid by the Tour Operator to the Hotel (implicit contractual price).

Once the Tour Operator has decided to confirm the rooms, it will include them in the "package tours" and it will sell them, usually through the intermediation of a Travel Agency, at the future price (called "posted price" or "brochure price"): $P^s = \overline{P}(1+m)$ where $m > 0$ is the mark-up percentage applied by the Tour Operator, that we assume in our model as an exogenous parameter.[23]

For simplicity we normalize the spot market price $\overline{P} \equiv 1$, so that the contractual prices become[24]: $P^a = 1 + o$ for confirmed rooms and $P^a = o$ for released rooms (or $P^a = 1$ for confirmed rooms and $P^a = o$ for all booked rooms) and $P^s = 1 + m$.

It must be stressed that a "positive profit" condition for the Tour Operator which is the natural consequence of the assumption of a monopoly market, implies that $P^s > P^a$, condition respected if $m > o$.

[22] For simplicity, we assume that all the rooms are standard rooms, e.g. double rooms.

[23] The Tour Operator does not charge the mark-up on the full cost P^a, but on the spot market price $\overline{P}$.

[24] As previously stressed, the economic significance of the price P^a implies the positivity constraint $P^a = 1 + o \geq 0$, and therefore $1 \geq -o$, always true by definition. On the contrary, the positivity of the price P^s is implicit in the assumption $m > 0$.

In this way, we are also assuming that the Tour Operator is applying a "fixed price" strategy: its products ("package tours") are sold at a unique price that does not change in the period of time considered.[25] Similarly we can assume a "positive profit" condition also for the Hotel, that implies that $P^a > c$ (where $c > 0$ is the Hotel unit production cost) and therefore, after price normalization, that $o > c$.

To simplify the analysis, we assume the following condition on the quantity variable:

$$D^L \leq E \leq D^H \ . \tag{2}$$

In fact, since the Tour Operator knows that market demand will be D^L or D^H, it would not be economically rational to book: (i) less than D^L rooms ($E < D^L$), otherwise the Tour Operator would certainly loose the favourable condition of an amount equal to $P^s \left(D^L - E\right)$; (ii) more than D^H rooms ($E > D^H$), otherwise the Tour Operator would have a certain loss due to the option price to be paid for the reservations in excess (released rooms), for an amount equal to $o \left(E - D^H\right)$.

The basic assumption of a stochastic market demand implies that Tour Operator sales are stochastic too.[26] We therefore assume that the Tour Operator sales S are a random variable conditional on observed demand, according to the so called "short-side rule"[27]: $S = \min\left[D, E\right]$ which is the "min" condition in the canonical disequilibrium model when the observed amount of transaction is equal to the minimum between the supply and the demand. The "short-side rule" assumption is consistent with the fact that the fixed selling price P^s ("fixed price" strategy) is higher than the booking price P^a ("positive profit" condition).

From these assumptions it follows that for the Tour Operator, it is profitable to sell (to confirm) every room demanded by the tourists, up to the quantity of booked rooms, otherwise (i) if $D = D^L$, by selling (confirming) $S^L < D^L$ the Tour Operator would have an opportunity

[25] On the basis of this "fixed price" strategy, the selling prices could change only in a different season or for extraordinary reasons. This is actually one of the price strategies that are most used by the touristic firms, while other possible price strategies are: changing price depending on the quality of the service (vertical differentiation) or on the different characteristics of demand segments (price discrimination).

[26] We assume that the rooms sold by the Tour Operator are identically equal to the rooms confirmed within the release date.

[27] According to the "short-side rule", or "Hahn-Negishi rule", the short side of the market determines the transaction quantity. See Hahn F.H. and T. Negishi (1962), Quandt R. (1988) and Fisher F.M. (1983).

cost equal to $P^s\left(D^L - S^L\right)$ with probability α^L; (ii) if $D = D^H$, by selling (confirming) $S^H < E$ the Tour Operator would have a certain loss due to the option price to be paid for the released rooms, equal to $o\left(E - S^H\right)$ with probability α^H. Another important consequence of these assumptions is that intuitively we expect that supposing an exogenous increase in the probability of high market demand α^H, the optimal quantity of rooms E^* will always be higher.

Another way to define the "short-side rule", is to express the Tour Operator sales as the following random variable:

$$S = \begin{cases} S^L = D^L \text{ with probability } \alpha^L = 1 - \alpha^H \\ S^H = E \text{ with probability } \alpha^H \end{cases} \tag{3}$$

To summarize, the model has the following assumptions: (i) a market composed of two monopolistic firms (the Tour Operator and the Hotel) and of consumers-tourists, (ii) a stochastic tourism demand, (iii) the form of an Allotment contract is analogous to an options contract, (iv) risk-aversion of the two agents and (v) exogenous market parameters (spot market price, Tour Operator mark-up, Hotel unit cost). Through this model we want to find the optimal contract in terms of (i) rooms E booked in advance by the Tour Operator, and (ii) option price o paid to the Hotel.

To model the Allotment contract, we start from the definition of Tour Operator and Hotel utility functions. Since the Tour Operator is an expected utility maximizer with a Bernoulli utility function over its profit[28], we can define its utility function as[29]:

$$U_{TO}\left(E, o\right) = Ex\left[u_{TO}\left(\mathit{\Pi}_{TO}\left(E, o\right)\right)\right] \ ,$$

where Ex is "expected value" and Π_{TO} is the Tour Operator profit, which we define as: $\Pi_{TO}\left(E, o\right) = P^s S - P^a E$.

The Tour Operator utility becomes:

$$\begin{aligned} U_{TO}\left(E,\, o\right) = \alpha^L u_{TO}\left[\overline{P}(1+m)S^L - \overline{P}S^L - oE\right] + \\ + \alpha^H u_{TO}\left[\overline{P}(1+m)S^H - \overline{P}S^H - oE\right] \end{aligned} \ , \tag{4}$$

[28] For further elements about risk-neutrality and risk-aversion, linear and concave utility functions and expected utility maximizers with a Bernoulli utility function, see Mas-Colell A., M.D. Whinston and J.R. Green (1995).

[29] Because of the concavity of a risk-averse agent utility function, we assume that $u' > 0$ and $u'' \leq 0$. Furthermore, we assume that $u'_o < 0$ and $u'_E > 0$.

and applying the "short-side rule" (3) and taking into account that $\alpha^L = 1 - \alpha^H$, we have the final result[30]:

$$U_{TO}(E, o) = \left(1 - \alpha^H\right) u_{TO}\left[mD^L - oE\right] + \alpha^H u_{TO}\left[mE - oE\right] \; . \quad (5)$$

Since the Tour Operator maximizes its expected profit subject to the Hotel participation constraint, we define Hotel utility function over its profit as follows[31]: $U_h(E, o) = Ex\left[u_h\left(\Pi_h(E, o)\right)\right]$.

We define the Hotel profit as: $\Pi_h(E, o) = P^a S - cE$, where $c > 0$ is the Hotel unit production cost.[32] This profit takes a different form depending on the actual market demand, because in the case of low market demand ($D = D^L$) it becomes:

$$\Pi_h^L(E, o) = P^a S^L - cE \; ,$$

while in the case of high market demand ($D = D^H$) it becomes

$$\Pi_h^H(E, o) = P^a S^H - cE + \left(\overline{P} - c\right)\left(D^H - S^H\right) \; .$$

The reason for this difference is that only with high market demand the quantity of rooms confirmed by the Tour Operator ($S = S^H$) is not sufficient to satisfy the entire market demand.[33]

Therefore the Hotel utility becomes equal to:

$$\begin{aligned} U_h(E,\, o) = \alpha^L u_h &\left[\overline{P} S^L + (o - c)\; E\right] + \\ &+ \alpha^H u_h\left[\overline{P} S^H + (o - c)\; E + \left(\overline{P} - c\right)\; \left(D^H - S^H\right)\right] \end{aligned} \quad (6)$$

and applying the "short-side rule" (3) and taking into account that $\alpha^L = 1 - \alpha^H$ we have:

$$U_h(E, o) = \left(1 - \alpha^H\right) u_h\left[D^L + (o - c)\, E\right] + \alpha^H u_h\left[(1 - c)\, D^H + oE\right] \; . \quad (7)$$

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[30] Similarly to the "positive profit" condition, a "positive expected profit" condition for the Tour Operator implies that $\left(1 - \alpha^H\right) u_{TO}\left[mD^L - oE\right] + \alpha^H u_{TO}\left[mE - oE\right] > 0$, condition as well respected if $m > 0$.

[31] Because of the concavity of a risk-averse agent utility function, we assume that $u' > 0$ and $u'' \leq 0$. Furthermore, we assume that $u_o' > 0$ and $u_E' > 0$.

[32] We assume therefore the following Hotel production cost: $C(E) = cE$.

[33] The Hotel can sell these additional rooms on the market (which are in excess with respect to the rooms confirmed by the Tour Operator) directly to the tourists at the spot market price $\overline{P}$, for an amount equal to $\left(\overline{P} - c\right)\left(D^H - S^H\right)$. As we have previously seen, the Hotel could sell directly to the tourists also the rooms released by the Tour Operator but in this case the all market demand is satisfied by the Tour Operator and accordingly the Hotel can sell the rooms only to the Tour Operator.

The Hotel participation constraint takes the form $U_h(E, o) \geq \overline{U}_h$, where $\overline{U}_h$ is the Hotel reservation utility, which is an exogenous variable equal to the expected profit deriving from sales on the spot market:

$$\overline{U}_h = Ex\left[u_h\left(\left(\overline{P} - c\right)\min\left(\overline{K}, D\right)\right)\right] \; . \tag{8}$$

Finally, we have the following optimization problem in which the Tour Operator's goal is to achieve the maximum expected profit, subject to Hotel participation and capacity constraints:

$$\begin{aligned} \underset{E,\,o}{Max}\, U_{TO}(E,\, o) &= Ex\left[u_{TO}\left(\Pi_{TO}(E,\, o)\right)\right] \\ \text{s.t. } U_h(E,\, o) = Ex\left[u_h\left(\Pi_h(E,\, o)\right)\right] &\geq \overline{U}_h \text{ and } E \leq \overline{K} \; , \end{aligned} \tag{9}$$

where $U_h(E, o) \geq \overline{U}_h$ is the participation constraint and $E \leq \overline{K}$ is the capacity constraint.

Since we do not consider capacity constraint $E \leq \overline{K}$[34], from the Lagrangian First Order Conditions (FOC's) we obtain:

$$\lambda^* = \frac{\left(1 - \alpha^H\right) u_{TO}'^L + \alpha^H u_{TO}'^H}{\left(1 - \alpha^H\right) u_h'^L + \alpha^H u_h'^H} = \frac{Ex\left(u_{TO}'\right)}{Ex\left(u_h'\right)} \; , \tag{10}$$

where $u_{TO}' = \frac{\partial u_{TO}}{\partial \Pi_{TO}}$, $u_{TO}'^L = \frac{\partial u_{TO}}{\partial \Pi_{TO}^L}$, $u_{TO}'^H = \frac{\partial u_{TO}}{\partial \Pi_{TO}^H}$, $u_h' = \frac{\partial u_h}{\partial \Pi_h}$, $u_h'^L = \frac{\partial u_h}{\partial \Pi_h^L}$ and $u_h'^H = \frac{\partial u_h}{\partial \Pi_h^H}$.

According to the second FOC we obtain, by plugging in $\lambda = \lambda^*$, the following equation:

$$\frac{Ex\left(u_{TO}'\right)}{Ex\left(u_h'\right)} = \lambda^* = -\frac{o\left[Ex\left(u_{TO}'\right)\right] - m\alpha^H u_{TO}'^H}{o\left[Ex\left(u_h'\right)\right] - c\left(1 - \alpha^H\right) u_h'^L} \; . \tag{11}$$

Finally, the third FOC is:

$$\left(1 - \alpha^H\right) u_h\left[D^L + (o - c)\, E\right] + \alpha^H u_h\left[(1 - c)\, D^H + oE\right] - \overline{U}_h = 0 \; . \tag{12}$$

[34] We can make the following qualitative analysis: (i) if $\overline{K} > D^H$, the constraint is not binding; (ii) if $\overline{K} \geq E^* \Rightarrow E = E^*$, the constraint is not binding; (iii) if $\overline{K}|! < E^* \Rightarrow E = \overline{K}$, the constraint is binding and the Hotel can not entirely fulfill the contract proposed by the Tour Operator. For the participation constraint $U_h(E, o) \geq \overline{U}_h$ we assume that the Lagrangian multiplier is ? > 0. It is economically rational to consider only the hypothesis of strictly equal $U_h(E, o) = \overline{U}_h$ (and therefore ? > 0) rather than the hypothesis of strictly greater $U_h(E, o) > \overline{U}_h$ (and therefore ? $= 0$) because in this way we minimize the Tour Operator costs, Hotel participation being equal. Hence, we obtain a higher maximum expected profit, which implies a higher maximum utility.

From the second and third FOC's, we derive the "efficient contract" in terms of the two decision variables E^* and o^* (conditional on exogenous parameters $D^L, D^H, \overline{U}_h, \alpha^H, m, c$), but this is not a Pareto Optimal Solution because the Tour Operator marginal rate of substitution is not equal to the Hotel marginal rate of substitution.[35]

On the contrary, from (11) and from the Pareto Optimal Condition, we derive the necessary (but not sufficient) condition for a Pareto Optimal contract:

$$MRS_{TO} = MRS_h = \frac{m}{c} \,, \tag{13}$$

where $MRS_{TO} = \frac{(1-\alpha^H)\, u'^L_{TO}}{\alpha^H u'^H_{TO}}$ and $MRS_h = \frac{(1-\alpha^H)\, u'^L_h}{\alpha^H u'^H_h}$ are the Tour Operator and the Hotel marginal rates of substitution between their marginal utilities in the case of low and high profit.

This condition is called "optimal risk sharing" rule because it represents the condition under which a socially efficient risk sharing takes place since it is optimal for the two firms to insure each other. This rule can be expressed as follows:

$$\frac{u'^L_{TO}}{u'^H_{TO}} = \frac{u'^L_h}{u'^H_h} = \frac{\alpha^H}{1-\alpha^H} \cdot \frac{m}{c} \,. \tag{14}$$

Starting with (14) it is possible to analyze the absence of aggregate uncertainty in the tourism market:

$$\frac{u'^L_{TO}}{u'^H_{TO}} = \frac{u'^L_h}{u'^H_h} = 1 \,. \tag{15}$$

In this equation the "optimal risk sharing" rule for the two firms implies the choice to fully insure each other, such that there is indifference between the two possible states of nature: since $u'^L_{TO} = u'^H_{TO}$ and $u'^L_h = u'^H_h$ then $\Pi^L_{TO} = \Pi^H_{TO}$ and $\Pi^L_h = \Pi^H_h$.

In our model, the condition under which it is optimal for the two firms to take out a reciprocal full insurance is the following one:

$$\alpha^H = \frac{c}{m+c} \,, \tag{16}$$

[35] Note that the condition for the Pareto Optimality of a risk allocation between two risk-averse agents (in our model the Tour Operator and the Hotel) is the equivalence between their marginal rates of substitution: $MRS_{TO} = MRS_h$. See McKenna C.J. (1986).

where it can be shown that $\alpha^H = \frac{c}{m+c} \leq 1$ since $m > 0$ by assumption. Starting with this condition and recalling that $0 \leq \alpha^H \leq 1$, we have the following "qualitative" conclusions about the Allotment contract and the "optimal risk sharing" rule: (i) only if $\alpha^H = \frac{c}{m+c}$ then $\Pi^L_{TO} = \Pi^H_{TO}$ and $\Pi^L_h = \Pi^H_h$, i.e. there is no aggregate uncertainty in the market, therefore it is optimal for the Tour Operator to propose an Allotment contract with a reciprocal full coverage to the Hotel; (ii) only if $\alpha^H \neq \frac{c}{m+c}$ then $\Pi^L_{TO} \neq \Pi^H_{TO}$ and $\Pi^L_h \neq \Pi^H_h$, i.e. there is aggregate uncertainty in the market, therefore it is optimal for the Tour Operator to propose an Allotment contract with a reciprocal partial coverage[36] to the Hotel.

In conclusion, we have shown that the Allotment contract is an options contract which is not completely Pareto Optimal partially due to the assumption of two risk-averse agents. Our model shows that under "optimal risk sharing" rule (14) an efficient contract can lead to Pareto Optimality depending on the value of α^H and of the parameters m and c. Normally we only find the conditions for a sub-optimal (but efficient) contract.

4.2 The Free Sale Model

The most important difference between Allotment and Free Sale contracts derives from the different risk-aversion degree of the agents. While the existence of the Allotment contract is justified by the assumption that both Tour Operators and Hotels are risk-averse agents, behind the Free Sale contract is the following basic assumption: the Tour Operator is a risk-neutral agent[37] while the Hotel is a risk-averse agent.[38]

The first assumption can be justified because the Tour Operator often is a firm large enough to manage the risk without going bankrupt. The costs will be thereby widely spread over the company's customers, shareholders and others. The assumption is reasonable especially when the firm has many shareholders, therefore the owners are capable of

[36] In particular, because of utility functions concavity (i) only if $\alpha^H > \frac{c}{m+c}$ then $\Pi^L_{TO} < \Pi^H_{TO}$ and $\Pi^L_h < \Pi^H_h$ and (ii) only if $\alpha^H < \frac{c}{m+c}$ then $\Pi^L_{TO} > \Pi^H_{TO}$ and $\Pi^L_h > \Pi^H_h$.

[37] Formally, this implies that the Tour Operator has a linear utility function, i.e. an utility function that exhibits a constant marginal utility.

[38] Formally, this implies that the Hotel has a concave utility function, i.e. an utility function that exhibits a diminishing marginal utility.

diversifying the risk via the financial markets.[39] In fact, the occurrence of two parties one of which is risk-averse and the other risk-neutral, is a necessary condition for an insurance market, but it is not a sufficient condition for a Pareto Optimal contract in a framework of "choices under uncertainty".[40]

The other obvious difference between Allotment and Free Sale contracts consists in their different contractual clauses. According to the Free Sale contract the Hotel sells rooms in advance to the Tour Operator at the price: $P^c = \overline{P} - d$, where P^c is the "contractual price"[41], $0 \leq d \leq 1$ is the discount (insurance premium) granted by the Hotel to the Tour Operator and E is Hotel supply, i.e. the "contractual quantity" (rooms booked in advance). In this way the Hotel insures itself against the risk of unsold rooms, granting the discount-premium d to the Tour Operator in return. In the case that quantity E of rooms booked in advance by the Tour Operator is not sufficient to satisfy market demand, then the Hotel has the possibility to sell these additional rooms directly to the tourists at the higher spot market price $\overline{P}$.

In terms of the Free Sale contract clauses, the discount d is equal to a percentage of the accommodation value. Therefore, the Free Sale model decision variables are: E, number of rooms booked in advance by the Tour Operator (contractual quantity) and d, discount rate given by the Hotel to the Tour Operator (implicit contractual price).

Once the Tour Operator has booked the rooms, it will include them in the "package tours" and it will sell them at a future selling price (usually through the intermediation of a Travel Agency) $P^s = \overline{P}(1 + m)$.[42] Once again we normalize the spot market price $\overline{P} \equiv 1$, so that the contractual prices become[43]: $P^c = 1 - d$ and $P^s = 1 + m$.

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[39] For a definition of risk-aversion and risk-neutrality, see Cooter R. and T. Ulen (2004) and Faure M. and S. Goran (2003).

[40] See McKenna C.J. (1986) and Rossini G. (1994).

[41] To insure the economic significance of the price P^c, we introduce the following positivity constraint (positive price condition): $P^c = \overline{P} - d \geq 0$ and therefore $0 \leq d \leq \overline{P}$.

[42] The Tour Operator does not charge the mark-up on the full cost P^c, but on the spot market price $\overline{P}$.

[43] As previously stressed, the economic significance of the price P^c implies the following positivity constraint: $P^c = 1 - d \geq 0$ and therefore $0 \leq d \leq 1$, always true by definition. The positivity of the price P^s is instead implicit in the assumption $m > 0$.

Tour Operator "positive profit" condition $P^s > P^c$ is respected if $m > -d$ (always true because $d \geq 0$ by assumption). The Hotel "positive profit" condition $P^c > c$ is respected if $0 < c < 1$ (given that $d \geq 0$ by assumption).

Again we assume condition (2) on the quantity variable E, because it would not be economically rational to book: (i) less than D^L rooms ($E < D^L$), otherwise the Tour Operator would certainly loose favourable conditions, for an amount equal to $P^s \left(D^L - E\right)$; (ii) more than D^H rooms ($E > D^H$), otherwise the Tour Operator would have a certain loss for the rooms purchased in excess (unsold rooms), for an amount equal to $P^c \left(E - D^H\right)$.

We always assume that Tour Operator sales S are a random variable conditional on observed demand, according to the "short-side rule" (3). For the Tour Operator it is therefore profitable to sell every room on the market, up to total booked rooms, otherwise: (i) if $D = D^L$, by selling $S^L < D^L$ the Tour Operator would have an opportunity cost equal to $\overline{P}^s \left(D^L - S^L\right)$ with probability α^L; (ii) if $D = D^H$, by selling $S^H < E$ the Tour Operator would have a certain loss for unsold rooms, equal to $P^c \left(E - S^H\right)$ with probability α^H.

To summarize, the Free Sale model differs from Allotment model only in the following assumptions: (i) the Tour Operator is risk-neutral and the Hotel is risk-averse and (ii) the form of a Free Sale contract is analogous to an insurance contract. We want to find the "optimal contract" in terms of: (i) rooms booked in advance by the Tour Operator (E, insurance level); (ii) discount given by the Hotel (d, insurance premium).

Given the assumption of a risk-neutral Tour Operator, we can define its linear utility function as[44]: $U_{TO}(E,d) = Ex\left[\Pi_{TO}(E,d)\right]$. Since the Tour Operator profit is: $\Pi_{TO}(E,d) = P^s S - P^c E$, its expected value is: $Ex\left[P^s S - P^c E\right] = (1+m)\left(S^L \alpha^L + S^H \alpha^H\right) - (E - dE)$.

According to the "short-side rule" (3) and taking into account that $\alpha^L = 1 - \alpha^H$, we have[45]:

$$U_{TO}(E,d) = (1+m)\left[D^L - D^L \alpha^H + E\alpha^H\right] - (E - dE) \ . \qquad (17)$$

[44] We assume that $u'_d > 0$ and $u'_E > 0$.

[45] Similarly to the "positive profit" condition, a "positive expected profit" condition for the Tour Operator implies that $(1+m)\left[D^L - D^L a^H + E a^H\right] - (E - dE) > 0$, condition as well respected if $m > -d$.

Given the assumption of a risk-averse Hotel, its utility function over its profit can be defined as[46]: $U_h(E,d) = Ex\left[u_h\left(\Pi_h(E,d)\right)\right]$. Since Hotel profit is: $\Pi_h(E,d) = (P^c - c)E$, where $c > 0$ is the Hotel unit production cost, the Hotel utility is[47]:

$$U_h(E,d) = \left(1-\alpha^H\right) u_h\left[(1-d-c)E\right] + \alpha^H u_h\left[-dE + (1-c)D^H\right] . \tag{18}$$

The Hotel participation constraint is $U_h(E,d) \geq \bar{U}_h$, where $\overline{U}_h$ is the Hotel reservation utility ([8]). Therefore the optimization problem becomes:

$$\begin{aligned} \underset{E,\,d}{Max}\, U_{TO}(E,\,d) &= Ex\left[\Pi_{TO}(E,\,d)\right] \\ \text{s.t.} U_h(E,\,d) &= Ex\left[u_h\left(\Pi_h(E,\,d)\right)\right] \geq \overline{U}_h \text{ and } E \leq \overline{K} , \end{aligned} \tag{19}$$

where $U_h(E,d) \geq \overline{U}_h$ is the participation constraint and $E \leq \overline{K}$ is the capacity constraint.

As far as capacity constraint $E \leq \overline{K}$ and participation constraint $U_h(E,d) \geq \overline{U}_h$ are concerned, we can make a qualitative analysis analogous to the one already made for the Allotment model. Therefore, from the Lagrangian First Order Conditions (FOC's) we obtain:

$$\lambda^* = \frac{1}{\left(1-\alpha^H\right) u_h^{\prime L} + \alpha^H u_h^{\prime H}} = \frac{1}{Ex\left(u_h^{\prime}\right)} . \tag{20}$$

According to the second FOC we obtain the following equation by plugging in $\lambda = \lambda^*$:

$$MRS_h = \frac{1-(1+m)\,\alpha^H}{(1+m)\,\alpha^H - c} , \tag{21}$$

[46] Because of the concavity of a risk-averse agent utility function, we assume that $u' > 0$ and $u'' \leq 0$. Furthermore, we assume that $u_d' < 0$ and $u_E' > 0$.

[47] The Hotel profit takes a different form depending on the actual market demand. The reason, as we have already seen for the Allotment contract, is that only in the case of a high market demand ($D = D^H$) the quantity of rooms booked in advance by the Tour Operator (E) can be not sufficient to satisfy entirely the market demand. The Hotel can therefore sell these additional rooms on the market (which are in excess with respect to the contractual commitment of the Tour Operator) directly to the tourists at the spot market price $\bar{P}$, for an amount equal to $\left(\bar{P} - c\right)\left(D^H - E\right)$.

where $MRS_h = \frac{(1-\alpha^H) u_h^{\prime L}}{\alpha^H u_h^{\prime H}}$ is the Hotel marginal rate of substitution between the Hotel marginal utilities in the case of low and high profit.

Finally, the third FOC is:

$$\left(1-\alpha^H\right) u_h \left[(1-d-c) E\right] + \alpha^H u_h \left[-dE + (1-c) D^H\right] - \overline{U}_h = 0 \ . \tag{22}$$

From the second and third FOC's, we derive the "efficient contract" in terms of the two decision variables E^* and d^* (conditional on the exogenous parameters $D^H, \overline{U}_h, \alpha^H, m, c$), but this is not a Pareto Optimal Solution because the Hotel marginal rate of substitution (21) is not equal to one.[48]

On the other hand, from (21) and from Pareto Optimal Condition, we derive the necessary (but not sufficient) condition for a Pareto Optimal contract:

$$MRS_h = 1 \tag{23}$$

that can be expressed as follows:

$$\frac{u_h^{\prime L}}{u_h^{\prime H}} = \frac{\alpha^H}{1-\alpha^H} \cdot \frac{1-(1+m)\ \alpha^H}{(1+m)\ \alpha^H - c} = 1 \ . \tag{24}$$

This condition is called the "optimal risk allocation" rule, i.e. it is the condition under which a socially efficient risk allocation takes place, because it is optimal for the Tour Operator to fully insure the Hotel.[49] This rule can be expressed as follows:

$$\alpha^H = \frac{c}{m+c} \ . \tag{25}$$

The "optimal risk allocation" rule implies therefore that there is indifference between the two possible states of nature and Hotel profits become deterministic: since $u_h^{\prime L} = u_h^{\prime H}$ then $\Pi_h^L = \Pi_h^H$.

[48] Note that the condition for the Pareto Optimality of a risk allocation between a risk-neutral agent (in our model the Tour Operator) and a risk-averse agent (in our model the Hotel) is the following one: $MRS_h = \frac{u_h^{\prime L}}{u_h^{\prime H}} = 1$. See McKenna C.J. (1986).

[49] In this way we have a Pareto Optimal risk allocation because the risk is totally shifted to the least risk-averse agent.

Therefore, in the Free Sale model the condition under which it is optimal for the Hotel to take out full insurance is (25) where it can be shown that $\alpha^H = \frac{c}{m+c} \leq 1$ since $m > 0$ by assumption. Starting with this condition and recalling that $0 \leq \alpha^H \leq 1$, we have the following "qualitative" conclusions about the Free Sale contract: (i) full insurance only if $\alpha^H = \frac{c}{m+c}$ (then $\Pi_h^L = \Pi_h^H$)[50]; (ii) partial insurance only if $\alpha^H < \frac{c}{m+c}$ (then $\Pi_h^L < \Pi_h^H$)[51]; (iii) no insurance only if $\alpha^H > \frac{c}{m+c}$ (then $\Pi_h^L > \Pi_h^H$).[52]

5 A Numerical Simulation of the Models

Now we present a numerical simulation of Allotment and Free Sale models in order to investigate how the optimal choice about decision variables (quantity and price) changes if we consider a change in the exogenous parameters (comparative statics).

5.1 The Allotment Model

Let us begin the simulation of the Allotment model from the following system composed by the above stated (11) and (12):

$$\begin{cases} \frac{\left(1-\alpha^H\right) u_{TO}'^L + \alpha^H u_{TO}'^H}{\left(1-\alpha^H\right) u_h'^L + \alpha^H u_h'^H} = -\frac{o\left[\left(1-\alpha^H\right) u_{TO}'^L + \alpha^H u_{TO}'^H\right] - m\alpha^H u_{TO}'^H}{o\left[\left(1-\alpha^H\right) u_h'^L + \alpha^H u_h'^H\right] - c\left(1-\alpha^H\right) u_h'^L} \\ \left(1-\alpha^H\right) u_h \left[D^L + (o-c)\, E\right] + \alpha^H u_h \left[(1-c)\, D^H + oE\right] = \overline{U}_h \end{cases} \tag{26}$$

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[50] In this case it is optimal for the Tour Operator to take out full insurance ("optimal risk allocation rule"). Therefore, we have a Pareto Optimal risk allocation because the risk is totally shifted to the least risk-averse agent.

[51] In this case it is optimal for the Tour Operator to take out only partial insurance. Therefore, we have a Pareto Sub-optimality (or socially inefficient risk allocation) because the risk is not totally borne by the risk-neutral agent. Furthermore this result confirms the intuition for which a higher discount given by the Hotel corresponds to a higher number of rooms booked by the Tour Operator (and vice versa) and it's consistent with the stylized fact that usually in the tourism market the discount rate is positively correlated with the quantity exchanged.

[52] In this case there are not the conditions to take out insurance at all because under optimistic expectations about market forecasts it is optimal for the Tour Operator not to propose any contract at all to the Hotel (case of non-insurance). Therefore, this case implies the greatest social inefficiency because the risk-averse agent faces the total risk.

To perform a numerical simulation of this system of two equations in two unknowns (E, o), first of all it is necessary to specify the form of both Hotel utility function u_h and Tour Operator utility function u_{TO}. Since they are both risk-averse by assumption, we specify their utility functions through a natural logarithmic function:

$$U_h(E,o) = Ex\left[\ln\left(\Pi_h(E,o)\right)\right] \text{ and } U_{TO}(E,o) = Ex\left[\ln\left(\Pi_{TO}(E,o)\right)\right] .$$

In this way, the system (26) after some algebraic manipulations becomes:

$$\begin{cases} c\left(\frac{1-\alpha^H}{mD^L-oE} + \frac{\alpha^H}{(m-o)\,E}\right)\frac{1-\alpha^H}{(1-c)\,D^L+oE} = m\left(\frac{1-\alpha^H}{(1-c)\,D^L+oE} + \frac{\alpha^H}{(1-c)\,D^H+oE}\right)\frac{\alpha^H}{(m-o)\,E}\,, \\ \left(1-\alpha^H\right)\,\ln\left[D^L + (o-c)\,E\right] + \alpha^H \ln\left[(1-c)\,D^H + oE\right] = \overline{U}_h \end{cases} \tag{27}$$

where $\overline{U}_h = (1-\alpha)\ln\left[(1-c)\,D^L\right] + \alpha\ln\left[(1-c)\,D^H\right]$.

Now, if we consider the two extreme cases in which the problem becomes a deterministic one, we have the following results:

- if $\alpha^H = 1$, then the system becomes:
$$\begin{cases} m = 0 \\ \ln\left((1-c)\,D^H + oE\right) - \overline{U} = 0 \end{cases}$$
- if $\alpha^H = 0$, then the system becomes:
$$\begin{cases} c = 0 \\ \ln\left(D^L + (o-c)\,E\right) - \overline{U} = 0. \end{cases}$$

From these results we derive that in a "choice under certainty" framework, in which the market demand is deterministic, the Hotel becomes totally indifferent between the choice to sell rooms on the future market (i.e. to the Tour Operator through the Allotment contract) or on the spot market (i.e. directly to the consumers-tourists), therefore the Allotment contract becomes economically "useless".

We want moreover to observe how the equilibrium values of the two decision variables E^* (optimal quantity of rooms booked by the Tour Operator) and o^* (optimal option price paid by the Tour Operator to the Hotel) change if we suppose a change in the exogenous parameter α^H (probability of high market demand): in this way, we can analyze the effects on the equilibrium values of an exogenous change in market demand, giventhe market supply. To do that, we

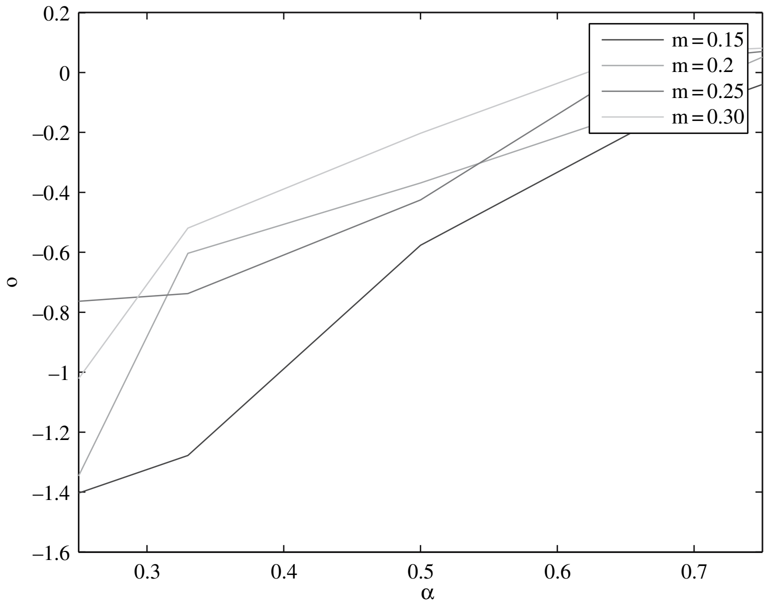

Fig. 1. Equilibrium values of the option price (o^*) for different values of the probability of high market demand (α^H) and the Tour Operator mark-up (m)

fix the following starting numerical values for the remaining exogenous parameters:

$$D^L = 25; D^H = 50; \overline{K} = 100; c = 0.35$$

and we obtain the following graphs, which plot α^H against o^* (Fig. 1) and against E^* (Fig. 2).

These results confirm the intuition for which if we suppose an exogenous increase in the probability of high market demand α^H, the optimal quantity of rooms E^* will always be higher (since the Tour Operator foresees a higher future market demand and therefore higher sales[53]) as well as the optimal option price o^*.[54] From this simulation

[53] This is the consequence of the assumption that the fixed selling price P^s ("fixed price" strategy) is higher than the booking price P^a ("positive profit" condition) and therefore that for the Tour Operator it is profitable to sell (to confirm) every room demanded by the market, up to the quantity of booked rooms E.

[54] This result is consistent with the canonical fact that the supply curve has a positive slope while the demand curve has a negative slope. In this way, if we suppose an exogenous increase in the market demand, *coeteris paribus*, both the price and the quantity exchanged in equilibrium will be higher.

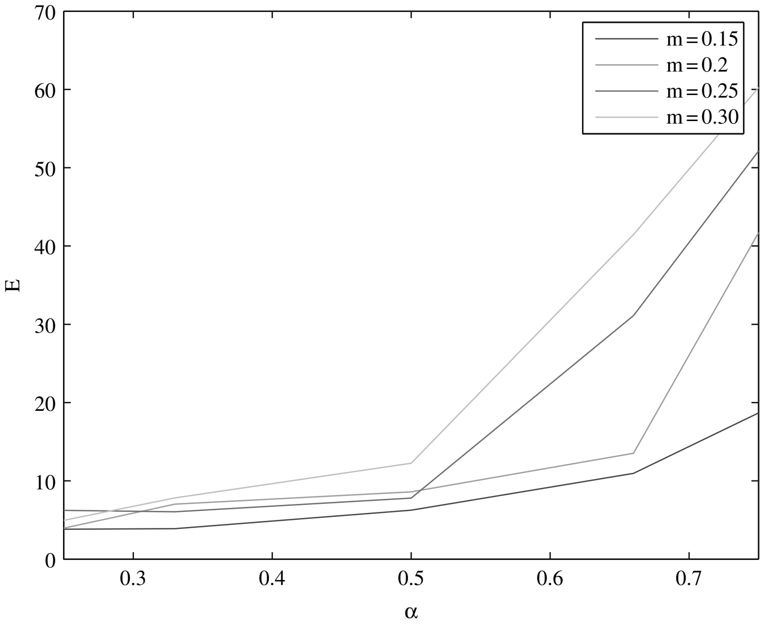

Fig. 2. Equilibrium values of the rooms booked by the Tour Operator (E^*) for different values of the probability of high market demand (α^H) and the Tour Operator mark-up (m)

we therefore always observe a positive correlation between the equilibrium values of the decision variables E^* and o^*, which is consistent with the stylized fact that usually a higher option price corresponds to a higher number of booked rooms (and vice versa).[55]

Finally, we fix the probability of high market demand at the value $\alpha^H = 0.5$, i.e. we consider the case of perfect uncertainty, and we observe how the equilibrium values of the two decision variables E^* and o^* change for different values of the exogenous parameters m (Tour Operator mark-up) and of c (Hotel marginal cost). In this way we obtain the following graphs, which plot c and m against o^* (Fig. 3) and against E^* (Fig. 4).

[55] Moreover, from the graphs we observe that both the lines describing the behavior of equilibrium values of the endogenous variables E^* and o^* (which are depicted for some different values of the exogenous parameter m) present some "kinks" at some values of α^H. We deduce that these points may correspond to the different threshold values of α^H extracted from the analytical solution of the Allotment model which yields the corresponding "qualitative" conclusions about the Free Sale contract (cases of reciprocal full insurance or reciprocal partial insurance).

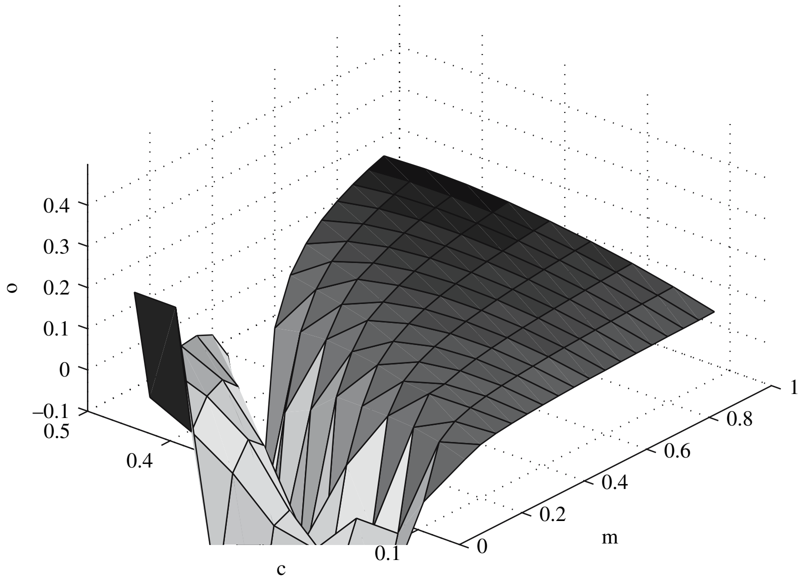

Fig. 3. Equilibrium values of the option price (o^*) for different values of the Hotel marginal cost (c) and the Tour Operator mark-up (m)

From this simulation we observe that if Tour Operator mark-up m increases, then in equilibrium it happens that:

- the option price o increases[56], i.e. intuitively if the Tour Operator has more bargaining power (its degree of monopoly power is higher) it becomes more profitable to rise its final selling price P^s and it can therefore afford to pay a higher option price to the Hotel[57];
- the number of booked rooms E increases[58], consistently with the previous result, i.e. for the Tour Operator it becomes more profitable

[56] Note that in Fig. 3 the left and light region of the graph lies in the negative area, therefore it does not respect the positivity constraint which guarantees the economic significance of the variables and accordingly it must not be evaluated.

[57] In other words, Tour Operator profit will be higher with the strategy "high price P^s-high option price o" rather than with the strategy "low price P^s-low option price o."

[58] Note that in Fig. 4 the left and dark region of the graph must not be evaluated, because it lies below the area depicted by the numerical values that we fixed for the two possible states of nature $D^L = 25$ (low market demand) and $D^H = 50$ (high market demand).

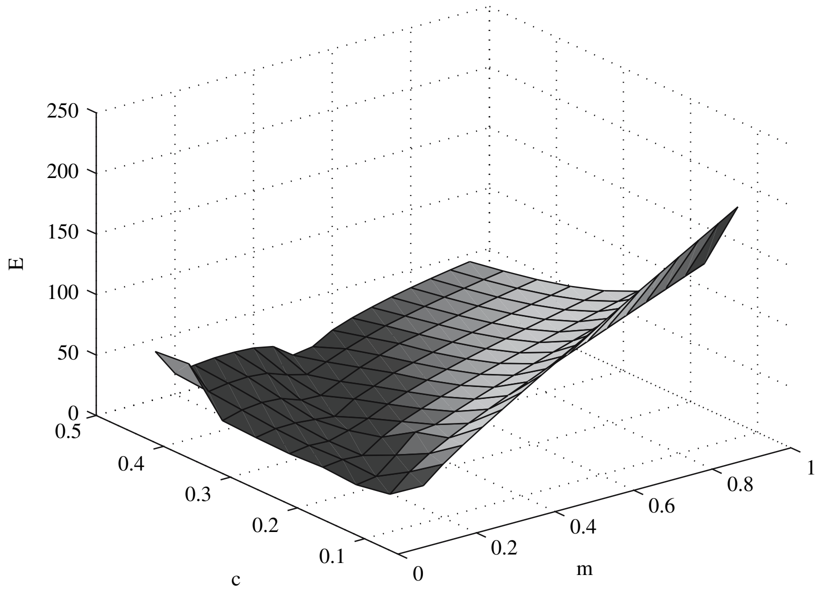

Fig. 4. Equilibrium values of the rooms booked by the Tour Operator (E^*) for different values of the Hotel marginal cost (c) and the Tour Operator mark-up (m)

to rise its final selling price P^s and therefore to supply, and hence to book, a higher number of rooms.[59]

If instead the Hotel marginal cost c increases, then in equilibrium it happens that:

- the option price o increases, i.e. if the Hotel has higher costs, it can accept only a contract with a higher option price paid by the Tour Operator;
- the number of booked rooms E decreases, consistently with the previous result, i.e. since its purchase price P^a will rise, for the Tour Operator it becomes more profitable to demand, and hence to book, a lower number of rooms.[60]

[59] Since we are analyzing a canonical supply relationship between price and quantity, this result is consistent with the stylized facts that usually the supply curve has a positive slope.

[60] Since we are analyzing a canonical demand relationship between price and quantity, this result is consistent with the stylized facts that usually the demand curve has a negative slope.

5.2 The Free Sale Model

Now we simulate the Free Sale model starting with the system composed by the above stated (21) and (22):

$$\begin{cases} \frac{\left(1-\alpha^H\right) u_h'^L}{\alpha^H u_h'^H} = \frac{1-(1+m)\,\alpha^H}{(1+m)\,\alpha^H - c} \\ \left(1-\alpha^H\right)\, u_h\left[(1-d-c)\ E\right] + \alpha^H u_h\left[-dE + D^H\left(1-c\right)\right] = \overline{U}_h\ . \end{cases} \tag{28}$$

Like for the Allotment model, to perform a numerical simulation of this system of two equations in two unknowns (E, d), it is necessary to specify the form of the two firms utility functions, but in this case we need to specify only the Hotel utility function u_h because the Tour Operator utility function u_{TO} has already been specified with a linear utility function.[61] Given the assumption of a risk-averse Hotel, we specify its utility over its profit through a natural logarithmic function:

$$U_h\left(E, d\right) = Ex\left[\ln\left(\Pi_h\left(E, d\right)\right)\right]\ .$$

So the system (28) becomes:

$$\begin{cases} \frac{\left(1-\alpha^H\right)\left[-dE+D^H(1-c)\right]}{\alpha^H E(1-d-c)} = \frac{1-(1+m)\,\alpha^H}{(1+m)\,\alpha^H - c} \\ \left(1-\alpha^H\right)\,\ln\left[E\left(1-d-c\right)\right] + \alpha^H \ln\left[-dE + D^H\left(1-c\right)\right] = \overline{U}_h\ . \end{cases} \tag{29}$$

If we consider the two extreme cases ($\alpha^H = 1$ and $\alpha^H = 0$) we have analogous results, so that also the Free Sale contract becomes economically "useless" in a "choice under certainty" framework:

- if $\alpha^H = 1$, then the system becomes $\begin{cases} m = 0 \\ \ln\left[-dE + D^H\left(1 - -c\right)\right] - \overline{U} = 0 \end{cases}$
- if $\alpha^H = 0$, then the system becomes: $\begin{cases} c = 0 \\ \ln\left[E\left(1-d-c\right)\right] - \overline{U} = 0 \end{cases}$

Now again we observe how the equilibrium values of the two decision variables E^* (optimal quantity of rooms) and d^* (optimal discount rate) change if we suppose a change in the exogenous parameter α^H (probability of high market demand), i.e. we analyze the effects on the equilibrium values of an exogenous change in market demand, given the market supply. As before, we fix the usual starting numerical values for

[61] Recall that given the assumption of a risk-neutral Tour Operator , we can define its linear utility function as $U_{TO}\left(E, d\right) = Ex\left[\Pi_{TO}\left(E, d\right)\right]$.

the remaining exogenous parameters ($D^L = 25; D^H = 50; \overline{K} = 100; c = 0.35$) and we obtain the following graphs, which plot α^H against d^* (Fig. 5) and against E^* (Fig. 6).

Again these results confirm the intuition for which if we suppose an exogenous increase in the probability of high market demand α^H, the optimal quantity of rooms E^* will always be higher, but in this case the optimal discount d^* will be higher only until a certain threshold value of α^H and afterwards on the contrary it will be lower. From this simulation we therefore observe the following correlation between the equilibrium values of the decision variables E^* and d^*:

- if $\alpha^H \leq 0.65$ then there is a positive correlation among E^* and d^*, i.e. below a certain threshold value of the probability of high demand α^H, it is necessary a higher discount rate to sell more rooms; this result, analogously to the Allotment model simulation, is consistent with the stylized fact that usually a higher discount corresponds to a higher number of booked rooms (and vice versa);

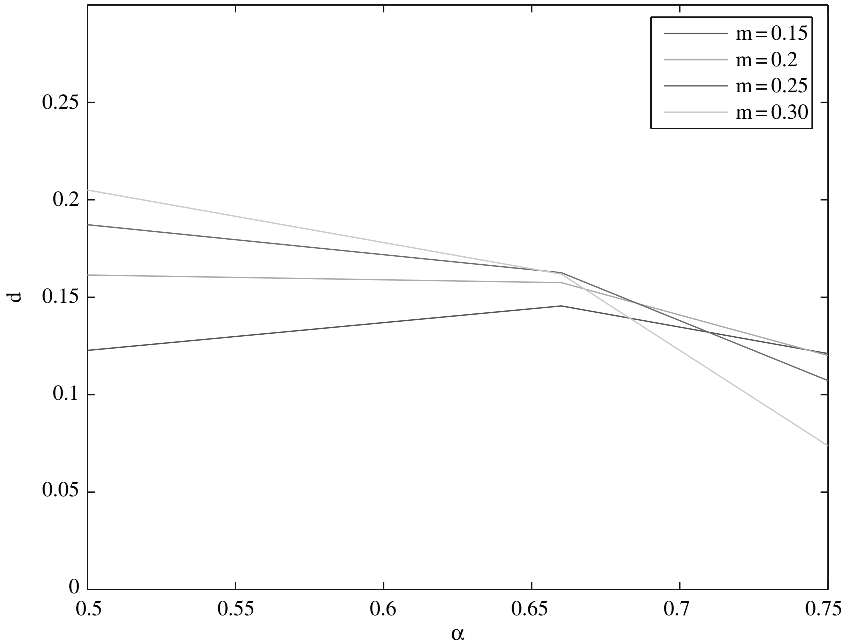

Fig. 5. Equilibrium values of the discount rate (d^*) for different values of the probability of high market demand (α^H) and the Tour Operator mark-up (m)

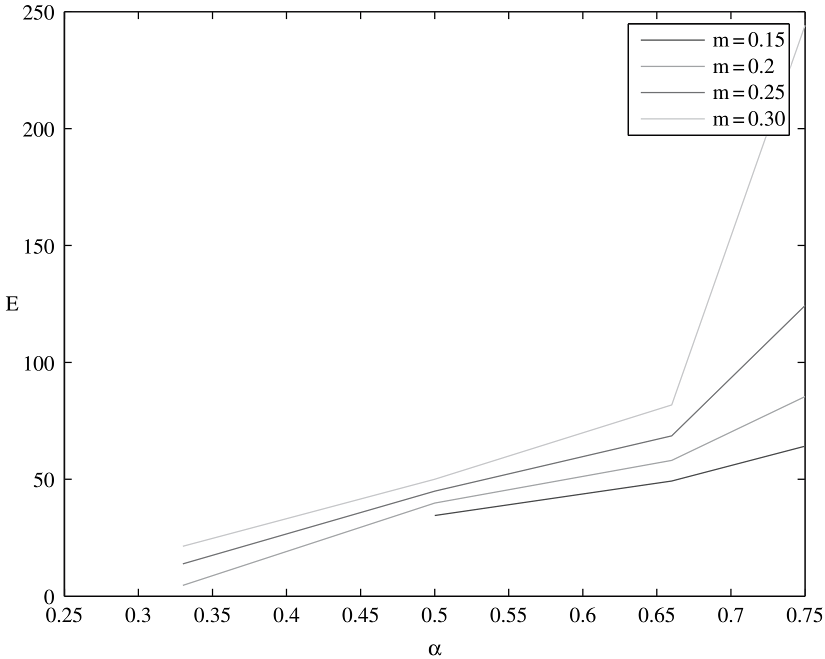

Fig. 6. Equilibrium values of the rooms booked by the Tour Operator (E^*) for different values of the probability of high market demand (α^H) and the Tour Operator mark-up (m)

- if $\alpha^H \geq 0.65$ then there is a negative correlation among E^* and d^*, i.e. above a certain threshold value of the probability of high demand α^H, it is sufficient a lower discount rate to sell more rooms; intuitively, under optimistic expectations about market demand for the Hotel it is profitable to give a lower incentive to the Tour Operator by decreasing the discount rate.

These results confirm the analytical solution of the Free Sale model, according to which there exists a threshold value $\alpha^H = \frac{c}{m+c} \cong 0.65$ which yields the corresponding "qualitative" conclusions about the Free Sale contract (cases of full insurance, partial insurance or non-insurance).

Finally, like in the previous Allotment model simulation, we fix the probability of high market demand at the value $\alpha^H = 0.5$ (therefore $\alpha^H < 0.65$), i.e. the case of perfect uncertainty and partial insurance, and we observe how the equilibrium values of the two decision variables E^* and d^* change for different values of the exogenous parameters m

(Tour Operator mark-up) and of c (Hotel marginal cost). In this way we obtain the following graphs, which plot c and m against d^* (Fig. 7) and against E^* (Fig. 8).

From this simulation we observe that if Tour Operator mark-up m increases, then in equilibrium it happens that:

- the discount rate d increases for low values of m ($m \leq 0.5$)[62], while d decreases for high values of m ($m \geq 0.5$)[63];

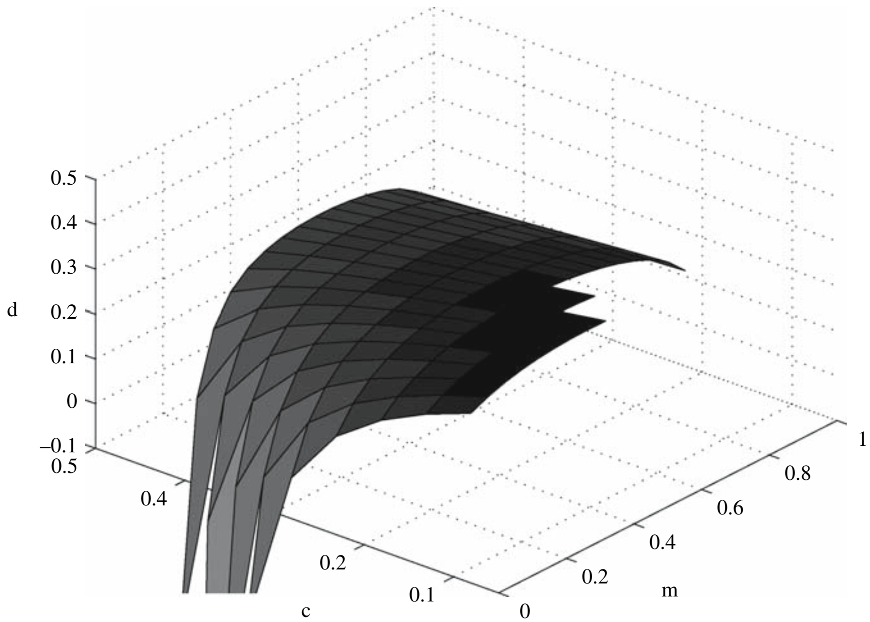

Fig. 7. Equilibrium values of the discount rate (d^*) for different values of the Hotel marginal cost (c) and the Tour Operator mark-up (m)

[62] Intuitively, if the Tour Operator degree of monopoly power increases, but anyway its mark-up is low in absolute terms, it becomes more profitable to reduce its final selling price P^s and it can therefore afford only a higher discount given by the Hotel. In other words, Tour Operator profit will be higher with the strategy "low price P^s (high E)-high discount rate d" rather than with the strategy "high price P^s (low E)-low discount rate d". This result is also due to the assumption that the Tour Operator does not charge the mark-up on full costs but fully gets the discount given by the Hotel. Therefore in this case the Tour Operator prefers to reduce its final selling price to increase both the number of sold rooms and the total discount received from the Hotel.

[63] Intuitively, if the degree of monopoly power of the Tour Operator is very high, for the Tour Operator it becomes more profitable to rise its final selling price P^s and it can therefore afford a lower discount given by the Hotel. In other words,

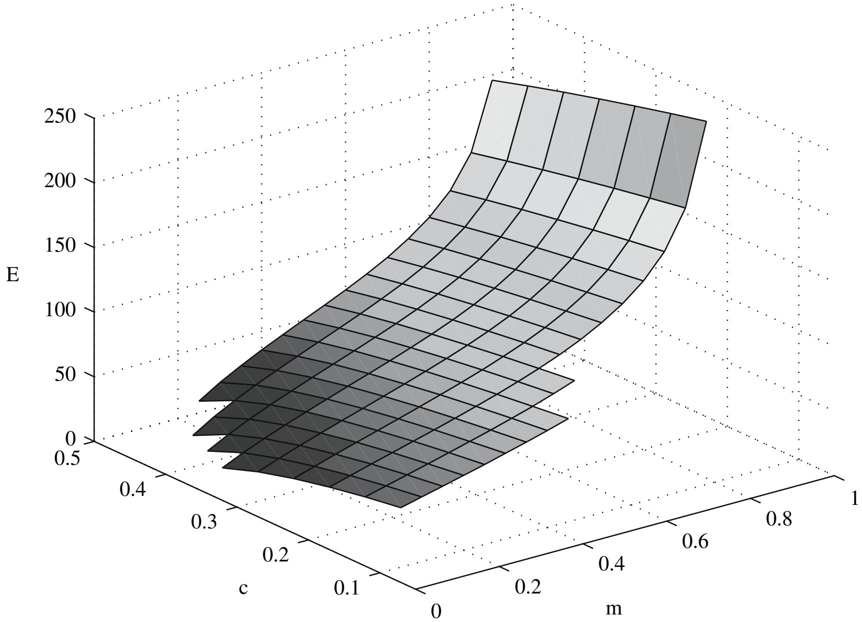

Fig. 8. Equilibrium values of the rooms booked by the Tour Operator (E^*) for different values of the Hotel marginal cost (c) and the Tour Operator mark-up (m)

- the number of booked rooms E increases[64], i.e. for the Tour Operator it becomes more profitable to rise its final selling price P^s and therefore to supply, and hence to book, a higher number of rooms.

If instead the Hotel marginal cost c increases, then in equilibrium it happens that:

- the discount rate d decreases, i.e. if the Hotel has higher costs, it can accept only a contract with a lower discount for the Tour Operator;
- the number of booked rooms E decreases[65], consistently with the previous result, i.e. since its purchase price P^a will rise, for the Tour

the Tour Operator profit will be higher with the strategy "high price P^s (low E)-low discount rate d" rather than with the strategy "low price P^s (high E)-high discount rate d". Therefore in this particular case the Tour Operator prefers to rise its final selling price even at the expense of a lower number of sold rooms.

[64] Once again, this result is consistent with the stylized facts that usually the supply curve has a positive slope.

[65] Once again, this last result is consistent with the stylized facts that usually the demand curve has a negative slope.

Operator it becomes more profitable to demand, and hence to book, a lower number of rooms.[66]

6 Conclusions

In this work our intent was to model Allotment and Free Sale contracts in order to compare and analyze them in terms of their efficiency and Pareto Optimality.

From the analytical solution of the two models we have shown that the exchange and the level of the two contractual variables, the price (o for the Allotment contract and d for the Free Sale contract) and the number of booked rooms (E for both the contracts), depend mainly on three factors: (i) the degree of risk-aversion for the two agents; (ii) the probability they assign to the different stochastic events (high or low market demand); and (iii) their bargaining power.

We have seen that the two contracts are consistent with the main stylized facts observable in the tourism market. The Allotment contract takes the form of an options contract (risk-sharing agreement) between two risk-averse agents, while the Free Sale contract takes the form of an insurance contract (risk-transfer transaction) between a risk-neutral agent and a risk-averse agent.

Through a comparative analysis in terms of contract efficiency, we can affirm that both contracts are not completely Pareto Optimal because the solutions obtained from the models are individually efficient (i.e. we have an "efficient contract") but not socially efficient or Pareto Optimal (i.e. we do not have an "optimal contract"). In fact, the general solutions obtained from the two models do not satisfy the corresponding conditions for the Pareto Optimality in a framework of risk allocation between two risk-averse agents (for the Allotment contract) or between a risk-neutral agent and a risk-averse agent (for the Free Sale contract). Therefore, both cases lead to a sub-optimal contract, though efficient for the agents.

[66] From the Hotel standpoint, it becomes more profitable to sell to the Tour Operator a lower number of rooms compared to the opposite choice. Intuitively, this result is correct only if, marginal costs being equal, the Hotel expected profit in the case of low market demand ("low sales") is higher than the expected profit in the case of high market demand ("high sales"), given the lower total discount d granted in the case of "low sales". In other words, it can be shown that Hotel profit will be higher with the strategy "low sales-low discount" rather than with the strategy "high sales-high discount" only if the total discount dE dominates the total cost cE.

Nevertheless, the Pareto Optimal Solutions, i.e. "optimal risk sharing" rule (13) and "optimal risk allocation" rule (23), depend on: (i) the probability α^H (or, analogously, $\alpha^L = 1 - \alpha^H$) assigned to the future market demand and (ii) the value of the exogenous parameters m (Tour Operator mark-up) and c (Hotel unit cost). In fact, both types of contracts share the same Pareto Optimal Condition for a full insurance (rather than a partial insurance): $\alpha^H <=> \frac{c}{m+c}$.

Precisely, only when $\alpha^H = \frac{c}{m+c}$, does (i) $MRS_{TO} = MRS_h = 1$ meaning the Allotment contract is optimal, therefore it is optimal both for the Tour Operator and the Hotel to fully insure each other and (ii) $MRS_h = 1$ meaning the Free Sale contract is optimal, therefore it is optimal for the Tour Operator to fully insure the Hotel.

On the contrary, for both types of contracts, when $\alpha^H \neq \frac{c}{m+c}$, then we only have the conditions for the optimality of a partial insurance. Moreover, if $\alpha^H > \frac{c}{m+c}$ in the Free Sale contract, the contract is no longer profitable for the Tour Operator.

This result is especially important because it shows that the two contracts have a common threshold value (16 and 25) which is independent from the specification of the utility functions for the two agents, i.e. from their different risk-aversion degrees, and independent from both the different legal characteristics and natures of the contracts.

Starting with the optimal decision rules we have shown, through a numerical simulation, how the "optimal contract"[67] changes if we consider a change in the exogenous parameters. The numerical simulation of the Allotment model shows the following results:

- there is a positive correlation between the equilibrium values of the decision variables E^* and o^*, which is consistent with the stylized fact that a higher option price usually corresponds to a higher number of booked rooms (and vice versa);
- an increase of Tour Operator mark-up m leads to an increase of the option price o and of the number of booked rooms E[68]; this result shows how a change in Tour Operator degree of monopoly power can influence the equilibrium (in a framework of imperfect competition market);

[67] We recall that the optimal contract is given by the equilibrium values of the decision variables E (number of booked rooms) and o (option price), for the Allotment contract, or d (discount rate), for the Free Sale contract.

[68] This result is due to the fact that for the Tour Operator it becomes more profitable to rise its final selling price P^s and therefore to supply, and hence to book, a higher number of rooms.

- an increase of the Hotel marginal cost c leads to an increase of the option price o and to a decrease of the number of booked rooms E; this result shows the importance of cost analysis.

The numerical simulation of the Free Sale model shows the following results:

- confirmation that if the probability of high demand α^H is below a certain minimum threshold (only if $\alpha^H < \frac{c}{m+c}$) or if the probability of low demand is above a certain maximum threshold, then the equilibrium values of the discount rate d and of the number of booked rooms E are positively correlated. Therefore, there are favourable conditions for partial insurance (only if $\alpha^H = \frac{c}{m+c}$, then a full coverage insurance contract for the Hotel is feasible)[69];
- an increase of Tour Operator mark-up m leads to an increase of the number of booked rooms E; this result shows how the market power can influence the demand choices of the Tour Operator;
- an increase of the Hotel marginal cost c leads to a decrease of the discount rate d and of the number of booked rooms E; this result shows how the cost parameter can influence the supply choices of the Hotel.[70]

Our conclusion argues that there are several potential causes for the contracts not being completely Pareto Optimal. In both cases the reason of this Pareto Sub-optimality can be found in the legal specifications of the contracts (i.e. terms and clauses) or in the economic specification of our models. In our opinion, these factors could not be sufficient incentive for the agents to behave optimally.

In the Allotment contract one possible cause could be the specification of option price o, while in the Free Sale contract it could be the specification of discount rate d. Moreover, this inefficiency may result from the two different objectives mixed into Allotment

[69] This result confirms the stylized fact that if the Tour Operator books a higher number of rooms it can obtain a higher discount from the Hotel (and vice versa), and it shows that the realization of the exchange depends on the probability of the favorable event α^H or, analogously, on the probability of the adverse event $\alpha^L = 1 - \alpha^H$ (because if $\alpha^H > \frac{c}{m+c}$ then the possibility of insuring a risk-averse Hotel is not even proposed by the Tour Operator).

[70] In fact, from the Hotel standpoint we have seen that the strategy to sell to the Tour Operator a lower number of rooms and to give a lower discount, is more profitable only in the case the total discount granted dominates the total cost sustained. In other words, an efficient Hotel (i.e. with lower marginal production costs) can obtain better contractual conditions.

and Free Sale contracts, i.e. profit maximization and risk allocation. As a consequence, it may be possible to modify the contracts in order to limit, or remove, their inefficiencies.[71]

Another assumption that could mitigate the two contracts inefficiencies is the possibility for the Tour Operator to negotiate with more than one Hotel.[72] This strategy would allow the Tour Operator to both diversify the risk and eliminate the single Hotel capacity constraint.

Analyzing the effect of the different degrees of risk-aversion for the agents[73] or of the different trends in Tour Operator mark-up[74] on the optimal contractual choices (in particular the choice between full and partial insurance) could also lead to different results. Furthermore, it would be interesting to model the case in which Tour Operators and Hotels agree on a contract which is a mix between Free Sale and Allotment contractual clauses.

In conclusion we would like to suggest other possible extensions to our models, such as introducing a certain degree of competition among the Tour Operators[75], assuming a simultaneous uncertainty in prices (market price) and quantities (market demand)[76], analyzing the possibility for the Tour Operator to follow a strategy of vertical integration[77] or applying the "mean-variance model".[78]

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[71] One possible revision could be, for instance, to change the specification of the option price o or of the discount rate d, such that they are function both of booked rooms E and of probability α^H, i.e. $o(E, \alpha^H)$ and $d(E, \alpha^H)$.

[72] In this way, we could relax the assumption of a monopoly market for the Hotels.

[73] A big Hotel, e.g. could be a firm more capable to manage the risk than a little Hotel.

[74] In fact, usually regarding the mark-up we observe a procyclical trend.

[75] By relaxing the assumption of a monopoly market for Tour Operators, the Hotel could look for alternative Tour Operators.

[76] This assumption implies two uncertainty sources for the firms: price risk and demand risk.

[77] Through this strategy, the Tour Operator becomes the owner of the Hotel, with the purpose of reducing the number and the complexity of business relationships established with other firms.

[78] See Candela G. and P. Figini (2003).

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Is Tourism Specialization Sustainable for a Small Island Economy? A Cyclical Perspective

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1 Introduction

While tourism is becoming one of the most important sectors of the world economy, the number of small islands trying to develop a competitive tourism sector is increasing (Logossah, 2004; Shareef, 2003). Observers have to recognize that an important part of these Small Island Tourism Economies (SITE) is successful. Lanza and Pigliaru (2000) showed that seven out of the fifteen fastest growing countries between 1985 and 1995 were tourism countries[3] and that most of them were SITE as St Kitts and Nevis, Antigua and Barbuda or Cyprus. Marques (2003) showed for example a strong correlation between the level of GDP and tourism receipts for the region of the Caribbean.

SITE are said to have some kind of absolute advantage in the production of tourist goods because of their natural endowments, and it implies that tourism is often seen by policy makers as the easiest way out to the "small island problem" (Crusol et al. 1989).

Nonetheless tourism must not be thought of as a panacea, as a study realized by the World Bank and the Commonwealth secretariat pointed out in 2000. In fact, even though tourism provides welfare gains (Copeland, 1991, Nowak, Sahli, 1999, Sinclair 1998) and constitutes a good engine of growth (Hazari and Sgro, 1995, Lanza et al. 2003), it may also generate static and dynamic perverse effects. Recent literature has widely explored negative economic consequences of tourism

[3] More than 30% of GDP stems from tourism.

specialization for small open economies: dependence on foreign capital, inflation, dependance to volatile demand (Sinclair, 1998), labor market disturbances (Nowak, Sahli, Sgro, 2003), Dutch disease effect (Nowak, Sahli, 1999), land competition, low-education trap (Augereau-Veron, Augier, 2003). All these papers emphasize the risk for small open economies specialized in tourism to become rent-based economies (such as petroleum ones) and all associated drawbacks. Tourism specialization seems to be a fruitful strategy in the short run but a competences destroying one in the long term.

The reviewed literature does not focus on what is at stake in our opinion: the deplation of the natural capital. The major part of tourism income relies on the direct or indirect exploitation of SITE's environmental assets. It is well known that island ecosystems are greatly sensitive to human pressure.[4] Sustainability of tourism means in a very naive acception to ensure the preservation of the environment while developing tourism activities. But tourism development may only be achieved if the local economy supplies all the services that visitors deserve in order to enjoy a good experience. Furthermore, the quality of the experience also depends on the availability of natural assets. The problem is that the construction of infrastructures generates damages to the ecosystem.

The aim of this paper is to explore the inter-temporal trade-off between tourism intensive investments and environmental quality preservation needed to ensure population income in the long run. In this perspective, we propose a simple dynamic model of tourism development.

Recent modeling was produced on this subject using a prey-predator framework (Casagrandi, Rinaldi, 1999, 2002; Kort et al. 2002). Both models develop an optimal control framework highlighting two kinds of trajectories.

The first one is a situation in which the number of tourists remains constant over time. A second possible path is given by a cyclical evolution in investments, in the number of tourists, in the pollution stock and in infrastructures inducing different phases in the tourism development and confirming Butler's (1980) lifecycle hypothesis. Tourism development may be sustainable, from the environmental viewpoint, because

[4] Islands usually have typical and fragile ecosystems (lagoons, mountains, rivers, etc.) due to specific and unique climatic, geographical and geological characteristics.

of alternative phases of high and low frequentation that enables the ecosystem to regenerate.

The paper is organized as follows. The first section reviews the environmental drawbacks arising from tourism specialization in a small island and recalls what the Butler's lifecycle hypothesis was. The second presents the model developed by Kort et al. (2002) and Casagrandi and Rinaldi (2002). From the discussion of their results, we can conjecture that an appropriate investment strategy along the lifecycle would prevent the island destination from experiencing a declining phase thanks to environmental regeneration.

The third section describes a model of tourism investments introducing the perceived environmental quality as a state variable. Our model confirms Butler's life cycle hypothesis and shows that even in the absence of external effect, the destination experiences a cycle. We highlight the role of investment decisions on the decline of the number of tourists.

When the perceived environmental quality is decreasing, tourism lobby is incited to disinvest in order to preserve the environment and it explains the cycle.

The last section concludes and opens up further research on differentiation strategies that small islands may implement in order to achieve sustainable development.

2 Environmental Drawbacks and Sustainability of Tourism

Developing a competitive tourism sector implies for a small island the exploitation of its natural rent. Tourism specialization is driven by the high environmental quality of the island as it constitutes an important attraction factor on the world market of tourism. So, tourists will come and visit a small island in order to enjoy its extraordynary landscapes or the great quality of its coastal waters. We have to agree with Punzo and Bimonte (2003) when they define the tourism good as an experience one. The tourist comes in order to experience an unique trip and may come back if his expectations were fulfilled.

Yet, tourism development may be at the basis of the environmental degradation. In order to welcome tourists, an island needs to build lodging infrastructures and the multiplication of such infrastructures generates visual pollution leading to a degradation of the experience.

Furthermore, when infrastructures are abandoned they can be seen as an irreversible damage for the destination.

Then the tourist flow in the island is synonim of an increase in the production of wastes and when it goes over a given threshold the environment is unable to assimilate it.[5] So, the tourist development is going to fragilise the insular ecosystem already known to be especially sensitive.

Developing the lodging capacities and the tourist flow in a few sites will generate an increased environmental pressure. It may lead to irreversible damages such as the destructions of natural habitats and finally the disparition of species from the insular ecosystem. So, tourism development of the island has more or less irreversible harmful effects.

All the stakeholders, from the private sector or representatives of the local community, are aware of these perverse effects.

For the host community, a first possible behaviour is to ignore these effects because people are only interested with short run profits. This may reflect a lack of information which isusually associated with poverty of the local community or simply with the greedy behaviour of firms going away as soon as the natural resource is exhausted.

The second behaviour is much more plausible. All the stakeholders are looking for a sustainable trade-off between tourism exploitation and environmental conservation which is a way to conciliate economic profitability and attractiveness of the island for the tourists in the long run.

Following to the World Tourism Organisation (1995), tourist development is sustainable if it enhances the way of living of the population without damaging the environmental and cultural capital of the destination. But there is no real criterion in order to measure the sustainability of a given development strategy. As said by Hawks and Williams (1993), sustainability is a challenge for the island and it has to increase the lodging capacity and the quality of services without having perverse effects on the environment.

In the island case, it seems that tourism must be seen as sustainable if it is possible in the long run to satisfy an increasing demand, major source of income, without damaging the natural attractions of the island on the tourism market: coastal areas, animal species, unique landscapes, resources in drinkable water.

Then all the problem is to find an equilibrium point between resource exploitation and resource preservation because it is the only way

[5] Think, e.g. of the many plastic bags floating on the water.

to maintain attractiveness over time. This equilibrium has to be found in the evolution of the tourist flow. By observing the evolution of tourist flows in a few destinations Butler (1980) identifies what he calls "a life-cycle of destinations" due to a cyclical evolution of the frequentation. A first plausible cause of the cyclical frequentation is the "crowding effect". As we already said, tourists are looking for the best possible experience but it will be worsen by the arrival of an increasing tourist flow. So from that point, we will have a fall in the number of tourists because the tourist flow is "destroying" the destination (see Fig. 1).

A second cause we think of is the declining environmental quality of the destination. Recent literature explains the different phases in the lifecycle by the interaction between infrastructures investments and pollution.

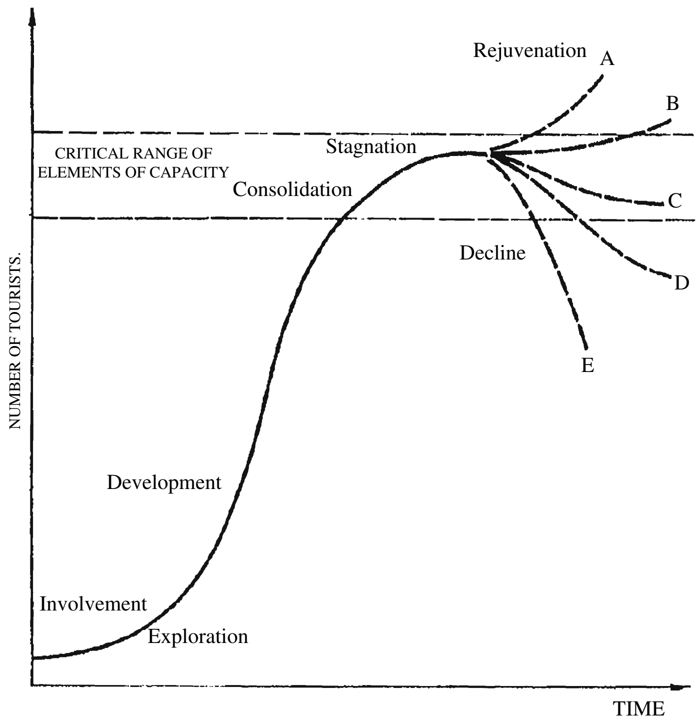

Fig. 1. The lifecycle of destinations
Source: Butler (1980)

3 Tourism Sustainability: A Lobby Profit Perspective

Theoretical models of tourism sustainability have been recently produced (Casagrandi, Rinaldi, 1999, 2002; Greiner et al. 2001; Kort et al. 2002; Candela and Cellini, 2004) following the prey-predator general background. They focus on the intertemporal trade-off between tourism investments (I) in infrastructures and preservation of natural capital that are both at the basis of the tourism attractiveness of the destination.

The purpose is to determine the optimal development of tourism (i.e. tourism infrastructures) taking into account that i) more infrastructures attract more tourists but increase directly and indirectly the stock of pollution ii) tourists are both pollution and frequentation adverse.

We test here the capability of this kind of models to be applied to our island perspective.

The local tourism lobby is assumed to maximise the intertemporal profit extracted from tourism specialization knowing that each tourist pays its journey at a given price p. It is assumed that perfect competition prevails on international tourism market and then that the destination cannot influence the price of a journey.

Tourist lobby has to support three kinds of costs:

- costs relative to infrastructures investments increasing with I (c(I)),
- maintenance infrastrucures costs and associated services costs (k_1 et k_2).

Kort et al. (2002) suppose that the number of tourists (T) arriving in the island depends positively on the number and the quality of infrastructures.

Nonetheless, a crowding effect (bT) exists, that affects negatively the number of tourists.

Infrastructures and tourists generate pollution (P) which affects negatively the attractiveness of the place.

Then the tourist lobby decision program may be written as follows:

$$\Pi = \max_{\mathrm{I}} \int_0^\infty e^{-rt} \pi_t dt = \int_0^\infty e^{-rt} \left(pT - c(I) - (k_1 + k_2)S\right) dt$$

subject to[6]

$$\dot{S}(t) = I(t) - \delta S(t),\ S(0) = S_0 > 0$$
$$\dot{T}(t) = a\left(S(t), k_1, P(t)\right) - bT(t),\ T(0) = T_0 > 0$$
$$\dot{P}(t) = \sigma S(t) + \tau T(t) - \alpha\left(P(t)\right),\ P(0) = P_0 > 0.$$

The first constraint reflects the evolution of the infrastructures stock, it means the net investment.

The second relation describes the evolution of tourist frequentation and is simply the difference between tourism attractiveness, $a\left(S(t), k_1, P(t)\right)$, and the crowding effect, bT.

The last differential equation sketching the evolution of the pollution stock needs some comments. σ and τ respectively represent the contribution of an additional unit of infrastructure and an additional tourist to the stock of pollution. α(P) is the absorption capacity of the environment.[7]

Kort et al. (2002) apply the Pontryagin's maximum principle to derive insights on the structure of the optimal trajectory by introducing the current-value Hamiltonian:

$$H(.) = pT - c(I) - (k_1 + k_2)\, S + \lambda_1 \left(I - \delta S\right) + \lambda_2 \left[a\left(S, k_1, P\right) - bT\right]$$
$$+ \lambda_3 \left[\sigma S + \tau T - \alpha\left(P\right)\right]\ .$$

The necessary conditions associated to the Hamiltonian are given by:

$$c'(I) = \lambda_1\ , \tag{1}$$

At time t the marginal of infrastructures is equal to the shadow price of infrastructures.[8]

$$\dot{\lambda}_1 = (r + \delta)\, \lambda_1 + k_1 + k_2 - \lambda_2 a_S(.) - \lambda_3 \sigma \tag{2}$$

$$\dot{\lambda}_2 = (r + b)\, \lambda_2 - p - \lambda_3 \tau \tag{3}$$

$$\dot{\lambda}_3 = \left(r + \alpha'(.)\right) \lambda_3 - \lambda_2 a_P(.) \tag{4}$$

[6] $a_{SS} < 0$, $a_{SP} < 0$, $a_{PP} < 0$ for low values of P, $a_{PP} > 0$ for high values of P.

[7] It is noteworthy that the choice of the functional form of this capacity (linear versus inverted U-shaped) will determine the result obtained.

[8] From the implicit functions theorem, we know that the higher the implicit value of an infrastructure will be the more investment there will be.

Inter-temporal optimality conditions. a_j denotes the derivative of a with respect to the variable j.

Following the authors, we assume a steady-state solution that will authorize a qualitative study of the dynamic of the system using simulations.

The conditions for a steady state to exist are:

$$I\left(\lambda_1^*\right) = \delta S^* \tag{5}$$

$$a\left(S^*, k_1, P^*\right) = bT^* \tag{6}$$

$$\alpha\left(P^*\right) = \sigma S^* + \tau T^* \tag{7}$$

$$\left(r + \delta\right)\lambda_1^* = \lambda_2^* a_S(.) + \lambda_3^* \sigma - k_1 - k_2 \tag{8}$$

$$(\mathrm{r} + \mathrm{b})\,\lambda_2^* = p + \lambda_3^* \tau \tag{9}$$

$$\left(\mathrm{r} + \alpha'(.)\right)\lambda_3^* = \lambda_2^* a_P(.) \tag{10}$$

Equation (5) shows that the optimal investment is a replacement one. Equation (6) recalls that, in equilibrium, attractiveness must exactly offset the crowding effect. Equation (10) shows that the pollution due to infrastructures and tourists arrivals must be totally absorbed by the environment.

Numerical simulations implemented by Kort et al. (2002) show that according to critical values of the discount rate r the described system follows two different evolutions:

– for $\mathrm{r} > \mathrm{r}_{\text{critical}}$, the system converges toward a saddle path equilibrium.[9]
– for $\mathrm{r} < \mathrm{r}_{\text{critical}}$, the system steadily oscillates around the steady-state.[10]

These results corroborate the analysis of Casagrandi and Rinaldi (2002) who identified both trajectories as two special issues of their broader dynamic analysis.

Let us explain the first scenario: the saddle-path means that in the long run the island would converge toward a stationary equilibrium where investments are those just necessary to offset infrastructures depreciation, where the number of tourists is constant over time and where each produced unit of pollution is absorbed by the environment. The conclusion is that the number of tourists is constant in the long run.

[9] For mathematical conditions see Kort et al. (2002).

[10] Briefly speaking, we can say that according to the value of the discount rate a Hopf bifurcation may appear that is a stable limit cycle.

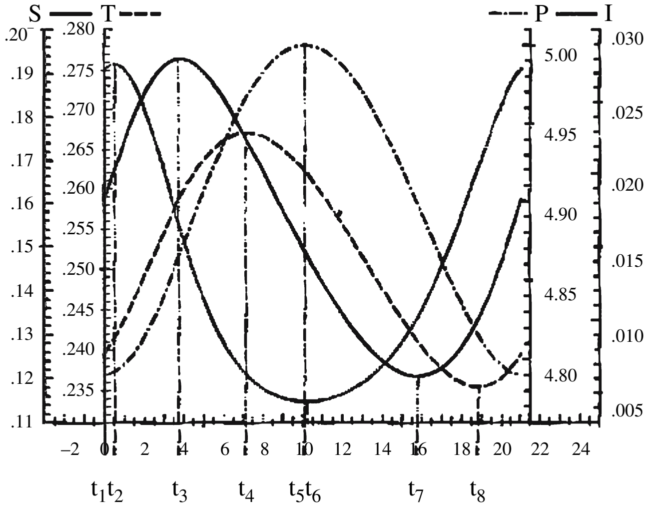

Fig. 2. Evolution of the variables over-time for low values of the discount rate
Source: Kort et al. (2002)

In the second scenario: for low values of the discount rate – that is for weak values of time preferences – a limit cycle appears and the tourism industry profit as well as investments experiment expansion and recession phases as hypothesized by Butler (1980). This scenario is depicted on Fig. 2.

We have yet interpreted this evolution from our island perspective as follows (Giannoni, Maupertuis, 2004). If we consider a small beautiful island, with a very low tourism infrastructures capacity, which decides to implement a tourism specialization strategy, it will experience according to the previous model various stages of development:

– *The prosperity phase*

With initial high endowments in environmental capital and low level of infrastructures, the number of tourists is weak. Additional infrastructures and a clean environment attract more and more tourists. Investment is increasing in order to gain rapidly more and more profit but then infrastructures generate indirect perverse effects. A weak investment is then optimal as the number of tourists keeps on growing.

– *The saturation phase*

The number of tourists reaches a peak as pollution is increasing. A reduction of the tourist flow is needed in order to lower pollution.

– *The declining phase*

There are few tourists in the island and the environment regenerates. The optimal behaviour is to increase again investment in order to welcome tourists again in the future. Cash flow is weak as tourists are few and investments are costly.

– *The recovering phase*

The number of tourists increases as the island is endowed in infrastructures and environment is clean.

We can conjecture from our island perspective that an appropriate investment strategy along the lifecycle would prevent the destination from a declining phase if environment regenerates. Nonetheless, the story described by Kort et al. (2002) is written using very specifical formalizations as a pollution stock depending from an absolute absoption capacity of the ecosystem. Moreover, this model – despite it authorizes to simulate a cyclical scenario – remains unsolved and small variations in parameters give radically different evolutions. Nonetheless, we try to ask for the validity of such a cyclical scenario simplifying the model in order to find a solution. In this perspective we introduce the perceived environmental quality as a state variable instead of a pollution stock.

4 Simple Model of Optimal Investment in Tourism with Environmental Quality

In this section, our aim is to build a simpler optimal investment model than the one built by Kort et al. (2002). It seems to us more suitable to take into account the environmental quality as it is perceived by tourists visiting the island. On that point, we follow recent literature on sustainable tourism (Lanza, 1995; Hernandez, Léon, 2003).

4.1 The Model

We consider, as in Kort et al. (2002), the point of view of a tourist lobby the problem of whom is to maximise the actualised sum of profits that the island will receive over time in selling tourist journeys.

$$\int_0^\infty e^{-\rho t}(\pi) = \int_0^\infty e^{-\rho t}(p_t T_t(S_t, Q_t, p_t) - c(I_t) - d(S_t))dt^{11} \qquad (1')$$

[11] From now on, we will skip the temporal index t.

with: T the number of tourists, S: the number of infrastructures, Q: the perceived quality of the environment c(I): investment cost at time t and d(S): maintenance costs at time t.

We suppose that the price of a journey is exogenously given and constant over time what is consistent with the standard hypotheses of smallness of the island and of perfect competition between destinations.

The profit at time t is increasing with the number of tourists T_t. Profit is decreasing with the cost of investment and with the cost of maintaining infrastructures.

The number of tourists is monotonically increasing with the perceived environmental quality. Reciprocally, if the environment deteriorates too much, the tourists will not be incited to come because of the bad environmental quality.

Further more, the number of infrastructures is increasing with the amount of investment but lower because of their depreciation. And, environmental quality is strictly decreasing with the number of tourists.

In order to solve our model we will use simple functional forms given below.

The number of tourists at time t is given by:

$$T(S,Q,p) = (\alpha S + \beta Q)\, p^{-\varepsilon} \text{ where } \alpha, \beta > 0 \text{ and } \varepsilon \geq 0. \qquad (2')$$

This way to define tourism demand is quite simple and may appear unrealistic. But we assume that demand is iso-elastic in order to make the model more tractable.

Investment cost is defined as: $c(I) = \frac{1}{2} c_1 I^2$ with $c_1 > 0$ (3')

Maintenance costs are given by: $d(S) = c2S$ with $c_2 > 0$ (4')

The flow of infrastructures at t is given by: $\dot{S} = I - \delta S$ with $\delta > 0$ (5')

The variation of environmental quality is given by:

$$\dot{Q} = rQ - \sigma S - \tau T = rQ - \sigma S - \tau\left[(\alpha S + \beta Q)p^{-\varepsilon}\right] \boxed{12} \qquad (6')$$

This formulation needs to be explained. r is a positive parameter reflecting the capacity of the ecosystem to regenerate. To be clear, in

[12] σS denotes the negative effect of an infrastructure on the environment because it exists and $\tau\alpha$S the indirect negative environmental effect of an infrastructure because it attracts more tourists.

the absence of human activity (with T = 0 and S = 0), environmental quality is monotonically increasing at the rate r. As an example, we can think to the evolution of an endemic plant variety. In the absence of tourists, the number of plants will grow at a given rate r, increasing biodiversity, but the presence of tourists is going to limit this growth[13] and finally in the case where $rQ < \sigma S + \tau(\alpha S + \beta Q)$, the quality of the environment is going to decrease.

Finally, the tourism lobby has to solve the following program:

$$\text{Max} \int_0^\infty e^{-\rho t}(p\left[(\alpha S + \beta Q)p^{-\varepsilon}\right] - \frac{1}{2}c_1 I^2 - c_2 S)dt \tag{7'}$$

s.t.

$$\dot{S} = I - \delta S$$

$$\dot{Q} = rQ - \sigma S - \tau\left[(\alpha S + \beta Q)p^{-\varepsilon}\right] \tag{8'}$$

$$\mathrm{S}(0) = \mathrm{S}_0 \geq 0, \mathrm{Q}(0) = \mathrm{Q}_0 \geq 0. \tag{9'}$$

The Hamiltonian of the program is written as follows:

$$H = p\left[(\alpha S + \beta Q)p^{-\varepsilon}\right] - \frac{1}{2}c_1 I^2 - c_2 S + \lambda_1 (I - \delta S) + \lambda_2 \left(rQ - \sigma S - \tau\left[(\alpha S + \beta Q)p^{-\varepsilon}\right]\right). \tag{10'}$$

The first order conditions are:

$$\frac{\partial H}{\partial I} = 0 \Leftrightarrow \lambda_1 = c_1 I \tag{11'}$$

$$\frac{\partial H}{\partial S} = \lambda_1 \rho - \dot{\lambda}_1 \Leftrightarrow \dot{\lambda}_1 = \lambda_1(\delta + \rho) + \lambda_2(\sigma + \tau\alpha p^{-\varepsilon}) + c_2 - p^{(1-\varepsilon)}\alpha \tag{12'}$$

$$\frac{\partial H}{\partial Q} = \lambda_2 \rho - \dot{\lambda}_2 \Leftrightarrow \dot{\lambda}_2 = \lambda_2\left(\tau\beta p^{-\varepsilon} + \rho - r\right) - p^{(1-\varepsilon)}\beta. \tag{13'}$$

From (8'), (9'), (11'), (12'), (13'), we obtain a dynamic system of four linear equations with four unknowns that we solve.[14]

We find that the system is converging toward a steady-state value and that this steady-state is a saddle-point provided that the capacity of the ecosystem to regenerate is low enough ($r < \tau\beta p^{-\varepsilon}$).

[13] Stamping, gathering, ripping off usually practiced by tourists.

[14] See the appendix for the full solution of the model and a numerical simulation of the model.

Steady-state values of the variables are given by:

$$
\begin{aligned}
S^* &= \frac{\left(p^{1-\varepsilon}\alpha - c_2\right)\left(\tau\beta p^{-\varepsilon} + \rho - r\right) - p^{1-\varepsilon}\beta\left(\sigma + \tau\alpha p^{-\varepsilon}\right)}{\left(\tau\beta p^{-\varepsilon} + \rho - r\right)\left(\rho + \delta\right)c_1\delta} \\
Q^* &= \frac{\left(\sigma + \tau\alpha p^{-\varepsilon}\right)\left[\left(p^{1-\varepsilon}\alpha - c_2\right)\left(\tau\beta p^{-\varepsilon} + \rho - r\right) - p^{1-\varepsilon}\beta\left(\sigma + \tau\alpha p^{-\varepsilon}\right)\right]}{\left(r - \tau\beta p^{-\varepsilon}\right)\left(\tau\beta p^{-\varepsilon} + \rho - r\right)\left(\rho + \delta\right)c_1\delta} \\
I^* &= \frac{\left(p^{1-\varepsilon}\alpha - c_2\right)\left(\tau\beta p^{-\varepsilon} + \rho - r\right) - p^{1-\varepsilon}\beta\left(\sigma + \tau\alpha p^{-\varepsilon}\right)}{\left(\tau\beta p^{-\varepsilon} + \rho - r\right)\left(\rho + \delta\right)c_1} \\
\lambda_2^* &= \frac{p^{1-\varepsilon}\beta}{\tau\beta p^{-\varepsilon} + \rho - r} \\
T^* &= p^{-\varepsilon}\left[\alpha S^* + \beta Q^*\right].
\end{aligned}
\tag{14'}
$$

Parameters values are such that the steady-state is economically consistent. It means that $S^* > 0$ and $I^* > 0$.

We observe that:

- In the long run the perceived environmental quality Q^* is negative. It means that in the long run profit may be negative because of the bad environmental quality depending on tourist preferences.
- λ_2^* is the value of a marginal increase in the environmental quality. We can see that $\lambda_2^* > 0$ so that in the long run the preservation of an additional unit of environmental quality increases the profit.

4.2 Economic Interpretation of the Results

We have just shown that our model is asymptotically converging toward a saddle-point stable steady-state value. This implies that we have found in a quite simpler model – and considering environmental quality instead of pollution level – the same qualitative result than Kort et al. (2002). But we cannot identify any limit-cycle because the appearance of such a trajectory is the result in Kort et al. (2002) of non-linear formalisation.

Nonetheless, it is possible to give an economic interpretation of the result in order to understand the mechanism leading, especially in the insular case, to the observance of a cycle.

First, consider an island initially endowed with little infrastructures and a high environmental quality, it may potentially attract lots of tourists but investment is needed in order to develop the lodging capacity.

In that case, the lobby will be incited to invest and the profit will be low (may be negative) but increasing as the number of tourists is also increasing.

Anyway, as the investment cost is growing, the number of infrastructures is increasing at a decreasing rate. Further more, as the number of tourists is increasing the pressure on the ecosystem is also increasing .

Because of the increasing costs and of the increasing environmental pressure, in the long run the lobby will be encouraged to disinvest[15] and then in the long run, only invest to replace obsolete infrastructures.

If the lobby goes on investing in new infrastructures, the result will be a decrease in the environmental quality leading to a dramatic fall in frequentation. But in the meantime the cost of investing and maintaining infrastructures are both increasing. So, in that conditions it is not a rational behaviour to go on investing.

We understand that when the lobby invest, there is an increase in frequentation but as a result of the environmental pressure, we then have a rapid fall in the number of tourists toward the steady-state frequentation, that is a plateau.

In fact, the optimal investment policy of the lobby leads to the observance of a cycle similar to the one described by Butler.

The existence of such a mechanism means that the number of tourists that an island would attract in the long run is constant.

Yet, our analysis also explains what is happening when environmental quality is degraded.

To understand this result, we have to consider that the island has reached a situation characterized by a high number of infrastructures and a poor environmental quality. In such a situation, the number of tourists is declining as the poor environmental quality is taking them away from the island. Then, the lobby is incited to let the number of infrastructures decline in order to save the maintenance costs. So, the island will once more be naturally driven toward the steady-state.

So these two results illustrate the scenario that Butler considered as one of the most plausible, a fall in the number of tourists until it reaches a *plateau*.[16]

As we are concerned about the profits associated with tourism, we ask for the effect of a change in the price of a journey on the previous results. How change in price affects *ceteris paribus* the steady-state

[15] Disinvest means that the net investment is negative.

[16] See trajectory C in Fig. 1 and Figs. 3 and 4.

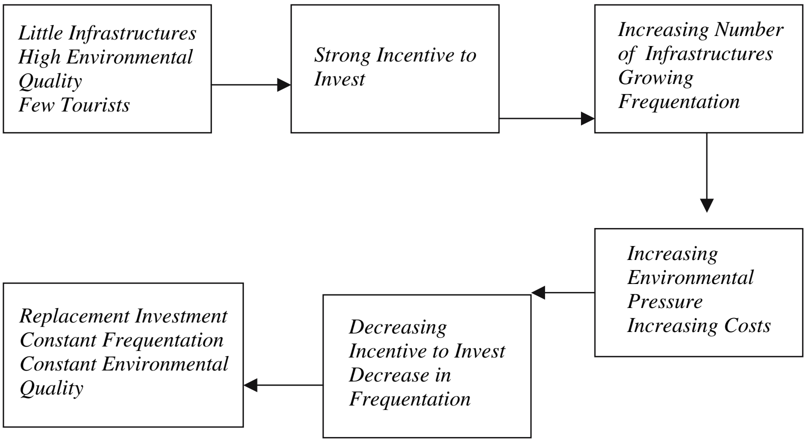

Fig. 3. The developing island case

values of the variables? The effect of an increase in price ceteris paribus is compliant with the standard results of environmental economics. An increase in price leads to a fall in frequentation and as a consequence to an increase in environmental quality in the steady-state. If the decline in the number of tourists is not harmful for the profit, a good policy would be to increase the price of a journey. Of course, a necessary condition is that the island has some kind of market power but we do not explore such a scenario in this paper.

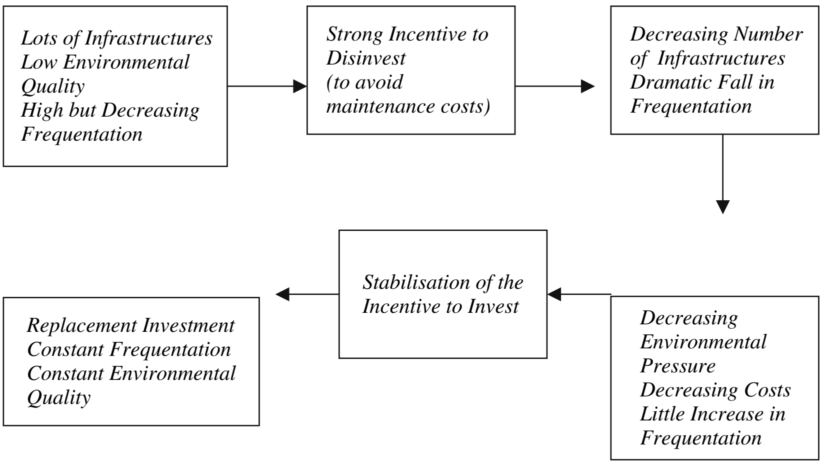

Fig. 4. The over-developed island case

5 Conclusions

The aim of this paper was to explore the inter-temporal trade-off between tourism intensive investment and environmental quality preservation needed to ensure local tourism lobby income in the long run. In this perspective, we proposed a simple dynamic model of tourism investment introducing the environmental quality as a state variable of the dynamic system. Despite limits inherent to the simplicity of the framework, our result confirms the Butler's lifecycle hypothesis. Our specific contribution is to show that even when the agents are aware of the environmental drawbacks of tourism development, the optimal investment policy leads to the observance of a cycle.

To put it differently, even in the absence of external effect, tourism slows down in the long run after a phase of boom.

According to us, the next step of our research is to study the opportunity for an island to differentiate its product. A monopolistic competition framework with several destinations competiting in the tourism industry could be of interest.

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Appendix

A1. Solution of the model

$$\begin{bmatrix}\dot{S}\\ \dot{Q}\\ \dot{\lambda}_1\\ \dot{\lambda}_2\end{bmatrix} = J + \begin{bmatrix}0\\0\\c_2 - p^{1-\varepsilon}\alpha\\ -p^{1-\varepsilon}\beta\end{bmatrix}$$

$$\text{with: } J = \begin{bmatrix}-\delta & 0 & \frac{1}{c_1} & 0\\ -\left(\sigma+\tau\alpha p^{-\varepsilon}\right) & r-\tau\beta p^{-\varepsilon} & 0 & 0\\ 0 & 0 & \rho+\delta & \sigma+\tau\alpha p^{-\varepsilon}\\ 0 & 0 & 0 & \tau\beta p^{-\varepsilon}+\rho-r\end{bmatrix}$$

$$\text{Eigenvalues of J are: } EV = \begin{bmatrix}-\delta\\ r-\tau\beta p^{-\varepsilon}\\ \rho+\delta\\ \tau\beta p^{-\varepsilon}+\rho-r\end{bmatrix}$$

Assuming that $r < \tau\beta p^{-\varepsilon}$ we see that the sign of the eigenvalues alternates. It is enough to say that the optimal path is a saddle.
From that point, the solution of the system is:

$$\begin{bmatrix}S_t\\ Q_t\\ \lambda_{1t}\\ \lambda_{2t}\end{bmatrix} = e^{-\delta t}A_1\begin{bmatrix}\frac{p^\varepsilon r+p^\varepsilon\delta-\beta\tau}{p^\varepsilon\sigma+\alpha\tau}\\ 1\\ 0\\ 0\end{bmatrix} + e^{\left(r-\tau\beta p^{-\varepsilon}\right)t}A_2\begin{bmatrix}0\\1\\0\\0\end{bmatrix}$$

$$+\begin{bmatrix}\frac{\left(p^{1-\varepsilon}\alpha-c_2\right)\left(\tau\beta p^{-\varepsilon}+\rho-r\right)-p^{1-\varepsilon}\beta\left(\sigma+\tau\alpha p^{-\varepsilon}\right)}{(\tau\beta p^{-\varepsilon}+\rho-r)(\rho+\delta)c_1\delta}\\ \frac{\left(\sigma+\tau\alpha p^{-\varepsilon}\right)\left[\left(p^{1-\varepsilon}\alpha-c_2\right)\left(\tau\beta p^{-\varepsilon}+\rho-r\right)-p^{1-\varepsilon}\beta\left(\sigma+\tau\alpha p^{-\varepsilon}\right)\right]}{(r-\tau\beta p^{-\varepsilon})(\tau\beta p^{-\varepsilon}+\rho-r)(\rho+\delta)c_1\delta}\\ \frac{\left(p^{1-\varepsilon}\alpha-c_2\right)\left(\tau\beta p^{-\varepsilon}+\rho-r\right)-p^{1-\varepsilon}\beta\left(\sigma+\tau\alpha p^{-\varepsilon}\right)}{(\tau\beta p^{-\varepsilon}+\rho-r)(\rho+\delta)}\\ \frac{p^{1-\varepsilon}\beta}{\tau\beta p^{-\varepsilon}+\rho-r}\end{bmatrix}$$

where:

$$A_1 = \left[S_0 - \frac{\left(p^{1-\varepsilon}\alpha-c_2\right)\left(\tau\beta p^{-\varepsilon}+\rho-r\right)-p^{1-\varepsilon}\beta\left(\sigma+\tau\alpha p^{-\varepsilon}\right)}{\left(\tau\beta p^{-\varepsilon}+\rho-r\right)\left(\rho+\delta\right)c_1\delta}\right]$$

$$\frac{p^\varepsilon\sigma+\alpha\tau}{p^\varepsilon r+p^\varepsilon\delta-\beta\tau}$$

and

$$A_2 = Q_0 - \frac{\left(\sigma + \tau\alpha p^{-\varepsilon}\right)\left[\left(p^{1-\varepsilon}\alpha - c_2\right)\left(\tau\beta p^{-\varepsilon} + \rho - r\right) - p^{1-\varepsilon}\beta\left(\sigma + \tau\alpha p^{-\varepsilon}\right)\right]}{\left(r - \tau\beta p^{-\varepsilon}\right)\left(\tau\beta p^{-\varepsilon} + \rho - r\right)(\rho + \delta)\, c_1 \delta} - A_1$$

A2. Simulation

In this section of the appendix, we present a simulation of the model for a given set of parameters. The simulation illustrates that the island behaves as predicted by Butler's lifecycle (see Figs. 5 and 6.)

Parameters	α	β	p	ε	σ	τ	R	c_1	c_2	δ	ρ
	50	10	1	1.05	0.05	0.1	10^{-5}	0.1	0.1	0.1	0.03

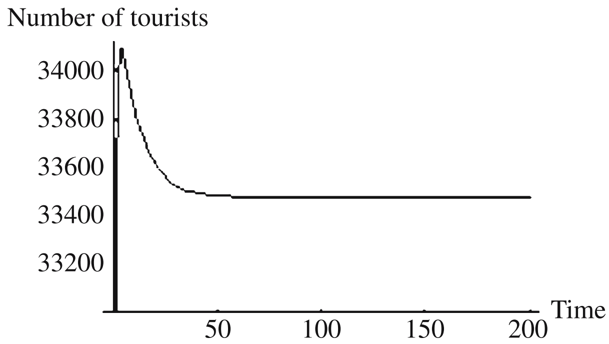

Fig. 5. Simulation results of life cycle model for tourists

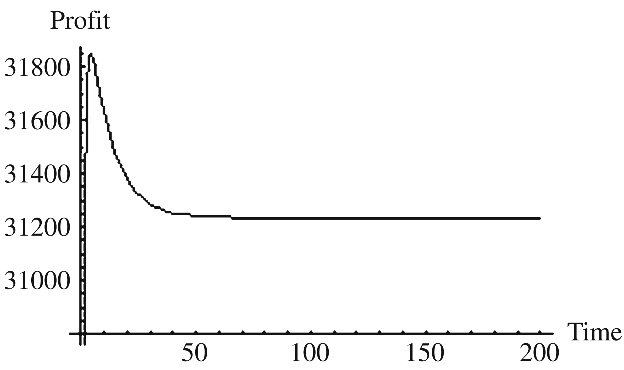

Fig. 6. Simulation results of life cycle model for profit

Efficiency in a Chain of Small Hotels with a Stochastic Production Frontier Model

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1 Introduction

Within the accommodation industry, small hotels have their own specificity that should be taken into account when analyzing their efficiency. Presumably, small hotels preserve traditions while offering a personal service in a welcoming atmosphere. Therefore, it seems fair to assume that the client is more likely to feel like a guest, in the true sense of the word. However, small hotels face an increasingly intense competition generated by medium and large size national and multinational hotel chains. These chains offer standardized architecture, rooms and services, which often result in a sterile, impersonal environment that is not conducive to providing a unique or unforgettable experience. Nonetheless, the key to such chains' success is in concealing their standardization by catering for clients' needs through efficiency and service quality. The large chain hotels, in particular, are more likely to be in highly accessible, central locations and aim to attract key market targets (i.e. business travelers and package tourists) by means of discounts, loyalty inducements and rates negotiated with carriers and tour operators. In contrast, small hotels suffer from their lack of economies of scale and scope which, in turn, affect turnover and profitability. Furthermore, their peripheral location, reliance on passing trade and local advertising, as well as an unclear conception of their clientele and a perceived

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lack of competitive advantage keeps them isolated from the industry at large (Glancey and Pettygrew 1997; Harris and Watkins 1998). Finally, Wanhill (1997) suggests that such additional weaknesses associated with small and medium-sized tourism enterprises as: (i) supply dominated by the family business; (ii) a lack of commercial drive and initiative, owing to non-economic motives for operating in the business; and (iii) limited skills of marketing, quality, assurance, pricing policy, cost control and re-adjustment and a shortage of financial resources, highly affect the efficiency of such enterprises. Consequently, such characteristics should be taken into consideration when analyzing the efficiency of small hotels.

Following Farrell (1957), frontier estimation techniques represent technology by a bounding function that reflects best-practice production; defined in terms of the maximum real output technologically possible to produce given available inputs. In general, there are two types of hotel benchmarking: (1) the internal method, conducted amongst different units of the same chain and adopted by Barros (2004), Barros and Alves (2004) and the present study; and, (2) the external method, based on comparing different enterprises within the same sector and adopted by Anderson et al. (1999a; 1999b; 2000), Morey and Dittman (1995) and Bell and Morey (1995). In addition, there are two scientific methods used to analyze efficiency quantitatively: the econometric stochastic frontier approach and data envelope analysis (DEA). Both methods have their advantages and drawbacks. Unlike the econometric stochastic frontier approach, DEA permits the use of multiple inputs and output, and does not impose any functional form on the data nor does it make distributional assumptions for the inefficiency term. However, both methods assume that the production function of the fully efficient decision unit is known; in practice, this is not the case as the efficient isoquant must be estimated from the sample data. Under these conditions, the frontier is, therefore, relative to the sample considered in the analysis. The econometric stochastic frontier also presents some important advantages, such as a number of well-developed statistical tests to investigate the validity of the model specification – tests of significance for the inclusion or exclusion of factors, or for the functional form. The accuracy of this hypothesis, however, depends to some extent on the assumption of the normality of errors, which is not all times fulfilled. Another advantage of the econometric frontier is that if a variable which is not relevant is included, it will have a low or even zero weighting in the calculation of the efficiency scores; so, its impact is likely to be negligible. This is an important difference from DEA, in which the weights for a variable are usually unconstrained. A third advantage is that it allows the decomposition of deviations from efficient levels between "noise" (or stochastic shocks) and pure inefficiency, whereas the DEA classifies the whole deviation as inefficiency.

In this paper, we undertake a benchmarking exercise of a Portuguese hotel chain comprised of small size hotels, in order to estimate the efficiency scores at the econometric production frontier. Frontier models have been applied in the study of tourism by Anderson et al. (1999a; 1999b; 2000), Morey and Dittman (1995) and, Bell and Morey (1995), to measure efficiency and enforce organizational arrangements that minimize costs. This paper contributes to the extant literature on small hotels by estimating a production function for a sample of small hotels, whereas previous research using frontier models does not consider small hotels, nor does it analyze production frontiers. The adequacy of production functions is derived from the competitive nature of the market in which the hotels operate (Khumbhakar 1987), whilst cost models are more appropriate for oligopolistic markets. In addition, this paper contributes to tourism research by estimating a production function allowing for contextual characteristics in a simultaneous two-stage procedure (Battese and Coelli 1995); this stands in contrast to previous research, in which the analysis of contextual variables relied on DEA or on econometric cost functions (Anderson, Fish, Xia and Michello 1999). Finally, the motivation for this research stems from the need to understand specific aspects of small hotel efficiency, which differentiate it from generic efficiency analysis according to the literature (Wanhill 1997).

2 Contextual Setting

In 1998, tourism in Portugal accounted for 1.1% of the total global tourism while its neighbor, Spain, accounted for 6.7% (see The Financial Times Survey on Portugal, 21 October 2002). This small value for tourism in Portugal at global level stands in sharp contrast to the significance of the tourist industry at the national level, where the industry represents an estimated 5% of the GDP, with Spanish demand accounting each year for over 60% of total demand (Matias 2004).

Considering the national level significance for Portugal of its tourist industry the case for addressing issues of efficiency within its hotel industry builds almost for itself, particularly on what concerns small hotels which, as a result of low (or rather absent) economies of scale, face a lack of competitive advantage. In addition, small hotels cater to discerning tourists who seek in their Portuguese experience an atmosphere far removed from what is offered by the large international hotel chains (Santos 2004).

The small hotels analyzed in this paper are managed by a holding company named Enatur. These hotels have various characteristics which distinguish them from other chains, associations or forms of accommodation available in the Portuguese market. The primary distinction is that the chain, indeed, the particular category of hotel, was created by the Portuguese state, but has recently been partially privatized.

The concept behind the Enatur hotels, the first of which opened in 1942, is to provide comfortable, rustic, genuinely Portuguese lodging in locations of outstanding historic or scenic merit, while restoring and preserving Portuguese cultural, historic and architectural heritage. The cuisine at all of today's forty-four hotels highlights traditional dishes and wines of the regions in which they are situated. The hotels are found outside densely populated dimensions and stand apart from the mass-tourism destinations. Each has its own unique characteristics, ranging from the moderate to the luxurious, and with a limited number of rooms (the smallest has only nine rooms and the largest has fifty-one). Enatur has developed two branches of the hotel chain: the historic and the regional. The 15 historic hotels are situated in carefully restored monuments, mainly castles, monasteries and convents, adapted to the needs of the modern hotel industry. The 28 regional hotels are purpose-built with its architecture respectfully blending into the local environment, in locations of great natural beauty or historic interest. The most recent hotel to be constructed opened to guests in 2002, so that there is no data available yet. However, since this is being operated under franchising, and therefore breaking with tradition, it will not be analyzed in this study.

Summarizing, these small Portuguese hotels are not necessarily on par with the best or the most comfortable hotels nor with those which offer a complete range of services; however, they possess their own identity, catering for the discerning tourist who seeks a memorable experience and atmosphere which is far removed from what is offered by the large international hotel chains in Portugal. Some characteristics of the Enatur hotels analyzed are represented in Table 1.

The hotel chain is dispersed throughout the whole of mainland Portugal; the clientele breakdown for 1999 shows that 49% of the guests were Portuguese and 51% were international. Among the latter, the strongest representation (17.2%) was from Germany, followed by the USA with 15.7%, then the UK with 10.4%. As a public enterprise committed to the restoration and conservation of Portuguese heritage, as well as the promotion of tourism, Enatur is confronted with conflicting objectives. The hotels are small, with small scale economies and a high level of debt due to the high cost of restoring and modernizing buildings sometimes hundreds of years old. Moreover, they are dispersed

Table 1. Characteristics of the hotel sample used in the analysis, 2001

Location	Rooms	Classification (Historic or Regional)	Location (coast=1, interior=0)	Dimension (square meters)
Condeixa	44	R	0	1393
Sagres	39	R	1	1959
Santiago do Cacém-Quinta da Ortiga	13	R	1	2347
Bragança	28	R	0	1632
Viana do Castelo	48	R	0	1778
Évora	32	H	0	2622
São Brás de Alportel	33	R	0	1089
Arraiolos	32	H	0	3495
Murtosa	19	R	0	600
Manteigas	21	R	0	644
Gerês	29	R	0	970
Alcácer do Sal	35	H	1	3009
Crato	24	H	0	3214
Guimarães-Santa Marinha	51	H	1	3804
Vila Nova de Cerveira	28	H	1	2632
Queluz	26	H	1	1245
Beja	35	H	0	3120
Serpa	18	R	0	1019
Batalha	21	R	1	1068
Marvão	29	R	0	1181
Torrão	14	R	0	768
Alijó	21	R	0	754
Vila Viçosa	36	H	0	3904
Santiago do Cacém-São Tiago	9	R	1	616

Table 1. (Cont.)

Location	Rooms	Classification (Historic or Regional)	Location (coast=1, interior=0)	Dimension (square meters)
Óbidos	9	H	1	583
Santa Clara a Velha	19	R	1	841
Monsanto	10	R	0	344
Alvito	20	H	0	1809
Guimarães-Nossa Senhora da Oliveira	16	R	1	392
Sousel	32	R	0	3170
Palmela	28	H	0	1881
Caramulo	12	R	0	726
Miranda do Douro	12	R	0	820
Póvoa das Quartas	16	R	0	1386
Estremoz	33	H	0	2070
Elvas	25	R	0	1600
Ourém	30	R	0	1000
Setúbal	16	H	1	2077
Marão	15	R	0	704
Valênça do Minho	18	R	0	992
Amares	32	H	0	1663
Castelo de Bode	25	R	0	1138
Almeida	21	R	0	1331
Mean value	25	–	–	1.614

Source: Enatur's Control Reports from 1999 to 2001

throughout the country, and in some cases situated in destinations where there is no other tourist infrastructure. Such characteristics must be taken into account when analyzing factors which affect the performance of the chain.

3 Literature Review

Extant analysis of hotel efficiency is restricted to a small number of studies. Among the earliest studies, we cite Baker and Riley (1994) who suggest the use of ratios to analyze the performance of the lodging industry, Wejeysinghe (1993) who suggests the use of break-even analysis to analyze the effectiveness of tourism management, and Brotherton and Mooney (1992), as well as Donaghy (1995), who suggest yield management to analyze the efficiency of hotel management. Among papers adopting more contemporary techniques we may find Bell and Morey (1995), who studied 31 travel departments with the help of DEA, by estimating their efficiency ratios. They used four inputs: (1) actual levels of support costs (fees, labor, space, technology, etc.), (2) actual levels of expenditure on travel (hotel, flight, and car rental charges), (3) level of environmental factors (means of negotiating discounts, percentage of trips with commuter flights required) and (4) nominal levels of other expenditures. They chose as outputs the level of service provided (excellent and average).

Anderson et al. (1999b) dissected the efficiency of 31 travel management departments, with the use of DEA and a stochastic frontier. They operated nine inputs: (1) fee expenditure, (2) car expenditure, (3) technology costs, (4) labor expenditure, (5) hotel expenditure, (6) hourly labor costs, (7) part-time labor costs, (8) total air travel expenditure, and (9) building and occupancy expenditure. They defined output by the number of trips. To convert inputs into prices, they divided the three following input categories by the number of trips. To estimate the price of labor, they divided labor expenditure by the number of trips. To assess the price of travel, they divided travel expenditure by the number of trips. To reckon the price of capital, they divided capital expenditure by the number of trips.

Other papers analyzing hotel efficiency are: Morey and Dittman (1995), who analyzed 54 USA hotels with a DEA model. The outputs adopted were room division expenditure, energy costs, salaries, non-salary expenditures, salaries and related expenditure for advertising, fixed market expenditure for administrative work. The inputs adopted were total revenue, level of service delivered, market share and the rate of growth. Johns, Howcroft and Drake (1997), who analyzed 15 UK hotels with DEA. The inputs used were number of room nights available, total labour hours, total food and beverage costs and total utilities costs. The output used were the number of room nights sold, total covers served and total beverage revenue.

More in line with the present research, Anderson, Fish, Xia and Michello (1999) analyzed 48 USA hotels with a stochastic production translog frontier. Total revenue is regressed in the prices and inputs. The prices were the price of labor proxied by the hotel revenue per full-time equivalent employee, room price proxied by the hotel revenue by the product of the number of rooms times the occupancy rate and day per year, and the price of gamming, food beverage and other expenses proxied as the percentage of total revenue. The inputs were the number of full-time equivalent employees, number of rooms, total gaming-related expenditures, total food and beverage expenses and other expenses.

Anderson, Fok and Scott (2000), applied a DEA technical and allocative model to 48 USA hotels. The inputs used were the full-time equivalent employees, the number of rooms, total gaming-related expenses, total food and leverage expenses and other expenses. The outputs used were total revenue and other revenue. The prices used were wages proxied by the hotel revenue per full time employee, the rooms price proxied by the hotel revenue divided by the product of rooms times occupancy rates and day per year.

Brown and Ragsdale (2002), analyzed the efficiency of 48 USA hotels with a DEA-CCR model and a cluster analysis. The data were individual questionnaire data. The inputs used were the median price, problems (defined in a 4-point scale), service quality, upkeep, hotels and rooms. The outputs were satisfaction value (defined on a 100-point scale) and value (defined in a 5-point scale).

Hwang and Chang (2003), who analyzed the efficiency of 45 Taiwan hotels with three DEA models (CCR, super-efficiency model and Malmquist model). The inputs used were the number of full-time employees, total number of guestrooms, total dimension of meal department and operating expenses.

Reynolds (2003) who analyzed the efficiency of 38 USA restaurants. The inputs used were front-of -the-house hours worked per day during lunchtime, front-of–the-hours worked during dinner per day, average wages. Uncontrollable inputs were used, namely, number of competitors with a two-mile radius and the seating capacity. The outputs were sales and consumer satisfaction.

Barros and Alves (2004), who analyzed 42 Portuguese small hotels with a DEA-Malmquist index. The inputs used were full-time workers, cost of labour, book value of property, operating costs and external costs. The outputs were sales, number of guests, night spent in the hotel.

Barros (2004), analyzed the same hotels with a stochastic Cobb-Douglas cost frontier model. The operational cost was regressed in prices and outputs. The prices were the value of sales and the number of nights slept. The input prices were the price of labour, price of capital and price of food. Chiang, Tsai and Wang (2004) analyzed 25 Taipei hotels with two DEA models (CCR and the BCC model); Barros and Mascarenhas (2005) analyzed 43 Portuguese small hotels with a DEA-Allocative model; Barros (2005A and 2006) analyzed the efficiency of Portuguese hotels with various efficient methods.

We verify that the research using frontier models applied to tourism is enlarging and encompassing the traditional models used in this methodological issue. When comparing this research with that undertaken in other fields, it should be considered that this is one of the main fields in economics in which frontier models have been applied, with such diverse methods that range from DEA to econometrics, thereby revealing openness to different approaches that we do not see in other fields.

The general conclusion that emerges from the research described above is that dimensions are important (Anderson, Fish, Xia and Michello 1999), that location is also important (Anderson, Lewis and Parker 1999) and that public ownership seems to constitute a significant disadvantage in relation to efficiency (Barros, 2004, 2005a). Moreover, action intended to improve the rate of total productivity growth is to be welcomed, as long as it is focused on capital accumulation and the rate of innovation to shift the frontier of technology, i.e. technical change (Barros and Alves, 2004). Price efficiency is also a major issue (Barros and Mascarenhas, 2005; Anderson, Fok and Scott, 2000). Finally, quality perception is important (Brown and Ragsdale, 2002).

What are the policy implications of these reviewed studies? They vary, but in general they propose policies to overcome the identified inefficiency. When compared with other research fields, this bibliography is, in our view, clearly brief for such an important issue in the tourism market context. With the present paper, we seek to enlarge the economics of tourism in this specific respect and to call the attention of other tourism researchers to this neglected aspect of tourism management.

4 Measuring Productive Efficiency

This paper adopts the stochastic production econometric frontier approach. The frontier approach, first proposed by Farrell (1957) and based on cost functions, came to prominence in the late 1970s as a result of the work of Aigner, Lovell and Schmidt (1977), Battese and Corra (1977) and Meeusen and Van den Broeck (1977). The adequacy of cost or production function depends on the environment in which the units analyzed exist. In an environment in which the ultimate objective is to maximize sales and profits, the producers face exogenously determined input and output prices and attempt to allocate inputs and outputs so as to maximize sales. We assume that this is the main strategy in hotels and, therefore, adopt the production econometric frontier. Frontier models with production function are common in banking, but rare in other literature. In a production frontier, the units on the frontier are efficient and the units below it are inefficient. The zone above the frontier is unattainable, since the most production-efficient unit is on the frontier. For reading purposes, frontier models normalize the efficient scores in order for them to be equal to one for the best performing hotels and less than one for the inefficient frontier. The econometric frontier estimates the units above the frontier econometrically and measures the difference between the inefficient units and the frontier by the residuals. This is an intuitive approach. However, when we assume that the residuals have two components (noise and inefficiency), we have the stochastic frontier model. Therefore, the main issue in econometric frontier models is the decomposition of the error terms.

The general frontier production function, dual to the cost function proposed by Aigner et al. (1977) and Meeusen and Van den Broeck (1977), is the following:

$$Y_{nt} = Y(X_{\text{int}}).e^{\varepsilon} \qquad \text{i, j} = 1, 2, \ldots \text{N; t} = 1, 2, \ldots \text{N}. \qquad \varepsilon_{nt} = V_{nt} - U_{nt}\,, \tag{1}$$

where Y_{nt} represents a scalar production (sales) of the n-th hotel in the t-th period; X_{int} is a vector of ith-input measurements (labour and capital) of the n-th hotel in the period t. ε is the error term. The error term is composed of V_{nt} which the traditional error term of econometric models assumed to be independently and identically distributed, which represents the effect of random shocks (noise) and is independent of U_{nt}. The inefficient term U_{nt} represents technical inefficiencies and is assumed to be positive and distributed normally with zero mean and variance σ_U^2. The U_{nt} positive disturbance is reflected in a half-normal independent distribution truncated at zero, $N(U_{nt,}\sigma_U^2)$, signifying that each hotel's production must lie on or above its cost frontier, as well as above the level of one. This implies that the two effects, the V effect, which is a random shock, and the U effect, which is a management shock controlled by the office, cause any deviation from the frontier. The mean inefficiency of the technical efficiency effects model, in Coelli et al. (1998) is a deterministic function of p explanatory variables:

$$U_{nt} = z_{nt}\delta\,, \tag{2}$$

where δ is a $p \times 1$ vector of parameters to be estimated. Following Battese and Corra (1977), the total variance is defined as $\sigma^2 = \sigma_V^2 + \sigma_U^2$. The contribution of the error term to the total variation is as follows: $\sigma_V^2 = \sigma^2/(1+\lambda^2)$. The contribution of the inefficient term is as follows: $\sigma_U^2 = \sigma^2\lambda^2/(1+\lambda^2)$, where σ_V^2 is the variance of the error term V, σ_U^2 is the variance of the inefficient term U, and λ is defined as $\lambda = \frac{\sigma_U}{\sigma_V}$, providing an indication of the relative contribution of U and V to ε.

The inefficiencies in U_{nt} in (1) can be specified as:

$$U_{nt} = Z_{nt}\delta + W_{nt}\,, \tag{3}$$

where W_{nt} is defined by the truncation of the normal distribution with mean zero and variance σ^2. Using this parameterization, a test can be run to determine whether the estimated frontier is actually stochastic; $\lambda = 0$ implies that the variance associated with the one-sided (efficiency) errors, σ_U^2, is zero, meaning that these deviations from the frontier are better represented as fixed effects in the production function. Therefore, a test of the null hypothesis that $\lambda = 0$ against the alternative hypothesis that λ is positive is used to test whether deviations from the frontier are stochastic and whether one should proceed with the estimation of parameters related to the sources of inefficiency within the context of a stochastic production frontier. Failure to reject the null hypothesis suggests that the determinants of inefficiency, Z_{it} should be included in the cost function. The parameters of the model (β, δ, σ and λ) are estimated using the maximum-likelihood estimator; the likelihood function can be found in Battese and Coelli (1988). Thus, the technical inefficiency of the i-th club at time t is:

$$TE_{nt} = ex(-U_{nt}) = \exp(-z_{nt}\delta - W_{nt})\,. \tag{4}$$

The conditional expectation of TE is defined under the half-normal assumption:

$$E\left[U_i/\varepsilon_{n1}, \ldots \varepsilon_{nt}\right] = \mu_n^* + \sigma_i^* \left[\frac{\phi(\frac{\mu_n^*}{\sigma_n^*})}{\phi(-\frac{\mu_n^*}{\sigma_n^*})}\right]\,, \tag{5}$$

where $\mu_n^* = \gamma_n\mu + (1-\gamma_n)(-\varepsilon_n)$, $\gamma_n = 1/(1+\frac{\lambda}{Tn})$ and $\sigma_n^* = \sqrt{(\frac{\sigma_U^2}{1+\lambda Tn})}$. μ is the mean value of the distribution and T is the time period of the panel, ϕ is the standard normal distribution, and ϕ is the respective cumulative distribution function (coelli, Rao and Battese 1998; Kumbhakar and Lovell 2000).

5 Data Collection and Analysis

To estimate the production frontier, we use a balanced-panel database from Enatur's Control Reports from 1999 to 2001 (3 years × 42 hotels 126 observations), containing information on both inputs and outputs. Frontier models require the identification of inputs (resources) and outputs (transformation of resources). Several criteria can be used in their selection. One empirical criterion is availability. The literature survey is also a way to ensure the validity of the research and therefore, another criterion to take into account. Finally, the last criterion for measurement selection is the professional opinion of managers. In this paper, we follow the first two criteria. The hotels used in the analysis and their economic characteristics were presented above in Table 1. Table 2 presents the characteristics of the variables used in the analysis. We transformed the variables according to the description column in Table 2. We adopt the traditional log-log specification to allow for the

Table 2. Descriptive statistics of the data 1999–2001

Variable	Description	Minimum	Maximum	Mean	Standard deviation
Log (Sales)	The logarithm of sales at constant price 1999=100	5.1	6.4	5.823	0.268
Log (Labor)	Logarithm of the number of equivalent employees	1.1	1.7	1.403	0.158
Log (Capital)	Logarithm of the book value of premises	4.1	6.9	6.010	0.638
Trend	Trend variable, aiming to capture time effects on the data, which are independent of the constant.	1.0	3.0	2.000	0.819
Dummy (Historic)	Dummy (one for historic hotels and zero for regional hotels)	0.0	1.0	0.357	—
Log (Dimension)	Square meters of the hotel premises	2.5	3.6	3.142	0.266

possible non-linearity of the frontier. In the production function, the dependent variable Sales is regressed in the trend, in the inputs labor and Capital, and in the inefficient variables Historic and location. These inefficient variables were selected based in the discussion of the contextual setting.

We verify that the range is narrow, indicating that the hotels in the sample are of similar dimension in terms of inputs and outputs; confirming the results of Table 3.

The contextual variables outside the control of the management are the dummy variable for classification (historic vs. regional), and the dummy variable for location (coast versus interior). The dummy, *historic* is an internal fixed characterization; we assume it to be a contextual characteristic but under the management's control. The dummy, *location* is a contextual variable beyond the management's control. The rationale for including this variable is based on the geographic division of the country into a coastal zone, in which is concentrated the majority of the population, and a relatively undeveloped interior. While we acknowledge that tourists are not locals, a remote location is recognized to be a weakness of small hotels (Glancey and Pettygrew 1997).

Table 3. Stochastic Cobb-Douglas panel production frontier

Variables	Coefficients (t-ratio)
Constant (β_0)	−1.918 [−16.993]*
Log Labor (β_1)	0.097 [8.263]*
Log Capital (β_2)	0.012 [3.729]*
Trend (β_3)	0.528 [3.618]*
Constant (δ_0)	−0.277 [−2.785]*
Historic (δ_1)	0.212 [9.993]*
Location (δ_2)	−0.006 [−0.458]
Variance parameters	
$\sigma_s^2 = \sigma_u^2 + \sigma_v^2$	0.306 [6.090]*
$\gamma = \frac{\sigma_u^2}{\sigma_s^2}$	0.058 [5.111]*
Log(likelihood)	206.785
LR test	107.142
Observations	126

t Statistics in parentheses are below the parameters, those followed by * are significant at 1% level.

6 Results

The Translog model was initially chosen on the basis of the number of degrees of freedom – considering 126 observations and 6 exogenous variables – but was later abandoned on observing the statistical results. A Cobb-Douglas model was then chosen and statistically supported by the data.

$$\begin{aligned} LogSales_{nt} &= \beta_0 + \beta_1 \log Labour_{nt} + \beta_2 \log Capital_{nt} + \beta_3 Trend_{nt} \\ &\quad + (V_{nt} - U_{nt}) \\ U_{nt} &= \delta_0 + \delta_1 Historic_{nt} + \delta_2 Location_{nt}. \end{aligned} \tag{6}$$

This model is the production frontier model, known as the Technical Efficient Effects Model (in Coelli et al. 1998), because it accounts for causes of efficiency due to the enterprise (Labor and Capital) and to the contextual characteristics not directly under the control of the management (*Historic, Dimension* and *Location*). The variables have been defined and characterized in Table 3. The time trend aims to approximate technical change. Table 3 presents the results obtained for the stochastic frontier.

We verify that the Cobb-Douglas production function specified above fits the data well, as the R-squared from the initial ordinary least-squares estimation that was used to obtain the starting values for the maximum-likelihood estimation is in excess of 93.6% and the overall F-statistic is 153,76. As the null hypothesis is formulated in terms of the absence of a one-sided error term (i.e. the errors consist only of normally distributed random errors), the fact that the LaGrange test statistic of 107,142 (critical value equal to 2.5) is significant confirms that we can specify and estimate a stochastic frontier analysis using the Cobb-Douglas production function. We also verify that the variables have the expected signs, with the productions increasing with the quantity of capital and the quantity of labor as well as the trend variable.

Relative to the frontier parameters, it is verified that σ2 is statistical significant meaning that the standard deviation of the sum of the error terms is statistical significant, which signifies that estimating this data with a standard production function will result in inefficient estimates. Moreover the λ is also significant and equal to 5.8%, which means that the inefficient term is 5% of the total error. This is a small, but significant value.

Regarding the contextual variables, the coefficients δ are the inefficient coefficients so a positive coefficient indicates a negative impact on efficiency. Therefore, the sales decrease with the historic classification, which signifies that this segmentation is not related to efficiency. However, the sales increases when the location is near the coast, which means that to be located in more crowded dimensions is a condition to attract more clients to such hotels. However, the location dummy is statistically insignificant, and therefore this conclusion is limited. Finally, the value of parameter γ is positive and statistically significant in the stochastic inefficiency effects. Therefore, the traditional production function with no technical inefficiency is not an adequate representation of the data.

7 Managerial Implications

Table 4 presents the results of the efficiency scores computed from the residuals for the years 1999–2001. Technical efficiency is achieved, in a broad economic sense, by the unit which allocates resources without waste; thus, the concept refers to a movement towards, or away from, the best-practice production frontier activity. A movement towards this sort of production is an improvement, while a movement away from it represents deterioration.

The efficient scores were calculated according to (7)

$$TE_{it} = \frac{X_{it}\beta + (V_{it} - U_{it})}{X_{it}\beta + V_{it}} . \tag{7}$$

Equation 7 measures technical efficiency scores as the production of the hotel relative to the ideal, or best-practice production function, using the same input mix. The estimation of the nominator needs the decomposition of the individual residuals into their component parts, which is done with the Jondrow, Lovell, Materov, and Schmidt (1982).

As shown in below, the mean score is high and fluctuates in the period. This score suggests that hotels are on the frontier of the best practices. The maximum unit efficiency score, which is naturally 1, is observed only for the two hotels: Obidos and Queluz. The minimum efficiency score was 0.8106 in 1999, 0.8136 in 2000 and 0.9080 in 2001. The median was 0.9775 in 1999, 0.9825 in 2000 and 0.9835 in 2001. The standard deviation was 0.0560 in 1999, 0.0566 in 2000 and 0.0333 in 2001. They are average in comparison with what is found elsewhere in

Table 4. Small hotels' efficiency scores

Location	1999	2000	2001
Óbidos	1.000	1.000	1.000
Queluz	1.000	1.000	1.000
Alcácer do Sal	0.997	0.998	0.999
Alvito	0.995	0.997	0.998
Amares	0.994	0.996	0.997
Vila Viçosa	0.981	0.997	0.997
Vila Nova de Cerveira	0.983	0.997	0.997
Beja	0.992	0.995	0.996
Crato	0.990	0.996	0.996
Estremoz	0.989	0.990	0.996
Arraiolos	0.993	0.994	0.996
Évora-loios	0.987	0.989	0.995
Guimarães-Santa Marinha	0.984	0.993	0.994
Palmela	0.983	0.989	0.991
Setúbal	0.985	0.988	0.99
Almeida	0.980	0.985	0.987
Batalha	0.979	0.984	0.986
Caramulo	0.978	0.983	0.985
Bragança	0.978	0.983	0.985
Castelo de Bode	0.977	0.982	0.984
Condeixa	0.977	0.982	0.984
Elvas	0.976	0.981	0.983
Gerês	0.964	0.969	0.980
Guimarães-Nossa Senhora da Oliveira	0.953	0.958	0.970
Manteigas	0.948	0.952	0.965
Marão	0.947	0.951	0.964
Marvão	0.920	0.924	0.963
Miranda do Douro	0.937	0.941	0.962
Monsanto	0.923	0.927	0.961
São Tiago do Cacém-São Tiago	0.885	0.889	0.957
Alijó	0.980	0.993	0.946
Murtosa	0.912	0.916	0.941
Santa Clara a Velha	0.844	0.847	0.940
Torrão	0.834	0.837	0.939
Valência do Minho	0.820	0.823	0.936
Póvoa das Quartas	0.910	0.914	0.932
Serpa	0.852	0.855	0.925
São Brás de Alportel	0.910	0.914	0.924

Table 4. (Cont.)

Location	1999	2000	2001
Viana do Castelo	0.810	0.813	0.908
Sagres	0.898	0.902	0.896
São Tiago do Cacém-Quinta da Ortiga	0.879	0.882	0.893
Sousel	0.852	0.855	0.880
Mean	0.944	0.949	0.967
Median	0.977	0.982	0.983
Std. Dev.	0.056	0.056	0.033

the same industry and higher than the results in other industries such as banking and insurance.

With regard to the significance of these results, clearly, they are mixed, but overall, we verify that the efficiency scores are time varying according to the trend parameter – signifying that the latter fluctuates. Moreover, almost half of the hotels have higher efficiency scores than the median –signifying that the sample has an almost normal distribution. However, as the median is smaller than the mean, the majority of hotels present an efficient score lower than the mean. We also verify that the most efficient hotels are situated on the outskirts of Lisbon, the capital and largest city in Portugal, while the least efficient hotels are situated in isolated areas of the country. The general conclusion is that the Enatur management is improving the hotels' efficiency, but structural limitations exist for the hotels with the poorest performance, since they are in locations which are more isolated and consequently, cannot benefit from the same potential flow of customers as those in the towns and dimensions which are more densely populated.

Based on the paper results, we emphasize three managerial implications for our findings. First, the group management should improve its procedures by adopting an efficient, enhanced-incentive policy, which would enable the inefficient hotels to catch up with the efficient frontier. Second, the adjustment must be based on the improvement of technical efficiency. Thirdly, in order to maximize production efficiency, hotel managers should control labor and capital and aim to increase the number of nights that guests stay based in their discretionary power. Moreover, they should adapt to their contextual setting in order to increase production efficiency. In the contextual variables, we observe that the historic classification is negatively and statistically significantly related to sales, signifying that this segmentation classification has no market value. Moreover, the situation of the hotels near the coast is not a condition to be efficient, since this parameter is also negative, but statistically insignificant. Finally, the dimension of the hotel has a positive effect on sales, which is statistically significant; therefore in this context small dimension is not an advantage.

Since we analyzed technical efficiency, it was necessary to look for the causes of technical inefficiency underlying the estimated model. Various causes, endogenous to the hotels analyzed, can be advanced to account for such performance differentials. Technical efficiency is, in a broad economic sense, about a unit allocating resources without waste and refers to a movement towards the best-practice production frontier function. Technical inefficiency of small hotels, according to the literature (Glancey and Pettygrew 1997; Harris and Watkins 1998; Wanhill 1997), is a consequence of one or more causes: Firstly, structural limitations related to planning, such as lack of economies of scale and scope and peripheral location. In the Cobb-Douglas production function the scale is the sum of the parameters, which are clearly higher than unity[3], signifying economies of scale, despite the small dimension of the hotels analyzed. Secondly, low-grade management practices, deriving from a lack of entrepreneurial drive, which are often due to an assortment of different causes, can only be analyzed in situ. This absence of good practices is usually related to the mismanagement of the resources (financial, physical, human, legal, organizational, informational, relational and cultural), but the data set does not allow us to engage in inference on this regard. Finally, structural restrictions inherent to the organizational management are also to be mentioned, such as: (1) the principal-agent relationship (Jensen and Meckling 1976). This relates to the difficulty of controlling those empowered as managers to act on behalf of the owner and is one of the more prevalent issues in dealing with efficiency – particularly in public enterprises; (2) structural rigidities associated with the labor market, which give rise to the collective-action problem (Olson 1965), and allow employees to "free-ride" on the management's own efforts to improve performance. This occurs when job tenure is not linked to performance but is overly dependent on laws that protect the employees; (3) an alternative structural restriction that causes waste in management by providing unequal access to information on operational activities; that is, asymmetric information distribution (Williamson 1975; 1998) among the hotels in

[3] We do not display this value, but the reader can immediately verify it.

the chain, due to the spatial dispersion of the hotels and the agglomeration context in which the hotels exist. If some of the hotels enjoy more privileged access to information than others, then the former will have the opportunity to attract more clients than the latter; and, (4) organizational factors associated with X-efficiency (Leibenstein 1966). These factors are derived from incomplete markets. Incomplete markets exist everywhere, but are prevalent in small hotel chains where different tasks are allocated to the central management and to the unit manager. In this situation, the management may be unable to adopt the correct strategy, since it may not know what it should be. We are unable to test bad management practices and structural restrictions with the present model, and therefore only cite them as possible causes of the performance differentials observed.

8 Contribution, Limitations and Extensions of This Study

In the light of the extensive literature on productivity in tourism, it is useful to consider the potential contributions of the current research. Based in our literature survey, we estimate a stochastic frontier model for hotel-chain efficiency. Moreover, we adopt the Technical Efficient Effects model proposed by Coelli et al. (1998) which accounts for efficiency due to the enterprise, as well as the contextual setting outside the firm. Finally, our stochastic production frontier model lends support to similar works (Anderson, Fish, Xia and Michello 1999), but it is worth noting that our construct has a stronger theoretical foundation, since it takes into account contextual variables. In term of limitations of the study, the homogeneity of the hotels used in the analysis is questionable, since we compare units with different dimensions. However, we posit that the units are not comparable and therefore, a ratio analysis could not be carried out. Moreover, the data set is short, thus the conclusions are limited. In order for them to be generalized we would need to have a panel data set with a larger span. Finally, a variety of extensions to this study can be undertaken. First, non-parametric free-disposal hull analysis can be used to assess the efficiency scores. However, previous research has shown that while the DEA scores are inferior in value to econometric scores, the ranking is preserved when the same variables are used (Bauer et al. 1998). Second, the comparisons with different chains acting in the same market, and with other European hotels acting in different markets, would be the road ahead for benchmarking purposes.

9 Conclusion

This article proposes a simple framework for the evaluation of small hotels and the rationalization of their operational activities. The analysis is based on a production frontier model that allows for the incorporation of multiple inputs and outputs in determining the relative efficiencies. Benchmarks are provided for improving the operations of the more poorly performing small hotels. Several interesting and useful managerial insights and implications from the study are raised. The general conclusion is that the majority of the small hotels analyzed are efficient, while a proportion of them are revealed to be inefficient when the benchmark used is the mean or the median. Overall, the results suggest that capital, labor and nights slept are the main determinant factors of efficiency in this sector. Inputs are negative determinants and nights slept are positive determinants. Also, important contextual variables, which are also positive determinants of efficiency in the hotel chain studied, are historic classification and the location. Negative contextual variables, on the other hand, are the dimension of the hotel. As such, a management policy to improve efficiency should take into account these results while further investigation is needed to address the limitations mentioned.

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Part II

New Operational Tools in Tourism Research

Destination Competitiveness: Meeting Sustainability Objectives Through Strategic Planning and Visioning

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1 Introduction

Destinations, whether national, state or local, are increasingly taking their role as tourist destinations very seriously as evidenced by the allocation of considerable funds towards tourism promotion and marketing. Much of this funding is being directed towards the enhancement and development of their touristic image and attractiveness (Ritchie & Crouch, 2000). With so many destinations competing for the tourist dollar, both on an international and domestic level, competition is fierce and destinations are looking to capitalize on all of their assets to differentiate themselves from their competitors. This increasing level of competition has highlighted the need for destination planners and managers to adopt a more strategic focus to ensure this share is sustained in the future (Faulkner, 2003; Ritchie & Crouch, 2000). As Ritchie (1999:273) notes, *"the growing level of international competition in the tourism marketplace, and the length of lead times for developing the major facilities necessary to meet this competition, have made strategic level planning increasingly imperative".*

A destination's competitiveness has traditionally been viewed in economic terms. However, the advent of triple–bottom line accounting in both the public and private sectors has placed increasing pressure on destination planners and managers to give due consideration to the sustainable management of the environmental and social resources of the destination. This has further highlighted the need for tourism destinations to proactively and strategically plan for future developments in order to secure, both the long–term sustainability of the destination and continuing market competitiveness, as the cumulative effects of today's development decisions will have impacts well beyond the lifetimes of those making the decisions (Ritchie, 1999).

While the notion of destination strategic planning itself is not new, incorporating the requirements of sustainability into the planning process has proven to be more of a challenge (Ruhanen, 2004). To address this cases are emerging where the strategic planning methodology has been revised to incorporate a 'strategic visioning' phase with the objective of developing a vision for the future of the destination. A recognized contributor to successful organizations in the private sector, the formulation of a destination vision aims to develop consensual guidelines on appropriate forms of development which are consistent with the values and goals of the destination community, while taking into account the opportunities and constraints of the market (Ritchie & Crouch, 2000).

This paper will examine the notion of destination competitiveness and the more recent incorporation of sustainability objectives into this field of research. To meet these objectives the strategic planning and visioning approaches to tourism destination planning will be discussed. The appropriateness of these approaches will be conceptually critiqued in light of their contribution towards sustainable development goals and destination competitiveness.

2 Destination Competitiveness

Increasing globalization and the shift from commodity–based economies towards economies driven by knowledge development, innovation and commercialization, have seen the issue of competitiveness rise in importance. Competitive advantage is considered imperative to the success of organizations, whether private or public, and for regions, states and countries (Porter, 1980). It is an issue that is receiving increasing attention from industry, government and academia and is an international phenomenon, not restricted to any particular countries (Kim & Dwyer, 2003). As with other fields, competitiveness has become a key area of focus in the tourism destination literature, with research focusing on such factors as destination attributes, image, price, consumer preferences and perspectives of experience, quality and performance (see Ahmed, 1991; Dwyer, Forsyth & Rao, 2000; Goodrich, 1977; Haahti & Yavas, 1983; Kim & Dwyer, 2003; Kozak & Rimmington, 1999; Laws, 1995; Pearce, 1997). Similarly much emphasis has been placed on the development of models and tools for enhancing and measuring a tourism destination's competitiveness (see Bordas, 1994; Evans, Fox & Johnson, 1995; Faulkner, Opperman & Fredline, 1999; Hassan, 2000; Kim & Dwyer, 2003; Ritchie & Crouch, 2003).

Tourism destination competitiveness can be defined as *"a general concept that encompasses price differentials coupled with exchange rate movements, productivity levels of various components of the tourist industry and qualitative factors affecting the attractiveness or otherwise of a destination"* (Dwyer, Forsyth & Rao, 2000: 9). It can also be said that destination competitiveness is the ability of a destination to deliver goods and services that perform better than other destinations on those aspects of the tourism experience considered to be important by tourists (Dwyer & Kim, 2003). The destination's resources are undoubtedly an important source of comparative and competitive advantage in tourism. *"Comparative advantage would relate to climate, scenery, flora, fauna, etc., while competitive advantage would relate to such items as the tourism infrastructure (hotels, events, attractions, transport networks), the quality of management, skills of workers, government policy etc."* (Kim & Dwyer, 2003: 58).

Buhalis (2000:106) adopts a slightly broader perspective and defines destination competitiveness as including *"the sustainability of local resources for ensuring the maintenance of long–term success as well as the achievement of equitable returns–on–resources utilized to satisfy all stakeholders".* Ritchie and Crouch (2000) support this view and note that competitiveness is illusory without sustainability and that to be truly competitive, a destination's tourism development must be economically, ecologically, socially, culturally and politically sustainable. A destination's competitiveness and success in the tourism marketplace has traditionally been measured in economic terms, and while this is likely to continue to be the most effective and prominent indicator, triple bottom line accounting is increasingly forcing attention towards the environmental and social aspects of the destination.

Entering the sustainability concept into the discussion on destination competitiveness reflects the recognition that economic issues cannot be given undue precedence over environmental and social issues. As Mihalič (2000) reflects, tourism planners and managers have generally only been willing to incorporate environmental measures into management strategies if they resulted in lower costs and/or higher profits. However, consumers increasing environmental consciousness and demands for better quality products, coupled with increased competition have seen environmental and social issues become an important management consideration (Mihalič, 2000). Further reason for the addition of sustainable development concepts to destination competitiveness considerations is that sustainability is at the forefront of the political agendas of many countries (Berke, 2002).

To ensure both the long–term sustainability of the destination and continuing market competitiveness, tourism destinations must proactively and strategically plan for future developments (Ritchie, 1999). As Chon and Olsen (1990:213) state, *"today's tourism environment is increasingly competitive and complex... and tourism organizations at national, state and local levels must make estimates about the what is likely to happen in the future and... decide how to adjust to future events"*. In the 21st century the world tourism environment is not only competitive and complex it is also politically unstable and continuously changing, and in order to make better estimates of future events and sound management decisions, the strategic planning process should be formally incorporated into the structure of operations (Chon & Olsen, 1990). Similarly, Faulkner (1994:231) notes that, *"in any country, the emergence and continuation of tourism as a dynamic and viable industry is dependent upon the adoption of a strategic approach to planning and marketing"*. Hudson, Ritchie and Timur (2004) comment that attractive, well functioning and highly competitive destinations do not exist by chance but are the result of a well–planned environment where appropriate forms of development are encouraged and facilitated. Therefore, when planning for the current and future development of the destination, the principles of sustainable tourism must be adopted, so that only those options which satisfy the needs of all destination stakeholders including residents and visitors, as well as preserve the natural and cultural assets of the region, and are economically viable should be considered (Faulkner, 2003; Hall, 1998; Inskeep, 1991; Ritchie, 1999).

3 Sustainable Tourism Planning

The sustainable approach to tourism planning stemmed from broader international concerns over ecological issues. The concept of sustainability was formally recognized by the 1987 World Commission on Environment and Development (WCED), which defined sustainable practices as those, which *"meet the goals of the present without compromising the ability of future generations to meet their own needs"* (WCED, 1987:43).

Sustainable development has been advocated for the tourism sector as a possible solution to the environmental and social degradation of the industry's resources and due to the fact that tourism is a resource industry which is dependent on nature's endowment and society's heritage (Cooper, 1995; Murphy, 1994). Simpson (2001) identifies two key precursors in achieving sustainable tourism destination planning which are pertinent to this discussion: the need for a more strategic and long–term orientation in tourism planning and multiple stakeholder participation in the planning process.

4 Strategic Planning

The concept of strategic planning is a cornerstone of conventional management theory and has proven to be an essential prerequisite in successful and competitive organizations since the 1950s. The impetus for strategic planning in the business environment arose as cultural, economic and political events began to change the dynamics and demands of the marketplace, forcing organizations to reconsider their practices and products (Ansoff, 1979; Joyce & Woods, 1996; Macmillan & Tampoe, 2000). The solution was seen to lie in strategic planning– a rational, analytical thought process, taking into account the opportunities offered by the environment, the strengths and weaknesses of the organization, culminating in a detailed specification of both the long–term aims of the organization and the specific strategy for achieving these aims (Ansoff, 1979; Heracleous, 1998).

Strategic planning has been described as *"a comprehensive plan of action that sets a critical direction, and guides the allocation of resources to achieve long term objectives"* (Schermerhorn, 1996:160). It can also be defined as the process of developing and maintaining a strategic fit between the organization's goals and capabilities and its changing marketing opportunities. It relies on developing a clear company mission, supporting objectives, a sound business portfolio and coordinated functional strategies (Kotler, Adam, Brown & Armstrong, 2001). Strategic planning is used in an attempt to understand an organization's external and internal contexts so that effective strategies can be developed to link the two and respond effectively to changes in the environment (Wortman, 1979; Bryson, 1995; David, 1999; Stokes & Wechsler, 1995).

While a number of approaches have been discussed and debated (see David, 1999; Macmillan & Tampoe, 2000; Porter, 1980), an effective strategic planning approach is generally recognized as beginning with the identification of critical stakeholder values, using these values to articulate a broad vision for the future, establishing generic goals which will contribute to a realization of a defined vision, establishing specific objectives to bridge the gap between current status and generic goals, and assigning priorities, responsibility and control systems to monitor implementation effectiveness (Bryson, 1995; Schendel & Hofer, 1979; Simpson, 2001). Such activities are undertaken with the objective of providing an organization: an understanding of its position in the marketplace; a direction and purpose; improve communication and motivation throughout the organization; enable a proper focus on key issues such as quality, production and customers and to help the organization deliver the required results and achieve targets of profitability (Birla, 2000).

Strategic planning for a tourism destination is not dissimilar to that of an organization where a sequence of choices and decisions are made about the deployment of resources to commit a destination to an agreed agenda regarding future development and management (Keane, Ó Cinnéide & Cunningham, 1996). Tourism destination strategic planning also is designed to be deliberate and integrative, allows for formalized higher order planning and permits the destination to adapt quickly to changing situations and develop information, planning and control systems to monitor and respond to change (Cooper, 1995). The benefit of a strategic approach for tourism destinations is that it forces destinations to look outside their artificial geographical boundaries and focus on the external environment, something which tourism destinations have not done well to date. Hall (1998) found that by doing so destinations can more readily accommodate for changing circumstances and have an increased receptiveness to opportunities in the external environment.

5 Stakeholder Participation

The second identified prerequisite of a sustainable tourism planning approach identified by Simpson (2001) is the engagement of multiple stakeholders in the planning process. Tourism destinations are broad and diverse with a range of stakeholders and constituents to consider in setting a strategic direction, all of whom have legitimate interests in the future of the destination. Therefore to meet sustainability objectives, strategic tourism destination planning must not only be proactive, but it must also be responsive to stakeholder needs. This requires the adoption of a participatory model, involving the meaningful engagement of the community, along with industry stakeholders and relevant government agencies, in an attempt to lead to agreement on planning directions and goals (Faulkner, 2003). Dutton and Hall (1989) claim that this has forced traditional decision–making bodies such as governments to actively seek and take into account host community attitudes to tourism, whereas in the past stakeholders may have been consulted, if at all, minimally near the end of the process leaving little chance for meaningful input. Here, effective strategic planning is a collective phenomenon, typically involving a diverse set of stakeholders, sponsors, champions, facilitators, teams, and task forces in various ways and at a various times (Bryson, 1995; Bryson & Roering, 1987).

The notion of stakeholder participation and collaboration in strategic planning is an important caveat to the sustainable approach to tourism planning and management (Simpson, 2001), as the strategic direction set for a destination will have far greater repercussions than simply maximising return to company shareholders, as is the case in the private sector. For sustainable, strategic planning to be effective, stakeholder cooperation and collaboration is necessary to lead to agreement and ownership of planning directions and goals, which in turn increases the likelihood of success and long–term support required for tourism management programs (Hall & McArthur, 1998). Further, if a destination can overcome its traditional hindrances of stakeholder fragmentation and un–coordination it will greatly increase its ability to compete more effectively in the tourism marketplace (Jamal & Getz, 1995; Minca & Getz, 1995; Ritchie, 1999; Ritchie & Crouch, 1993).

6 Strategic Visioning for Tourism Destinations

The importance of integrating sustainability objectives into destination planning and management is recognized as crucial for long–term success and competitive advantage. It has been discussed that strategic planning and stakeholder participation are two requirements in meeting sustainability objectives. However incorporating these requirements into the traditional strategic planning process has proven to be a challenge (Ruhanen, 2004). One possible solution, also stemming from the management literature, is the concept of strategic visioning. Visioning is a process that can be broken into three distinct stages: the envisioning of an image of a desired future state; articulated and communicated to followers, and the empowerment of the followers to enact the vision (Westley & Mintzberg, 1989). Essentially visioning is the ability to create a positive image of an organization in the future (Thoms & Greenberger, 1998), which is then used as the foundation and guide for the more traditional strategic planning process.

Increasingly the practice of strategic planning has been extended to include a 'strategic vision', which has been hailed as a key to managing increasingly complex organizations (Westley & Mintzberg, 1989). Shipley and Newkirk (1998) note that management thinkers have almost always talked about vision as a tool to increase productivity and competitiveness, and according to Mintzberg (1994) it is a more flexible way to deal with an uncertain world. Vision sets the broad outlines of a strategy, while leaving the specific details to be worked out. In other words, the broad perspective may be deliberate but the specific positions can emerge. So when the unexpected happens, assuming the vision is sufficiently robust, the organization can adapt and change is more easily accommodated (Mintzberg, 1994). Critics of formal planning argue that we live in a world in which uncertainty, complexity and ambiguity dominate and in which small chance events can have a large and unpredictable impact upon outcomes. In such an environment even the most carefully thought out strategic plans are prone to being rendered useless by rapid and unforseen changes in the environment. In an unpredictable world, there is a premium on being able to respond quickly to changing circumstances, and the ability to alter the strategies of the organisation accordingly. Such a flexible approach to strategy making is not possible within the framework of the traditional strategic planning process.

Not only has strategic visioning being credited with contributing to a more responsive and in turn competitive organisation, Nanus (1992) actually suggests that the right vision can actually jump–start that future by mobilizing people into action toward achieving it. Nutt and Backoff (1997) find that visioning is most successful when the vision is developed with ideas drawn from many people. At the heart of building shared vision is the task of designing and evolving ongoing processes into which people at every level of the organization, in every role, can speak on what really matters to them and should be heard by both senior management and one another. The quality of this process will determine the quality and power of the results. The content of a truly shared vision cannot be dictated or prescribed; it can only emerge from a coherent process of reflection and conversation (Senge, Kleiner, Roberts, Ross & Smith, 1994).

As with the private sector, strategic tourism destination planning processes are beginning to be revised to include a 'strategic visioning' phase, that is, the formulation of a destination vision. Even though the direction for tourism development is implicit in strategic planning, strategic visioning has a stronger emphasis on nurturing appropriate forms of development, through a publicly driven process based on stakeholder values and consensus, as opposed to a more private 'expert–driven' process based solely on market forces (Ritchie & Crouch, 2000). Faulkner (2003:55) notes that, *"a strategic vision is a succinct statement of the essential ingredients of the preferred future of the destination. The vision for the preferred future of the destination is then supplemented by a series of more detailed statements (strategic plans), which articulate the benchmarks for specific issues such as infrastructure development and marketing".*

A key benefit of strategic visioning is the emphasis on the future. Generating a vision for a destination is seen to be important, because it demands a future perspective, the development of goals and objectives, and it is from that platform the strategic plans are modeled (Korac–Kakabadse & Kakabadse, 1998; Vogel & Swanson, 1988). As strategic visioning places considerable emphasis on determining 'appropriate' forms of development, with the process providing a framework that sets the guidelines as to the kinds of major facilities, events and programs that the stakeholders desire for the destination, or as Ritchie (1993) finds, are most consistent with stakeholders values and aspirations for the long–term development and well being of their community. As Getz and Jamal (1994) state, any type of development requires a plan, which clearly delineates the type and pace of tourism development, capacity and growth management policies, socio–cultural and environmental considerations as well as supply/demand parameters. A strategic vision for a tourism destination aims to address these issues by determining the nature of long–term major developments. Major developments such as resort infrastructures are often irreversible, so the choice of vision is absolutely critical, as it will set in motion the development of the destination for many years to come, not to mention the nature of the destination product (Ritchie, 1993). Therefore, the destination vision should ideally be identified before development is permitted to occur and should be the first step in the development of a destination strategic plan (Ritchie, 1999; Ryan, 2002).

The strategic visioning process also places considerable emphasis on the concept of stakeholder collaboration and participation in determining the future of the destination, which is an important caveat to sustainability. Even though there may be varying opinions on the destination's future, the objective of the process is for all stakeholders to be involved in determining appropriate forms of development, through a publicly driven process based on stakeholder values and consensus (Faulkner & Noakes, 2002). A well–articulated vision that has been constructed in a manner that ensures it represents consensus among stakeholders can provide a focus for the strategic planning process and act as a vehicle for mobilizing cooperative action (Faulkner, 2003). As was mentioned previously, the ability for destination stakeholders to collaborate is considered an important ingredient for the long–term success of the destination and its ability to compete more effectively in the tourism marketplace (Jamal & Getz, 1995; Minca & Getz, 1995; Ritchie, 1999; Ritchie & Crouch, 1993). The involvement of key players is crucial in the development of the strategic direction as they will need to demonstrate consistent and visible support for the change (Hackett & Spurgeon, 1996). This was noted in a study of the competitiveness of Canadian ski resorts by Hudson et al. (2004) who found that the most successful are those that are owned by an organization that places considerable emphasis on a planning process that involves a visioning process with stakeholders at the community level involved in the planning and decision making process.

Although authors are increasingly claiming that visioning is an important prerequisite for strategic tourism planning (Jamal & Getz, 1995; Ritchie, 1999; Ritchie & Crouch, 2000; Ryan, 2002) there have been few documented cases where the visioning process has been applied to tourism destinations. There are even fewer studies that have evaluated the success of the approach in meeting sustainability objectives or the impact of the approach on destination competitiveness. However one of the most extensive strategic visioning processes undertaken to date was for the Gold Coast in Queensland, Australia. The Gold Coast has traditionally been one of Australia's most popular international and domestic tourism destinations. However, a range of indicators proposed by Faulkner (2003) highlighted the fact that the destination was facing decline: emphasis on high–volume, low yield inclusive tour market and mass tourists; a decline in visitors length of stay; the destination is well known, but no longer fashionable; diversification into conventions, conferences, and man made attractions; market perceptions of the destination becoming over–commercialized, and declining profits of major tourism businesses. Faulkner (2003:43) therefore concluded that the Gold Coast was a mature destination showing some early signs of stagnation, paralleling the experience of coastal tourist resorts elsewhere in the world and that, *"given this, it is clear that a fundamental shift in the approach to destination planning and management is necessary if the region is to rejuvenate and remain competitive in the longer term. However, regardless of the stage the destination has reached the pressures of an increasingly competitive global environment point to the necessity of a more comprehensive approach that embraces sustainable development principles as a framework for tourism development".* Thus the impetus for employing a strategic visioning approach for the Gold Coast was to examine the impacts and opportunities of sustainable tourism for the Gold Coast community, while creating a more strategic perspective towards tourism policy, planning, development and marketing.

As the visioning project was only completed in 2002 it is too soon to determine the full impacts of the exercise. However, the process does offer a general, if somewhat theoretical model to assist destinations in overcoming the challenges of remaining competitive and at the same time ensuring that the management of tourism is consistent with the principles of sustainable development (Faulkner, 2003). Despite the fact that there is no one 'right' way to formulate a vision and undertake a strategic visioning process, the outcome of the process should ultimately be agreement amongst destination stakeholders that the final vision statement provides a meaningful and operational picture of the future of their destination; while reflecting the values of the destination stakeholders and appreciating the realities and constraints of the marketplace (Ritchie, 1993; Ritchie & Crouch, 2000).

7 Discussion

In the modern tourism marketplace the truly competitive destination will not solely focus on economic measures as an indicator of success. While financial returns are obviously important, such a narrow view will not contribute to the long–term and sustainable competitiveness of tourism destinations. This has been seen in a number of destinations around the world where a lack of strategic planning and management of tourism development and an overemphasis on the economic benefits has resulted in social and environmental degradation, and eventually, declining market share. Buhalis (2000) describes this 'high–volume–low–profit' as jeopardizing resource sustainability and ultimately the competitiveness of the destination. Therefore one possible mechanism for enhancing the long–term competitiveness of destinations is the adoption of strategic planning and visioning based on the principles of sustainable tourism and stakeholder collaboration, in conjunction with economic policies to increase the financial benefits of tourism. As has been discussed, the concept of strategic visioning is emerging as a precursor to the more general practice of strategic planning undertaken for tourism destinations. This 'strategic approach' has been advocated for two primary reasons. Firstly, it provides a broad framework for the future development of the destination, and secondly; the destination stakeholders are the key decision–makers in determining the size and scope of future development. This is opposed to: ad hoc decision–making and planning; private sector interests driving development; stakeholder needs (particularly those of local residents) being overlooked and a general apathy towards the destination's future competitiveness and long-term sustainability.

Strategic visioning and planning for tourism is based on the philosophy of sustainability, which is recognized as a key factor in achieving long–term competitiveness. With the inescapable problems of pollution and degradation of resources, the issue of sustainability has not only become a key policy concern, but a necessary consideration in sustaining the assets of the destination. It is these assets which attract visitors, and thus make the destination economically viable, as resource degradation often results in visitors seeking new, better managed destinations. Therefore, Crouch and Ritchie (1999) note that to be competitive, tourism development must be economically, ecologically, socially, culturally and politically sustainable. Sustainable development refers to economic development which safeguards the economic possibilities of future generations by, e.g. preventing or controlling the adverse impacts which often accompany economic development, such as long–term resource depletion; environmental degradation, cultural disruption and social instability (Hall, 1998). This will lead to sustained productivity over the longer–term to benefit future generations and their ability to be competitive. A strategic perspective can assist in ensuring that the destination remains competitive while incorporating the principles of sustainability.

One of the primary reasons for implementing a strategic visioning program identified in the literature is to set a framework for the future development of the destination. Strategic visioning demands a future perspective in order to make better estimates of the prospective development needs of the destination so that the necessary services and infrastructure to cater to the future tourist needs of the destination can be met. This strategic perspective is vital to ensure that the destination is competitive in the tourism marketplace (Ritchie, 1999). It is unrealistic to expect that a destination can be competitive in the long–term if proactive, strategic decisions are not made to determine the future development needs of the destination. Strategic visioning encompasses this issue by proactively looking to the future through the development of a vision and identifying the desired states of the destination before developing strategies to achieve those desired states. It avoids the ad hoc decision making which has been so prevalent in tourism destinations, and which compromises the ability for a destination to be successful in the long–term if there is no clear pathway to achieve lasting competitiveness.

A further benefit of adopting a strategic visioning approach is the collaboration which the process requires between destination stakeholders. One of the major appeals of strategic visioning is the emphasis the process places on stakeholder collaboration and participation in decision–making to determine the future development of the destination. While the process of broader based decision–making has often being impeded by traditional decision–makers who see it as a threat to their power, incorporating participation by the various destination stakeholders can lead to greater acceptance of tourism development. Also, Hardy, Beeton and Pearson (2002) find that involving the local residents of the destination lessens the likelihood that the community will feel alienated and oppose tourism development, thus negative impacts will be minimized and economies may be revitalized. In practice, the importance of stakeholders participation and collaboration in destination decision–making and planning is often overlooked, yet stakeholder support for tourism development is widely advocated as a prerequisite for the destination to be able to compete more effectively in the tourism marketplace, and is also a key caveat in achieving sustainability (Jamal & Getz, 1995; Minca & Getz, 1995; Ritchie, 1999;

Ritchie & Crouch, 1993; Simpson, 2001). A strategic visioning approach to destination planning can provide the practical framework needed for facilitating stakeholder collaboration.

A strategic visioning approach also provides the destination with the flexibility to adapt to changing environmental conditions. As opposed to the more static approaches of master plans and other planning approaches, strategic visioning and planning provides a more flexible way to deal with the uncertainties of the future. As Mintzberg (1994:209) found, *"vision sets the broad outlines of the strategy while leaving the specific details to be worked out... so when the unexpected happens... the organization can adapt".* Similarly, Moutinho (2000) claims that essentially the whole process of tourism strategic planning boils down to planning on uncertainty, and a strategic vision is one such means to cope with the uncertainties of the future and the ever changing conditions of the global tourism marketplace.

8 Conclusion

Economic growth as a sole measurement of destination competitiveness is increasingly becoming outdated. In the modern tourism marketplace successful destinations are those that not only incorporate economic considerations, but also appreciate that the environmental and social sustainability of the destination is just as crucial for long-term competitiveness. To achieve this balance tourism destinations must proactively and strategically plan for future developments in order to secure, both the long–term sustainability of the destination and continuing market competitiveness. The strategic visioning and planning process places considerable emphasis on determining appropriate forms of development from the perspective of destination stakeholders, while taking into account the opportunities and constraints of the marketplace. It is important that destination stakeholders agree that the final vision statement provides both a meaningful and operational dream for the future of their destination– one that reflects stakeholder values but does not ignore the realities and constraints of the marketplace (Ritchie & Crouch, 2000).

A possible criticism or concern is that ecological and social advocates are condemning economic goals and the ability of a destination to be competitive. This is not the case and can be seen in the United Nations goals for sustainable tourism planning which clearly identifies the need to maintain the competitiveness of the destination (Economic and Social Commission for Asia and the Pacific, 2001). There is simply a need to broaden the long–standing view of destination competitiveness and success. Planners and their communities must foresee and shape the scope and character of future development, identify existing and emerging needs, and fashion new or amended existing plans and policies to ensure those needs will be met and that communities will be able to continually reproduce and revitalize themselves (Berke, 2002). The multiplicity of industries involved in creating and sustaining destinations highlights the need for developing a competitiveness model that examines the extent of cooperation needed for future competitiveness. This paper has examined the strategic planning and visioning approach as a contributor to not only destination competitiveness but also destination sustainability. It has been discussed that the adoption of such an approach can enhance the competitiveness of a tourism destination due to the processes' integration of sustainable development principles; the emphasis on the future; the requirement for collaboration between destination stakeholders; and the flexibility the process provides for adapting to changing market conditions.

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International Tourism and Economic Growth: A Panel Data Approach

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1 Introduction

On average, tourism-specialized countries grow more than others (see Table 1). Table 1 shows average growth rates between 1980 and 1999 for all countries for which data are available and for subsets of countries specialized in tourism. Data are from a panel of countries through four five-years periods: 1980–84, 1985–89, 1990–94 and 1995–99.

This fact seems to be inconsistent with economic theory as endogenous growth theory suggests that economic growth is linked with: (1) sectors with high intensity in R&D and thus high productivity (Romer, 1990 and followers); (2) large scale (Romer, 1990, Grossman and Helpman, 1991 and Kremer, 1993). However none of these explanations fits the case of tourism-intensive countries because: (1) tourism is not an R&D-intensive sector-in fact, services in general are not R&D intensive-and (2) in general, tourism-intensive countries are small

Table 1. Specialization in tourism and growth

	Observations	g_Y
Total	509	0.9%
10%	167	1.4%
20%	69	1.7%

Note: Specialization measures the proportion of Tourism receipts in Exports; g_Y is the growth rate of real *per capita* GDP. Sources: Summers–Heston (2002) and World Development Indicators (2001).

(see for instance Easterly and Kraay, 2000 and Lanza and Pigliaru, 2000). Some explanations have appeared linked to a terms-of-trade effect (Lanza and Pigliaru, 2003 and Copeland, 1991) and a resources abundance approach (Lanza and Pigliaru, 2000 and Sinclair, 1998).

An increasing amount of literature has analyzed the relationship and causality between tourism and the economic growth rate, both in specific countries (Durbarry, 2004 for Mauritius or Balaguer and Cantavella-Jordá, 2002 for Spain) or in broader samples (Eugenio-Martín, Morales and Scarpa, 2004 for Latin America). The first used standard time-series methods to conclude that tourism had fostered growth in Mauritius and Spain, while the second used a dynamic panel data method estimator to provide evidence that the increasing number of tourists per capita caused more economic growth in the low and medium-income countries of Latin America, but did not contribute to economic growth in richer countries. The test done by Braw, Lanza and Pigliaru (2003) for a broad cross-section of countries is not robust to the possible existence of endogeneity of tourism. Tourism may be correlated with human capital, geographic or cultural features, for instance, and may not be an independent determinant of growth. Thus tourism can possibly foster growth within countries, demanding a qualified labor force or promoting competitiveness but it may be not able to explain differences in growth patterns between countries that may derive from other explanatory factors.

In this article panel data techniques that closely follow the empirical economic growth literature are employed to test the influence of tourism variables on economic growth in a broad panel data. Adding to previous literature that often uses arrivals of tourists *per capita* as a *proxy* for tourism intensity, variables that link the proportion of tourism in exports and in GDP are also used. Additionally, different sub-samples of countries are considered. Furthermore, this is the first attempt to study the effect of tourism in a world panel data of countries.[3] In general, establishing the relationship between tourism and economic growth is essential as this sector is increasing at impressive rates and policy-makers are attributing to the sector major importance.

In sect. 2, data, method and variables are presented. Section 3, presents the results and sect. 4 concludes and outlines future research areas.

[3] For further reading on the issue, see Sequeira and Nunes (2007, forthcoming) in *Applied Economics.*

2 Data and Method

2.1 Introduction

We have used panel data methods to analyze this issue. The use of traditional panel data methods allows not only an increase in degrees of freedom and better estimators' large sample properties but also the reduction of endogeneity, due to the consideration of specific country effects that can be correlated with regressors (fixed effects) or not (random effects). In the random effects model, the individual behavior of countries is supposed to be unknown and is treated as random. Nevertheless, in fixed effects, individual effects are treated as fixed through time. Thus this last model is more appropriate for exhaustive samples of the population. It is worth noting that the fixed effects estimator is robust to the omission of any time-constant regressor. Additionally, when the random effects estimator is valid, the fixed effects estimator continues to produce consistent estimators (although potentially not efficient) (Johnston and Dinardo, 1997).

Data was drawn from the Penn World Table (Summers-Heston, 2002) and the World Development Indicators (World Bank, 2001). Four five–year periods, between 1980 and 1999, have been considered to decrease measurement errors and the effects of cycles in variables, as is usual in empirical literature on economic growth. A broad sample of 509 observations and several smaller samples were adopted: Specialization in Tourism 1 (receipts from tourism represent 10% or more of exports); Specialization in Tourism 2 (receipts from tourism represent 20% or more of exports); Islands (except Australia); Small Countries (fewer than an average of 1 million inhabitants between 1980 and 1999); Rich Countries (for which GDP *per capita* is above average); Poor Countries; African countries; Asian countries, Latin American countries and European Countries. In general the normality of the economic growth rate within this period can be accepted, although exclusion of a few outliers was tested and results do not change.[4]

[4] Table 5 has results without outliers. For this, we exclude observations which are greater than $q_{0.75} + 1.5(q_{0.75} - q_{0.25})$ or below $q_{0.25} - 1.5(q_{0.75} - q_{0.25})$, where q_i is the quantile of order i.

2.2 Variables

To test the significance of tourism in explaining economic growth, we have used the following variables, which are standard in the literature (Barro, 1991 and Barro and Sala-i-Martin, 1995):

- Real Gross Domestic Product *per capita in the previous period* (GDP_{-1})-is used to measure conditional convergence and a negative sign is expected;
- Secondary Male Enrolment (Sec. Enrolment) – is used as a proxy for human capital and a positive sign is expected, although different signs are reported in the literature;
- Investment-Output ratio (I/Y) – is used as a proxy for physical capital investment and a positive sign is expected;
- Government Consumption-Output ratio (G/Y) – is used to measure long-run crowding-out and the overall negative effect of Government Consumption in long-run growth;
- Exports plus Imports to output ratio (Openness) – is used to measure the impact of openness of the economy in its growth performance, and a positive sign is expected although this is not consensual in the literature (e.g. Edwards, 1998);
- Black Market Premium ($\log(1 + BMP)$)–is used to measure market distortions in the economy and the overall negative impact of institutions;

To use proxies for the influence of international tourism the World Development Indicators (World Bank, 2001) database was used, and the following selected:

- Tourist Arrivals as Population Proportion (A) – International inbound tourists are the number of visitors who travel to a country other than that where they have their usual residence for a period not exceeding 12 months and whose main purpose in visiting is other than an activity remunerated from within the country visited. This proportion is calculated as a ratio to total population (WB, 2001);
- Tourism receipts in % of Exports (R_1) – International tourism receipts are expenditures by international inbound visitors, including payments to national carriers for international transport. These receipts should include any other prepayment made for goods or services received in the destination country. They also may include

receipts from same-day visitors, except in cases where these are so important as to justify a separate classification. Their share in exports is calculated as a ratio to exports of goods and services (WB, 2001);

- Tourism receipts in % of GDP (R_2) – the same as the previous variable but their share in GDP is calculated using the previous variable and the ratio of exports of goods and services to GDP (WB, 2001).

These are the most available variables to study tourism specialization worldwide.

3 Results

This section presents the main results obtained so far. The remainder part of the section shows panel data estimators for growth regressions that consider *tourism specialization* as a right-hand-side determinant.

Table 2 shows OLS, Random Effects and Fixed Effects estimators of the three variables linked with tourism specialization in a simple regression with economic growth as a dependent variable.

Table 2. Simple regressions between tourism and growth

Variable X	*OLS*	*RE*	*FE*
A	5.23**	4.74	-1.51
R_1	0.42***	0.42***	0.14
R_2	0.71***	0.70***	0.19

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%.

3.1 Results for the Broad Panel

Tables 3 and 4 show the results for the Random Effects and Fixed Effects Estimator.

A general positive causality between tourism specialization and economic growth is not obtained in the results above. The consideration of usual determinants of economic growth when covariates and the country effects are assumed to be uncorrelated dismiss a positive economic causality from the proportion of tourism arrivals to economic growth, but continue to predict a positive causality between the

Table 3. Growth regressions (Random Effects – RE)

Dep Var.: g_Y	(0)	(1)	(2)	(3)
GDP_{-1}	–0.00148	–0.00163	–0.00147	–0.00143
	(–3.3)***	(–3.7)***	(–3.3)***	(–3.19)***
Sec. Enrolment	0.189	0.184	0.181	0.140
	(2.12)**	(2.04)**	(1.99)**	(1.63)*
I/Y	1.154	1.286	1.243	1.389
	(3.91)***	(4.35)***	(4.32)***	(5.67)***
G/Y	–0.364	–0.376	–0.392	–0.381
	(–2.11)**	(–2.15)**	(–2.30)**	(–2.18)**
Openness	0.0564	0.0570	0.0554	0.0125
	(1.34)	(1.26)	(1.31)	(0.28)
$\log(1 + BMP)$	–1.53	–1.82	–1.59	–1.47
	(–1.67)*	(–2.03)**	(–1.82)*	(–1.72)*
Tourist Arrivals (% of Population)	–	1.44	–	–
		(0.39)		
Tourism receipts (% of Exports)	–	–	0.329	–
			(2.22)**	
Tourism receipts (% of GDP)	–	–	–	1.104
				(2.26)**
Pseudo R^2	0.17	0.20	0.21	0.22
Hausman Test	15.0**	16.0**	18.0**	14.8**
N	293	285	289	288

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. RE model based on population-average estimator; t-statistics based on the robust variance-covariance matrix appear in parentheses. Hausman Test tests the null hypothesis that the RE estimator is correct.

tourism receipts proportion in the economy and growth (see Table 3). However, the Fixed Effects estimator' negative sign for all variables linked with tourism solves the apparent puzzle of the positive correlation between both phenomena. More precisely, this seems to indicate that in the Fixed Effects estimation (in general more robust than that of the Random Effects as is also shown by the Haussman Test), tourism specialization (measured as a percentage of GDP, as a percentage of Exports or as Population proportion) has either a non significant or a marginally significant negative impact on economic growth. This sign and significance seem to be dependent on the consideration of usual growth determinants (compare Table 4 with Table 2).

Table 4. Growth regressions (Fixed Effects – FE)

Dep Var.: g_Y	(0)	(1)	(2)	(3)
GDP_{-1}	–0.00667	–0.0063	–0.0067	–0.0067
	(5.53)***	(–5.17)***	(–5.49)***	(–5.48)***
Sec. Enrolment	0.247	0.290	0.243	0.239
	(1.75)**	(1.97)**	(1.72)**	(1.63)
I/Y	–0.187	–0.204	–0.405	0.134
	(–0.44)	(–0.48)	(–0.91)	(0.32)
G/Y	–0.761	–0.777	–0.922	–0.866
	(–2.17)**	(–2.05)**	(–2.61)***	(–2.38)**
Openness	0.216	0.241	0.222	0.231
	(1.82)*	(1.87)*	(1.11)	(1.95)*
$\log(1 + BMP)$	–1.82	–1.92	–2.50	–2.10
	(–1.64)	(–1.58)	(–2.08)**	(–1.83)*
Tourist Arrivals (% of Population)	–	–14.21	–	–
		(–1.37)		
Tourism receipts (% of Exports)	–	–	-0.692	–
			(–1.78)*	
Tourism receipts (% of GDP)	–	–	–	–1.89
				(-1.29)
Pseudo R^2	0.12	0.13	0.13	0.13
(N)	293	285	289	288

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. t-statistics based on the White-consistent variance-covariance matrix appear in parentheses.

3.2 Results from Sub-Samples

Some argue that tourism is important to promote the development of poor countries (e.g. Sinclair, 1998). Thus, we have divided the broad sample into poor and rich countries. The threshold value for the division was the average real GDP *per capita* between 1950 and 2000 among all countries in the sample (6094.5 US dollars). Others argue that only countries with a comparative advantage in tourism would benefit from it (Lanza and Pigliaru, 2000); this can occur in countries with high specialization in tourism, in small countries and Islands, both typically well-endowed with natural resources. These results are presented in Table 5 (where outliers in the dependent variable were excluded).

According to the results in Table 5, the conditional impact of tourism is either negligible or appears with the puzzling negative impact in some sub-samples and variables. The signs and significance of

Table 5. Growth regressions in sub - samples

Dep Var.: g_Y	N		FE/RE[a]		H–T	Normality Test
Variables		A	R_1	R_2		(Prob.)
Total	280, 284	–14.9	–0.83	–2.28	20.5–23.8***	2.76
	283	(–1.46)	(–2.23)**	(–1.55)		(0.25)
Poor	176, 179	1.87	–0.72	–2.09	17.2–20.1***	0.07
	178	(0.04)	(–1.62)	(–0.97)		(0.96)
Rich	101, 101	–0.69	–0.93	–0.69	19.6–21.5***	0.57
	101	(–0.42)	(–1.69)*	(–0.42)		(0.75)
Asia	44, 45	17.4	–0.04	–0.75	9.10–10.5	0.37
	45	(1.49)	(–0.17)	(–0.71)		(0.83)
Africa	93, 96	69.7***	0.27	1.08	5.7–9.2	2.73
	95	(3.37)	(1.20)	(1.55)		(0.26)
Europe	69, 69	–18.96**	–0.20	–1.35	15.6–16.4**	2.50
	69	(–2.90)	(–0.30)	(–0.68)		(0.29)
Latin Am.	42, 42	103.5	–11.9	–3.63	6.7; 31.5***	0.31
	42	(3.83)***	(–3.44)***	(–5.57***)	13.6*	(0.86)
Tourism Sp. (10%)	82, 82	–0.56	–1.71***	–6.29***	10.3; 18.2**	0.41
	82	(–0.07)	(–3.44)	(–4.93)	25.4***	(0.82)
Tourism Sp. (20%)	21, 21	5.07	0.33	–1.65	6.7–9.8	0.01
	21	(0.99)	(0.81)	(–3.39)***		(0.99)
Small Countries	26, 26	–5.64	0.29	0.75	7.1–8.8	3.76
	26	(-0.51)	(1.21)	(1.09)		(0.16)
Islands	45, 45	6.63	0.19	0.29	6.4-9.2	0.01
	45	(1.11)	(0.98)	(0.54)		(0.99)

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. t-statistics based on robust variance-covariance matrix appear in parentheses. All variables listed in Table 1 are inserted in regressions but omitted in the table. H-T stands for Hausman Test. a) we report either FE or RE according to the Hausman Test result. Normality test states the value and significance of a combined skewness-kurtosis test for the dependent variable, in which H_0 is a normal distribution.

tourism estimators are worth noting in Africa, Latin America, Europe and in the 10% tourism specialized sub-sample, in which countries were supposed to have comparative advantage in tourism. Caution has to be made on analyzing these results due to two factors: (1) the small sample biases in the sub-samples, in particular the small time-series dimension (4 periods) in the panel; (2) the dynamic panel bias in non-corrected fixed-effects.[5]

4 Conclusion and Prospects

In general and contrary to most previous works, it can be concluded from this study that tourism, by itself, cannot account for the higher growth rates of countries that specialize in tourism. A large panel of countries was studied and also sub-samples of countries specialized in tourism, small countries and islands. In all of these samples, the results were the same: in general, variables linked with tourism are not significantly related to economic growth and in the cases in which a significant relationship arises, it is sometimes negative in fixed-effects estimators. To sum up, closer consideration of the relationship between tourism and economic growth to empirical economic growth literature (e.g. Barro, 1991) and a Panel Data approach (Islam, 1995) to this relationship dismiss a general positive causality between specialization in tourism and economic growth with the use of traditional panel data analysis. This result is in line to existing theory that argues that growth is promoted by most productivity-enhancing sectors. For this result, we have used all three variables linked with international tourism available in the World Development Indicators database.

These results are quite useful to design some paths for future research, such as: (1) tourism can act as a demanding sector for human capital accumulation and this in turn, promotes economic growth, which is the same as saying that tourism is endogenous in the relationship between human capital and growth and (2) tourism can promote economic growth with some time delay. Thus future research should study its relationship with human capital and possibly implement a dynamic panel data and instrumental variables estimators to the relationship between tourism and economic growth, allowing for a greater

[5] The bias that affects our variable of interested is smaller than that on the lagged dependent variable (see Nickell, 1981 and Judson and Owen, 1999). However, for further results using dynamic panel data estimators see Sequeira and Nunes (2007, forthcoming) in *Applied Economics*.

variety of time-series effects. This implementation may require more time series periods to continue avoiding measurement and business cycles effects. There is a potential downward bias in the fixed-effects estimators, due to the consideration of a small panel, imposed by the availability of data. So, future research in correcting standard-errors is also a necessity.

It is worth noting that establishing the relationship between tourism and economic growth is essential concerning the importance that policy makers are attributing to this sector and the rates at which it is growing.

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Benchmarking in Tourism Destinations; Keeping in Mind the Sustainable Paradigm

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1 Introduction

Decisions taken within the framework of tourism management may have important impacts on the environment that may in turn trigger feedback effects on tourism responses. Environmental conscious practices of tourism management may be either reactive, e.g. responding to environmental regulations, or proactive, e.g. effective in order to be competitive with other tourist locations and to satisfy consumers' preferences. However, this is just one side of the coin. The tourism industry exerts several effects on the management of environmental resources, which often work in opposite directions. In addition to the positive impact due to the increased demand for high environmental standards, a negative impact derives from the anthropisation of natural areas, increased air (mainly due to increased traffic) and water pollution, abnormal production of waste, a higher number of arsons in the woods, etc.

Although the relationship between tourism management and environmental quality is a topic requiring further investigation (but this is not the focus of this paper)[4], it is however undeniable that a good

[4] The theme of integration between economy and environment is faced also by ISTAT through the elaboration of a system of *"Environmental and Economic Integrated Accounting" ("Contabilità integrata ambientale ed economica")*, a part of which structured on satellite accounts (Namea, which considers the pressures exercised on environment by the economic system, and Epea, which considers the environmental expenses faced by economic operators to mitigate environmental

notion of the performance in the management of both provides a better understanding of the sustainable efficiency of tourism locations. Developing tools for the evaluation of the performance of tourism activities not only in economic terms, but also from an environmental perspective, is of critical importance. In particular, in order to provide policy makers with guidelines to correct management inefficiencies and to promote positive effects from the competition between destinations, the use of performance indicators is fundamental. Finding ways to produce simple indicators summarising the different features which characterise a management strategy, is crucial to policy mechanisms. Indeed, as Hart emphasises, an indicator is *"something that helps you to understand where you are, which way you are going and how far you are from where you want to be"* (Hart, 1997, pp. 67–76).

Though indicators have a growing resonance in politics, it is often easier to discuss them in theoretical terms than it is in practice. Difficulties arise in choosing good indicators for each feature we want to emphasise in the analysis, in aggregating them in a wrap–up index, and more importantly, in finding data, which in the case of tourism activities are often scarce and incomplete and available only for more recent years. Similarly, data concerning natural resources management have been collected only lately; this is even more true for data concerning environmental impacts of/on tourism activities, see e.g. Cammarota et al. (2001) and Miller (2001).

The present paper discusses a methodology developed to perform tourism destination benchmarking within the broader perspective of sustainability and in order to overcome the difficulties discussed; for this purpose, Data Envelopment Analysis (DEA) is applied. Indeed, DEA is a methodology, which has been developed and successfully applied in order to deal with multiple and non–commensurable input and output problems.

The developed methodology is applied to the assessment of the relative efficiency of Italian Regions from a sustainable perspective. The tourism industry is a sector of fundamental importance for the Italian economy contributing 12.1 % to GDP in 2003 (World Travel & Tourism Council, date) and its relevance is undoubtedly growing considering

pressures or to restore deteriorated environmental situations). Here the economic system is seen as an organism that transforms the matter taken from its environment (nature) in residuals and discards of various kind, with the aim to use energy and materials for the operation and the increase of the system itself.

that tourism flow has increased by 18.6% during the period 1990–1997.[5] Further, 33.8% of tourists visit the coastal areas of Italy, with a resulting intense pressure on local ecosystems. The dataset is composed of 20 Regions. These have been chosen as the basic decision units for comparison, because they represent the main decision authority in managing tourism destination in terms of land use planning, business permit allocation, environmental management, other regulations and tourism advertising, nationally and internationally. One should also bear in mind that tourism in Italy is a matter of exclusive Regional competence since 2001 (art 117, Title V, of the Italian Constitution, modified by the law 3/2001). For each Region, the analysis takes into consideration a set of indicators (inputs and outputs) which are considered relevant when valuing the performance of a management strategy, from an economic as well as environmental perspective.

The paper is organised as follows. In Sect. 1 a brief description of the DEA methodology is given, while in Sect. 2 the data set, the model developed and the performed analysis are described. Section 3 provides a description of the main results and Sect. 4 concludes.

2 Methodology

Following the first appearance in the pioneering work by Charnes et al. (1978), in the early applications, DEA has been traditionally confined to productivity and efficiency analysis. Subsequently, DEA has been applied to evaluate the relative performance of public and private organisations, as in the study on medical services done by Nyman and Bricker (1989) or that on educational institutions by Charnes et al. (1981). In more recent research, DEA is frequently applied in many other areas of applied economic sciences, ranging from environmental economics to public economics and macroeconomic policy, among others. In 1986 DEA was first applied to the hospitality industry (see Banker and Morey, 1986), and specifically to the restaurant section. Corporate travel management has been analysed in Bell and Morey (1995), while the hotel sector has received increasing attention as proved by the development of several analyses, as for example Johns, Howcroft and Drake, (1997), Morey and Dittman (1997), Anderson et al. (2000) and Wober (2000).

[5] For general information and statistics on tourism in Italy see ISTAT publications (ISTAT, 1997).

An overview of DEA applied to tourism and hospitality industries can be found in Wober (2002). Finally, a study of the relative performance of tourism advertising programs in the United States has been analysed by Wober (Wober and Fesenmaier, 2004).

The DEA is a multivariate technique for monitoring productivity and providing some insights on possible directions of improvements of the status quo, when inefficient. In particular, DEA is a non–parametric technique, i.e. it can compare input/output data making no prior assumptions about the probability distribution under study. Although DEA is based on efficiency and on the theory of the classical production function, the latter is typically determined by a specific equation, while DEA is generated from the data set of observed operative units. The DEA efficiency scored by any decision unit is derived from the comparison with the others included in the analysis; considering the maximum score of unity (or 100%) as a benchmark. The score is independent of the units in which outputs and inputs are measured, and this allows for a greater flexibility in the choice of inputs and outputs to be included in the study.

A commonly accepted measure of efficiency is given by the ratio of the weighted sum of outputs over the weighted sum of inputs. It is, however, necessary to assess a common set of weights and this may raise some problems. With DEA for each unit whose efficiency has to be assessed, the set of weights is computed through the process of maximising efficiency. Given a set of N decision units, each producing J outputs from a set of I inputs, let us denote by y_{jn} and x_{in} the vectors representing the quantities of outputs and inputs relative to the m–th unit, respectively. The efficiency of the m–th unit can thus be calculated as:

$$e_m = \frac{\sum_{j=1}^{J} u_j y_{jm}}{\sum_{i=1}^{I} v_i x_{im}}\,, \qquad \begin{bmatrix} j = 1, .., J \\ i = 1, .., I \end{bmatrix} \tag{1}$$

where u_j and v_i are two vectors of weights that unit m uses in order to measure the relative importance of the multiple consumed and the factors produced. As mentioned, the set of weights, in DEA, is not given, but is calculated through the maximisation problem, faced by each decision unit. Let us consider as an example the maximisation problem to the m–th unit.

$$\begin{aligned}
&\max e_m \\
&s.t. \\
&\frac{\sum_{j=1}^{J} u_j y_{jn}}{\sum_{i=1}^{I} v_i x_{in}} \leq 1 \;\forall n = 1,.,m,.,N \\
&0 \leq u_j \leq 1 \\
&0 \leq v_i \leq 1 \;.
\end{aligned} \tag{2}$$

To simplify computations it is possible to scale the input prices so that the cost of the unit m's inputs equals 1, thus transforming the problem set in (2) in the ordinary linear programming problem stated below:

$$\begin{aligned}
&\max h_m = \sum_{j=1}^{J} u_j y_{jm} \\
&s.t. \\
&\sum_{i=1}^{I} v_i x_{im} = 1 \\
&\sum_{j=1}^{J} u_j y_{jn} - \sum_{i=1}^{I} v_i x_{in} \leq 0 \quad \forall n = 1,.,m,.,N \\
&\varepsilon \leq u_j \leq 1,\; \varepsilon \leq v_i \leq 1,\; \varepsilon \in \Re^+ \;.
\end{aligned} \tag{3}$$

A further constraint is imposed on weights that have to be strictly positive; this is done to rule out the case that some inputs or outputs may be ignored.

If the solution to the maximisation problem gives a value of efficiency equal to 1, the corresponding unit is considered to be efficient or non–dominated, if the efficiency value is inferior to 1 then the corresponding unit is dominated. Dominating units define the efficiency frontier.

As for every linear programming problem, there exists a dual formulation of the primal one outlined in (3), which has identical solution. While the primal problem can be interpreted as an output–oriented formulation (for a given level of input, units maximising output are preferred), the dual problem can be interpreted as an input–oriented formulation (for a given level of output, units minimising input are preferred).

Consider for the sake of clarity a simple numerical example of five regions, denoted in Fig. 1 as A, B, C, D and E, and each using different

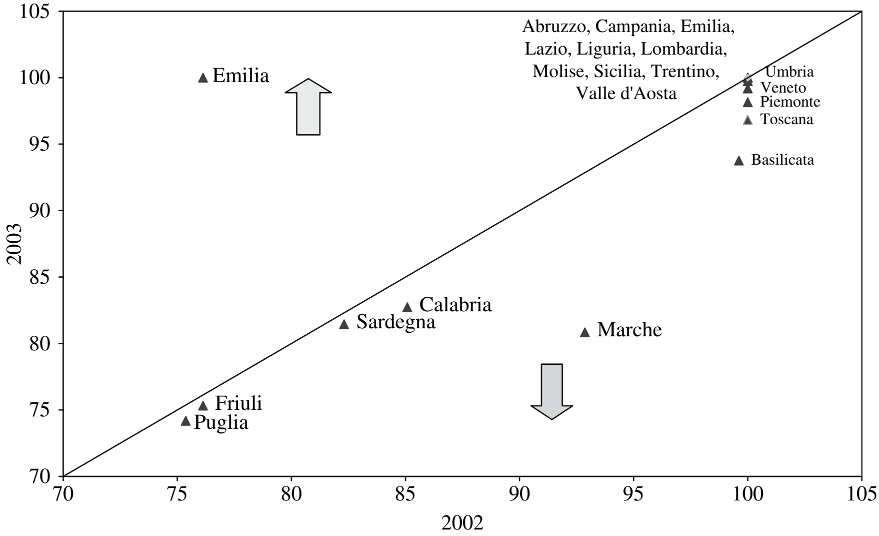

Fig. 1. Results from model 1 in a dynamic analysis

combinations of two inputs, say labour and number of beds, required to produce a given output quantity, say, number of tourists (data are summarised in Table 1).

In order to facilitate comparisons, input levels are converted to those needed by each region to 'produce' one tourist.

Data plotted in Fig. 1 refer to the solution of the input minimisation problem. A kinked frontier is drawn from A to C to D and the frontier envelopes all the data points and approximates a smooth efficiency frontier using information available from the data only. Regions on the efficient frontier of our simple example are assumed to be operating at best practice (i.e. efficiency score equal to one), while Regions B and D are considered to be less efficient. DEA compares B with the artificially constructed Region B', which is a linear combination of A

Table 1. Example data

DMUs	Labour	Beds	Tourists	Labour per tourist	Beds per tourists
A	200	600	200	1	3
B	600	1200	300	2	4
C	200	200	100	2	2
D	600	300	200	3	1.5
E	500	200	100	5	2

and C municipalities. A and C are said to be the ‘peer group members’ of B and the distance BB’ is a measure of the relative inefficiency of B.

Finally, in order to perform dynamic analysis, thus producing not only static pictures of efficiency, but considering the efficiency evolution of each region, the window approach has been used. The DEA is performed over time using a moving average similar procedure, where a municipality in each different period is treated as if it were a ‘different’ region. In other words, a region’s performance in a particular period is contrasted with its performance in other periods in addition to performance of the other Regions.

One last analysis has been conducted in order to calculate the Malmquist productivity index (Total Factor Productivity), thus getting more information on the dynamics of efficiency. This index measures management efficiency changes for each region between two different time periods.

Fare et al. (1984) specifies the output based Malmquist productivity change index as:

$$Mo_{t,t+1}(y_{t+1}, x_{t+1}, y_t, x_t) = \left[\frac{D_o^t(x_{t+1}, y_{t+1})}{D_o^t(x_t, y_t)} \times \frac{D_o^{t+1}(x_{t+1}, y_{t+1})}{D_o^{t+1}(x_t, y_t)}\right] , \tag{4}$$

where the notation D represents the distance function and the value of M is the Malmquist productivity index. This index represents the efficiency of the activity at time t+1 (x_{t+1}, y_{t+1}) relative to the activity at time t (x_t, y_t). A value of M greater than one will indicate positive TFP growth from period t to period t+1, while a value less than one indicates efficiency decline, and a value equal to 1 corresponds to stagnation.

Fare et al. (1989) showed that the Malmquist productivity index can be decomposed into two components, i.e. technical efficiency change (eff) and technological change (tech):

$$Mo_{t,t+1}(y_{t+1}, x_{t+1}, y_t, x_t) = \underbrace{\frac{D_o^{t+1}(x_{t+1}, y_{t+1})}{D_o^t(x_t, y_t)}}_{eff} \underbrace{\left[\frac{D_o^t(x_t, y_t)}{D_o^{t+1}(x_t, y_t)} \times \frac{D_o^t(x_{t+1}, y_{t+1})}{D_o^{t+1}(x_{t+1}, y_{t+1})}\right]^{\frac{1}{2}}}_{tech} . \tag{5}$$

This index can be applied in order to obtain greater insight into the dynamic valuation of regional tourism and environmental management.

3 Data and Indicators

In order to represent the sustainable efficiency of tourism management, for each of the 20 regions a set of eight indicators is considered: four inputs, of which one uncontrollable, and four outputs (indicators are summarised in Table 2, 4 and 6). In particular, inputs are tourism development, public expenditures in tourism management and advertising, public expenditures in environmental protection and market size. As a measure for the level of tourism development in each destination, one of the most commonly used indicators is applied; namely, the indicator is given by the number of beds in hotels, campings, registered holiday houses and other receptive structures per 100 inhabitants (ISTAT[6]). Public expenditures in tourism management and advertising embody all regional expenses devoted to tourism support and development which are enrolled in regional budget plans (XIII Italian Tourism Report, 2005). Public expenditures in environmental protection (ISTAT□) represent quite intuitively a good proxy for public effort in environmental quality management at regional level. Currently, these are the only available data, while in the forthcoming years the EPEA–Environmental Protection Expenditure Account–standards will be applied. The implied definition of environmental protection of current data includes expenses in environmental protection as defined in the EPEA, but also expenses in the use and management of natural resources.

The fourth input indicator, market size, is incorporated in the analysis in order to measure the reachability and size of each regional market, and is included in order to make regions more comparable. The model used to measure market size is a gravity model also adopted in Wober (2003).[7]

The outputs used to control for tourism performances *per se* are total presences of tourists and homogeneity of tourism flows during the

[6] ISTAT–National Institute of Statistics. Tourism Statistics for year 2000–2001.

[7] MARKET SIZE has been incorporated into the analysis in order to consider the difference between different Italian regions and make possible the comparison. The proposed model for market size consists of two components. The first is a measure of the 'density' of the local population, thus a surrogate for the attractiveness of the 'domestic' market. The second is a measure of 'reachability' (measured in terms of the average distance a visitor has to travel during a domestic trip assuming a uniform topological shape of Italian Regions and evenly distributed population density). (Wober and Fesenmaier, 2004).

year. Total presences measure the absolute dimension of the market which is assumed to be proportional to economic benefit deriving from tourism (ISTAT). The degree of homogeneity of tourism flows during the year (ISTAT), measured as a distance from a completely uniform distribution, represents an important indicator of quality of tourism services and quality of tourism management in general. A high seasonality, thus a high concentration of tourists during short periods, has a substantial impact on environmental quality and on the quality of tourism services. As an example, a water supply system or a waste disposal program and depurative systems which are extremely sensitive to tourism pressure because generally designed on the needs of the resident population and not on peak periods population.

The outputs controlling environmental quality are the percentage of protected areas and an index of efficiency in waste treatment. The percentage of protected area is measured as the percentage of the regional territorial area occupied by natural protected areas. This is a fundamental indicator of environmental protection, because the presence of a protected area implies the existence of regulations, norms and limitations, also affecting the reshaping of the territory due to tourism development. Waste treatment efficiency is measured as the urban waste incinerated over the urban waste produced. However, this does not represent the absolute production of solid waste, but the characteristics of the waste management system which is a fundamental measure of environmental policy efficiency.

4 Models and Results

Three different analyses have been undertaken for the year 2003, each based on a different idea of efficiency. Indeed, the models have been designed in order to investigate each region's relative efficiency when both tourism activity and environmental management performances are considered (model 1); when only the performance of tourism–related activities is considered (model 2); and, finally, when only environmental management is considered (model 3). All three models are necessary to the complete picture. Indeed, although some regions may show relatively high efficiency scores in the overall analysis (model 1), this may depend on high performances in one of the two policy objectives, say tourism management, and may be covering a low performance in the other objective, say environmental quality management.

Table 2. List of input and output in tourism and environment management analysis – model 1

INPUT	Market Size
	Public expenditures in environmental protection (thousands of Euro) (2003, ISTAT)
	Tourism Development Index (2003, ISTAT)
	Public expenditures in tourism management and advertising (2003, XIII Italian Tourism Report)
OUTPUT	Total presences of tourists (2003, ISTAT)
	Homogeneity of tourism flows during the year (2003, ISTAT)
	Percentage of protected areas (2001, ISTAT)

In Table 2 model 1 is described.

What happens if policy makers have both tourism–oriented and environmental goals (as it should be) in their policy agenda and they are both included in the DEA analysis? The model which accounts for both tourism and environmental objectives produces a ranking which is described in Table 3.

Note that, the way DEA works, the set of weights for each region, computed through the maximisation problem, is chosen to hide that regions' weaknesses as much as possible and to magnify its strengths. Thus, the ranking should always be read having in mind the complementary information provided by the other two models, which consider each goal separately, thus making it impossible to hide potential shortages in one of the two objectives.

In particular, model 2, described in Table 4, assumes that each region, given some expenditure on tourism advertising, management and strategic planning, and given a certain level of tourism development, aims at maximising the number of total visitors as well as their homogenous distribution in time.

Each region is then ranked on the basis of how well it fulfils its tourism management objective. The derived ranking is depicted in Table 5; it defines who is operating at maximum efficiency, given these purely tourism–oriented objectives, and, conversely, who is dominated.

As an example, and as one would expect given the national and international recognised fame, Toscana and Liguria appear to be operating at full efficiency, both following model 1 and 2.

However, low performances in environmental management, accompanied by a very high performance in attracting tourism may raise

Table 3. Ranking from model 1

Region	Score
Emilia Romagna	100,00
Molise	100,00
Lombardia	100,00
Liguria	100,00
Sicilia	100,00
Umbria	100,00
Toscana	100,00
Abruzzo	100,00
Campania	100,00
Lazio	100,00
Piemonte	100,00
Veneto	100,00
Valle d'Aosta	100,00
Trentino Alto Adige	100,00
Basilicata	93,86
Marche	92,38
Puglia	66,06
Sardegna	63,04
Calabria	54,65
Friuli Venezia Giulia	53,15

some doubts on the long–term sustainability of a fully efficient score obtained in the tourism–oriented or in the comprehensive analysis. Table 6 describes model 3 which is built to detect environmental management only.

In particular, given their level of public expenditure in environmental protection and the level of tourism development (which is considered to have a negative impact on environmental protection), regions are assumed to maximise the percentage of protected area and the efficiency

Table 4. List of input and output in tourism management analysis – model 2

INPUT	Market Size
	Tourism Development Index (2003, ISTAT)
	Public expenditures in tourism management and advertising (2003, XIII Italian Tourism Report)
OUTPUT	Total presences of tourists (2003, ISTAT)
	Homogeneity of tourism flows during the year (2003, ISTAT)

Table 5. Ranking from model 2

Region	Score
Campania	100,00
Emilia Romagna	100,00
Lazio	100,00
Liguria	100,00
Lombardia	100,00
Molise	100,00
Piemonte	100,00
Sicilia	100,00
Toscana	100,00
Trentino Alto Adige	100,00
Umbria	100,00
Valle d'Aosta	100,00
Veneto	100,00
Sardegna	85,48
Marche	81,84
Puglia	78,51
Friuli Venezia Giulia	78,26
Basilicata	78,22
Abruzzo	73,10
Calabria	70,79

in waste treatment. Table 7 shows that the ranking of Italian regions is extremely different if this new perspective is adopted.

When the objective at stake is designed to reflect the efficiency of environmental quality management, regions such as Liguria and Toscana appear less virtuous than they did before.

It is in the dynamic behaviour of efficiency that the interplay of tourism–oriented and environmental factors is expected. Furthermore, environmental costs have a multi–period dimension since they generate

Table 6. List of input and output in environmental management analysis – model 3

INPUT	Market Size
	Public expenditures in environmental protection (thousands of Euro) (2003, ISTAT)
	Tourism Development Index (2003, ISTAT)
OUTPUT	Percentage of protected areas (2001, ISTAT)
	Index of efficiency in solid waste treatment (2003)

Table 7. Ranking from model 3

Region	Score
Basilicata	100,00
Campania	100,00
Emilia Romagna	100,00
Friuli Venezia Giulia	100,00
Sardegna	100,00
Trentino Alto Adige	100,00
Valle d'Aosta	100,00
Lombardia	100,00
Abruzzo	100,00
Sicilia	80,06
Calabria	70,01
Lazio	67,52
Umbria	60,27
Piemonte	52,58
Toscana	43,28
Puglia	43,17
Marche	35,06
Veneto	34,44
Liguria	18,78
Molise	18,11

effects, which are generally visible in future periods. Consequently, it appears more interesting to get an idea of how the efficiency of such regions is performing over time, rather than giving just a static picture. A dynamic analysis of efficiency for the 20 regions has been performed using both moving window and Malmquist DEA approaches and considering indicators' values relative to a previous period (three years). Results are given in Fig. 1 and Table 8. In particular, in Fig. 1, regions above the bisectrix present a relative efficiency score that appears to be improving over time, while the opposite is true for regions below.

Table 8 indicates the inferred total factor productivity of each region.

Even though the analysis would deeply benefit from a dataset covering a larger number of samples in time, still the comparison of computed efficiency to a previous period gives an idea of management directions. Going back to the example, it is interesting to notice how Toscana, e.g. considered in a dynamic setting, appears to be in a descendent phase in terms of tourism and environmental quality management performances.

Table 8. Malmquist DEA (model 1) results. Ranking TFP

Region	TFP
Campania	2,159
Emilia Romagna	1,946
Marche	1,401
Lombardia	1,143
Piemonte	1,04
Puglia	1,013
Lazio	1,003
Trentino Alto Adige	0,994
Friuli Venezia Giulia	0,993
Valle d'Aosta	0,902
Abruzzo	0,863
Toscana	0,851
Sicilia	0,809
Basilicata	0,746
Veneto	0,724
Sardegna	0,708
Calabria	0,686
Liguria	0,663
Molise	0,612
Umbria	0,427

This may partly depend on identified poor performances in environmental quality preservation and management.

5 Final Remarks, Conclusions and Recommendations

There are several phases characterising a management decision process. First, it is necessary to identify problematic and crucial issues. This status quo analysis is normally followed by the formulation of reacting strategies, which in turn are implemented. In the final phase, effectiveness of results is evaluated. The use of synthetic efficiency indicators may be crucial, particularly at earlier and latter stages of the management process.

Data Envelopment Analysis can be effectively applied in assessing and comparing economic and environmental performances of tourism management units. As discussed, DEA analysis produces relative efficiency indices for each considered unit and also gives useful information concerning which lever would play a more effective role in improving management efficiency. The methodology can handle input and output of multiple natures, as e.g. economic factors and environmental quality indicators, and this can prove to be of crucial importance when taking into account incommensurable issues.

The present study discusses a methodology that can provide insights on the issue of sustainable tourism management, however, there are some important further steps that should be considered. First, a survey investigating stakeholders' opinions should be carried out in order to better understand what input and output indicators should be considered in order to provide the most relevant information to the decision process. Subsequently, the data set could be extended both spatially, in order to include other European tourist resorts, and temporally, in order to obtain a better understanding of the dynamics of the system. Indeed, changes in terms of time management efficiency are the most relevant element in addressing the issue of sustainable tourism management.

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Microeconomic Determinants of the Duration of Stay of Tourists

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1 Introduction

The classical demand theory overlooks the peculiarities of tourist services (Quandt, 1970; Rugg, 1973; Papatheodorou, 2001). An analysis of the tourism demand should recognize that this is a time-consuming activity. In this paper we discuss the discrete/continuous choice model proposed by Dubin and McFadden (1984) and Hanemann (1984) as an alternative way of analysing the tourism demand. Our model focuses on one of the main characteristics of a tourist trip, the length of stay. Although the evolution of the length of stay has critical implications for tourist destinations, particularly on the income generated[3] but also on tourists' spatial distribution throughout a destination (Opperman, 1994) and destinations' seasonality (Alegre and Pou (2003), it has received little attention in literature.[4] For that purpose, an empirical model is estimated using data from one of the Mediterranean's lead-

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[3] See Spotts and Mahoney (1991), Taylor, Fletcher and Clabaugh (1993), Nogawa, Yamaguchi and Hagi (1996), Seaton and Palmer (1997), van Limburg (1997), Mules (1998), Agarwal and Yochum (1999), and Cannon and Ford (2002), among others.

[4] To the best of our knowledge, only the papers by Mak, Moncur and Yonamine (1977) and Mak and Nashimura (1979), both examining cross-section data from a survey on U.S. visitors to Hawaiï in 1974, and Fleischer and Pizam (2002) for Israeli seniors, test explanatory models of the length of stay.

ing sun and sand destinations, the Balearic Islands, applying Pollak's (1969, 1971) conditional demand function.

Lancaster (1966) modified the classical demand theory, reformulating it as a theory of the demand for attributes. In his simpler version, Lancaster (1966, p.137) proposes a technology of consumption that relates attributes (from which consumers derive direct utility) with a group of goods. Lancaster's model of consumption (1966) has been applied to the demand for tourism by Rugg (1973), Morley (1992), Papatheodorou (2001), Seddighi and Theocharous (2002) and Huybers (2003 a), among others. These authors assume that the utility generated by some relevant characteristics of the trip increases with the time spent on holiday. In Rugg (1973) it is assumed that tourism generates a vector z, the elements of which are quantities of destinational characteristics. The values of this vector are dependent on the length of stay at different destinations, $z = B\,t$, where t is the vector of the lengths of stay and B is the matrix of coefficients that generates the quantities of characteristics z. This function describes the production of characteristics by commodities, that is, the days spent visiting each destination (Rugg, 1973).

The above approach has several drawbacks. Firstly, no direct utility is derived from the length of stay, since it only affects the values of the consumed amounts of holiday characteristics. Following Gorman (1980), it can be assumed that the consumed amount of a good or service itself generates utility. This implies that the length of time a tourist spends on holiday contributes directly to his satisfaction with the trip and, by extension, that the length of stay should be treated as a holiday characteristic. Secondly, the empirical applications of the model should, on the one hand, explicitly define the technology of consumption (i.e. the coefficients of matrix B) and, on the other, justify the product characteristics dependent on the length of stay. None of the previous authors complies with these two requirements.

The discrete choice or random utility model proposed by McFadden (1974) and Manski (1977) has also been applied to recreational or tourism demand.[5] The model assumes that consumers compare the utility of alternative choices, selecting the one that maximises their utility. These choices can concern any of the trip's different characteristics.

[5] See Morey, Rowe and Watson (1993), Haab and Hicks (1997), Eymann and Ronning (1997), Berman and Kim (1999), Shaw and Ozog (1999), Huybers and Bennett (2000, 2003), Huybers (2003 a and 2003 b) and Papatheodorou (2003), among others.

However, in literature on leisure and tourism demand where discrete choice models are used, only the discrete characteristics of the trip have been analysed.[6]

The aim of this study is to use the discrete/continuous model of consumer demand proposed by Dubin and McFadden (1984) and Hanemann (1984) for modelling tourism consumption. These authors present a consumer choice model from which demand functions for the discrete or continuous characteristics of a good or service can be derived.

Dubin and McFadden (1984) apply the discrete/continuous model to the household demand for energy. They suggest that domestic appliances are chosen according to their characteristics and the amount and type of energy that they consume. Households must weigh up the benefits that each appliance offers against expectations of future use and future energy prices. A similar approach can be taken to the demand for a length of stay at a holiday destination. Consumers weigh up the benefits of different holiday choices, bearing in mind the cost of each one and the length of stay they can afford, given their budget and time constraints.

The model integrates the concept of Pollak's conditional demand function (1969, 1971), according to which consumers assign optimal quantities of some goods, dependent on another part of their consumption having already been determined. One advantage of this function is the fact that the conditioning goods need not be explicitly modelled. Moreover, the demand system will be correctly specified, whether the conditioning goods are chosen optimally or not (Browning and Meghir, 1991). In the case of the demand for length of stay, the tourist is assumed to choose the optimal length of stay, conditioned on the remaining holiday characteristics he has chosen (i.e. the destination, type of accommodation etc).

The model for the length of stay is applied to tourists visiting the Balearic Islands, one of the Mediterranean's leading *sun and sand* destinations.[7] The data was drawn from the Tourist Expenditure Survey (TES) conducted by the Regional Government of the Balearic

[6] See Crouch and Louviere (2000) for a review of choice models in tourism, hospitality, and leisure.

[7] Just over 10 million tourists, mainly Germans and Britons, visited the Balearic Islands in 2003. On the other hand, the islands' hotel supply represented around 22% of all Spain's hotel beds and 3.36% of the European Union's in year 2000 (European Commission, 2002).

Islands in collaboration with the University of the Balearic Islands. The TES provides information about the tourists' sociodemographic profile as well as holiday characteristics, including the length of stay. According to the TES, the average length of stay fell by just over three days between 1989 and 2003 (from 13.14 to 9.89 days), representing a cumulative average fall of 2% per year. This trend is common to most European holiday destinations as well as to the main issuing countries (Tourism Intelligence International, 2000 a and 2000 b).

Figure 1 shows the percentage of British and German tourists who visited the Balearic Islands on a holiday of up to a week, from 8 to 14 days and for over two weeks. It clearly highlights the importance of the downward trend in the Balearic Islands. Whilst in 1989, 17.1% of tourists spent up to a week in the Balearics, 74.6% spent between

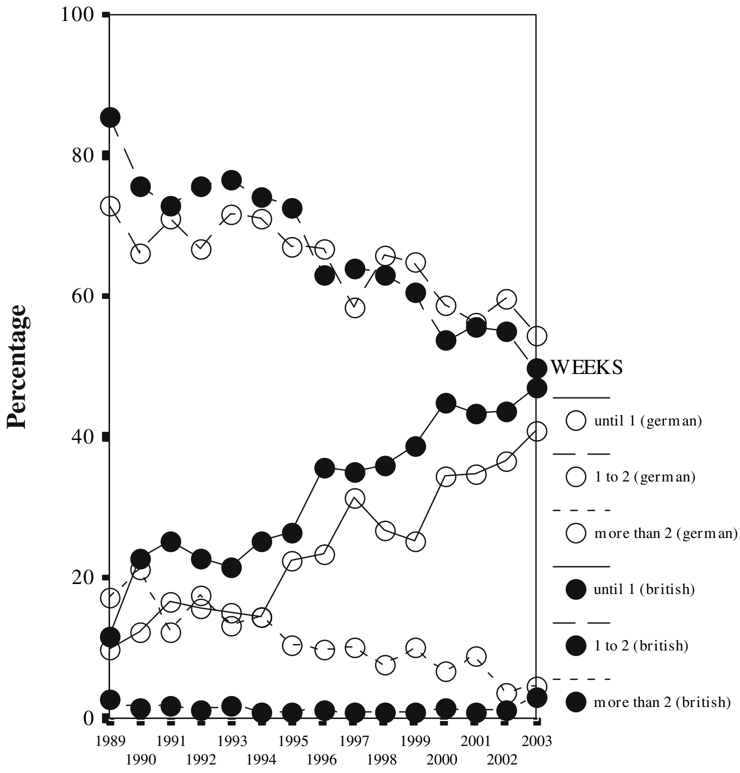

Fig. 1. German and British tourists by lengths of stay (in percentages)

eight and fourteen days and 8.3% spent over two weeks, in 2003 the respective percentages were 47.6%, 46.5% and 5.8%.

The outline of the paper is as follows. Section 2 describes the discrete/continuous choice model applied to the tourism demand and proposes a conditional demand function for the length of stay. Section 3 discusses the econometric specification and the data used. The results of the empirical model are outlined in Sect. 4. Finally, Sect. 5 contains the main conclusions.

2 The Economic Model

In our model we suppose that consumers plan a single annual trip.[8] It is assumed that the maximum annual length of available holiday time is determined exogenously. Consumers can choose from among J holiday alternatives, where each one entails a choice of destination and set of characteristics that make up the tourist product.

The discrete/continuous choice model (Dubin and McFadden, 1984; Hanemann, 1984) can be specified for a consumer who maximizes a utility function with the following arguments: the vector of consumer goods (excluding tourist services), q; the vector of characteristics that define the holiday (the destination, type and category of accommodation etc.), z; and the length of the trip, t, separated into the transit time to the destination, t_{trans}, and the length of stay there, t_{tour}. The utility function also includes a vector of taste shifters, η, comprising those consumer characteristics that might influence his preferences, and a random term, ε, for non-observable characteristics of the trip (McFadden, 1981). Thus the consumer maximizes the following problem:

$$\max_{q,\,z,t_{trans},t_{tour}} u\left(q, z, t_{trans}, t_{tour}, \eta, \varepsilon\right) , \qquad (1)$$

subject to budget and time constraints, Y and T:

$$\begin{aligned} & p'\, q + p_{trans} + p_{tour}\, t_{tour} \leq Y \\ & t_{trans} + t_{tour} \leq T \\ & q, z, t_{trans}, t_{tour}, p, p_{trans}, p_{tour} \geq 0 \ , \end{aligned} \qquad (2)$$

where p is the vector of prices of q; p_{trans} and p_{tour} are the transport cost and price per day's stay at the destination, respectively.

[8] The model can easily be extended to allow for more than one annual holiday.

From the above utility optimization problem, the consumer chooses the level of consumption of non-tourism goods, the characteristics of the holiday trip and its length. The indirect utility function is given by:

$$\begin{aligned} &v\left(p, p_{trans}, p_{tour}, z, t_{tour}, t_{trans}, Y, T, \eta, \varepsilon\right) = \\ &= \max_{q,z,t_{trans},t_{tour}} u\left(q, z, t_{trans}, t_{tour}, \eta, \varepsilon\right) \\ &\quad -\lambda\left(p'q + p_{trans} + p_{tour}t_{tour} - Y\right) - \mu\left(t_{trans} + t_{tour} - T\right) \ . \end{aligned} \tag{3}$$

Suppose the consumer chooses a specific trip, j, thus fixing the holiday characteristics, z_j, and transit time $t_{j-trans}$. This does not determine the length of stay at the destination, but it does determine the price per day's stay, which will be a function of selected characteristics $p_{j-tour} \equiv p_{tour}\left(z_j\right)$. The conditional utility function will then depend on the remaining variables to be chosen, q and t_{j-tour}. It can be expressed as follows:

$$\overline{u}_j = \overline{u}_j\left(q, z_j, t_{j-trans}, t_{tour}, \eta, \varepsilon_j\right) \ , \tag{4}$$

with the indirect utility function given by:

$$\overline{v}_j = \overline{v}_j\left(p,\, p_{j-trans},\, p_{j-tour},\, z_j,\, t_{tour},\, Y - p_{j-trans},\, T - t_{j-trans},\, \eta,\, \varepsilon_j\right) \ . \tag{5}$$

The conditional demand for the set of goods, q, and the length of stay can be obtained from Roy's identity. More specifically, for the length of stay:

$$\begin{aligned} t_{j-tour} &= t_{j-tour}\left(p,\, p_{j-tour}, z_j, Y - p_{j-trans}, T - t_{j-trans}, \eta, \varepsilon_j\right) = \\ &= -\frac{\partial v_j\left(p, p_{j-tour}, z_j, Y - p_{j-trans}, T - t_{j-trans}, \eta, \varepsilon_j\right)/\partial p_{j-tour}}{\partial v_j\left(p, p_{j-tour}, z_j, Y - p_{j-trans}, T - t_{j-trans}, \eta, \varepsilon_j\right)/\partial Y} \ . \end{aligned} \tag{6}$$

Expression (6) conditions the length of stay on the chosen holiday characteristics. This prior choice can be treated as a discrete problem, the result of the compared utility of different options. That is, the consumer chooses option j if:

$$\begin{aligned} &\overline{v}_j\left(p, p_{j-tour}, z_j, Y - p_{j-trans}, T - t_{j-trans}, \eta, \varepsilon_j\right) \\ &> \overline{v}_i\left(p, p_{i-tour}, z_i, Y - p_{i-trans}, T - t_{i-trans}, \eta, \varepsilon_i\right) \text{for all } j \neq i \ . \end{aligned} \tag{7}$$

The discrete/continuous choice model can therefore be construed as a two-stage process. The selection of the holiday characteristics can be dealt with using a discrete choice model, where the decision depends, among other variables, on the price per day of each of the holiday alternatives. Once the holiday characteristics have been chosen (i.e. the destination, type and category of accommodation etc.), the consumer decides the length of stay.

The conditional demand function can be related to the ordinary demand function (Pollak, 1969; Hanemann, 1984). The demand function for the length of stay conditioned on a choice of holiday, j, is equivalent to the ordinary demand function if the holiday characteristics are those derived from the unconditional optimization problem (Hanemann, 1984):

$$t_{j-tour}\left(p, p_{trans}, p_{tour}, z, t_{trans}, Y, T, \eta, \varepsilon\right) = \delta_j \cdot t_{j-tour} \left(p, p_{j-tour}, z_j, Y - p_{j-trans}, T - t_{j-trans}, \eta, \varepsilon_j\right) \text{ for j} = 1, \ldots, J \ , \quad (8)$$

where

$$\delta_j = \begin{cases} 1 & if\ v_j\left(p, p_{j-tour}, z_j, Y - p_{j-trans}, T - t_{j-trans}, \eta, \varepsilon_j\right) > \\ & v_i\left(p, p_{i-tour}, z_i, Y - p_{i-trans}, T - t_{i-trans}, \eta, \varepsilon_i\right) \text{ forall } j \neq i \ . \\ 0 & \text{otherwise} \end{cases}$$

The attractive feature of this conditional demand function is the fact that the demand function for the length of stay can be estimated, taking pre-assigned values for the choice of destination and set of holiday characteristics. It is important to note that these characteristics are not dropped from the demand function, but instead included as conditioning arguments.

In the empirical application of the model, weak separability is assumed between the tourist trip and the rest of the goods. The conditional demand function (6) can then be expressed as:

$$t_{j-tour} = t_{j-tour}\left(p_{j-tour}, z_j, Y - p\,q - p_{j-trans}, T - t_{j-trans}, \eta, \varepsilon_j\right) \ . \quad (9)$$

Thus, the length of stay is a function of the holiday characteristics, the daily price of the stay (dependent on the selected characteristics), the total expenditure available for the holiday, the maximum time available for holiday purposes, the characteristics of the consumer and a non-observable random effect.[9]

[9] Note that if we allow for more annual holidays, this will only imply a reduction in the time and expenditure available for this current holiday trip.

One important issue to bear in mind is the fact that, *a priori*, the effect of price variations on the stay might not only imply a reduction in the length of stay, but a different choice of holiday characteristics altogether. Taking a similar approach to Rouwendal and de Vries (1999), the variation in utility that would occur if a different choice of destination were made can be expressed as follows:

$$\Delta \overline{v}_j = \frac{\partial \overline{v}_j{}'}{\partial z} \Delta z - \frac{\partial \overline{v}_j}{\partial \left(Y - p_{trans}\right)} \Delta\, p_{trans} + \frac{\partial \overline{v}_j}{\partial\, p_{tour}} \Delta\, p_{tour}\ , \tag{10}$$

where the first term to the right of the equal sign would be the product of two vectors. Dividing (10) by the partial derivative $\partial\, \overline{v}_j / \partial\ (Y - p_{trans})$ and applying Roy's identity, we get:

$$\frac{\Delta \overline{v}_j}{\partial \overline{v}_j / \partial \left(Y - p_{trans}\right)} = \frac{\partial \overline{v}_j / \partial z}{\partial \overline{v}_j / \partial \left(Y - p_{trans}\right)} \Delta z - \Delta p_{trans} - t_{tour} \Delta p_{tour}\ . \tag{11}$$

Disregarding the non-financial consequences of the change in destination embodied in the first term, a different choice of destination would imply greater utility if:

$$\Delta\, p_{trans} < -t_{tour} \Delta\, p_{tour}\ , \tag{12}$$

where $-t_{tour}\, \Delta\, p_{tour}$ represents the saving on the cost of the stay through the selection of a different destination, and $\Delta\, p_{trans}$ is the change in the transport cost.

From (12) it follows that an increase in the price of the holiday might not affect the length of stay there, but instead the actual choice of destination or the holiday characteristics.

3 Econometric Specification and Data

The model was estimated using data drawn from the Balearic Islands Tourist Expenditure Survey (TES) for the high seasons between 1993 and 2003. The initial sample had 61,914 observations. Tourists who stayed at the homes of friends or relatives or in second homes were excluded. To avoid heterogeneity among tourists from different countries, nationalities other than the Germans and the British (the two major nationalities, accounting for 70% of the interviewees) were excluded. Observations lacking information for any of the variables of the estimated model were also excluded. The final sample was made up of 13,280 German tourists and 17,351 British ones.

The survey requests information about the tourists' sociodemographic characteristics, and enquires about different characteristics of the holiday. Nevertheless, specific characteristics or comparisons that finally led them to choose a particular product and destination are not known. The information about the holiday product is therefore limited to their final choice, with no data on possible alternatives the tourist may have considered during the decision process. Furthermore, as commented above, separability is assumed between tourist consumption during the trip and the remaining goods and services. Likewise, separability is also assumed between the global leisure time available and leisure time for holiday purposes. The maximum amount of holiday time at the tourist's disposal, which determines his time constraints, is not known. The effect of this variable has been proxied for the number of tourist trips made over the last twelve months.

Although the endogenous variable (the length of stay) could be treated as a continuous one, its bimodal distribution (with modes of 7 and 14 days, see Fig. 2) made the estimation of a discrete choice logit model more preferable. The length of stay was codified as a variable with three categories: up to 7 days (1 week), between 8 and 14 days (2 weeks) and over 2 weeks. Because the variable being categorized was a continuous one, initially an ordered logit model was estimated. However, the hypothesis of proportional odds or parallel regression (Brant, 1990) was rejected. From the possible alternatives, a multinomial logit model was preferred, taking the most frequent category (2 week-stays) as our reference.[10]

Regarding the explanatory variables of the model, the TES provides the following information for each tourist: (1) Age: under 30 years old, 30–45, 45–60, over 60. (2) Profession: salaried workers and manual labourers; civil servants; professionals; head technicians, company directors, managers and middle managers (for the sake of brevity henceforth referred to as Level A); pensioners; students; other professions. (3) Size of the party. (4) Type of accommodation: guesthouses and 1 or 2-star hotels; 3-star hotels; 4 or 5-star hotels; apartments and

[10] The test for homogeneity between a choice of 2 weeks and over 2 weeks was rejected. Thus the final estimated model distinguished among three time intervals: one week, two weeks and over two weeks.

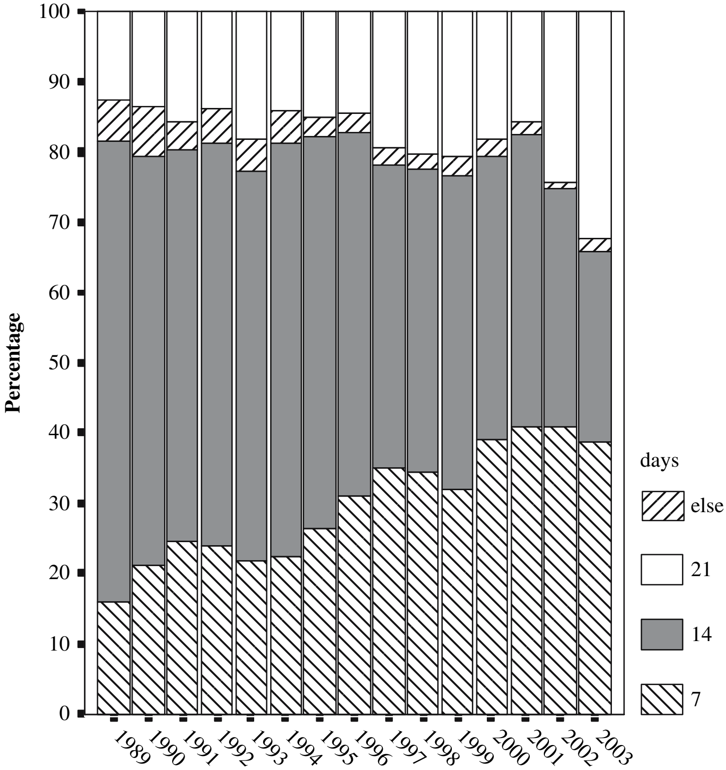

Fig. 2. Percentage of tourists with stays of exactly 7, 14 and 21 days, and remaining lengths

villas. (5) Type of board: distinguishing between transport only, transport and room accommodation, bed and breakfast, half board and full board. (6) Number of holiday trips over the last twelve months (including this one). (7) Number of previous visits to the Balearic Islands: first visit, second, third, fourth or more. (8) Whether or not the tourist came on a package tour. (9) The tourist expenditure of the party (including what they paid in their country of origin and transport). From the tourist expenditure of the party (excluding transport costs), the price of the holiday per person per day was calculated. The explanatory variables for the size of the party, total expenditure and the daily price per person were specified as continuous variables, whilst the remaining ones were included as dummies, taking one of the categories as the reference group.

4 Results

As commented above, the final sample was made up of German and British tourists. Preliminary tests rejected the homogeneity of the coefficients for both nationalities. Thus we estimated the model for each nationality separately. Tables 1 and 2 show the estimation results for German and British tourists respectively. Each table presents the estimates for a choice of up to one week versus an 8 to 14-day stay (hereafter first equation), and an over two week stay versus a choice of an 8 to 14-day stay (henceforth second equation). To interpret the signs of the estimated parameters, it must be taken into account that the reference category for both equations was a two-week stay. Tables 1 and 2 also include the *p-value* of the null hypothesis that the coefficients of each variable equal zero across both equations, as well as the odds ratios. [11] Table 3 shows the marginal effects of each categorical variable for each length of stay,[12] plus the elasticities in the case of the continuous variables. [13] The main results are commented below.

Age. Although the age categories were jointly significant for each nationality, the individual estimated parameters were not equally relevant. Only in the case of German tourists were all differences between the age intervals significant when stays of 2 weeks versus over 2 weeks (i.e. second equation) were compared. Tourists in the oldest age group were more likely to stay for longer. The lack of significance of the age variable might be explained by its high correlation with other variables included in the model. Nonetheless, tests (not shown in the tables) for the equality of coefficients of age intervals below the age of 60 showed a difference in behaviour between German and British tourists in the first equation of the model (i.e. 1 week versus 2 weeks). Whereas German tourists between the ages of 30 and 60 displayed lower odds ratios than those in the under 30s age interval, British tourists between the

[11] The odds in favour of an event are the quantity p/(1 − p), where p is the probability of the event. An odds ratio is defined as the ratio of the odds of an event occurring in one group to the odds of it occurring in another group. The odds ratio is a way of comparing whether the probability of a certain event is the same for two groups. An odds ratio of 1 implies that the event is equally likely in both groups. An odds ratio greater than one implies that the event is more likely in the first group, meanwhile an odds ratio less than one implies that the event is less likely in the first group.

[12] The mean marginal effects measure the percentage change in probability in relation to the reference category.

[13] See Long (1997) for the estimation of elasticities with limited dependent models.

Table 1. Results of the multinomial logit model for German tourists (1993–2000). The model's reference category was the 2-week length of stay

	1 week versus 2 weeks			Over 2 weeks versus 2 weeks			
	B	Sig.	Exp(B)	B	Sig.	Exp(B)	Global sig.
Age							
Under 30	–0.084	0.734	0.920	–1.269	0.000	0.281	0.000
30 – 45	–0.221	0.370	0.801	–0.836	0.000	0.434	0.001
45 – 60	–0.547	0.042	0.579	–0.596	0.009	0.551	0.005
Over 60	–	–		–	–	–	–
Labour status							
Salaried & manual workers	−0.319	0.000	0.727	0.027	0.806	1.028	0.000
Civil servants	–0.354	0.007	0.702	0.290	0.081	1.337	0.006
Pensioners	–1.138	0.001	0.320	0.358	0.120	1.431	0.001
Students	–0.508	0.000	0.602	–0.290	0.267	0.748	0.000
Other professions	–0.537	0.000	0.585	–0.124	0.509	0.883	0.000
Level A	–	–	–	–	–	–	–
Accommodation							
Guesthouses & 1 & 2-Star hotels	0.467	0.000	1.595	0.241	0.126	1.272	0.000
3-Star hotels	0.427	0.000	1.532	0.075	0.517	1.078	0.000
4 & 5-Star hotels	0.544	0.000	1.724	0.347	0.278	1.415	0.000
Apartments or villas	–	–	–	–	–	–	–
Type of board							
Transport only	0.393	0.222	1.481	1.167	0.000	3.211	0.001
Transport & room	0.554	0.039	1.741	1.004	0.000	2.728	0.000
Trans, bed & breakfast	0.597	0.024	1.817	0.836	0.012	2.306	0.004
Trans & half board	0.699	0.003	2.012	0.117	0.637	1.125	0.013
Trans & full board	–	–	–	–	–	–	–

Table 1. (Cont.)

	1 week versus 2 weeks			Over 2 weeks versus 2 weeks			
	B	Sig.	Exp(B)	B	Sig.	Exp(B)	Global sig.
Number of trips							
One (including this)	–0.124	0.124	0.883	–0.217	0.167	0.805	0.119
Two	–0.007	0.921	0.993	–0.103	0.428	0.902	0.727
Three	0.027	0.734	1.027	–0.173	0.186	0.841	0.388
Four	–0.003	0.973	0.997	–0.538	0.002	0.584	0.010
More than four	–	–	–	–	–	–	–
Package holiday							
Yes	–0.233	0.013	0.792	–0.320	0.030	0.726	0.005
No	–	–	–	–	–	–	–
Repeat visitation							
First visit	0.160	0.033	1.174	–0.967	0.000	0.380	0.000
Second	0.180	0.024	1.198	–0.524	0.000	0.592	0.000
Third	0.176	0.057	1.192	–0.444	0.000	0.641	0.001
Fourth or more	–	–	–	–	–	–	–
Size of party	3.849	0.000	46.94	–3.685	0.000	0.025	0.000
Price per day's stay	0.130	0.000	1.139	–0.205	0.000	0.815	0.000
Total spending on trip	–0.008	0.000	0.992	0.005	0.000	1.005	0.000

Note: The results are not shown for the yearly dummies and the constant. (–) refers to the reference group.

ages of 30 and 60 had higher odds ratios. In general terms, it could be interpreted that middle-aged British tourists were more likely to make trips of up to a week.

Profession. When stays of up to one week were compared with two week stays, the most highly qualified professional category (Level A) displayed an odds ratio below one in relation to each other professional category. In comparison with Level A, pensioners showed the highest marginal effect for two-week stays (3.84% and 8.61% for German and British tourists, respectively), followed by students (2.53% and 6.71%) and other professions (2.55% and 4.50%). When a comparison was made between stays of over 2 weeks and stays of 2 weeks, salaried workers and

Table 2. Results of the multinomial logit model for British tourists (1993–2000). The model's reference category was the 2-week length of stay

	1 week versus 2 weeks			Over 2 weeks versus 2 weeks			
	B	Sig.	Exp(B)	B	Sig.	Exp(B)	Global sig.
Age							
Under 30	–0.047	0.716	0.954	–0.555	0.229	0.574	0.464
30 – 45	0.412	0.001	1.510	–0.333	0.408	0.717	0.003
45 – 60	0.162	0.171	1.175	–0.267	0.449	0.765	0.271
Over 60	–	–	–	–	–	–	–
Labour status							
Salaried & manual workers	–0.388	0.000	0.679	–0.854	0.003	0.426	0.000
Civil servants	–0.351	0.005	0.704	–1.317	0.060	0.268	0.003
Pensioners	–0.670	0.000	0.512	0.285	0.403	1.330	0.000
Students	–0.481	0.000	0.618	–0.691	0.141	0.501	0.000
Other professions	–0.303	0.000	0.738	–0.546	0.178	0.579	0.001
Level A	–	–	–	–	–	–	–
Accommodation							
Guesthouses & 1 & 2-Star hotels	0.299	0.019	1.348	–0.130	0.834	0.878	0.061
3-Star hotels	0.008	0.942	1.008	0.093	0.855	1.098	0.981
4 & 5-Star hotels	–0.327	0.120	0.721	–0.062	0.955	0.940	0.298
Apartments or villas	–	–	–	–	–	–	–

Transport only	0.395	0.075	1.485	–0.214	0.731	0.808	0.189
Transport & room	0.463	0.014	1.588	–0.895	0.136	0.408	0.014
Trans, bed & breakfast	0.732	0.000	2.078	–0.356	0.542	0.701	0.000
Trans & half board	0.497	0.001	1.644	–1.670	0.000	0.188	0.000
Trans & full board	–	–	–	–	–	–	–
Repeat visitation							
First visit	0.355	0.000	1.427	–0.157	0.582	0.855	0.000
Second	0.252	0.000	1.287	–0.801	0.023	0.449	0.000
Third	0.265	0.000	1.303	–0.883	0.022	0.414	0.000
Fourth or more	–	–	–	–	–	–	–
Size of party	2.624	0.000	1.379	–1.436	0.000	0.238	0.000
Price Per Day's Stay	0.142	0.000	1.152	–0.107	0.000	0.899	0.000
Total Spending on Trip	–0.007	0.000	0.993	0.002	0.000	1.002	0.000

Note: The results are not shown for the yearly dummies and the constant. (–) refers to the reference group.

Table 3. Mean estimated marginal effects and elasticities

	German			British		
	Up to one week	Between 1to 2 weeks	Over 2 weeks	Up to one week	Between 1to 2 weeks	Over 2 weeks
Age						
Under 30	–0.0035	0.0158	–0.0124	–0.0054	0.0062	–0.0008
30 – 45	–0.0097	0.0194	–0.0965	0.0568	–0.0562	–0.0006
45 – 60	–0.0216	0.0291	–0.0075	0.0205	–0.0200	–0.0005
Over 60	–	–	–	–	–	–
Labour status						
Salaried & manual workers	–0.0162	0.0159	0.0003	–0.0550	0.0560	–0.0011
Civil servants	–0.0179	0.0155	0.0023	–0.050	0.0516	–0.0014
Pensioners	–0.0415	0.0384	0.0032	–0.0870	0.0861	0.0009
Students	–0.0238	0.0253	–0.0015	–0.0662	0.0671	–0.0009
Other professions	–0.0249	0.0255	–0.0006	–0.0442	0.0450	–0.0007
Level A	–	–	–	–	–	–
Accommodation						
Guesthouses & 1 & 2-Star hotels	0.0191	–0.0206	0.0015	0.0445	–0.0442	–0.0002
3-Star hotels	0.0172	–0.0175	0.0003	0.0011	–0.0012	0.0001
4 & 5-Star hotels	0.0231	–0.0254	0.0023	–0.0393	0.0393	–0.0000

Apartments or villas	–	–	–	–	–	–
Type of board						
Transport only	0.0110	–0.0218	0.0109	0.0445	–0.0435	–0.0010
Transport & room	0.0170	–0.0255	0.0084	0.0537	–0.0509	–0.0027
Trans., bed & breakfast	0.0189	–0.0252	0.0063	0.0933	–0.0917	–0.0017
Trans. & half board	0.0236	–0.0241	0.0005	0.0586	–0.0549	–0.0037
Trans. & full board	–	–	–	–	–	–
Number of trips						
One (including this)	–0.0051	0.0065	–0.0014	–0.0535	0.0550	–0.0015
Two	–0.0003	0.0010	–0.0007	0.0042	–0.0030	–0.0012
Three	0.0013	–0.0001	–0.0012	0.0352	–0.0342	–0.0010
Four	0.000	0.0031	–0.0031	0.0332	–0.0324	–0.0007

Table 3. (Cont.)

	German			British		
	Up to one week	Between 1to 2 weeks	Over 2 weeks	Up to one week	Between 1to 2 weeks	Over 2 weeks
More than four	–	–	–	–	–	–
Package holiday						
Yes	–0.0110	0.0133	–0.0023	0.0192	–0.0160	–0.0031
No	–	–	–	–	–	–
Repeat visitation						
First visit	0.0071	–0.0002	–0.0068	0.0486	–0.0483	–0.0004
Second	0.0079	–0.0034	–0.0045	0.0335	–0.0324	–0.0011
Third	0.0076	–0.0036	0.0040	0.0353	–0.0341	–0.0012
Fourth or more	–	–	–	–	–	–
Size of party (*)	8.766	–0.360	–9.098	6.450	–1.247	–5.460
Price per day's stay (*)	5.321	–0.195	–8.851	4.803	–0.926	–5.235
Total spending on trip (*)	–12.733	0.553	8.873	–9.707	1.880	5.775

Note: (–) refers to the reference group. The marginal effects were calculated in relation to the reference group as differences between probabilities (using mean sample values). The mean elasticities were calculated for the continuous variables (values shown with an asterisk).

civil servants stood out as being different from Level A (the reference category), albeit with a very low marginal effect (under 1%).

Type of Accommodation. When one-week and two-week stays were compared for Germans, accommodation in guesthouses or hotels displayed an odds ratio above the unity in relation to the reference group (villa or apartment accommodation). Among the hotel categories, the highest category of hotel was the one that registered the strongest marginal effect, with a value of 2.31%. In the case of British tourists, only the lowest category of hotel displayed a significant differential effect in the first equation, with a marginal effect for two-week stays of 4.45%. For the second equation, no significant differences were detected among the accommodation categories for either nationality.

Type of Board. In the first equation, compared with full board accommodation, all the other categories had an odds ratio higher than one, with marginal effects for two-week stays ranging between 1% and 2% for German tourists, and between 4% and 9% for British tourists. In the second equation, the estimation results showed different patterns for German and British tourists: while Germans showed statistically significant effects for most types of accommodation, for British tourists they were not different from zero.

Number of Trips. This variable was regarded as a proxy for time constraints on the available free time for this holiday. When a joint analysis was made of the two nationalities (the results are not reported), a negative relationship between the number of trips and the length of stay was obtained. However, when British and German tourists were analysed separately, that relationship was not statistically significant. Only in the case of British tourists on their first and only trip over the last twelve months did the estimated marginal effects show a propensity toward 2-week stays instead of longer or shorter ones. This result might suggest that having less available holiday time does not seem to have a direct effect on the length of stay at a destination. Nevertheless, it must be interpreted with caution. It should be taken into account that the distribution of the number of trips for both sample nationalities was very different, due to their different vacational habits. For example, only 15.3% of the German sample had just made one trip, whilst the corresponding percentage for British tourists was 51.8%. [14]

Package Holiday. Booking a package holiday tends to lead to a greater probability of two week stays. When the tourist did not opt for a package holiday, the odds ratios showed that tourists were more flexible in their choice of a length of stay, with holidays of up to one week or over two weeks being more probable than two-week stays.

Repeat Visitation. In both logit model equations, the highest repeat visitation category is associated with a longer stay. Consequently, in the first equation the odds ratios displayed values of over one, whilst in the second equation they were below one.

Size of the Party. The results show a statistically significant effect for the size of the party. In particular, for both equations, the larger the size of the party, the higher the probability of a shorter length of stay. Thus a larger party would increase the probability of stays of up to a week (with elasticities of 8.77 and 6.45, respectively, for German and British tourists) and would reduce the probability of a trip of over 2 weeks (with elasticities of –9.09 and –5.46 respectively).

Daily Price of the Stay. The estimates show that the price factor has a statistically significant effect on probability, with the expected sign. That is, the mean estimated elasticities indicate that higher prices increase the probability of shorter stays. For Germans, the mean price elasticities between 1993 and 2003 were 5.32, –0.20 and –8.85 for probabilities of up to a week, two weeks, and over two weeks respectively. For Britons, the price elasticities were 4.80, –0.93 and –5.23. These results suggest that, holding the holiday characteristics fixed, an increase in the daily price of a stay would be offset by a reduction in its length. Furthermore, according to the estimation results, the length of stay's sensitivity to the price of the holiday increased over the period, reaching high values during the final years (see Fig. 3). For instance, for the probability of a two week stay, the mean price elasticity rose from –0.036 and –1.24 for Germans and Britons, respectively, in 1993 to –2.47 and –3.08 in 2003.

[14] It should also be noted that the length of previous trips is not known. The different degree of importance of short-breaks, such as week-end ones, might also explain the lack of significance of the variable of the number of trips.

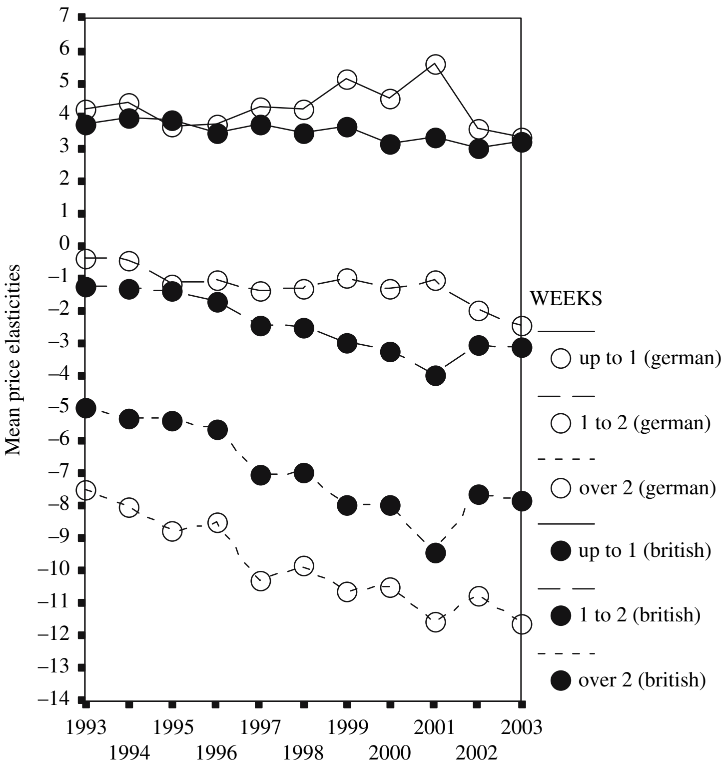

Fig. 3. Mean estimated price elasticities for German and British tourists (1993–2003)

Figure 4 shows the evolution of the (absolute) mean price elasticities for each nationality estimated for the period 1993–2003. Whilst at the beginning of the period, there was a price elasticity of almost 2, price sensitivity increased over time to reach values of over 3 at the end of the period.

Tourist Expenditure. The (absolute) mean expenditure elasticity was higher than the corresponding price elasticity, with a value of around 4.5 for both nationalities. The most important effect was obtained in the expenditure elasticities for the probability of a stay of up to a week, with a value of 12.73 for German tourists and 9.71 for the British.

Thus from the microeconometric analysis, two main conclusions can be drawn. On the one hand, the estimates reflect the heterogeneity of tourist behaviour. On the other hand, the importance of the price effect

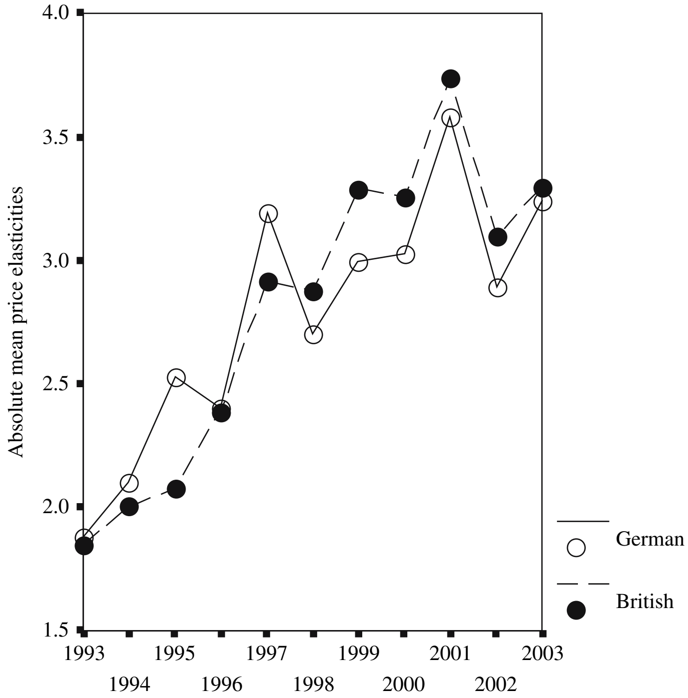

Fig. 4. (Absolute) mean estimated price elasticities for German and British tourists (1993–2003)

is also shown, supporting the hypothesis that although increases in the daily price of a stay might not necessarily dissuade consumers from making a trip, a price rise would induce them to shorten it.

5 Conclusions

One of the main characteristics of a tourist trip is the length of stay. Although its implications for tourist destinations, this variable has received little attention in literature. This could be due to the difficulty of adapting tourism demand models to this travel characteristic.

Dubin and McFadden's discrete/continuous choice model can be used to explain a choice of either discrete or continuous variables. When applied to tourism demand, it enables continuous variables, like the length of stay at a tourist destination, to be included in the set of demanded characteristics. The empirical application of the model admits the concept of a conditional demand, justifying the estimation of the demand for a continuous attribute conditional on a previous choice of discrete characteristics.

Despite the limitations of the dataset used in the paper, the estimated multinomial logit model pointed to the existence of different preferences for lengths of stay, together with the likely existence of different opportunity costs in the use of time. The estimation results highlight that the length of stay is not an exogenous variable. Alike, the results from this paper show that sociodemographic and economic variables influence the length of stay. In this sense, the significant effect of the explanatory variables, such as age, repetition rate and party size, indicate that general processes such as the population ageing, changes in household composition and loyalty to tourist destinations might affect the evolution of the length of stay. Furthermore, the significant effect of the above mentioned variables suggest that the length of stay should be taken into account in the design of tourism policies.

A special concern should be drawn from the high sensitivity of tourists' length of stay to price changes, with price elasticticies well above one. Thus faced with increases in the price of a holiday, tourists can opt to reduce their length of stay substantially. The evolution of the price elasticity over time, detected in this paper, highlights the need to devote more attention to this variable, since it could become a key factor in the survival of many European destinations. In this sense, the results of this paper underline the need to take into account the fact that tourism is a time-consuming activity. Otherwise part of the variability of the tourist's behaviour cannot be explained.

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Multicriteria Evaluation and Local Environmental Planning for Sustainable Tourism

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1 Introduction: Evaluation and Construction of a New Development Framework for Tourism

During the last 30 years, the successful development of a variety of regions has been paralleled by growing confidence in tourism as a catalyst for economic and cultural development. In a classical perspective, economists in developing countries have been supporting policies for a higher level of tourist activities and revenues in the hope of obtaining overall higher performances in the whole economic system.

However, there have been many changes in this paradigm. Recent advanced studies on the concept of integrated tourist development (Pearce, 1989; Wall, 1997) reveal how tourism per se can not be indicated as a factor of development, as it has to be linked to the other sectors of the economy. On the other hand, research findings (APDR, 2000) also indicate that integrated tourist development involves many stakes and interests that most of the time are conflicting. Butler (2000) notes that integration in tourism is often regarded as a common purpose in many research studies on environmental policy and planning.

Indeed, integration is frequently associated with sustainability. In the light of many institutional reports, as long as theobjectives of the development are generally linked to the human and material resources embedded in the local context, sustainable development can then be guaranteed by the positive attitude of local communities towards social learning and self-organizing.

In the perspective of policy makers and planners, addressing local societies to sustainability calls for the adoption of methodologies and indicators able to capture hardly measurable properties conveyed in the issues at hand, such as tourism integration, community empowerment, and self-reliance. In this realm, multicriteria analysis represents a suitable methodology to tackle complexity, as it provides a framework for constructing, aggregating, and managing complex indicators.

On the basis of this background, the aim of this chapter is the construction of a multicriteria methodology suited for measuring the level of achievement of the integration of tourism within the whole economic system. The methodology, based on a combination of two multicriteria tools, the Regime method and the analytic hierarchy process (AHP), is then tested on the assessment of the attitude to sustain policies towards tourist integrated development demonstrated by seven municipalities along the southern coast of Sardinia, Italy.

This chapter is structured as follows. The remainder of this section deals with innovative approaches to tourist policies for coastal environments as a catalyst for development in the context of sustainability and with the assessment of composite indicators able to analyze complexity. In Sect. 2, the parts of the methodology adopted are described. Then, in Sect. 3 the results are discussed and screened by means of sensitivity analysis. In Sect. 4, the conclusions of the chapter are proposed and confronted with new research directions.

1.1 New Developments of Coastal Planning: Pushing Economic Activities by Environmental Protection

According to classical economic approaches, tourism per se is able to bring advantage to the economies of developing countries. The main assumption of these theories is that especially international tourism is able to generate a higher level of consumption, thus leading to an overall higher level of disposable income (Krapf, 1961). As a consequence, since the end of the 1960's many developing countries have been introducing international tourism into their economic system. Examples are the Caribbean Islands, Mexico, Thailand, Indonesia, the Maldives, and Spain. In summary, the following characteristics can be attributed to the traditional approach to tourist policies: autarchy of tourist entrepreneurship; internationalization; and lack of perception of the local culture. One of the main results of these practices is the perception of an initial lack of concern of tourist ventures for local environments and ecosystems.

On the other side, Coccossis and Nijkamp (1996), reflecting on the interaction between tourism and environment, emphasize that tourist activities, if correctly conceived, might actually contribute to the protection of the natural environment. They point out that classical economic frameworks, such as the internalization of the externalities, do not seem to solve the dilemma of tourist impacts.

In the same perspective, Briassoulis (1996, p. 33) claims that mainstream economic analysis is not adequate to support tourism policy decisions because tourism is not a typical economic sector or activity as is assumed by this kind of analysis. When tourism is conceptualized as a complex and multifaceted socio-economic activity, more integrated analytical approaches are required to represent the interrelatedness among the tourism-related economic sectors and environment. A new paradigm in tourism economics is required, because today tourism is recognized worldwide as a strategic sector of the economy.

The tourist experience is indeed a multifaceted phenomenon. Many research studies (Ryan, 1998) have identified the main characteristics of leisure traveling. In the last few years, the technological change, the widening of leisure time and the specialization of tourism demand have introduced new elements into the classical patterns of tourist sector planning. The idea is that mono-cultural tourism based on the exploitation of singular beauties of a country is no longer considered sustainable. It seems that an innovative development model should involve diversifying activities and smoothing out seasonal fluctuations in demand.

Butler (2000, p. 50) proposes the term "complementarity", which is similar to sustainable tourism, in that it is an integrative concept. Complementarity is the optimal level of the relationship between tourism and other resource activities. This term implies that tourism and other activities are not only in relative harmony with each other in the destination region, but in fact enhance each other by their mutual presence. Accordingly, as many research studies point out (Law, 1993; Shaw and Williams, 1994; Harvey, 1989; Ashworth and Voogd, 1990;

Urry, 1990; Poon, 1989), there has been an increase of tourism initiatives based on local urban and rural entrepreneurship. Usually these processes are managed along three main strategies: tourism promotion; image restructuring; and place marketing. Many times, integration of tourism activities with the local *milieu* is based on diversification of local economies, de-industrialization, and fragmentation of ownership.

1.2 Towards Tourist Complementarity in the Framework of Sustainability

In the perspective of policy makers and planners, understanding the level of achievement of tourist integration with respect to the remaining economic sectors and readdressing local strategies and operative actions accordingly represent major issues. Planning and managing new sustainable tourist destinations imply a conspicuous demand of contextual knowledge and information retrieval. The assessment of the characteristics of tourist entrepreneurship and its relations with local economies, environment and societies is a primary yet complex activity focused on benchmarking actual and potential performance improvements, recommending policy actions, and suggesting financing strategies.

This is why evaluation plays a central role in the identification of suitable conditions for tourist development for contemporary societies. In many countries, increasing concerns for environmental protection and sustainable development have recently led to the inclusion in central policy programs of procedures for evaluating the compatibility between projected activities and the environment.

According to recent studies, relating soundly productive tourist ventures and their economic activities with local environmental systems as well as developing efficacious communication strategies proved to become success factors for tourist destinations. Mihalic (2000) stresses that environmental management of a destination, when correctly conceived, constitutes a determinant factor for its success and attractiveness. In the same direction, Lee (2001) stresses the potential comparative advantage of sustainable tourism destinations. Crucial components of a path toward sustainability for tourism destinations are actions for implementing environmental management systems (EMS), eco-labelling, local agenda 21 (LA21), and cleaner production (Lee, 2001, p. 316).

According to De Montis and De Montis (2004), two families of environmental evaluation procedures characterize the set of tools able to support decision making: mandatory procedures such as environmental impact assessment (EIA) and strategic environmental assessment (SEA), and voluntary ones, such as environmental quality certification. Rad (2000) points out that many small and medium tourist ventures, as well as international organizations, show an interest in environmental certification. The International Standard Organization (ISO) in 1996 developed the 14.000 series of regulations dedicated to the environmental area. The main concerns of these directives are: specifications for pollution prevention and environmental management; environmental auditing; environmental performance evaluation; life-cycle assessment; the environmental aspects of product standards; and environmental labeling (Rad, 2000). The diffusion of tourism ecolabels has affected at the first stage developed countries, while recently also in developing countries a number of small size tourism entrepreneurs display a positive tendency to acquire those voluntary certifications (Sasidharan et al. 2002).

Many institutions stress that evaluation of the environmental impacts has to become a requirement for the acceptability of territorial projects. As the UNI ISO 14000 regulations and many other homologous documents also associated with LA21 suggest, each territory can be assigned a certain level of quality and can thus more easily access the network European funding for tourism. The UNI ISO 14001 regulation, in particular, refers to activities carried out by an organization, with the aim to receive the Certificate of Environmental Quality about its environmental management system (EMS). According to a recent handbook (RINA, 1999), in Italy this Certificate is issued after the evaluation of the environmental policy program of the candidate organization. The aim of this international standard regulation is to contribute to environmental protection and to pollution prevention, in line with the needs of the local socio-economic context (UNI, 1996). According to the Introductory Guide to the application of UNI EN ISO 14001 to the environment management system of a municipality (RINA, 1999), the Italian Communes may tailor their policies according to the series UNI EN ISO 14001 and then become eligible for the Certificate of Environmental Management System (EMS). These remarks suggest that, in their policies for tourism development, municipalities should aim to manage their natural resources in such a way so as to achieve a high level of quality. In this way, protection of the environment and integration of tourism with the other local economic sectors can be interpreted as coordinated strategies of development.

This approach is confirmed by the principle of integration between tourism and a healthy environment, embedded in Local Agenda 21, the document that proposes a translation of the principle of sustainable development into policy practice.

Turning to coastal management, according to recent research studies (Vallega, 1996), the principles inspiring the Rio Conference apply in operative planning in the case of coastal sites and cities, as they are part of a complex regional ecosystem. Three particular ecosystems need to be examined: the land ecosystem affected by coastal facilities and resource uses; the fresh-salt water ecosystem; and the marine ecosystem. Respect for the main idea of sustainable development leads to acting according to three paradigms: integrity of the ecosystem; economic efficiency; and social equity. In the tourist-development perspective of city port management, Vallega argues that the more the city port stimulates sustainable-development-based functions, the more it is able to serve as a main reference basis for regional policy, and the more it is able to attract attention from the international market for clean technology and emerging tertiary activities (Vallega, 1996).

Coastal sustainable planning is related to three main geo-political scales: the intra-urban scale; the urban scale; and the regional scale. It should lead to the implementation of the still abstract advice included in LA21 stemming from the warning concerning the limits to growth and natural resources.

1.3 Measuring the Immeasurable: Towards Composite Indicators for Tourism Policy Making and Planning

In general terms, the need to understand and address progress toward tourist sustainability recalls the broader issue of assessing a system of measures able to face complexity. It is very difficult to conceive a unique yardstick able to yield a reliable assessment of, for instance, the degree of environmental performance. Under an analytic perspective, it is easier to rephrase the question by referring to a number of simple components and by adopting a coordinated set of parallel composite indicators. Usually, these indices are meant as complex measurement instruments and

> "are based on sub-indicators that have no common meaningful unit of measurement and there is no obvious way of weighting these sub-indicators" (Saisana and Tarantola, 2002, p. 5).

According to Saisana and Tarantola (2002), composite indicators, while presenting a bundle of shortcomings,

> "are useful to provide experts, stakeholders and decision-makers with: the direction of developments, comparison across places, situations, and countries, assessment of state and trend in relation to goals and targets, early warning, identification of areas for action, anticipation of future conditions and trends, and communication channel for general public and decision-makers." (Saisana and Tarantola, 2002, p. 6)

Many methods are suitable for constructing and aggregating composite indicators, such as principal component analysis, factor analysis, aggregation techniques, multicriteria analysis, but they obey to a general scheme. This is articulated in the following steps:

> "deciding on the phenomenon to be measured, selecting sub-indicators, assessing the quality of the data, analyzing the relationships between the sub-indicators, normalizing and weighting the indicators, and testing for robustness and sensitivity." (Saisana and Tarantola, 2002, p. 8)

It is possible to observe an explosion in the number of composite indicators and related methods assessed or proposed by a series of international bodies. Saisana and Tarantola (2002) select 24 composite indicators, analyzing their scope, related sub-indicators, and aggregation method. Bandura (2005) lists 135 indices, reporting issuer organization, methodology, country coverage, year of creation, update frequency, publication, and source website. Nardo et al. (2005) present a broad and updated review of methodologies able to support each step needed for constructing composite indicators.

Environmental policy makers and planners are daily confronted with a wide range of questions, such as pollution control and natural resources depletion, and face continuously a lack of precise and timely information. Thus their activities require suitable support tools and methods. The Environmental Performance Index (EPI) is a composite indicator specifically built to support decision makers facing uncertain or fuzzy environmental phenomena (Esty et al. 2006). It is based on the aggregation of 19 indicators grouped in six policy categories pointing at two broad objectives: environmental health and ecosystem vitality.

This indicator measures the performance of world countries: top scorers are New Zealand, Sweden, and Finland while lowest ones Ethiopia, Mali, and Mauritania.

As many scholars point out (Reed et al. 2005 and in press; Dougill et al. 2006), indicators are adopted within actual decisional processes according to two main broad methodological paradigms -the first expert-led and top-down, the second one society-driven and bottom-up- that need to be integrated in order to stimulate community learning, understanding and empowerment. In this panorama, multicriteria analysis stands as a methodology suitable to guide the construction of composite indicators, and to support interactive and mutual learning-based policy making and planning. With this respect, many examples can be quoted (Ferrarini et al. 2001; Sheppard and Meitner, 2003; Doumpos and Zopounidis, 2003; Kangas et al. 2001; Rauschmayer, 2001; Rotmans and Van Asselt, 2000; Hostmann et al. 2005).

2 Description of the Methodology

In this specific application, the multicriteria method adopted is the qualitative choice method known as "Regime" (Hinloopen and Nijkamp, 1990), combined with the analytical hierarchy process (AHP), assessed by Saaty (1988). The first of these methods belongs to the broader family of concordance methods developed by Roy (1985). Even though a description of the mathematics, already well known in the literature, is not the aim of this paper, a brief note has to be added about the usability of the Regime method. It has a number of important advantages with respect to the classical outranking methods (belonging to the family of Electre tools), since it makes it possible to process mixed data in an intuitive way and provides the user wih a complete final ranking of the alternatives. On the other hand, concordance analysis, allowing for incomparability and incomplete ranking of the alternatives, may lead to misunderstanding of the final output.

This combined multicriteria method has been tested, as a social learning instrument, to the evaluation of the environmental and tourist performance displayed by seven municipalities in Sardinia, Italy. Testing is meant in this chapter as a crucial step to understand the usability of the specific tool, to highlight possible pitfalls, and to stress eventual advantages. Moreover,the exposition of the whole process developed proves to be useful for adopting this procedure in institutional decisional settings.

The exposition of the application to the case study is divided into three different steps: the identification of the alternatives; the list of criteria; and the assessment of the weights.

2.1 The Set of Alternatives

Since the main objective of the method is to help an institutional body to evaluate the territorial quality with reference to tourism, this analysis considers a set of seven alternatives, which correspond to particular territories that could host tourist activities. A review of the current state of European funding programs and of regional special programs reveals that these territories are accorded many possibilities of receiving support. The alternatives consist of the following municipalities located in Southern Sardinia: Arbus, Pula, Carloforte and Iglesias in the western part of the province of Cagliari, the main urban center Cagliari, Muravera and Villasimius in the eastern part of the province of Cagliari. The restriction of the whole range of Sardinian coastal municipalities to seven allows a better understanding of the model. Eventually, this procedure could be extended to the whole set of coastal communes. It should be noted that the alternatives do not consist of different project options. Rather they refer to different potential characteristics for the seven alternative municipalities, treated as complex values.

2.2 The Set of Criteria and Their Proxies

In order to assess a proper list of criteria, a decision-making process has been simulated, as it allows the definition of the main concerns involved in the general issue of integration. In particular, concerns have been identified, by means of the generation of social scenarios. The main assumption implies that a reasonable scheme for the development of local communities can be deduced from the comparison of a number of best practices that have been successful in the Mediterranean Area (De Montis, 2002). Therefore, the list of criteria has been derived via a meta-analysis of the characteristics of those case studies.

Criteria are clustered according to a hierarchy: the general goal, i.e. the development of integrated and sustainable tourism, which is articulated as 7 complex criteria that are themselvesdecomposed into

26 simple criteria. Table 1 shows the list of simple criteria, with respect to their policy concern, unit of measurement, direction of preference[4], modality and source.

2.3 The Score Table

The score table adopted consists of a 7 by 26 matrix (Tables 2 and 3), which shows the values criteria functions assume for each alternative. In the case of cardinal mode, figures have been normalized according to linear min/max formulas, described as follows: $f_1(X) = (X - Xmin)/(Xmax - Xmin)$, for positive criteria, $f_2(X) = (Xmin - X)/(Xmax - Xmin)$, for negative criteria. For the ordinal mode, a discontinuous five-step scale has been utilized. In this way, data can be processed by means of the experimental software "Samisoft", tested at the Department of Spatial Economics, Free University Amsterdam. The requirement of the framework is the following: the higher the score the better the alternative. The choice of a linear normalizing curve is due to the assumption of a neutral attitude of decision-makers towards risk.

2.4 The Weights: Politics and Subjectivity in Decision-making

According to the general multicriteria theory, the weights can be considered as reflecting the importance of the criteria. In this case, they have been assessed by means of the analytical hierarchy process (AHP). Criteria were subjected to pairwise comparisons, based on the judgment expressed by a variety of stakeholders. In other words, as far as the importance of the criteria can be considered as being free from subjective

[4] The readers may note that criteria sometimes show a negative direction of preference, i.e. "Human capital" and "Accessibility". This unexpected feature is due to the need to manage a general framework able to support hypothetical institutional bodies, i.e. belonging to the Autonomous Region of Sardinia, interested into developing the economic activities of specified regions by balancing the growth of their tourist settlements. In this approach, negative criteria should be regarded as strategic functional parts of the model and, thus, means for encourage financial paths towards a "convergence" in tourism-based activities over the spatial dimension. Within this perspective of economic redistribution, the adoption of this support system seems to boost a wider diffusion of the benefits connected to integrated tourism. Hence, new investments are likely to be allowed by this multicriteria decisional device not only for already tourist-facilities- well-equipped regions, but also, and especially, for relatively lagging-behind environments.

Table 1. Policy concerns and units of measurement associated with the simple criteria

Complex criteria	Simple criteria						
	Code	Generic name	Policy concern	Unit of measurement	Direction of preference[5]	Mode	Source
DEMOGRAPHIC DEVELOPMENT (C_{DD})	C_{DD1}	Population	Stable settlement	Number of residents in 1991	Negative	Cardinal	Census 1991, Istat
	C_{DD2}	Population growth	Re-equilibrium of population	Population rate of growth between 1991 and 1996	Negative	Cardinal	Census 1991, Istat; Municipal Registry Office
	C_{DD3}	Human capital	Educating to a highly qualified and diffused culture of tourism	Aggregated percentage of graduates (University and High-School) over total population in 1991	Negative	Cardinal	Census 1991, Istat
ECONOMIC DEVELOPMENT (C_{ED})	C_{ED1}	Employment	Reducing unemployment starting from critical areas	Unemployment rate in 1991	Positive	Cardinal	Census 1991, Istat
	C_{ED2}	Income per capita	Income distribution	Average monthly income per capita in 1991	Negative	Cardinal	Estimation by Mura (1996)
	C_{ED3}	Productivity	Balancing the productivity of the areas	Average yearly value added per worker in 1991	Negative	Cardinal	Estimation by Usai (1998)
	C_{ED4}	Coherence with EU	Linking operational tourist projects to EU programs of financial support	Qualitative attribute	Positive	Ordinal	Regional Centre for Programming, Autonomous Region of Sardinia

[5] In the case of positive criteria, the level of performances corresponds directly with the score; in the case of negative ones, inversely. Therefore, the highest value is given to the highest score for positive criteria, and to the lowest for negative criteria

Table 1. (Cont.)

Complex criteria	Simple criteria						
	Code	Generic name	Policy concern	Unit of measurement	Direction of preference[2]	Mode	Source
TOURISM DEMAND (C_{TD})	C_{TD1}	Bed-nights	Balancing tourist bed-nights	Total yearly bed-nights in 1996	Negative	Cardinal	ESIT (Sardinian Boureau of Tourit Industries), Cagliari
	C_{TD2}	Length of stay	Balancing tourist length of stay	Average length of stay in 1996	Negative	Cardinal	ESIT (Sardinian Boureau of Tourit Industries), Cagliari
	C_{TD3}	Accessibility	Balancing the quality of infrastructures for transportation	Complex index	Negative	Cardinal	Master Plan the Coastline, Cagliari, Technical Report
	C_{TD4}	Tourist consumption	Balance of the tourist revenues among the areas	Qualitative attribute	Positive	Ordinal	Department of Tourism, Council of the Ministries, Italy
TOURISM SUPPLY (C_{TS})	C_{TS1}	System capacity	Sustain a balanced increase of hotels and residences	Total spare beds in 1996	Negative	Cardinal	ESIT (Sardinian Boureau of Tourit Industries), Cagliari
	C_{TS2}	Specialized employment	Balancing attitudes to specialization of tourist services	Average length of stay in 1996	Negative	Cardinal	Census 1991, Istat
	C_{TS3}	"Second houses"	Recover fiscal benefits	Total non-utilized houses, 1991	Negative	Cardinal	Census 1991, Istat
	C_{TS4}	Output in services	Sustaining autonomous development of integrated tourist services	Percentage share of output produced in services over total output	Positive	Cardinal	Banco di Sardegna, 1998
	C_{TS5}	"Tertiary" employment	Encourage tourism within economies of services	Percentage share of employee in the "tertiary" sector over total employment	Positive	Cardinal	Census 1991, Istat

OPERATIVE TOURISM PLANNING (C_{TP})	C_{TP1}	"F"[6] zones	Emphasis of tourist policies within urban and environmental planning	Percentage share of area classified as "F" zone over total area of the Municipality	Positive	Cardinal	Master Plan the Coastline, Cagliari, Technical Report
	C_{TP2}	Built "F" zones	Assign tourist settlements to suitable zones	Percentage share of built area within the "F" zones over total area of the "F" zones	Positive	Cardinal	Master Plan the Coastline, Cagliari, Technical Report
	C_{TP3}	Carrying capacity	Respecting the equilibrium of local natural resources	Forecasted number of inhabitants (Rule D.D.A.A./u/83 2266)	Positive	Cardinal	Master Plan the Coastline, Cagliari, Technical Report
PROTECTION MANAGEMENT (C_{PM})	C_{PM1}	Diversification	Emphasis of tourist policies in non-coastal domains	Percentage ratio between length of the coast line and length of the whole municipal boundary	Negative	Cardinal	IGM Cartography
	C_{PM2}	Park Integration	Linking tourist activities to natural parks	Percentage share of municipal area within natural parks over total municipal area	Positive	Cardinal	IGM Cartography
	C_{PM3}	Reserve Integration	Linking tourist activities to nature reserves	Percentage share of municipal area within natural reserves over total municipal area	Positive	Cardinal	IGM Cartography

[6] Homogeneous functional zones dedicated to the development of tourist settlements, according to the local master plan

Table 1. (Cont.)

Complex criteria	Simple criteria						
	Code	Generic name	Policy concern	Unit of measurement	Direction of preference[2]	Mode	Source
ENVIRONMENTAL IMPACT (C_{EI})	C_{EI1}	Bathing	Better use of coastlines	Percentage ratio between length of bathing coast and total length of the coast	Negative	Cardinal	Master Plan the Coastline, Cagliari, Technical Report
	C_{EI2}	Water	Continuous water delivery	Water flow	Positive	Cardinal	Master Plan the Coastline, Cagliari, Technical Report
	C_{EI3}	Forest	Integrated tourist use of forests	Percentage share of municipal area covered by forests over total municipal area	Positive	Cardinal	Census Istat, 1990
	C_{EI4}	Naturalness	Environmental compatibility	Qualitative attribute	Negative	Ordinal	Naturalness Chart, Cagliari[7]

[7]Synthetic chart obtained by overlaying geo-referred information from different sources about land cover and uses. The criterion "Naturalness" measures the level of absence of human settlements. The highest value corresponds to the lowest score.

Table 2. Score table, Part 1

Alternatives	Scores												
	C_{DD1}	C_{DD2}	C_{DD3}	C_{ED1}	C_{ED2}	C_{ED3}	C_{ED4}	C_{TD1}	C_{TD2}	C_{TD3}	C_{TD4}	C_{TS1}	C_{TS2}
Arbus	0.97	0.42	0.86	0.78	1.00	1.00	1.00	1.00	0.90	0.88	1.00	0.87	1.00
Cagliari	0.00	1.00	0.00	0.00	0.00	0.29	3.00	0.33	1.00	0.00	3.00	0.63	0.00
Carloforte	0.98	0.30	0.44	0.42	0.72	0.85	1.00	0.98	0.76	1.00	2.00	0.99	1.00
Iglesias	0.84	0.42	0.49	0.44	0.70	0.84	3.00	1.00	0.92	1.00	1.00	1.00	0.99
Muravera	0.99	0.03	0.66	0.15	0.66	0.49	2.00	0.03	0.00	0.49	3.00	0.40	0.96
Pula	0.98	0.07	1.00	0.26	0.68	0.64	2.00	0.27	0.50	0.41	4.00	0.21	0.93
Villasimius	1.00	0.00	0.95	1.00	0.70	0.00	2.00	0.00	0.04	0.71	4.00	0.00	0.95

Table 3. Score table, Part 2

Alternatives	Scores												
	C_{TS3}	C_{TS4}	C_{TS5}	C_{TP1}	C_{TP2}	C_{TP3}	C_{PM1}	C_{PM2}	C_{PM3}	C_{EI1}	C_{EI2}	C_{EI3}	C_{EI4}
Arbus	0.98	0.59	0.35	1.00	0.07	1.00	0.66	0.40	0.40	0.00	0.00	0.49	3.00
Cagliari	0.00	1.00	1.00	0.00	0.00	0.71	0.66	0.12	0.00	0.36	1.00	0.00	5.00
Carloforte	0.88	0.21	0.58	1.00	0.43	0.04	0.00	1.00	1.00	0.93	0.00	0.04	2.00
Iglesias	0.86	0.41	0.42	0.56	0.00	0.00	1.00	0.30	0.30	1.00	0.10	0.66	4.00
Muravera	0.98	0.54	0.61	0.95	0.21	0.41	0.63	0.16	0.15	0.63	0.04	0.59	5.00
Pula	0.95	0.99	0.00	0.89	1.00	0.39	0.79	0.00	0.00	0.58	0.05	1.00	3.00
Villasimius	1.00	0.00	0.59	0.94	0.21	0.47	0.50	1.00	0.17	0.55	0.04	0.13	2.00

feelings and experiences, the set of weights has been calculated according to a survey of a variety of stakeholders. Thus 26 actors were selected, on the basis that they were concerned with tourism policy and planning. These professionals represent the following categories: professionals working for bodies responsible for planning (BP); officials of environmental and cultural organizations (EN); freelance professional urban planners (LP); public administrators (PA); managers of institutional bodies or of private companies (MG); and researchers (RE). Each stakeholder was presented with the list, and asked to compare criteria pairwise. In this experiment, no substitution of the original tentative criteria list was allowed: each interviewee expressed his judgments on the same list.

Tables 4 and 5 show the 7 by 26 matrix of weights calculated for the 7 complex criteria. The complete review of the weights should have required also showing the table of the 26 by 26 matrix of the weights of the simple criteria. However, for ease of reading, and to avoid cumbersome notation, these figures have been omitted.

The algorithm has a computational framework that allows processing a maximum of ten criteria. Thus two cycles of calculations have been applied: first for simple criteria, then for complex ones.

Table 4. Weights of the complex criteria, by professional categories, Part 1

Complex criteria	Weights												
	BP1	BP2	BP3	BP4	BP5	BP6	EN1	EN2	EN3	LP1	LP2	LP3	LP4
C_{DD}	0.052	0.031	0.030	0.023	0.126	0.180	0.139	0.018	0.024	0.031	0.174	0.176	0.022
C_{ED}	0.052	0.076	0.095	0.059	0.126	0.069	0.205	0.064	0.065	0.263	0.277	0.266	0.210
C_{TD}	0.087	0.243	0.050	0.059	0.060	0.047	0.093	0.025	0.075	0.109	0.066	0.094	0.083
C_{TP}	0.146	0.136	0.154	0.021	0.083	0.041	0.093	0.050	0.075	0.182	0.069	0.266	0.075
C_{TS}	0.230	0.136	0.136	0.088	0.117	0.253	0.139	0.136	0.293	0.115	0.044	0.098	0.158
C_{PM}	0.347	0.243	0.255	0.375	0.229	0.413	0.166	0.353	0.234	0.106	0.261	0.060	0.145
C_{EI}	0.087	0.136	0.279	0.375	0.258	0.158	0.166	0.353	0.234	0.195	0.109	0.040	0.308

Table 5. Weights of the complex criteria, by professional categories, Part 2

Complex criteria	Weights												
	MG1	MG2	MG3	MG4	MG5	MG6	PA1	PA2	PA3	PA4	PA5	RE1	RE2
C_{DD}	0.082	0.019	0.034	0.023	0.026	0.029	0.034	0.031	0.021	0.029	0.091	0.214	0.027
C_{ED}	0.106	0.052	0.139	0.172	0.095	0.142	0.054	0.456	0.051	0.142	0.151	0.065	0.027
C_{TD}	0.078	0.061	0.089	0.272	0.164	0.091	0.242	0.055	0.044	0.091	0.034	0.032	0.322
C_{TP}	0.093	0.089	0.046	0.272	0.164	0.083	0.370	0.211	0.093	0.083	0.035	0.033	0.322
C_{TS}	0.317	0.192	0.061	0.053	0.340	0.239	0.122	0.033	0.221	0.239	0.067	0.094	0.160
C_{PM}	0.163	0.293	0.270	0.080	0.100	0.208	0.122	0.107	0.285	0.208	0.244	0.319	0.044
C_{EI}	0.161	0.293	0.362	0.127	0.112	0.208	0.056	0.107	0.285	0.208	0.379	0.242	0.099

It should be noted that during the interviews, the analyst presented the criteria list to each interviewee, discussing their concern and meaning. The interviewee was asked to express judgments in dedicated talks consisting of a one-to-one communication between the analyst and the interviewee. The main consequence of this procedure was that the analyst elaborated 26 different judgment systems and obtained 26 different

Table 6. Final rankings, by professional categories, Part 1

Alternatives	Final scores												
	BP1	BP2	BP3	BP4	BP5	BP6	EN1	EN2	EN3	LP1	LP2	LP3	LP4
Arbus	0.82	0.77	0.65	0.80	0.64	1.00	0.93	0.87	0.75	0.80	0.83	0.47	0.91
Cagliari	0.02	0.35	0.14	0.14	0.39	0.40	0.04	0.19	0.49	0.25	0.23	0.12	0.03
Carloforte	0.50	0.71	0.35	0.35	0.32	0.08	0.32	0.16	0.08	0.27	0.78	0.52	0.44
Iglesias	0.56	0.72	0.93	0.93	0.70	0.29	0.79	0.63	0.52	0.66	0.89	0.81	0.54
Muravera	0.90	0.39	0.89	0.53	0.49	0.42	0.49	0.77	0.66	0.57	0.46	0.61	0.66
Pula	0.42	0.14	0.29	0.25	0.43	0.73	0.31	0.40	0.60	0.80	0.17	0.90	0.60
Villasimius	0.28	0.43	0.25	0.50	0.53	0.58	0.63	0.49	0.33	0.15	0.15	0.06	0.32

Table 7. Final rankings, by professional categories, Part 2

Alternatives	Final scores												
	MG1	MG2	MG3	MG4	MG5	MG6	PA1	PA2	PA3	PA4	PA5	RE1	RE2
Arbus	0.43	0.90	0.81	0.79	0.99	0.36	0.52	0.71	0.71	0.66	0.80	0.97	0.41
Cagliari	0.42	0.15	0.03	0.01	0.05	0.20	0.28	0.56	0.46	0.05	0.28	0.01	0.46
Carloforte	0.02	0.36	0.47	0.67	0.73	0.49	0.84	0.29	0.04	0.44	0.22	0.22	0.08
Iglesias	0.67	0.73	0.90	0.45	0.60	0.37	0.36	0.99	0.77	0.53	0.97	0.65	0.14
Muravera	0.81	0.68	0.37	0.54	0.54	0.76	0.79	0.44	0.88	0.65	0.67	0.58	0.81
Pula	0.54	0.15	0.32	0.26	0.40	0.55	0.04	0.29	0.25	0.35	0.40	0.39	0.89
Villasimius	0.61	0.54	0.59	0.78	0.20	0.77	0.67	0.22	0.39	0.83	0.17	0.69	0.70

and independent sets of weights. Again, this event depends on the evidence that none of the actors have met each other.

The output of the combination of the weights with the scores yields a 7 by 26 matrix, as Tables 6 and 7 show. This matrix represents the resulting final rankings of the alternatives for each interviewee selected.

3 Discussion of the Results

This section is mainly concerned with the interpretation of the resulting output, as shown in Tables 6 and 7 above. Two ways of doing this are discussed, and they can be considered, respectively, a synthetic and analytic scheme for analysis. First, unique indexes will be assessed for final ranking and weight vectors. Second, frequency analysis will be applied to explain the relationship between group composition, final rankings and weight vectors.

3.1 The Synthesis of Unique Indexes

This synthesis is based on the assumption that the ranking, which symbolizes the aggregated preference of the group of interviewees, can be calculated as a vector function of the rankings expressed by each stakeholder. In this case, this function has been adopted as the linear unweighted mean of the final scores expressed by each stakeholder. In such a pattern, the resulting ranking (see Table 8) consists of the outcome of voting, provided that each elector has the same political weight.

The group puts the Commune of Arbus in first place, Iglesias in second place and Muravera in third place; the main town of the Island, Cagliari, comes last in this ranking. According to its output, the

Table 8. Aggregate final ranking of the alternatives

Alternatives	Aggregate scores
Arbus	0.74
Iglesias	0.66
Muravera	0.63
Villasimius	0.46
Pula	0.42
Carloforte	0.37
Cagliari	0.22

multicriteria system suggests scenarios where territories with underdeveloped social and economic and sometimes also tourist systems need to be promoted, especially if they are well endowed with natural resources.

For the aggregation, the same assumption has been adopted for the weights attached to the complex criteria (Table 9), i.e. the vector of the weights has been calculated as the unweighted mean of the weights expressed by each interviewee.

In the light of these results, some remarks can be drawn on the computational behavior of the solution algorithm. First of all, those criteria that have been given the highest weight are connected to the environmental aspects of urban transformation and planning. Secondly, the comparison between the final average ranking in Table 8 and the complex criteria average weights vector in Table 9 reveals some kind of "environmental bias" of the multicriteria framework. The highest values of the environmentally-driven criteria linked to the mitigation of the environmental impact confirms that the group of actors interpret these criteria in the sense of the integration of tourist development.

Table 9. Aggregate weights of the complex criteria

Complex criteria	Aggregate weights
Protection Management(C_{PM})	0.217
Environmental Impact(C_{EI})	0.205
Operative Tourism Planning(C_{TP})	0.157
Economic Development (C_{ED})	0.134
Tourism Supply (C_{TS})	0.126
Tourism Demand (C_{TD})	0.103
Demographic Development (C_{DD})	0.065

Table 10. Variability of the positions in the final average ranking referred to each category of actors: professionals working for bodies responsible for planning (BP); officials of environmental and cultural organizations (EN); freelance professional urban planners (LP); public administrators (PA); managers of institutional bodies or of private companies (MG); and researchers (RE)

Alternatives	Aggregate scores					
	BP	EN	LP	MG	PA	RE
Arbus	1	1	1	1	3	3
Cagliari	7	6	7	7	6	6
Carloforte	5	7	5	5	5	7
Iglesias	2	2	2	2	2	5
Muravera	3	3	4	3	1	1
Pula	6	5	3	6	7	4
Villasimius	4	4	6	4	4	2

As an immediate consequence, territories richly endowed with natural resources receive a higher score than the others, because they are judged to be able to couple the resource stock with economic activities within a project of integrated tourist development.

The thesis of the environmental bias can be tested by means of a comparison of the final average rankings and weight vectors referring to each group of interviewees. The values of the scores and weights have been obtained to represent the aggregate expression of each group of professionals as unweighted means of the scores and weights of the interviewee belonging to the same group. For ease of understanding, scores and weights are expressed in ordinal values.

Table 10 shows in ordinal terms the different positions occupied in the final ranking by the alternatives, according to each group of stakeholders. The results confirm what Table 8 shows: those territories that received the highest scores still continue to occupy the highest positions also according to the different groups of professionals. Therefore the Municipality of Arbus occupies the first position, according to the judgment of four groups out of six and the Municipality of Iglesias occupies the second position, according to the judgment of five groups out of six.

It is useful to compare the ordinal values of the rankings in Table 10 with the ordinal values of the weights of the complex criteria for each group in Table 11.

Table 11. Mean of the weights of complex criteria expressed by the different categories of actors: professionals working for bodies responsible for planning (BP); officials of environmental and cultural organizations (EN); freelance professional urban planners (LP); public administrators (PA); managers of institutional bodies or of private companies (MG); and researchers (RE)

Complex criteria	Aggregate weights					
	BP	EN	LP	MG	PA	RE
Demographic Development (C_{DD})	5	6	7	4	6	3
Economic Development (C_{ED})	5	6	7	4	6	3
Tourism Demand (C_{TD})	5	6	7	4	6	3
Tourism Supply (C_{TS})	4	5	3	5	1	2
Operative Tourism Planning (C_{TP})	3	3	5	2	5	5
Protection Management (C_{PM})	1	1	4	3	2	1
Environmental Impact (C_{EI})	2	1	2	1	4	4

The results shown in this table display a high volatility. Yet still the environmental complex criteria occupy the highest positions: three groups out of six put in the first position the criterion “Protection management” in the first place and two groups out of six put the criterion “Environmental impact” first.

According to public administrators, the most important criterion is “Tourism supply”, while for freelance professionals it is “Economic development”. Professionals working for bodies responsible for planning and freelance professionals put the criterion “Environmental impact” in second place, while officials of environmental and cultural organizations put the criterion “Operative tourism planning” in third place. On the other hand, the criterion “Demographic development” is ranked last, according to four groups out of six. This robust result seems to be linked to the belief that demographic increase is more an effect than a cause of the other criteria, such as “Economic development” and “Protection management”, which are more directly linked to the structure of society.

It is possible to derive some important conclusions from the sensitivity analysis of the mean of the values expressed by each group. The main conclusion is that the multicriteria procedure, which we constructed, seems to be strongly influenced by environmental factors.

3.2 The Frequency Analysis

Frequency analysis was applied to investigate the sensitivity of the final rankings with respect to the weights of the complex criteria.

As in Sect. 3.1 above, the scores and the weights, originally expressed in cardinal terms, have been converted into ordinal terms. These figures represent the relative rank of the alternatives and of the complex criteria for the whole set of interviewees. Thus, it is possible to calculate absolute frequency matrices showing the percentage number of times an alternative, or criteria, has been ranked in a certain position.

Following the structure of the previous Sect. 3.1, a test was conducted to verify the "environmental bias", i.e. the sensitivity of the multicriteria framework to the environmental concerns.

In Table 12, absolute frequency values refer to the relative number of times interviewees put the alternatives in the different ranks.

The Municipality of Arbus comes in first place, according to 42 % of the interviewees, and in second place, according to 30 %, while the territory of Iglesias is put in first place, according to 27 %, and in second position, according to 23 %. The Municipality of Muravera is put in the first place, according to 11 % of the interviewees, and in the second position, according to 27 %.

It is not surprising that these results confirm the picture that emerges from the ranking of the mean of the scores, as displayed in Table 8. This evidence again points out that territories with a rich natural endowment are placed in the highest position by quite a large proportion of the interviewees.

Table 12. Alternatives versus ranks: absolute frequencies

Alternatives	Absolute frequencies						
	1	2	3	4	5	6	7
Arbus	42.31	30.77	7.69	3.85	11.54	3.85	0.00
Cagliari	0.00	0.00	3.85	7.69	15.38	30.77	42.31
Carloforte	3.85	3.85	11.54	19.23	26.92	7.69	26.92
Iglesias	26.92	23.08	19.23	11.54	11.54	7.69	0.00
Muravera	11.54	26.92	19.23	34.62	7.69	0.00	0.00
Pula	11.54	3.85	11.54	7.69	26.92	30.77	7.69
Villasimius	7.69	7.69	26.92	15.38	3.85	19.23	19.23

Again, following the structure of Sect. 3.1 above, it was useful to compare the results portrayed in Table 12 above with the results of the frequency analysis of the weights of the complex criteria (Table 13).

The complex criterion "Environmental impact" was put in first place, according to 35 % of the interviewees, and in second, according to 23 %. The complex criterion "Protection management" was placed first, according to 30 % of the interviewees, and in second, according to 38 %. At the other extreme, the complex criterion "Demographic development" was placed seventh and last, according to 58 % of the interviewees, and sixth, according to 15 %. Also at the bottom of the rankings the complex criterion "Tourism demand", which was ranked seventh, according to 15 %, and sixth, according to 23 % of the interviewees. Other complex criteria present more volatile behaviour, e.g. "Economic development" and "Tourism supply", judged first, respectively, by 19 % and 11 % of the interviewees.

Again, it is possible to observe, as an overall output, that the environmentally-oriented criteria are ranked higher than the others.

In conclusion, the comparison between the last two tables confirms the preponderance of the environmental factors for the output of the whole multicriteria evaluation system.

Table 13. Complex criteria versus ranks: absolute frequencies

Complex criteria	Absolute frequencies						
	1	2	3	4	5	6	7
Demographic Development (C_{DD})	0.00	0.00	19.23	7.69	0.00	15.38	57.69
Economic Development (C_{ED})	19.23	3.85	15.38	19.23	15.38	26.92	0.00
Tourism Demand (C_{TD})	11.54	7.69	0.00	15.38	26.92	23.08	15.38
Tourism Supply (C_{TS})	15.38	7.69	15.38	11.54	11.54	30.77	7.69
Operative Tourism Planning (C_{TP})	19.23	7.69	30.77	19.23	11.54	7.69	3.85
Protection Management (C_{PM})	30.77	38.46	7.69	3.85	11.54	7.69	0.00
Environmental Impact (C_{EI})	34.62	23.08	11.54	23.08	3.85	0.00	3.85

4 Future Research Perspectives

This paper points out how evaluation might become a useful tool to develop suitable policies for integrated sustainable development. This concept is quite complex and requires analysis able to cope with conflicting multiple objectives. Notwithstanding these assumptions, the Regime method combined with the AHP approach has proved in this application to be a useful multicriteria procedure, since it yields very good and easy to handle results.

In a more general perspective, this paper sheds some light on the broad basis of decision-making processes.

One of the main findings is that the application of the Regime method framework has allowed the analyst to use both cardinal and ordinal criteria within the system of individual preference structure, mathematically described by means of the outranking analysis. In this case, there seems to be enough evidence to confirm that the outranking structure embedded in the Regime framework is able to cope much better with the complexity and uncertainty, which is often present in environmental tourist policies, than other multicriteria frameworks.

Nevertheless, the analysis of the results considered in this exercise demonstrates how subjective the advice for the final choice might become, especially when different stakeholders are involved at the same time in the same decisional arena. In this case, the degree of uncertainty of the system has been limited by fixing the list of criteria and by allowing variability only to the weight vector. However, the volatility of the final ranking may increase, if subjectivity is also allowed to creep in for the construction of the criteria system. In this case, the whole system of criteria and weights should be tuned every time according to each different stakeholder.

Starting from this lesson, further research has to be directed into studying the relationship between politics and evaluation procedure, with a particular focus on the meaning of delegation in decision-making. Future research should focus on the way systems of access for everybody could be put into practical application. This is one of the main reasons for developing research on the role that the World Wide Web could play in this perspective and on the distribution of information for decision-making (Carver, 1999; De Montis, 2002; De Montis and Nijkamp, 2006).

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Strategic Planning of Territorial Image and Attractability

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1 Introduction

The growing digitalization and virtualization process which currently characterize the world economy create a wide variety of economic activities in both a real and a virtual dimension. This fact seems to imply a declining impact of territoriality on economic relations and the development and proliferation of virtual territories which tend to question the epicentre of the economic relations and decisions at different territorial levels.

Globalisation leads to processes involving a change in the perception of distance (the stretching of all kinds of social, cultural, political and economic relations across space and time), and time-spaced compression (the apparent annihilation of space by time as a result of a wide variety of media and communication technologies) as speed-distance reconfigures many of assumed correspondences between social space and physical distance (Doel and Hubbard, 2002). The global economy is an increasingly symbolic space-economy.

On the other hand, the added competition within the European Union boundaries, among cities and regions, creates a dispute for visibility and for recognition of the quality, differentiation and competitiveness of their territorial economic specialization and institutional density.[1] Due to the growing competition between local and regional territories at different territorial scales many regions and cities, around the world, constantly try to successfully compete for attracting

[1] The number and nature of the public and private institutions present in the territory.

investors, conferences, entrepreneurs, company headquarters, tourists (Avraham, 2004; Ashworth and Voogd, 1990; Bradley et al, 2002; Van Limburg, 1998; Smith, 2005; Gold and Ward, 1994; Kotler et al, 1993; Paddison, 1993; Short and Kim, 1993).

Five of the most important features of the territory which condition its survival and its opportunities for present and future, in this very competitive context, are: 1) The territory capability to adapt to structural and conjuncture economic changes and threats – its plasticity; 2) The territory ability to manage in a strategic way the passage of time in territory (to manage the long and the short run) – its temporality; 3) The territory economic and social *functioning model*, the way it operates, how the economic and institutional agents located therein act together, the specific characteristics of its territorial economic specialization, the way in which its territorial governance models[2] operate, the sophistication level of interaction and collaboration models among the most relevant agents/actors, the models of collective learning and innovation which characterize it and the higher or lower participative culture of its citizens – its *personality*; 4) The territory's formal and informal memory (the memory of implemented policies, memory of the results of those policies, memory of the projects being implemented in the territory, both by agents and by the State, memory of successful and unsuccessful cases) which determines very much the way institutional and economic agents in territory behave – its memory; 5) And the territory capacity to establish a strong and diversified connectivity at different territorial scales – its internal and external relational dimension.

At this time of strong inter-territorial competition, success in the planning of organisations, firms and territories depends to a large extend on their capacity to reformulate and up-date their competitive advantages in ever shorter periods of time. The economic rise and decline of certain regions seems to result from their ability to develop and to up-date their relational portfolio. The relational portfolio of local and regional territories is the set and characteristics of their internal and external relations – the wallet of the internal and external relationships of territories and of its economic and institutional agents (Neto, 1999).

The strategic management of territory's relational portfolio is a very important instrument to drive them within this complex system organised into hierarchy of networks of specialisation, innovation,

[2] See OECD (2001, 2005).

co-operation and the reticular and informational organisation of markets, sectors and economic agents at different territorial scales (Neto and Silva, 1999).

In this context, one of the territory's biggest challenges, in terms of territory's capability to assure competitive strategies and to implement efficient public policies for territorial planning and management relays on five characteristics of its own economic and social production system that will condition very much its present and future: 1) a higher or lower level of *plasticity* which describes it 2) as well as the form of management of its *temporality* 3) its economic, social and institutional *functioning model* 4) the territory's formal and informal *memory* and 5) the sophistication of the territory's internal and external relational portfolio.

The main purpose of this article is to analyse the importance of these territory's dimensions (plasticity, temporality, personality, memory and relationship) for the definition and management of the strategic planning of territorial image and attractability.

In order to better achieve this purpose, this paper is structured on the following items of analysis: 1) The *plasticity* and the *temporality* of the territory; 2) The territory's *personality*; 3) The territory's *identity* and perception process; 4) The territory's *memory*; 5) The territory's relational dimension; 6) Managing the territory's temporality and plasticity; 7) Public policies, territorial governance and territory's image building process; 8) The territory's image strategic management; 9) Territorial marketing strategies and attractability management; 10) Conclusions.

2 The Plasticity and the Temporality of the Territory

The territory's level of plasticity is associated with a higher or lower possibility of acting upon it in order to make changes to its features and to improve or heighten other characteristics.

Thus, the territory's level of plasticity consists on its greater or lesser possibility to be moulded, and the ability to mould itself, to reconvert itself, to adapt to new internal and external challenges and to find solutions to survive the conjuncture or long term shocks.

The territory is moulded by the economic and institutional agent's decisions and by the implemented public policies[3] at different territorial scales, which influence it throughout time. The territory is by the quality of the conjuncture and long term. The economic, social and institutional strategies and decisions applied over a local and regional territory along the time determines very must its present economic characteristics and its relative positioning with respect to all others.

The current economic and social reality of any local or regional territory is the result of a historical process of sedimentation of public policies and of private decisions and strategies. The result of this process of sedimentation grants it a set of economic and social features containing a higher or lower potential of development and valorisation or recon version and a greater or lesser versatility of its resources and agility of its agents. The way in which this process of sedimentation took place and be achieved lend the territory's economic and social production system a higher or lower plasticity.

The territory's plasticity varies from one case to another and from a territory to another. The greater or lesser plasticity of each territory' economic and social production system depends, to a great extent, on its economic structure, on the characteristics of its predominant economic sector(s), on the degree of sophistication and diversification of its production base, on the economic relevance of the available resources, on its economic development, on the type and quality of its infrastructures, on the level of training and qualification of its human resources, on the level of innovation and technical development which characterizes it and on the nature of inter-organizational and inter-institutional relationships, both internal and external, in action within it.

Bearing in mind that each of these elements may be itself more or less *plastic* in light of the level of development or sophistication which describes it and that different combinations of each of them, at different states of complexity, imply different sub-levels of plasticity in the territory.

3 The Territory's Personality

In the same manner that the influence of each of those elements has a bearing effect on the territory's level of plasticity, so it is differentiated

[3] Defined at different territorial levels and by various political and administrative levels.

in light of its relative importance in terms of each concrete local or regional economic and social reality.

Thus, the greater or lesser plasticity or rigidity regarding economic development is never exclusively budgetary.[4] The territorial plasticity stems from intrinsic features within the territory, from the way in which the local/regional economy operates, from the particularities of its social production system[5], from the territoriality model of the companies within it and from the nature of entrepreneurial strategies which normally are in operation.

The way in which these aspects combine within the territory determine its specificity and *personality*. The territory's *personality* is the way it operates, how the economic and institutional agents located therein act together, the specific characteristics of its territorial economic specialization, the way in which its territorial governance models[6] operate, the sophistication level of interaction and collaboration models among the most relevant agents/actors, the models of collective learning and innovation which characterize it and the higher or lower participative culture of its citizens.

To a large extent, the territory's *personality* is also its ability to find new forms of combining resources and factors, and to adapt and react to decisions of relocating companies as well as to the loss of competitiveness of dominant economic sectors.

The territory's *personality* and the set of material and non material resources it can use make up its identity. The territory's *identity* and the collective awareness of its existence are key factors in order to build territorial feelings of belonging (to a certain territory, to its values and its defence) and intra-territorial solidarity.

4 The Territory's Identity and Perception Process

In spite of its identity (more or less consolidated, recognized and recognizable or not recognizable, much or less valorised or valorizable and

[4] That is, it does not depend exclusively on budgetary availability.

[5] The social production system of a territory is the configuration of norms and regulations which govern and influence the territory's system of industrial relations, its training system, its criteria and production and management methods, the structure of relations among companies located within it and the internal structure of those companies itself (Hollingsworth, 1998).

[6] See OECD (2001, 2005).

more or less adopted collectively) there are numerous internal and external perceptions of the territory – that is, different ways to regard it and different forms in which it is regarded.

In other words, the perception of the territory, of its potential, features and needs (and above all of the solutions and potentials for its development) common among populations and economic and institutional agents within the territory differs from that of the populations and agents outside (affectively and geographically speaking) of it.

The problem of how the territories are perceived at different territorial levels. The difficulties in perception in both internal and external terms – demands a strategic management of perceptions regarding the territory – the way in which the territory is perceived and how it may be perceived.

The image of a place, or territory, is the sum of beliefs, ideals, and impressions people have toward a certain territory. The image represents a simplification of a large number of associations and pieces of information related to a place, and is a cognitive product of the attempt to process large amount of information (Kotler et al, 1993).

Furthermore, the external perception tends to vary in light of the degree of separation or compromise of the external agents in relation to the territory.

Many different factors influence a territory's (region or city) image or perception. Among those are: the characteristics of the territory population, its status or political power, the size of its population, socio-economic status and employment situation, the important presence of internet domain names (Tousend, 2001), the relevance of public-private partnerships (Kresl, 1995), the number and character of national institutions located within, its location and historical background, its media coverage, atmosphere, entertainment options, tourist or cultural value and physical appearance (Avraham, 2004), its cultural vitality (Smith and Timberlake, 1995).

Similarly, there is more than one perception of the territory on the part of the economic and institutional agents belonging to it. The internal perception varies a great deal from one case to another. The different economic and institutional agents within the territory not only have a different position with respect to the territory, according to what type of activity they are in, but also in light of the type of intervention skills they have which determine their own perception.

The type of each economic and institutional perception[7] conditions the position and the relationship the different agents have with the territory. The way in which the territory is perceived and understood (still) by each economic or institutional agent has an implicit previous option, conscious or unconscious, for a position, collective or individual, regarding the way its model of development is understood, the designing model of policies for the territory and regarding the way of relating and accepting each one of the territorial levels in which the territory may be considered.

Along with the growing awareness of the importance of a territory's positive image, many regional and local leaders believe that their territory's negative image is an obstacle that prevents it from becoming more attractive and in fact forestalls a brighter future (Avraham, 2004).

Public policies devised for local and regional territories must lead to the reinforcement and development of their plasticity and to building differentiated territorial identities, but specially develop a strategic management way the territory is perceived by each population target it wants to attract and fix in it.

5 The Territory's Memory

The territory identity building process and the process of perceiving the territory are strongly related and dependent on the process of constructing the territory's *memory*. Formal and informal memory of and about the territory (the memory of implemented policies, memory of the results of those policies, memory of the projects being implemented in the territory, both by agents and by the State, memory of successful and unsuccessful cases) which determines very much the way institutional and economic agents in territory behave.

The territory's memory in the sense of being possible to establish relationships among dispersed information (whether it is in sectorial terms or in terms of places of storage of information). In the territory much of the memory exists in an informal condition, but public administration institutions and many of the firms (depending on the territory's development stage) have a lost of archived information but often they don't used it as a memory source (Neto, 2003).

[7] There has been extensive research on destinations image and perceptions in travel and tourism. See, among others, Echtner and Richtie (1993), Oppermann (1996), Gartner (1993), Baloglu and Love (2005).

However many of the explanations for the present economic, social and development characteristics of a specific local or territory are closed in this memory process formation (formal and informal) and we should make profitable this memory, construct informational territorial decisions systems[8] and introduce it in the planning and management process of territory (Neto, 2003).

Also, *good and bad* memory regarding the local and regional territories is also an historical process which often influences in a very deeply form the choices and options the public and private agents do about territorial development strategies.

The territory's temporality has to do with the territory throughout time. The territory building process consists of an historical process. The current features of each territory are the result of an historical process of decision making, of location and change of location, of successful and unsuccessful cases, of individual and collective initiatives and of implementation of public policies. The territory is, in itself, a process of construction and destruction.

To a large extent, the distinction between space and territory is made by taking temporality into consideration. As socioeconomic construction, the territory is nourished by temporality.

6 The Territory's Relational Dimension

The relational dimension of each local and regional territory consists of a conjunction of economic and institutional relationships developed intra and inter-territorially by firms and institutions in the ambit of the performance of their specific activities and or in the course of their own strategic intention to increase their competitiveness and to add value to their relative positioning.

The degree of sophistication, diversification and effectiveness of the intra- and inter-territorial relational portfolio (Neto, 1999) of each territory (the combination and characteristics of their internal and external relationships – the relationships wallet of the territory) constitute a determining factor in terms of territory's capacity to reformulate and update competitive advantages.

[8] It will be important to apply and developed applied data miming models in order to bring to light those kind of information's. The informational territorial decisions systems are very much important for the territory's understanding and strategic manage.

In the present context of great inter-territorial competition the development and strengthening of inter-institutional, inter-organisational and inter-firms relationships, with strategic intention within a determined territory, could constitute an important factor for reinforcing intra-territorial cohesion and for the preserving local and regional interests and identity (Neto and Silva, 1999).

In the same way, the great values and the multipliable effects which could result from the intra-territorial articulation of the individual strategies of different institutions, firms and organisations present there, and from the strategic sharing of their portfolio of external relationships, could ensure a new internal dynamic as well as being a major facility for the supranational positioning and the relationship of the territory and of each of the firms located in it.

In this context of the widespread integration of markets and of transnational relationships of firms and institutions, local and regional territories must develop a continuous process of reformulation of their competitive advantages and the anticipation of effects on their territorial economic specialisation – the importance of the development in territory of competitive intelligence territorial systems.

The reformulation of competitive advantages of each local and regional territory in large measure could result from the development of these internal and external cooperation strategic alliances and from the possibility to reconcile competition and collaborative strategies between firms and between institutions and organisations.

The development on the territory of strategic combinations of competition and collaborative strategies between firms and between institutions and organisations could be of a great importance in order to introduce new forms of plasticity in the territory as well introduces new possibilities to manage its temporality.

The development of collaborative strategies between public and private agents in territory could of course be a very strategic tool to the promotion of territory visibility and atractability and to the implementation of territorial brands and marketing strategies. The existence of a good economic and institutional collaborative context is a pre-condition to the possibility to conceive and implement territorial collective development and marketing strategies.

The building process of a collectively consensual development strategy, and the finding process of the appropriate territorial brand are obviously very complex and requires a good relational context in territory.

Some of the difficulties to construct a consensual territorial marketing strategy and a territorial brand start, among others, with the problem of: 1) Raising consciousness and reaching a consensus in the use of a brand; 2) The difficulty to establish an uniformity on the territorial marketing strategy and on the content of the brand; 3) The definition of who owns the regional / local brand. Which authority manages the territorial brand – great need to consolidate and to perfect inter-institutional relations; 4) The difficulty of manage a set of territorial brands; 5) The manage process of the relations between firm's brands and territory's brands.

7 Managing the Territory's Temporality and Plasticity

Managing temporality, managing time and the passage of time in the territory is one of the biggest challenges faced by territorial planning and by those with political and administrative responsibility. Namely, with regard to long term management of the territory's attractability and of the strategic management of the territorial relational portfolio (Neto and Silva, 1999).

Managing short term temporality and managing medium and long term temporality in order to ensure the perpetuity of the development of each territory and in order to soften the development level fluctuation and competitiveness cycles of each economic activity sector located in the territory.

This manage is deemed to be one of the most decisive factors for the survival and future development of each local and regional territory.

The territory's time and the passage of time management demands a strategic planning management and territorial development which are based on an understanding of the territory's past, on rigorous knowledge of the way it currently operates and on the anticipation and pre-construction ability of its future.

This new approach demands a new territorial management perspective, from a reactive type based on funding solutions for impacts, weaknesses or current conjuncture needs to a territorial management of a proactive type based on predicting sectorial or structural changes and on the anticipation of future needs and their solutions as well as defining and implementing long term strategies, that is, lasting into the future.

The territory's temporality[9] is the way in which time goes by in the territory, the decision time, the reaction time, the decision for each time, the time in which companies settle in it, the lifetime of the companies themselves, the time in which their comparative and competitive advantages last and make a difference. Each economic agent's time is also the time of their own territories, the changes in their productive abilities cause a change in the location territories of each economic agent.

The territory's time is the time of the economic agents located therein, and the way they last, multiply themselves and become stronger with the passage of time determines the quality and the level of the territory's development capacity at each moment of time.

The present globalization process is specially demanding for local and regional territories in what concerns its competitive ability, particularly due to the growing relevance of the following aspects:

1) Greater exposure of territories to inter-territorial competition.
2) Growing risks related to changes in inter-territorial solidarities.
3) New accessibility, new relational configurations and new proximities.
4) Growing change in the conditions and criteria of attractability of local and regional territories.
5) Greater potential for visibility and for reproducing planning and development solutions, at a transnational scale, among territories – the growing importance of territorial benchmarking.[10]

Paradoxically, the opening of borders between member States within the European Union and the building of the EU's territory has created, for many local and regional territories a process of quasi invisibility, that is, they ceased to deserve the interest of decision-makers and of companies, in so far as other territorial options became more interesting.

So, there are many reasons for building territorial marketing strategies and, between them, the most relevant ones are the following:

1) To ensure the territory's visibility.
2) To consolidate the territory's identity and to carry it out as a competitive factor.

[9] Temporality in the sense of the territory's development life-cycle.

[10] About territorial or city benchmarking see Luque and Muñoz (2005), Massheder and Finc (1998) and Longbottom (2000).

3) To build and make competitive advantages profitable and to reinforce the territory's relational position.

8 Public Policies, Territorial Governance and Territory's Image Building Process

Public policies aimed at local and regional territories must contribute to reinforce and develop that plasticity, temporality and that relational dimension, as well as for building differentiated territorial identities and assure its attractability.

The quality and the implementation process of public policies are very much dependent of the characteristics and of the sophistication level of the territorial governance systems.

The territorial governance, according to Domingues (1998), can be defined as being "not only, the mere territory government, but all the system of relations between institutions, organizations and individuals, which assure the collective choices and their accomplishment".

The use of the governance concept regarding the Regional Economy dates from the early 90's through the paper of M. Storper and B. Harrison (1992) intituled "*Flexibilité, hiérarchie et dévelopment régional: les changements de structure des systèmes productifs industriels et leurs nouveaux modes de gouvernance dans les années 1990*".[11]

In the regional analysis, the governance concept has dwelled on, subsequently, to the set of relationships and interactions, existent or potential, among the companies and institutions, in a determined territory, which determine their collective model of functioning and economic development.

In this sense, the territorial governance system is the way by which, in a determined territory, the different actors interact, the level of sophistication of these relationships, their continuity, productivity and intentionality.

The quality of the territorial governance depends immensely on the territorial capacity to foment and mobilize ways of cooperation and partnership public-public, private-private, and yield the relational portfolios of each one of them. Territorial governance constitutes a decisive aspect to the construction of developing collective territorial strategies and territorial marketing strategies.

[11] Published in the book of G. Benko and A. Lipietz "Les Regions qui Gagnent."

In a large extent, the territory government authorities are those who have a particular responsibility in the creation of territorial conditions, at the politics level, and of the infrastructures and equipment that favour their own performance disregarding the other actors. As well as, is their way of relating with the remaining authorities, companies and present institutions, which determines their own territorial governance quality – is from the political-administrative administration of the territory that it builds, it should stimulate and it should conduct a creative context of governance (Neto, Couto and Natário, 2006).

The local and regional territories are, mainly, spaces of collective action, so that it results, on one hand, in the accurate knowledge and identification of behaviour and relationship of the most relevant territorial agents, and on the other hand the ability to yield their performance and coordination.

The territorial governance, thus, lays on the accomplishment, in a concrete territory, of proceedings and mechanisms that we may call of horizontal subsidiary, mobilizing for the territory development, the different institutional and managerial abilities that the territory has (Neto, Couto and Natário, 2006).

The importance of the governance local contexts, known as organizer support of the local/regional capacity of strategic management and the recognition that the regulation forms of local and regional nature constitute a crucial factor for the trajectory of these territories development (Fermisson, 2005).

The possibility of mobilizing these abilities is naturally, strongly dependent on the creation of concrete territorial conditions for the development of new ways of inter-actuation that may conciliate the individual strategies of the agents present in the territory and generate mobilizing and legitimate enough jointly strategies.

The creation of institutional/formal mechanisms of territorial governance are particularly necessary given: 1) The natural non existence of a rationalizing automatic and integrative logic of the territory actions; 2) The necessity to assure the conditions for the collective appropriation of the territorial strategies; 3) The relevancy of assuring the envolvement, in the collective development strategies, of the different institutions and companies; 4) The necessity of formalizing collective strategies of territorial strategic planning and for territorial marketing.

9 The Territory's Image Strategic Management

The territory's image strategic management[12] – what the territory is like and the way it wants to be or may be perceived – and therefore the initiatives to influence perceptions and expectations held by both decision-makers and organizations regarding each one of them – the perception of their potential, of their opportunities and of their stock of material and immaterial resources – is considered to be a condition for survival and a competitiveness factor for cities and regions.

This demands a higher sophistication with respect to the way in which the design and the creation of new territorial public policies are understood and which may take these aspects into consideration. Namely, as regards the need to articulate the process of creating skills and abilities in the territory, along with initiatives to highlight those skills.

Also, in the sense that the development strategies themselves may lead to ensuring an added visibility, since they focus on different initiatives when compared to other solutions being implemented in other territories and not in replicating by imitating solutions among local and regional territories.

The standardised territorial development strategies in what concerns infrastructures, equipments, economic sectors, image and territorial marketing must be avoided entirely.

This should be done not only because these replicating options do not ensure visibility, but mostly because they cause no differentiation among territories and, consequently, they cause a loss of competitiveness. The competitive advantages of a territory often results from the implementation of a differentiation process of the territory's economics basis and infrastructures, avoiding the standardization options.

The process of fostering attractability in a local and regional territory is, first of all, a process of managing expectations both internally and externally, The type of perception conditions, very much, the position and the relationship of economic agents and institutions within and to the territory.

The level of consolidation, recognition and valorisation of each territory's identity varies immensely and as a result there are multiple

[12] Kotler et al. (1993) presents the strategic management as an ongoing process of researching a place's image among target populations, clarifying its advantages, examining the factors influencing its image and delivering relevant messages to different audiences.

perceptions regarding each concrete territory which must be perfected and consolidated. It is absolutely vital to ensure visibility of the territory's features, as well as of its companies and products.

Therefore, the process of strategic planning of cities and regions must take place by adopting initiatives and concrete measures which enable the territory to find innovative and differentiated development solutions valorising territorial specificities and potentialities. This territorial process of strategic positioning and differentiation isn't, of course, an easy process but should be achieved by fulfil and passing through four essential stages:

1) From identity to specificity[13];
2) From specificity to intentionality[14];
3) From intentionality to visibility[15];
4) From attractability to competitiveness.

This means that by building the strategic development initiatives and strategic positioning on their identity, their specificity and the stock of material and non material skills they possess, the territories will be able to conquer, intentionally and as planned, their visibility and thus ensure interesting thresholds of attractability which warrant competitiveness. From the start it implies finding a new meaning for territorial specificities – reinventing specificity and its value, especially for the less developed territories.

Territorial specificities are the territory's skills,culture, environment, landscapes, architectural heritage and goods or services with unique characteristics or brand identification for which a significant group of buyers is willing to make a special purchase effort (Kotler, 2000).

Naturally, the evolution process of each local and regional territory along theses four stages is very distinctive. Each evolution process is very dependent from the levels of plasticity, temporality, identity, memory and relational capacities that characterize each territory.

[13] The importance and the new meaning of territorial specificities – the strategic relevance of reinventing and revalorising territorial specificity.

[14] The importance of valorization and strategic drive of territorial development potentials in order to reinforce the territory's visibility and viability.

[15] The importance of take advantage of cultural identity and intra-regional solidarity and transform it in collective strategic actions, collective images and brands.

10 Territorial Marketing Strategies and Attractability Management

The place marketing involves activities undertaken to create, maintain, or alter knowledge, attitudes and/ or behaviour toward particular places (Kotler, 1982) in order to successfully compete for international status that could assist in attracting tourists, conferences, sporting events, entrepreneurs, investors, industries, company headquarters and global capital.

Place promotion involves the re-evaluation of place to create and market a new image for localities to enhance their competitive position in attracting or retaining resources (Short et al. 2000).

The territorial marketing, when viewed as a process and as a supporting decision tool, is an exceptional tool to manage plasticity, temporality and the perceptions of the territories, the territory's image and identity building and a heightened visibility/attractability.

Territory marketing can be looked upon as a refreshing of identity or as the creation of new forms of identity (Dunn et al. 1995).

Marketing of place seldom restricts itself to extolling the existing virtues of a given city, but seeks to re-invent the city (Doel and Hubbard, 2002) or to re-imaging it[16] (Smith, 2005).

Building territorial marketing strategies is a continued process of promotion and communication, which greatly differs from occasional promotional and communication practices. The process of promoting a territory's attractability is, above all, a process of managing both internal and external territorial expectations and perceptions.

The design and development of territorial marketing strategies and their ability to build the territory's image, and territorial brands, consists on defining planning strategies by articulating four dimensions within the territory (Texier, 1999)[17]:

1) A real dimension, which refers to the territory's infrastructures, human resources, companies and economy – the territory itself, quantifiable;
2) A symbolic dimension which results from the territory's predominant image, and that makes it attractive or not;

[16] The term re-imaging refers to attempts of urban destinations to purposefully reconfigure the ideas or conceptions held individually or collectively of a destination.

[17] See also Texier (1993) and Bailly (1993).

3) A potential dimension, closely related to the symbolic one, which entails the territory's real or potential features and that are viewed by institutional and entrepreneurial decision-makers as a set of potentialities or not;
4) A relational dimension, linked to the institutional and inter-organizational relations taking place within the territory – the territory's relational portfolio (a set of relations that are economically relevant and their characteristics, at different territorial levels – its relational *wallet* (Neto, 1999)) – many times these relations are decisive towards building attractability;

And also, a virtual dimension which results from using information and communications technology and their applications in the territory.

These five dimensions should be undertaken in all conception processes of territorial marketing strategies and promotional and communicational initiatives.

Taking theses dimensions in account, the consolidation process of the territory's identity, and its operationalization in direction to a higher territory's competitiveness and visibility and, consequently, attractability, entails, among other aspects, a very demanding and sophisticated building process of territorial marketing strategy and attractability management.

The most important elements for the definition of the territorial marketing strategy and attractability management are the following:

1) Identifying and building in the territory points and elements of real differentiation – the importance of choosing a differentiating function to carry out;
2) Choosing and differentiating the symbolic elements related to the territory – the importance of graphic symbols of reference – the building of the territory's *identity card*;
3) The growing professionalization and sophistication in the techniques for promoting the territories;
4) Choosing specific communication plans for specific target groups;
5) The joint management of the symbolic, real, potential and relational dimensions of the territory;
6) The building of the territorial brand(s) – the territory is a complex product having a complex way of being promoted – firstly one needs to know where one is headed to;
7) The importance of taking account the territory's plasticity and personality on the building process of territory's image and brand;

8) The congruence between public policies operating in the territory and the kind of image one is seeking to project - the need to choose the image in accordance with the goals to be attained;
9) The option about building the territory's image(s) based on the territory itself or based on the most relevant economic sectors territorially or even based on the main companies located therein;
10) Sometimes it's possible to implement strategies of *cobranding* – the importance of the association of the territorial brand and the brand of spotlight events or infrastructures within[18]. An exercise of co-branding is justifiable where success depends upon the relationship between the image of the destination and the image of the event staged.
11) The possibilities of cobranding are also possible to associate different individual territorial brands in a set of territories common marketing strategies - Building territorial marketing strategies and brands strategies for sets of territories/cities valorising the building of a common global image based on associating/ combining images/brands and territorial marketing strategies of specific local and regional territories;
12) The quality of the territory's relational portfolio could very useful for developing inter-territorial cobranding strategies;
13) The clear option about building territorial marketing strategies which combine the territory's past and future;
14) The need to design a specific image for regional territories based on the strategic perceptions and options held by the main companies and public institutions which are more territorially relevant.
15) The strategic selection of the channels / circuits / target segments to reach and the building of communication plans geared to specific target groups – constructing a continued global strategy of communication.
16) The importance of choose just one or few territorial brands - the existence of several territorial brands, or attempts to have theses different brands, also creates a visibility problem to the extent that there is no consistency in the image one wishes to project;
17) The need to build a global strategy of communication for the territory;

[18] Many authors have analysed the image effects on territory of sport events. For instance, Massberg and Hallberg (1999), Chalip et al. (2003), Higham (1999), Schimmel (1995), Whitelegg (2000).

18) The need for a consensus regarding the major common objectives and the need to design strategies and initiatives with a common and collective vision – great need to consolidate and perfect inter-institutional territorial relations.

The promotion and communication strategy will naturally be based on a fundamental mediator – the territory's image. This image consists of a qualitative representation of each territory, built from objective indicators but also based on symbols and associations of symbols between the real and the imaginary, developing a set of representations.

The construction process of the image for the territory relays on the identification and selection of the image the territory wants to generate among the different target population. The symbols[19], logo and the slogan chosen to promote the chosen image and the promoting strategy are very important and should, of course, be select in a very criterious and strategic way.

Through the development of territorial marketing these representations or symbols of each one of the territories are progressively being generated as products. Thus the territories gain, artificially or not, a differentiating specificity and a vocation.

Credibility, continuity and imageability[20] are important parts of the image formation process.

Territorial marketing strategies should not be viewed and implemented with only the goal of promoting the territory as a tourist destination, but also, and mainly, in order to attract investment and population, to promote the companies located in it as well as their products and to increase the portfolio of established companies. In other words, territorial marketing strategies are a very important instrument for building territorial development.

Building territorial brands and marketing strategies is even an important element in order to foster and add value to territorial solidarities between economic agents and institutions of a precise territory.

The information and communications technologies (ICT) are a new opportunity for territories to acquire visibility. ICT encompasses a brand new relational and accessibility potential which becomes particularly relevant in a context where the possibility of accessing and holding information and the searching of strategic partners are of

[19] See Lash and Urry (1994).

[20] Imageability refers to the quality in a physical object that gives it a high probability of evoking a strong image in any given observer (Lynch, 1960).

decisive importance. ICT allows the territory as well as the agents located therein to be projected and positioned at other territorial levels and enable the sophistication of the attractability promoting processes.

Therefore, ICT has become an exceptional tool to lend sophistication to the territories' and the organizations' relational portfolios, as well as to build promotional strategies for territories, at another dimension and with an enormous degree of interaction and efficiency.

11 Conclusions

The current economic and social reality of any local or regional territory is the result of a historical process of sedimentation of public policies as well as private decisions and strategies. Nowadays, what results from that process of sedimentation grants it a set of economic and social features bearing a higher or lower development potential as well as valorisation and recon version and a greater or lesser versatility of the territory's resources and agility of its agents. The manner in which that process of sedimentation occurred and the achieved result grant the territory a greater or lesser plasticity in relation to change, a higher or lower capacity to manage and drive the territory's life-cycle and its temporality, and a smaller or bigger ability to develop and sophisticate the territory's relational dimension.

Public policies aimed at local and regional territories must contribute to reinforce and develop that plasticity, temporality and that relational dimension, as well as for building differentiated territorial identities and assure its attractability.

We are living a period of raising consciousness for territorial marketing strategies, not only to promote the territory as a tourist destination but also to attract investment, and to promote the territory's companies and their products.

Today as cities and regions attempt to acquire a favourable image among investors the leaders of many local and territories believe that the unfavourable images are obstacles that forestall a brighter future (Avraham, 2004).

The territory's capacity to manage and sophisticate its image and attractability never is an exclusively budgetary problem, it is above all very much depending of the local and regional territory's ability to: 1) implement territorial policies which may assure an important level of plasticity to its economic and social characteristics; 2) a pro-active attitude of the public policies which may assure a possibility to strategically anticipate, prevent and foresee the territory's future and a better management capacity to deal with structural and conjuncture changes; 3) a strategic management of the territory's relational dimension which assure its relational connectivity at different territorial scales and its visibility.

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Part III

Applied Country and Regional Studies

A Comparison of Methods for Assessing the Short-Run Economic Impacts of Tourist Spending on a County Economy

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1 Introduction

Tourism has considerable appeal to communities in search of economic development. As noted by Tooman (1997), tourism is often seen as attainable for most communities with minimal public investment in infrastructure and marketing, while the private sector is expected to provide hotels, restaurants and other tourist facilities. The extent to which a local economy benefits economically from tourism spending is a function of the industries contained in the area and their linkages to other industries and households. The degree of linkages is revealed by the magnitude of the multipliers (related to e.g. sales, income or employment) for the area economy. Conceptually the notion of a multiplier is quite simple. Money received is spent and re-spent, resulting in a final change in spending that is a multiple of the initial change. At each round of re-spending, funds are taken out of the local economy through savings, taxes and imports (money spent outside the area economy). This process continues until all the initial change has flowed outside the region. The quantitative estimate of the relationship between the initial change (in spending/income/employment) and the total change is described as a multiplier (Loomis and Walsh, 1997).

The Nova Scotia Department of Tourism and Culture uses an input-output (I/O) model to estimate the impact of tourism on the provincial economy. However, the ability to estimate the economic impacts of tourist expenditures at the sub-provincial (county) level is lacking. This scenario prompts the following problem statement. How can sub-provincial areas in Nova Scotia measure the economic impacts of tourism on their economies?

In the United States, microcomputer based input-output models have been available for regional economies since the early 1980's. Examples of US based models include: RIMS II (Regional Input-output Modelling), IMPLAN (IMpact Analysis for PLANning, or REMI (Regional Economic Models Inc.). No such models exist in Canada. Survey based area specific models produced by professional consulting firms are prohibitively expensive and are not a viable option for most local governments or tourism organizations. As, Smith (1995) notes, (in Canada) there clearly exists a need for models that can be implemented at a relatively low cost yet still provide basic impact analysis for local economies.

2 Research Goals

The goals of the research are as follows: 1) To identify methods of economic impact analysis applicable in measuring the direct and indirect effects of tourist expenditures at the sub-provincial (county) level; 2) To ascertain whether these methods can be employed using secondary data sources, so as to avoid the prohibitive costs of primary data collection; 3) To compare the selected methods based on proper evaluation criteria.

3 Outline of the Study

This paper identifies four models (methods of analysis), that can be constructed using secondary data, and are capable of measuring economic impacts of tourism expenditures on a sub-provincial (county) economy. Each method of analysis is reviewed in turn. The four approaches are then employed in estimating the impact of tourist expenditures on the economy of Kings County, Nova Scotia. The impacts (expressed in terms of total income generated from a given level tourism expenditures) resulting from each method are compared. The four models and resulting impacts are evaluated on a set of criteria. The criteria relate to: 1) conceptual soundness 2) relevance, 3) replicability and 4) efficiency.

4 Previous Research

Efforts at investigating the impact of tourism at the sub-provincial level in Canada have: 1) Measured only direct expenditures, thereby ignoring any multiplied effects. Examples include Marsh (1984), Murphy and Carmichael (1991), Ferris (2000). 2) Used provincial multipliers or multipliers for another region. Such studies include DPA Group (1988), Yardley (1990), UMA Group (1991). 3) Employed Keynesian – type economic base multipliers based on survey data. Examples of this approach are Foster and Harvey (1976), Rioux and Schofield (1990). 4) Adapted a provincial model to a metropolitan area using primary and secondary data. Examples of this approach include Davis (1974), Liu and Var (1983) and Carteri (1997).

The first approach is inadequate given that the tourist expenditures do generate some multiplied effects even at the community or county level. Using provincial multipliers or multipliers for another region is inherently incorrect. Borrowing multipliers calculated for other economies is problematic because such multipliers are derived from how a particular economy actually performs (Getz, 1991).

A number of approaches have been utilized to measure the economic impact of tourism expenditures on the host economy, with the economic base model, the Keynesian multiplier model, and the input-output model being the most popular (Kim and Kim, 1998).

The economic base multiplier approach, initiated by Tiebout (1962), is the simplest model of economic activity and employs data generally available at the county level. Its drawbacks include that it generates a single sales/employment/income multiplier for all exporting industries and that it assumes that growth in an area economy is attributable totally to exports, thereby ignoring other variables that can influence regional growth (Krikelas, 1991).

The Keynesian or ad hoc approach by Archer and Owen (1972) traces the income generated in the area from direct tourism expenditures and related area residents consumption patterns. Even the simple version of this model requires a substantial amount of data and does not provide multipliers for each industry as does an input-output model. Furthermore, as noted by Frechtling (1994) in its more developed form, it is not clear in the literature how the direct and indirect income is generated by each type of business. Liu (1986) solved for this problem using estimates of direct and indirect income from an I/O model. But as Frechtling (1994, p. 386) notes, "If the researcher has access to an adequate input-output model, why ignore it in favour of the ad hoc model approach."

Simple scaling of a provincial I/O model to produce a city model (where the metropolitan economy represents a significant proportion of the provincial economy) has been used by DPA Group (1988) and Cateri (1997). In many cases however, individual counties comprise only a small part of a provincial economy. Consequently, differences in economic structure and magnitude of leakages for smaller county areas, relative to the provincial economy, reduce the effectiveness of this approach.

As Strang (1970) notes, the Keynesian model and the input-output approach can be viewed as alternative approaches to studying the local economy; however, I/O with its greater detail, provides a much more complete picture of the economic structure and allows the analyst to determine the impacts of changes in demand on individual industries as well as the community as a whole. Input-output is clearly a useful tool for studying a local area's economic structure. Survey-based local input–output tables represent the most satisfactory basis for multiplier estimation (Rioux and Schofield, 1990). The primary weakness of survey-based input-output as noted by (Braschler and Devind, 1993 and VanHoeve, 1995) is its cost and the difficulty in obtaining data.

Comparisons of tourism multipliers for an area derived from a range of multipliers, such as input-output tables, ad-hoc models and other approaches, could suggest relative strengths and weaknesses of the different methods (Frechtling and Horvath, 1999).

5 The Study Area

The County of Kings is located on the Bay of Fundy, approximately one hundred kilometers west of Halifax, Nova Scotia's capital city. The municipality of Kings covers approximately two thousand square kilometers. Much of the county is made up of the fertile Annapolis Valley, Nova Scotia's richest agricultural region. The population of Kings County is just under 60 thousand and with a labour force of 29 thousand (2006 census). Key industries include agriculture, manufacturing (tires and food processing), retail trade, health and education.

Blomidon Provincial Park is situated on the rugged headland of Cape Blomidon, is renown for its panoramic views overlooking scenic Minas Basin, home of some of the worlds highest tides. The park occupies approximately 759 hectares of the Cape Blomidon promontory and provides visitors with opportunities for camping, hiking, beachcombing and nature appreciation. Visitors to the park have access to numerous natural habitats including bog, softwood and hardwood forests via the interconnected trail system. The park is home to such rare species as Wild Leek, a rare variety of Fairy Shrimp and the Peregrine Falcon as well as the American Bald Eagle (Nova Scotia Department of Natural Resources, 2003).

6 Methods of Economic Impact Analysis

Four methods of analyses were selected: 1) Development of a "ground up" input-output based model, 2) Economic base model, 3) Keynesian multiplier model and 4) Location quotient scaled provincial I/O model.

These methods were chosen based: 1) The availability of secondary data necessary to construct a given model, and 2) on a review of economic impact literature that traced the development of impacts estimation techniques, starting with economic base models, progressing through Keynesian type multipliers to input- output models. More recently, Computable General Equilibrium (CGE) models have increased in popularity. The CGE approach is not included here given that its computational complexity and extensive primary data needs negate it as a relatively low cost method of analysis at the sub-provincial level.

The base year for the models is 1996. Data used to develop each of the models comes from a variety of public agencies primarily Statistics Canada, Industry Canada and the Province of Nova Scotia. Each model was used to estimate the income effect of domestic (Canadian) tourist spending on the economy of Kings County, Nova Scotia. Domestic tourist expenditure data in Kings County is from Statistics Canada's Canadian Travel Survey 1996. Each model is described in what follows.

6.1 Input-Output Based Model Development

An input-output based model was developed for the county economy using secondary data. A direct requirements matrix was constructed using data from Industry Canada's Small Business Profiles. The direct requirements matrix was regionalized using employment based location quotients. The model was subsequently closed with respect to household. Household expenditures were adjusted for leakages based on non-local spending, trade margins and sales taxes. The Leontief inverse was used to generate a closed model total requirements matrix and associated multipliers.

The closed model can be summarised as:

$$X^* = (1 - A^*)^{-1} F^* ,$$

where:

- X^* = the vector of total output
- $(1 - A^*)^{-1}$ = the closed model total requirements matrix (Leontief inverse)
- F^* = vector of final demand changes associated with tourist spending.

Data for Canadian tourist expenditures in the study area comes from Statistics Canada's Canadian Travel Survey 1996 and are estimated to be $19.6 million in 1996. Adjustments for trade margins and sales tax leakages, give a final demand change of $12.3 million. The total income impact using the I/O based model is estimated at $4.85 million.

6.2 Economic Base Model

The export base model entails bifurcating the local economy into basic (exporting) industries and non-basic (non-exporting) industries. The criteria for bifurcation is the income based location quotient. The location quotient calculates the concentration of income by industry, (1980 standard industrial classification) in Kings County, relative to the provincial (Nova Scotia) economy. More specifically:

$$\mathrm{LQ} = \frac{\text{percentage of total Kings County income generated in industry i}}{\text{percentage of total Nova Scotia income in generated in industry i}} .$$

An LQ of greater than one for a given industry means that Kings County is considered to be more than self-sufficient in that industry and therefore is classified as a basic (exporting). Industries having an LQ of less than one are considered to be non-basic (non-exporting). Non-basic industries are assumed to derive no income from export activities. Basic classified industries, however, may have a portion of income derived from non-exporting activities. The level of income for basic industries attributable to exports is calculated as follows:

$$\mathrm{Ibi} = \mathrm{Iti}^{*}(1 - 1/\mathrm{LQi})\ ,$$

where:

- $\mathrm{Ibi} =$ basic income in industry i
- $\mathrm{Iti} =$ total income in industry i
- $\mathrm{LQi} =$ income location quotient in industry i.

All federal and provincial government agencies and institutions, including military, university and correctional institution income, are classed as basic (Tiebout, 1962). Summing across all industries gives the total income in basic and non-basic industries for Kings County. The income multiplier is calculated as the ratio of total income to basic income as shown:

$$\text{Income multiplier} = \mathrm{It}/\mathrm{Ib}\ .$$

The economic base approach produced an income multiplier of 2.41 for Kings County, meaning a dollar of basic (export) income would generate total income of \$2.41. Tourism revenues are considered exports, as Kings County firms sell goods and services to non-resident tourists. Basic (export) income derived from domestic tourism expenditures was estimated by multiplying direct tourism spending in each industry by the corresponding ratio of wage payments to revenue for that industry. Direct wage income resulting from domestic tourism spending was estimated to be \$4 million in Kings County. Domestic tourism expenditures are estimated to create a total of (\$3.985 million * 2.41 =) \$9.6 million in total income for the Kings County economy.

6.3 Keynesian Multiplier Model

Values for each of the variables in the Keynesian income multiplier equation were estimated using data from a variety of Statistics Canada sources as well as formulations from the input-output based model described next. These values were substituted into the multiplier equation to derive the income multiplier for Kings County. The resulting multiplier (shown below) was used to estimate the total impact of Canadian tourist expenditures.

Keynesian income multiplier approach states:

$$Y = X^*(A/(1 - (B^*C)) ,$$

where:

- $Y = \$19.551$ million * $0.3349/(1-(0.4521^*0.1587)) = \$7.05$ million (total income effect of visitor expenditures in the county economy)
- $X = 19.551$ million dollars (domestic tourism expenditures)
- $A = 0.3349$ (proportion of tourism expenditure remaining in the economy after first round leakages)
- $B = 0.4521$ (proportion of residents' income spent locally)
- $C = 0.1587$ (proportion of spending by residents that accrues as income in the local area)
- $A/1-(B^*C) = 0.3349/(1-(0.4521^*0.1587)) = 0.3608$ (Keynesian income multiplier).

The Keynesian income multiplier equals 0.3608. The total income estimate using this model is ($19.551m*.3608 =)$7.05 million.

6.4 Location Quotient Adjusted Provincial Input-Output Model

The provincial I/0 direct requirements matrix was obtained from the Nova Scotia (NS) Department of Finance. This matrix contains, for each industry, sales to and purchases from, all other industries (per dollar of output). The provincial matrix is adjusted via employment based location quotients to approximate the Kings County economy. It is assumed that all wage payments are made to county residents and profits are treated as leakages. Consequently, profits (which are identified separately and grouped with depreciation under "Other operating surplus" in the provincial model) are excluded and no adjustment is made for commuters. Household expenditures were adjusted for leakages based on non-local spending, trade margins and sales taxes.

The location quotient (as described earlier) is a measure comparing the concentration of an industry in Kings County and its concentration in the province of Nova Scotia. Since, at the county level, employment data (by industry), are available at a greater level of detail than data on output or income, employment data is used to calculate the location quotients.

If the LQ is equal to or greater than one, then the county is considered to be specialized (relative to the province) in this industry and produces enough output to satisfy county demand (with excess production being exported). If the LQ is greater than or equal to one the provincial coefficient in the direct requirements coefficient is used for the county economy. If the LQ has a value that is less than one, then county output is considered to be less than what is required locally and imports into the county are assumed necessary. If LQi is less than one, the county coefficients for row i are estimated by multiplying the provincial coefficients by the location quotient.

Mathematically:

$$\mathrm{rij} = \mathrm{aij} \times \mathrm{LQi}\ ,$$

where:

- rij = the county coefficient
- aij = the provincial coefficient
- LQi = the location quotient.

Location quotients were calculated for each industry (excluding households) based on employment. The rows of the direct requirements matrix are adjusted based on the LQ values. After adjusting the direct coefficients via the location quotients, the model is transformed into the total requirement matrix via the Leontief inversion technique.

The closed model can be summarized as:

$$\mathrm{X}^* = (1 - \mathrm{A}^*)^{-1}\mathrm{F}^*\ ,$$

where:

- X^* = the vector of total output
- $(1 - \mathrm{A}^*)^{-1}$ = the closed model total requirements matrix (Leontief inverse)
- F^* = vector of final demand changes associated with tourist spending.

The resulting income multipliers were used to estimate the impact of tourism expenditures on Kings County. This approach produced a total income estimate of $7.4 million.

7 Findings

There exists sufficient secondary data available in Nova Scotia (and the rest of Canada) to employ each of the four methods identified as applicable in assessing the economic impacts of tourism at the county level.

Table 1. Summary of model impacts and multipliers

Model	Total Income Impact ($millions)	Tourism Income Multiplier (total income /total tourism spending)	Ratio Income Multiplier (total income/direct income
I/O based	4.850	.25	1.64
Economic base	9.604	.49	2.41
Keynesian Multiplier	7.054	.36	1.77
LQ scaled N S I/O	7.374	.38	1.37

By employing secondary data, these models that can be implemented at a relatively low cost yet still provide basic impact analysis for local economies.

The total income impact ($millions) for each model along with the corresponding tourism income multiplier and ration income multiplier are shown in Table 1. The tourism income multiplier is the ratio of tourism expenditures to the total income impact (which includes the multiplied effects of re-spending). The ratio multiplier is the ratio of direct income created from tourism expenditures to the total (multiplied) income impacts.

The input-output model produced a conservative tourism multiplier (.25) compared to the Keynesian multiplier (.36) and the LQ scaled provincial I/O model (.38). Consistent with the literature reviewed, the economic base approach (.49) produced a tourism multiplier that exceeded the other three approaches.

The input-output based model (1.64) produced a ratio income multiplier (change in total income/change in direct income) that was about midway between the Keynesian model (1.77) and the LQ scaled provincial model (1.37). The economic base multiplier was significantly greater (2.41).

8 Model Evaluations

The four approaches used to estimate the impact of tourism on Kings County are discussed relative to a set of evaluational criteria and given a rating of low, medium or high. The criteria relate to: 1) conceptual soundness, 2) relevance, 3) replicability, 4) efficiency.

Conceptual soundness, as it relates to tourism impact models, is addressed by Leitch and Leitstritz (1985) under the heading of credibility, and by Flemming and Toepper (1990) under model accuracy. As Leitch and Leitstritz (1985) note, a model must be credible in that it is grounded in theory and has been tested. Relevance refers to the ability of the model to measure applicable economic impacts and effectively exclude other simultaneous economic activity. Replicability relates to the notion that the impacts for a province (state)/county/city should be comparable to other estimates for similar geographical areas. As noted by Flemming and Toepper (1990), estimates of impacts for an economic area should also be comparable to past and future estimates. As Frechtling (1994) notes, resources for economic impact estimates are limited, therefore the impact estimation approach should make maximum use of available data commensurate with satisfying the study objectives. . Efficiency refers to the ability of a model to maximize completeness and minimize costs, subject to achieving the stated objectives.

Clearly, the multipliers for a given study region are dependent on the unique economic structure of that region and its relationship with surrounding regions. While a comparison of multiplier values across study regions fails to account for structural differences, it is a useful exercise from a "ball park" perspective regarding the magnitude of the resulting multipliers.

The tourism income multipliers (total income/total tourism spending) generated by each approach were compared to those produced by other municipal/metropolitan tourism studies in the US, UK and Canada (Fletcher 1989 and Wanhill 1994). With the exception of the economic base model, the multipliers appeared consistent with studies from the UK and Canada and conservative relative to US study results. Similarly, the income ratio multiplier produced by the economic base was significantly larger relative to the US studies reviewed, where the other model results were similar. Consequently, the economic base model received a poor rating on replicability, while all other methods were rated highly.

The LQ scaled provincial I/O model obtained the highest overall rating, garnering a medium rating on conceptual soundness and a high rating on all other criteria. The comprehensive nature of the I/O framework (tempered conceptually by the use of location quotients), the minimal data requirements and computational ease, were key factors in this rating.

The conceptual soundness and replicability of the I/O based model are equivalent to that of the LQ scaled NS I/O model. However, the inability to capture certain inter-industry linkages, the significant data requirements and computational complexity of the I/O based approach, led to a medium rating in terms of relevance and efficiency.

The economic base model is computationally simple and has minimal data requirements. However, it produces a single multiplier, views exports as the sole generator of economic growth and tends to overstate exports and the resulting multiplier. This approach received a rating of medium on efficiency and poor on all other criteria.

The Keynesian model is firmly grounded in macroeconomic theory. However, there exists confusion regarding indirect income generated by each industry and must be augmented with an I/O model to capture induced impacts. This model produces only a single aggregate multiplier, although it is sensitive to variations in the distribution of tourist expenditures. This approach was given a medium rating for conceptual soundness, relevancy and efficiency, and high for replicability.

Based on the evaluational criteria, the location quotient adjusted provincial model is deemed preferable given its completeness in identifying inter-industry linkages and computational ease. Given that a relevant up to date provincial model is available, this method appears superior to the other approaches. Despite its shortcomings related to intra-primary industries linkages, the input-output based model is seen as favourable compared to the Keynesian approach. The increased data requirements and computational complexity are outweighed by the comprehensive nature of the I/O framework, which presents a more comprehensive picture of the local economy.

9 Discussion

The magnitude of the tourism income multipliers (change in tourism spending/change in total income) ranging from .25 (for the I/O based model) to .49 (for the economic base approach) illustrates that there are significant leakages from the local economy as it relates to tourism spending. Similarly, the income ratio multipliers (total income change/

direct income change) ranging from 1.37 (LQ scaled provincial model) to 2.41 (economic base model) illustrate the importance of secondary (spin-off) benefits. Consequently, policies that can reduce leakages and strengthen/expand the linkages between firms in the local economy can increase the economic benefits from tourism expenditures. The local inter-industry linkages, illustrated by the input-output approach, can provide evidence where improved linkages are possible and most beneficial.

The economic contribution of visitor expenditures in the local economy is of interest to area businesses, public agencies and citizens. Informed decision making and public policy necessitates that stakeholders understand the economic contribution made by tourists (directly and indirectly) to the local economy. Awareness of the economic benefits is vital in order to make comparisons with the associated economic and social costs related to tourism development.

Use of the techniques examined in this study can allow county area tourism agencies and organisations to cost effectively assess the economic contribution of its current stock of tourism attractions. This information can illustrate the significance of tourism spending in the local economy. Initial estimates can provide benchmark data and allow comparisons of tourism trends in a given county to be compared with trends in other counties or overall provincial/national trends. The provision of benchmark data on tourism impacts enables an assessment of current and future policies related to economic development via tourism. An economic perspective is important to the development and management of tourism resources and can play a key role in achieving a balance between resource conservation and improving the socio-economic standing of the host area residents.

This study has shown that the impacts of tourism expenditures at the county level in Nova Scotia (and Canada) can be cost effectively analysed using secondary data. Use of the data and analytical techniques employed in this study can lead to informed decision making, as it relates to county level economic development via tourism. There is a constant need for local public agencies and private industries involved (directly and indirectly) in delivering tourism goods and services to identify their relationship with the local economy. It is hoped this research can allow such stakeholders to take a step in that direction.

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Measuring the Impact of Tourism on Production by means of an Input-Output Model of Interior Flows. An Application to Galicia

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1 Introduction[3]

Recent research shows how specialisation in tourism is a relevant factor for economic growth (Brau et al. 2004; Campos and Sequeira, 2005). The relationship between tourism and economic growth is established through a wide range of impacts. This paper considers some aspects of the economic effects of incoming tourism on the Galician economy.[4] It concentrates on the impacts of tourist expenditure on the production of the different productive branches. The tourist expenditure directly affects a large group of sectors but also brings about secondary effects which must be considered. Therefore, the basic objective of this paper will be to obtain an estimate of the total effects of the tourist expenditure of non-residents in Galicia and of its distribution between direct and indirect effect by sectors. To cover this complex dimension of the

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[4] Galicia doesn't benefit from the massive sun and beach tourism to Spain, given its Atlantic climate, which is due to its location in the north-west corner of the Iberian Peninsula.

tourist phenomenon it is very useful to use an input-output table and its associated analytical techniques.[5]

Before starting it is necessary take into account some considerations of a methodological nature. First of all the following lines refer to the concept of tourism employed. Secondly they refer to the method used and to the sources available. Finally, a brief description of the contents of this article will be carried out.

The definition of tourism by the United Nations comprises those *"activities carried out by people during their journeys and stays in places which are different from their normal habitat, during a consecutive period of time which is under a year, with the aim of leisure, business or other purposes"*.

In the case in question it is also necessary to add one more point: only the expenditure on final consumption of the non-residents will be considered.[6] Therefore, strictly speaking, it will not be taken into account the whole of tourism, but only a part. In Chart 1 the field covered in this article is clearly shown and will be exclusively defined as that in the cell named "*incoming tourism*". So, from now on, tourism should be considered only in this limited way.

Chart 1. Classification of tourist consumption

	Area where the expenditure is carried out		
Residency of the traveller	Economic area	Outside the ec. area	Total
Residents in the economic area	Internal tourism	Outgoing tourism	National tourism
Non-residents	Incoming tourism		
Total	Interior tourism		

Source: INE. *Satellite account of tourism. www.ine.es*

For this study *the "Input-output table for Galicia 1998"* (IGE, 2001)[7] will be used. Obviously, in this table tourism does not constitute a productive sector and therefore does not appear among the branches of

[5] Some of the problems regarding the measurement of economic impacts of tourism can be found in Dziedzic (2005).

[6] The reason for this limitation is that, as it will be explained later, the principle source of this study does not give information on the tourist expenditure carried out by the residents.

[7] It is important to highlight here the enormous difference observed between the estimates for tourist expenditure of the IGE and Turgalicia (2002): from 223 to 300 thousand million Pesetas respectively for the year 1998. As is natural, the gap widens greatly if it is considered the expenditure estimates of the IGE for hotels of 3 or more stars, which are around 60,000 million pesetas for the year 2000.

the intersectorial transactions matrix. Tourist expenditure is a type of expenditure within final consumption. The most important point about the source used is that this information is explicit in the use table with the heading *"Final consumption of non-residents in the economic area"* (at acquisition prices). In addition, this table offers a vector distinguishing between internal flow (the consumption of products produced within Galicia) and imported (both from the rest of Spain as well as from the European Union and the world).

However this source has two serious limitations for its use as required by this study. The first is that it is only available as a part of the symmetrical table, that which corresponds to intermediary consumption (63 by 63 branches) at basic prices, given that unfortunately the final demand matrix was not published.[8] The second limitation is that the information which this table offers is too aggregated since as it will be shown, nearly half of the tourist expenditure by non-residents is concentrated in only two products (which, on top of that, are in the same branch).

The time period studied is limited to the year 1998, as this is the only year for which exists the necessary information. This implies, -with respect to the moment at which this study was finished-, that a significant time gap has already been accumulated. For this reason the conclusions should be considered valid for that time and only with reservations can be transposed to the present time. Besides other changes which have happened to the structure of the Galician economy, it is important to point out that since then there has been a gradual increase in the incoming tourism in Galicia. This development has been heightened by the "Holy Years" (1993, 1999 and 2004).[9] In any case, given the structural nature of the inter-sectorial connections outlined in an input-output table and the specificities of the tourist supply and demand, it is reasonable to think that the fundamental features that are identified characterise at the least the whole of the end of the nineties and the beginning of the new century.

The study develops as follows: first of all, it will consider the vector of the final demand corresponding to the expenditure in goods and services by non-residents. However, these direct relationships do not

[8] Nevertheless authors would like to acknowledge the IGE for the data supplied (Final Consumption, in basic prices, of non-resident families; both total and internal).

[9] These are years when a large number of pilgrims and tourists come to Santiago de Compostela, the capital of Galicia.

explain the implicit effects brought about. For this reason an input-output model was developed to consider exclusively the internal flows, which allowed making the calculation of the total effects of tourism on production.[10] In the next section the indirect effects brought about by the expenditure of the non-residents on production will be considered. These are obtained by the difference between the total and direct effects and are illustrated by a symmetrical table which shows this tourist "intersector".

2 Calculating the Effects of Tourist Expenditure on Production

The final demand matrix of the "I*nput-Output table for Galicia 1998"* shows the products from which the demand of the non-residents is formed. From this it is possible to answer the question of how the rest of the economy is affected by this demand or, in other words, what productive interrelations are established in the supplying of this demand.

Nevertheless, the analysis of the intersectorial relationships present in the intermediary consumption matrix is not a good enough calculation. This is because on the one hand, it is necessary to incorporate the indirect effects of the impact of tourism and on the other hand, it is not possible to consider in isolation the quantities that are due to tourism and not to other demands.

In the following pages it will be studied how tourist expenditure induces activity in the different branches and on the Galician economy as a whole. The consumption of non-residents generates a requirement on the productive sectors, bringing about an increase in production (and/or in imports) in those sectors which furnish these goods and services (direct effect). But these branches, in order to carry out their productive activity, require inputs from other sectors, which will also see their activity increased and so on (indirect effect). Finally, the sum of these two effects is the total effect, or productive impact, that tourism has on the Galician economy. Or, in other words, this total effect brings together the effort necessary in all the sectors to satisfy the demand of the non-residents.

[10] An input-output model is an analytical framework built upon an input-output table, which considers inter-industry relations in an economy, in order to study a wide range of economic problems such as forecasting, sectorial analysis, economic impacts, etc.

A classic method for calculating these effects are input-output models. Here, there are two important methodological options. The first one is to follow the models designed for working with the supply and use tables from the ESA-95 system.[11] In this respect notice can be given to the models suggested by the United Nations (1999), Cañada (2001), Viet (1994), ten Raa and Rueda-Cantuche (2003), or, in an application specific to tourism, the model by de Filho (2002). The second option would be to use traditional models based on the symmetrical matrix (Lee and Taylor, 2005). In the first of the two alternatives the problems are serious, given that not all the necessary elements are available (the Galician Statistics Institute, IGE, does not offer the supply and use tables with the same price system). This would force the research to go from a system of prices to another one with very limited information "*given the omission of information of disaggregated values of commercial profits and transport, of the taxes on imports and production, of the CIF/FOB adjustments and of the consumption of residents outside the area and of non-residents inside the area, it is impossible to carry on without the incorporation of ad hoc criteria and hypothesis*" (Fernández and Grela, 2002).

For this reason the option chosen was to construct a traditional demand model, using a use matrix to analyse the structure of direct effects and the symmetrical, for the calculation of total effects.[12] But to this end initially there was an important limitation: this type of analysis requires a complete symmetrical input-output table, which, -

[11] In this case it would be a good idea to work with the demand model relative to the hypothesis of product technology (along the lines suggested by L. De Mesnard, 2004), in spite of its limitations (like the possibility of the appearance of negative intermediate consumption). This would allow the building of a symmetrical matrix for products without the necessity of carrying out aggregations.

[12] As well as this "practical "reason this option can be put forward along other lines. Given that one of the objectives of this research is to study the accumulative effects brought about by tourism, it would seem preferable to adopt this formula. As the ESA itself says (9.13), "*supply and use tables and symmetrical input-output tables are also used as instruments of economic analysis although each of these two types of tables offers different advantages. To calculate the direct and indirect effects it is necessary to complete the origin and destination tables with specific hypothesis or with supplementary statistical information. These requirements of specific hypothesis and supplementary data are especially important for the calculation of accumulative effects. In fact the requirements for the calculation of accumulative effects are equivalent to the elaboration of a symmetrical input-output table. Therefore, in order to calculate the aforementioned accumulative effects it is preferable to make use of the symmetrical input-output table*".

as has been commented-, does not exist in the publication of the IGE (given that it only includes the matrix of inter industrial transactions).

In order to find a solution to this problem fortunately it was possible to count on some additional information which was given by the IGE itself. This avoided having to develop a process for the transformation of the price system for the part of the final demand of interest for the research (the expenditure of non-residents) to make it compatible with the available matrix of intermediate consumption, calculated in basic prices. So the only manipulation necessary was the adding of products in sectors.[13]

3 Direct Effects: The Tourist Demand Vector at Basic Prices

To reach the objective, which is to consider the effects of tourist expenditure on the productive activity of Galicia, firstly it is necessary to consider the final demand vector of expenditure on goods and services of the non-residents. This direct effect can be seen in the following table. Afterwards, this vector will be used along with an interior Leontief inverted matrix to obtain the total effect.

In Table 1, the most notable sectors are the hotel trade, which is in first place, followed by "the property market", and leisure activities.[14]

[13] In order to construct a vector for tourist demand (final consumption of non-resident families) at basic prices from the product information, firstly it is necessary to proceed with its aggregation. For this it is necessary to compare the original table (where the value of the production for products at basic prices is shown) and the matrix for intermediate consumption from the total symmetrical table (where the production by sectors, also at basic prices, appears). The aggregation is carried out by attributing to each product its corresponding sector code. This procedure is the same as the one used by the IGE, except for certain exceptions of little importance which were also taken into account.

[14] In the ESA-95 system commerce and transport has a different treatment in basic and in acquisition prices. It is worthwhile remembering that the expenditure that tourists (usually families) make in shops is not all counted as sales in this sector. The production in this sector is really only that of the commercial profits, with the corresponding sectors (e.g. postcards or books will appear under "Publishing and graphic arts", and so on). However it is necessary to bear in mind that the same is not the case in the hotel and catering sector, where the value of the sales includes that of the food product concerned. In any case, the retail sales figures under consideration may appear a little lower than what would have been expected. In this respect as an example it could be quoted the "Intersectorial Table of the Tourist economy TIOT 92", which for Spain gave to commerce approximately 10% of tourist expenditure in final consumption.

Table 1. Consumption of non-resident. Direct effects by sectors. Internal flows at basic prices

Code	Sector	Value	Percentage of the total	Percentage of the production of the sector
42	Hotel trade[15]	105.645.279	59,29	26,06
51	Property market	18.496.949	10,38	3,54
61	Recreational, cultural, and sporting facilities, except those of the public administrat. (PP.AA).	15.982.202	8,97	15,35
41	Retail Commerce, except motor vehicles; repair of personal effects and household and household goods	11.644.809	6,54	3,01
47	Mail and telecommunications	3.563.263	2,00	2,54
40	Wholesale commerce and commercial intermediaries, excluding motor vehicles.	3.097.945	1,74	1,12
43	Transport by land	2.618.561	1,47	1,01
39	Sale and repair of motor vehicles, retail sale of motor vehicle fuel	2.138.961	1,20	1,05
52	Rent of user-operated machinery and equipment, of personal effects and domestic appliances	1.818.084	1,02	9,33
	Total	178.175.517	100,00	2,07

Source: Our own calculations, based on information obtained directly from the IGE. Values in thousands of pesetas.

In all, it is possible to observe a clear orientation towards tertiary activities. Not included in the above table, with percentages around 0,7%, are the following sectors: various activities of personal services, "The milk industry", "Agriculture, livestock farming, hunting and related service industries," and "fishing, fish farming and related service industries."

If instead of listing the different sectors based on the total tourist expenditure, focus were on the importance of the tourist demand in the production of the sectors, then the ranking would differ appreciably. This is the information contained in the last column on the right of

[15] Including hotels, restaurants, cafés, etc

Table 1. In this case for the "Hotel trade", tourism is still a basic source of income, while for the rest of the sectors its weight is less appreciable, except in the case of "Recreational, cultural and sporting activities", and for "Machinery renting". Finally it should be pointed out that the direct impact on the whole sectors is 2,07%. In the following section an estimate of the overall impact will be obtained, in other words, including not only the direct but also the indirect impact as well.

4 The Total Effects of Tourism: The Demand Model with Internal Flows

The Leontief model relating to total flows is usually represented as follows:

$$q = (I - A)^{-1}(y - m) ,$$

with q as the output, $(I - A)^{-1}$ as the inverse matrix of Leontief, y as the final demand vector of each sector and m as the vector of imports in each sector.[16] In this system of equations the independent variable $(y - m)$ can also be expressed, if the origin of the flows are differentiated, as

$$y^d + y^m - (X^m i + y^m) ,$$

where X^m is the matrix of intermediate consumption of imported flows and i is a matrix column of ones. Therefore $X^m i$ is the vector of intermediate demand of imported flows. Once the previous expression has been simplified it is obtained

$$y^d - X^m i ,$$

which is the difference between the final demand covered by internal flows and the imported intermediate demand.

However, in this paper it is not desirable to go straight to Lentief's model of total flows. This is because the source does not provide detailed information on imported intermediate consumption brought about by tourism. That's why this paper developed a model which allows dealing with the calculation of the total effects of tourism on

[16] In the literature the normal notation of the independent variable is characterised as y. It should be pointed out that in this case y is understood as a final demand vector net of imports.

production, considering only internal flows.[17] To this end, the starting point is the equality of supply and demand of goods and services.

$$q + m = Xi + y \ ,$$

with Xi being the vector of the intermediate demand of each sector. In the following the demand is broken down according to its origin, thus obtaining the equation:

$$q + m = X^d i + X^m i + y^d + y^m \ .$$

Now, given that the imports are to satisfy the intermediate or final demand, or in other words, $m = X^m i + y^m$, it is possible to simplify the above into

$$q = X^d i + y^d \ .$$

But as it is known that the matrix of internal technical coefficients[18], A^d, is obtained through the matricial product $A^d = X^d \ \hat{q}^{-1}$, where $\hat{q}^{-1}$ is the inverse of the diagonal matrix, and where the elements of the main diagonal correspond to the productions of the different sectors, then the vector for the intermediate demand of internal flows is

$$X^d i = A^d q \ .$$

Once it was made the substitution was obtained:

$$q = A^d q + y^d \ ,$$

with the result that the corresponding model would be

$$q = (I - A^d)^{-1} y^d \ .$$

So obtaining the total effects brought about by tourism, q^t, is possible from the expression

$$q^t = (I - A^d)^{-1} y^{d^t} \ ,$$

where y^{d^t} is the vector representing the consumption of internal flows of the non-residents, or in other words, that part of the final demand which corresponds to tourism. Tables 2 and 3 show some of the main results. Firstly let's consider the total effects. Table 2 brings together the most significant sectors affected by tourist expenditure.

[17] However in opposition to this option other authors, like those of the SAETA project (2000, p. 25), opt for not considering imports, which implies a certain over-valuing of the results.

[18] Note that the greater instability in time of internal technical coefficients with respect to the totals here does not cause a problem which could affect the result, as in the case in question simulations in time were not made.

Table 2. Consumption of non-residents. Total effects by sectors. Internal flows at basic prices

Code	Sector	Value	Percentage of the	
			Total	Prod. of the sector
42	Hotel trade	106.695.619	42,71	26,32
51	Property market	20.174.710	8,08	3,87
61	Recreational, cultural, and sporting facilities, except those of the PP.AA.	16.456.326	6,59	15,80
40	Wholesale commerce and commercial intermediaries, excluding motor vehicles.	13.302.156	5,32	4,79
41	Retail Commerce, except motor vehicles; repair of personal effects and household and household goods	11.644.809	4,66	3,01
55	Other business activities	8.740.935	3,50	2,83
47	Mail and telecommunications	7.121.278	2,85	5,09
01	Agriculture, livestock, hunting and related service activities	6.973.295	2,79	2,54
43	Transport by land	6.093.654	2,44	2,35
	Total	249.811.973	100,00	2,90

Source: Our own calculations, based on information obtained directly from the IGE and the IGE (2001) "Economic accounts and Input-Output table for Galicia 1998" Xunta de Galicia. (Galician Government). Values expressed in millions of pesetas.

Table 2 is remarkably similar to Table 1 (of direct effects) which goes to show the great importance that the direct effects have on the totals. The additional sectors that appear here are because of the indirect effects that are examined in the following section. Once again the "Hotel Trade" constitutes a fundamental part of the sectorial effects of tourism and is far ahead of the second sector. But now it has appreciably less

Table 3. Consumption of non-residents. Indirect effects by sectors. Internal flows at basic prices

Code Num.	Sector	Value	Percentage of		
			Total	Requirement of inputs	Production
40	Wholesale commerce and commercial intermediaries, excluding motor vehicles.	10.204.211	14,24	4,08	3,67
55	Other business activities	8.552.889	11,94	3,42	2,77
01	Agriculture, live-stock, hunting and related service activities	5.841.622	8,15	2,34	2,13
12	Drinks industry	5.081.844	7,09	2,03	12,07
36	Production and distribution of electricity, gas, steam and hot water	4.735.593	6,61	1,90	2,07
47	Mail and telecom-munications	3.558.015	4,97	1,42	2,54
43	Transport by land	3.475.093	4,85	1,39	1,34
08	Meat industry	3.202.316	4,47	1,28	3,25
03	Fishing, fish farming and activities of related services	3.043.585	4,25	1,22	1,82
	Total	71.636.456	100,00	28,68	0,83

Source: Our own calculations, based on information supplied by the IGE and IGE (2001), "Economic Accounts and Input-Output table for Galicia, 1998" Xunta de Galicia. Values expressed in millions of pesetas.

weight, due to the fact that this sector is clearly geared towards the final demand. A long way behind it's possible to find the "Property Market" to which the aforementioned can also be applied.

The following sectors which are not in the table are the "Drinks industry", "Production and distribution of electricity, gas, steam and hot water", "Fishing, fish farming and activities of related services", "Meat industry" and "Sale and repair of motor vehicles, the retail sale of vehicle fuel", all of these have percentages of around 2%.

If the importance that the tourist expenditure has for each of these sectors is considered, then the ranking changes appreciably. As well as the two sectors which stand out in Table 2 (i.e. "Hotel Trade" and "Recreational activities"), one should also point out the importance that they have for other headings such as the "Drinks industry" (with 14.28 %) or the "Hiring of machinery and equipment, personal effects and domestic appliances" (with 12.13%).

The impact of inbound tourism, once all the indirect effects have been considered, is 2,9% of the production of the economy as a whole. The previous total effects can be broken down into two, direct effects and indirect. The former are those seen in Table 1 while the indirect are considered in the next section.

5 Effects on Intermediate Demand

As was shown, multiplying the internal inverse matrix by the vector of the tourist demand at basic prices gives a vector of the total effects of tourism (direct and indirect). As the direct effects are available, from them through the difference, it is possible to obtain the indirect (in other words, the intermediate consumptions by sector of activity brought about by tourism). The main results of these calculations are contained in Table 3.

The meaning of the different columns should be interpreted as follows: the "Percentage of the total" means the proportion of the internal intermediate inputs which the economy needs to supply the tourist final demand. The "Percentage of the input requirement" shows the values as given by the expression

$$\frac{x_n^t}{q^t} \cdot 100 ,$$

or, in other words, the percentage represented by the intermediate inputs of internal origin on the "tourist" production. The final column brings together that part of the production of the different sectors which satisfies the intermediate demand caused by tourism, i.e., the distribution coefficients of that tourist "*inter-sector*".

Beside the sectors which appear in the table, mention should be made of "Activities related to transport", "Building", "Financial Sector, excluding insurance and pension plans" and "Property market", all with percentages around 3% of the total.

Perhaps one of the most interesting conclusions, although not surprising, of Table 3 is that even if a strong presence of tertiary activities in the direct effects was observed, now there is a more important role for industrial and primary activities.

With regard to the input requirements for the different sectors, the total figure of 28.68% stands out, as this means that the remaining 71.32% is imported intermediate consumption and the contribution of productive factors. This result is not strange if it is compared with the sum of the internal technical coefficients (the μ coefficient of Chenery-Watanabe) of the "Hotel trade", whose value is 0,2952.

In order to illustrate these calculations of intermediate consumption, now it is necessary to proceed to modify the interior symmetrical table. For this it is defined a fictitious branch which will be called "tourism" and which will be situated in juxtaposition with the matrix of intermediate consumptions.[19]

This "*inter-sector*" is calculated by subtracting from each sector that part of the production necessary to supply the intermediate demand generated by tourist expenditure. Through this procedure it is obtained a branch which brings together the intermediate supply of sundry goods and services, which are to be absorbed by the intermediate demand tagged as "tourism" (therefore, a non-homogeneous sector). This results in a matrix of intermediate consumption of $\mathrm{n} \times \mathrm{n} + 1$ order.[20] The same number of sectors in rows are maintained, but in columns (concerning intermediate consumption and primary inputs) it is showed whether the different sectors which make up an economy demand inputs due to tourism,- represented by only one column-, or whether they are due to the remaining causes. Chart 2 shows a graphic representation of the aforementioned.

In Chart 2 the upper index t refers to the inputs and to the productions brought about by tourism, while the upper index nt refers to the rest.

[19] At this point authors should like to express their gratitude for the suggestions received from M. Fernández Fernández.

[20] For this study its calculation is not necessary, since focus is only on the vector which represents that "tourism" inter-sector.

Chart 2. Input-output table with *Tourism* vector

	s.1^{nt}	s.2^{nt}	....	s.n^{nt}	Tourism	Intermediate demand of interior origin	Final demand of interior origin	Production
Sector 1	x_{11}^{nt}	x_{12}^{nt}	....	x_{1n}^{nt}	x_1^t	$\sum_{j=1}^{n} x_{1j}$	y_1^d	q_1
Sector 2	x_{21}^{nt}	x_{22}^{nt}	....	x_{2n}^{nt}	x_2^t	$\sum_{j=1}^{n} x_{2j}$	y_2^d	q_2
Sector n	x_{n1}^{nt}	x_{n2}^{nt}	....	x_{nn}^{nt}	x_n^t	$\sum_{j=1}^{n} x_{nj}$	y_n^d	q_n
Intermediate inputs with interior origin	$\sum_{i=1}^{n} x_{i1}^{nt}$	$\sum_{i=1}^{n} x_{i2}^{nt}$	....	$\sum_{i=1}^{n} x_{in}^{nt}$	$\sum_{i=1}^{n} x_i^t$			
Intermediate inputs with imported origin	m_1^{nt}	m_2^{nt}	....	m_n^{nt}	m^t			
Primary inputs	v_1^{nt}	v_2^{nt}	....	v_n^{nt}	v^t			
Production	q_1^{nt}	q_2^{nt}	....	q_n^{nt}	q^t			

Source: Our own elaboration.

In this way the production vector of an economy, q, is disintegrated depending on its destiny, tourist or non tourist, as expressed in the following equation

$$q = q^{nt} + q^t = \sum_{j=1}^{n} q_j^{nt} + q^t \ .$$

This allows expressing the total "tourist" production as the sum of the intermediate tourist consumption, the necessary corresponding imports and the Gross Added Value of "tourism", as follows:

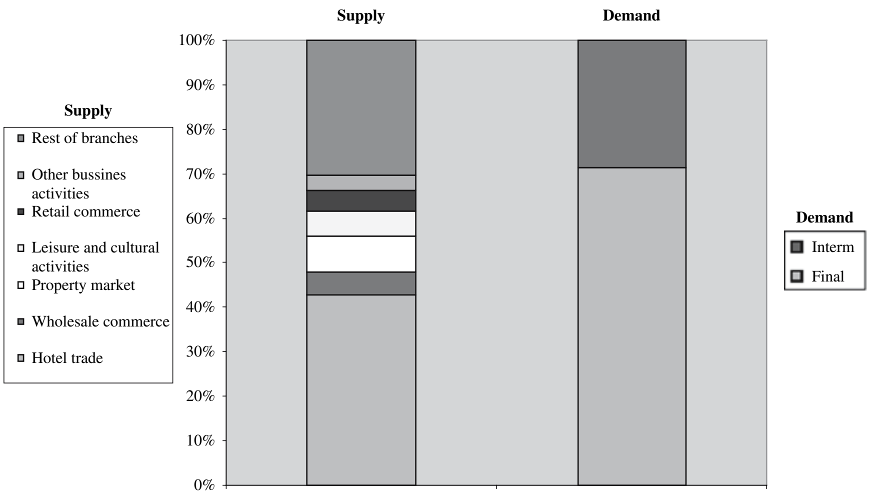
$$q^t = \sum_{i=1}^{n} x_i^t + m^t + v^t \ ,$$

where m^t is the total of the imported intermediate consumption necessary to supply the tourist demand and v^t is the Gross Aggregated Value of *tourism*.

6 The Structure of the Tourist Supply and Demand

Graph 1 shows the internal composition of the supply and demand taking into consideration only the internal flows. The demand can be broken down into the final demand (that which is carried out directly by tourists) and that caused by the final demand (or intermediate). Concerning the demand, it should be pointed out that approximately a third of the total effect of the tourist expenditure comes from the productive interrelationships that the tourist expenditure gives rise to.

Supply brings together all the production necessary in each sector to supply the totality of the demand (both final and intermediate). As it was already stated, the following stand out in the table: "Hotel Trade", "Real Estate", "Recreational activities (cultural and leisure)", "Wholesale commerce" or "Retail commerce", to mention just the most relevant sectors. Finally, the rest of the sectors together contribute just over 30% of the goods and services demand.



Graph 1. Composition of the *tourism* supply and demand. Internal flows
Source: Our own calculations, based on information supplied by the IGE and the IGE (2001), "Economic accounts and Input-output Table for Galicia, 1998" Xunta de Galicia (Galician government). Values expressed in millions of pesetas

7 Conclusions

In this paper various aspects of the economic effects of tourism on the Galician economy have been considered. Attention was centred on the impact of the tourist expenditure of non-residents on the different productive sectors. To this end an input-output model was constructed which allowed the calculation of the total effects on production taking into account only internal flows, without the need to use information on imported intermediate consumption motivated by tourism.

As was to be expected, the "Hotel sector" (hotels, restaurants, cafeterias…) is the nucleus of a large part of the interior impact of tourism. Nevertheless, as well as this sector, the total effects on sectors such as "real estate activities", cultural and recreational activities, and commerce, both wholesale and retail, also proved to be significant. The total effect on production comes out at 2,07%, due to direct effects, and an additional 0,83% deriving from indirect effects.

However, it is necessary to remember the scope of the concept of tourism employed. These pages have to account for the effects only of incoming tourism (as defined in Chart 3). This means that tourism as a whole must certainly account for a far higher volume of business. This is explained by the strong tendency of the local inhabitants to be tourists at home, as several studies have found (such as *Familitur* of the Spanish "Institute of Tourist Studies").

Finally, it is important to point out some areas which have not been covered by this study but would be of interest to further in the future. Of these, an analysis of the effect on employment and the generation of income; or an attempt to make a more detailed breakdown of the hotel and catering sector should be mentioned. On the other hand, although tourist expenditure has traditionally been thought of as "autonomous", it would be interesting to study the economic implications of tourist promotion abroad.

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On “E-Attraction” Tourism Destination – Extension and Application

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1 Introduction

Tourism is one of the most important industries in the world. France is the most visited country in the world. The Languedoc-Roussillon area (L-R) has a number of tourism assets with its coastline, its mountainous region and its many picturesque locations. It is the third most popular destination in France (outside of Ile-de-France) after the Rhônes-Alpes and Provence Alpes Côte d’Azur areas. Records show that 15 million tourists arrive each year, including some 5 million foreign visitors; what represents 103 million overnight stays, or bed-nights, with 40% recorded outside the months of July and August. As far as accommodations are concerned, 2 million beds are available, which represents almost one tourist bed for every inhabitant in the area; indeed, the area counts 2.3 million inhabitants. Languedoc-Roussillon also has the highest average length of stay out of all the French regions, with an average of 7.5 bed-nights in any kind of lodging. From the employment viewpoint, tourism represents 65,000 direct workers, including 32,000 seasonal workers, that is to say, the equivalent of the construction or the food industries. With regards to the tourism expenditure, visitors spend somewhere from 4.5 to 5 billion Euros in the area, which is the equivalent to 10.5% of the regional GDP. And looking at number of arrivals, if the Languedoc-Roussillon area was considered a country, it would rank 30$^{\text{th}}$ in the world, in front of countries like Morocco or Tunisia.[3]

[3] Source : World Toursim Organization (WTO).

However, the Languedoc-Roussillon is one of the areas in France where the unemployment rate is highest and the GDP per capita is weakest.[4] Thus, we can ask ourselves whether tourism could not be a more important factor in improving the economic situation. In order to better understand the tourism sector, it is advisable to characterize the types of attractions that constitute the full tourism of the region. In a recent taxonomy, Caccomo and Solonandrasana (2001) suggest the first steps of a new classification of the tourism attraction[5], based on a central component which is the time. For these authors, all attractions can be summarized in terms of only two types; they call "D-attraction" and "E-attraction". The tourist is in the centre of the definition of these recent concepts because he will determine the nature of the attraction. Along this line, a tourism destination will be, on the one hand, with prevalent "D-attraction", if the tourist adopts a passive type of consumption behaviour. Indeed, the motivation to stay for the tourist is the discovery of a new site or a particular monument and he consumes the attraction in a passive way insofar as he is simply a witness. After the discovery of the attraction, the site becomes a rather meaningless place to stay in and the tourist puts a term at his stay. In other words, in this case, tourist's satisfaction begins to increase with the duration of the stay in order to reach, more or less quickly depending on the case, one in maximum. The existence of a turning back point is then related to the motive of the stay, that is to say from the intention and personnel perception of the tourist. In addition, in the case of a tourism destination with prevalent "E-attraction", the stay of the tourist is justified by the escape and he has an active behaviour of consumption since it takes an active part in it. Tourist's satisfaction increases with the duration of the stay as to reach a maximum point in regard to which it will be sustained during the rest of the stay. Since the tourist does not explicitly seek to discover a particular site or to visit a specific monument, there is no turning back point, therefore any optimal duration stay[6]. The consequences to be characterized as an "E-attraction" or "D-attraction" by tourists for a destination are very important and an

[4] Source : INSEE (2004).

[5] For a complete panorama of the various classifications of tourist attractions, see Mehmetoglu and Abelsen (2005).

[6] To better understand these concepts, we can consider the following example: Let two tourists (a caver and a non-specialist) and a cave. In the eyes of the caver, the attraction is with prevalent "E-attraction" because he consumes actively the site and there is no turning back point in its satisfaction; on the contrary, in the eyes of the non-specialist tourist, the attraction is with prevalent "D-attraction"

overview of the economic impacts is given in Peypoch, Robinot and Solonandrasana (2005).

In this paper, a characterization of tourism attraction in L-R by connecting the notions of “D-attraction” and “E-attraction” with the length of stay is implemented. Along this line, we will first draw up a tableau of tourism in L-R by proposing a precise description of the length of stay as well as an analysis of the tourist’s behavior. Afterwards, we will propose an econometric model permitting us to empirically check these different types of attraction in relation to the length of stay. These two points will be treated by using the data of the regional department of tourism in Languedoc-Roussillon from 1993 to 2003, which traces the evolution of bed-nights and visitor arrivals on a nationality-by-nationality basis, as well as on an accommodation-by-accommodation basis. The paper unfolds as follows; sect. 2 is devoted to the presentation and the analysis of the tourism in Languedoc-Roussillon. In sect. 3 we focus on modeling the length of stays. Section 4 presents the results and the interpretations in attraction terms. Section 5 contains a summary and discussion.

2 Tourism in Languedoc-Roussillon

2.1 Length of Tourist Stays on the Accommodation-by-Accommodation Basis

Turning to accommodations, we prioritize the hotels and campsites. We choose to analyze the length of tourist stays in L-R from 1993 to 2003 by looking at the evolution in the number of bed-nights and arrivals. Indeed, we have not taken into account the bed-nights in vacation houses and in friends’ homes because they are uninteresting in terms of economic repercussions and are not available in data form.

Figures 1a and 1b[7] report the evolution of bed-night and campsite numbers between 1993 and 2003:

Generally speaking, we notice that for these accommodations, the evolutions are similar. Indeed, we notice a fall in number of arrivals until 1996; this year is the start of a continuous growth phase until 2001. Next, the trend falls again. The significant drop in the two groups can

because he consumes passively the site and after the discovery its satisfaction decrease.

[7] Notice that the graphics comprise two y-axes.

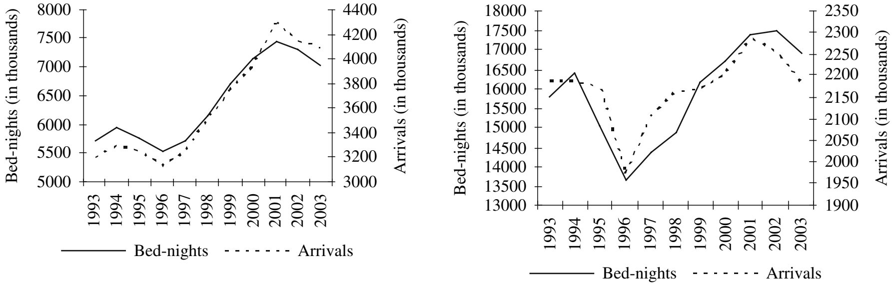

Fig. 1. (a) Evolution of bed-nights and arrivals in hotels; **(b)** Evolution of bed-nights and arrivals in campasites

be explained by the following reasons: the truck driver strike in 1995, the devaluations of Spanish and Italian currencies (these two countries are considered two direct competitors of France due to their geographical situations and cultural heritages...), making these countries more attractive, and finally the deregulation of air transport. These phenomena particularly affected the L-R because of it's proximity to Spain. Spain is becoming a "good substitute" in the tourist's eyes, reducing the L-R to a simple passing through area. As for the fall observed since 2001, we attribute it to the circulation of the Euro on the one hand, which allows for a better legibility and price comparison. On the other hand, the fall can be attributed to the European enlargement, which results in more varied tourism destinations (Croatia for example). Indeed, a good many of these new destinations have tourism characteristics similar to the L-R region. In addition, they attract tourists by their discovery[8] angle. Notice that these observations are valid when we consider the evolution of the bed-nights number.

As for the length of stay, or in other terms, the relation between the number of bed-nights and the number of arrivals, different points can be highlighted according to the type of accommodation. For hotels, the annual mean length of stay is steady throughout the given period with 1.8 bed-nights per tourist. In others words, the bed-nights and arrival numbers vary with the same proportions.

For the campsites we observe a general upward trend with 7.2 to 7.7 bed-nights per tourist, that is to say, an increase of 7% in the last ten years. However, this trend is changed by a decrease in the second half

[8] We understand by aspect "discovered" the fact that these destinations are new to tourists.

of the nineties, when the mean length of stay is reduced to less than one week per tourist (6.8 bed-nights in 1997 precisely).

By way of conclusion, the L-R region is characterized by outdoor accommodations because despite fewer arrivals it still has more bed-nights (7.7 bed-nights per tourist compared to 1.7 bed-nights per tourist in hotels). The hotels are clearly less efficient. These results justify the specialization of the region in campsites; it ranks first among the regions in France for this type of accommodation. However, this result is not surprising considering that the region is composed more of "E-attractions" than "D-attractions".

2.2 Length of Stays Analysis on a Tourist Nationality by Tourist Nationality Basis

In order to better examine the length of stay evolution, we must look at tourists based on their country of origin[9]. We will consider five origin countries for tourists in L-R: Belgium, England, France, Germany and the Netherlands. The choice of these countries is justified because these tourists represent, each year more than 80% of the tourists in the campsites and hotels of the L-R region[10]. Before the analysis, note that the L-R receives very significant levels of domestic tourism. Indeed, French tourists represent 70% of the total number of arrivals and about 75% of the total bed-nights[11]. Figures 2a and 2b show evolutions of arrival numbers based on a tourist's origin country, in hotels and campsites.

At first sight it appears that there is no trend for accommodations. Concerning the evolution of arrival numbers, German and Belgian tourists have been equally divided between campsites and hotels within the last ten years. French and Dutch tourists do not display the same behavior when it comes to this type of accommodation. Indeed, contrary to the French, the Dutch more often frequent campsites than hotels. Finally, since 1996 the number of English tourist in hotels has increased while campsite numbers have stayed steady.

Figures 3a and 3b present the evolution of bed-night numbers in hotels and campsites in L-R based on a tourist's origin country.

As in Figs. 1a and 1b, we notice that the number of bed-nights evolves based on accommodation and on nationality, and follows the

[9] Note that there are also some other aspects of socio-cultural character that can be considered like the level of studies, job, age, etc. but appropriate data are not available for this study.
[10] Source: Regional observatory in tourism of Languedoc-Roussillon.
[11] Source: Regional observatory in tourism of Languedoc-Roussillon.

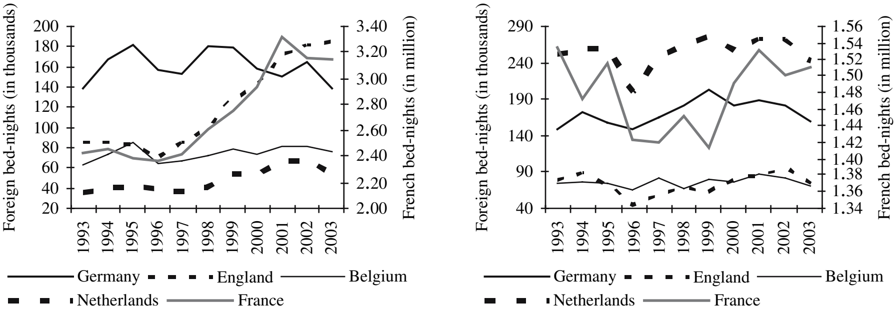

Fig. 2. **(a)** Evolution of arrivals in hotels on an origin country by origin country basis; **(b)** Evolution of arrivals in campsites on an origin country by origin country basis

same trend as the arrival numbers. More precisely, with regards to hotel accommodation, the strong increase in the number of bed-nights is due to the English and French visitors. However, since 2001, erosion in the number of bed-nights is observed that particularly affects French and German clients. Looking at the campsites, after hard years at the height of the nineties, the number of bed-nights increases between 1996 to 2003 and is divided in the following manner: the strong increase is shown among French (56%), Dutch (67%) and English (134%) tourists.

As far as the mean annual length of stay, we notice on the one hand for hotels, a steady consistency for English, French and German tourists with 1.8 bed-nights per tourist. The weaker performance by Dutch tourists (1.5 bed-nights per tourist) while the Belgians make the longer stays with 2.5 bed-nights per tourist. On the other hand,

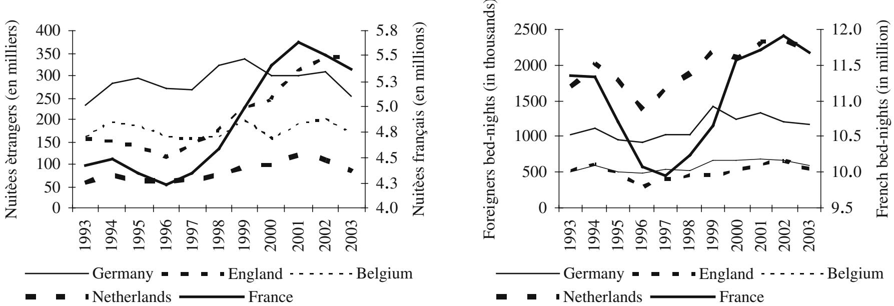

Fig. 3. **(a)** Evolution of bed-nights in hotels on an origin country by origin country basis; **(b)** Evolution of bed-nights in campasites on an origin country by origin country basis

for campsites we notice small variations as far as Germans, English and French tourists are concerned, with 6.9, 7 and 7.5 bed-nights by nationality respectively. The greatest increase concerns Belgians (from 6.8 bed-nights in 1993 to 8.6 bed-nights in 2003, a rise of 27%) and Dutch tourists (from 6.8 bed-nights in 1993 to 9.1 bed-nights in 2003, a rise of 34%).

By way of conclusion, it is evident from these results that the length of stays made by Belgian and Dutch tourists has continued to increase throughout the last ten years. In addition, Belgian tourists make longer stays in all categories of accommodation. However, in terms of economic repercussions, these results are to be considered carefully since they do not necessarily indicate expenditures that tourists are likely to make in the region.

2.3 An Interpretation in Terms of “Attraction”

Generally speaking, in all accommodations, Belgian tourists stay very long in Languedoc-Roussillon. We can integrate this behavior in the following way: Belgians consider that the region is a source of “E-attraction”, that is to say, they consume domestic products in an “active manner”. Moreover, following the “Eurêma” survey[12], 70% of Belgians visit the region to relax and to swim. It is also the case for Dutch tourists who have had a 34% increase in their length of stay in the last ten years and 85% of whom chose this destination for the same reasons. On the contrary, German and French tourists make shorter stays, whose length has remained steady since 1993. It is evident that their behaviors and motivations are different, which is confirmed by the “Eurêma” survey indicating for example that only 20 to 30% of French look for relaxation and swimming, while 40% look to educational activities throughout their stay. This behavior indicates that they are looking rather at “D-attractions”. As for the English tourists, their length of stay has only increased by 15% in the last ten years and has stayed relatively small; hence, their behaviors are more difficult to identify, and are a mix between the two “attractions”.

In the next section, we intend to construct a specific model which permits us to model the length of stay and hence, to verify the preceding analysis.

[12] For this survey the regional department of tourism in Languedoc-Roussillon gives the profile of tourists’ expenditures and motives on a nationality-by nationality-basis.

3 Modelling Length of Stays

3.1 The Model

Our objective is to model the length of the tourist stay. Traditionally, the length of the stay is measured by the relationship between the number of bed-nights and the number of arrivals. With the recent developments of econometric tools, we propose to explain bed-nights (*BNI*) as a function of arrivals (ARV)[13] over the period considered using a robust model. Based on this intention, we initially propose to reflect on the relationship between these two variables. Thus, we use the cointegration theory[14] because it justifies and identifies the relationship between the number of nights and arrivals. Further more, we privilege the application of the error correction models (ECM). Indeed, this enables us to establish the exact relationship between the long term and the short term variables. Moreover, this type of model procures efficient estimations (Engle and Granger, 1987).

We consider the two series BN_t and ARV_t. We know that these series are cointegrated of order (1,1)[15] and that according to the Granger representation theorem (see Granger, 1981), we can always represent them by an error correction model. Thus, we can write the generic error correction model as follows:

$$\Delta BNI_t = \beta_1 \Delta ARV_t + \beta_2 (BNI_{t-1} \hat{\alpha}_1 ARV_{t-1} - \hat{\alpha}_2) + c. \tag{1}$$

Let $\hat{\varepsilon}_{t-1} = (BNI_{t-1}\hat{\alpha}_1 ARV_{t-1} - \hat{\alpha}_2)$, the estimated long term relationship with a lag of one period; we obtain:

$$\Delta BNI_t = \beta_1 \Delta ARV_t + \beta_2 \hat{\varepsilon}_{t-1} + c\,. \tag{2}$$

This representation allows us to integrate, in the long term relationship, the fluctuations of the short term. It describes an adjustment process and combines two types of variables: first, the difference variables, which represent short term fluctuations, and second, level variables, which represent the long term.

In addition, for each model we want to check if the growth rates of past tourist arrivals and past tourist nights have consequences on the present growth rate of tourist nights. Thus, we integrate in the equation

[13] Variables *BNI* and *ARV* are expressed in logarithm.
[14] For a synthesis on the cointegration theory, see Lardic and Mignon (2002).
[15] See Peypoch (2003).

(2) the variables ΔBN_{t-1} and ΔARV_{t-1}. This allows us to model the "memory" effect which characterizes the "E-attraction".

Formally:

$$\Delta BNI_t = \gamma_1 \Delta BNI_{t-1} + \beta_1 \Delta ARV_t + \gamma_2 \Delta ARV_{t-1} + \beta_2 \hat{\varepsilon}_{t-1} + c, \qquad (3)$$

where γ_1, β_1, γ_2 et β_2 are the coefficients associated with the explanatory variables; c is the constant.

3.2 Estimation Method

This procedure is an application of the Engle-Granger two-stage approach (see Engle and Granger, 1987) for estimating the parameters of the above model[16]. In the first step, we estimate for the static long term relationship using the ordinary least square (OLS) method:

$$BNI_t = \alpha_1 ARV_t + \alpha_2 + \varepsilon_t, \qquad (4)$$

where α_1 is the coefficient of the explanatory variable, α_2 is the constant term and ε_t is the residual term. Then, we make an augmented Dickey-Fuller (ADF) test[17] on the residuals to confirm that the series are cointegrated. Following this test, if the residuals are not stationary, then the estimated relation (4) is a spurious regression[18]. However, if the residuals are stationary, we proceed to the second step.

Using the OLS method, the second step is devoted to the estimation of the parameters of the following equation:

$$\Delta BNI_t = \gamma_1 \Delta BNI_{t-1} + \beta_1 \Delta ARV_t + \gamma_2 \Delta ARV_{t-1} + \beta_2 \hat{\varepsilon}_{t-1} + c + \mu_t, \quad (5)$$

where γ_1, β_1, γ_2 et β_2 are the coefficients of the explanatory variables; c is the constant and μ_t is the residual term.

The coefficient β_2 represents the *spring back force* that keeps the two variables, ΔBNI_t and ΔARV_t, moving together in the long run. It characterizes the catching up effect aimed at the long run relationship. This coefficient must be significantly negative.

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[16] This method is recommended for estimate ECM models with only one explanatory variable.

[17] We implement the ADF test using the Ertur strategy (1992). The optimal lag for the ADF test is determined by the minimization of Akaike information criterion (1979) and the Schwarz Bayesian criterion (SBC).

[18] See Granger and Newbold (1974) for more precision about the spurious regression.

4 Data and Empirical Results

Our data is based on monthly calculations and corrected based on seasonal variations (CSV)[19]. They concern the same period as the analysis in Sect. 2, that is to say, from January 1993 to October 2003. We have 55 observations for the campsites and 130 observations for the hotels. The source of our data is the regional department of tourism in Languedoc-Roussillon.

4.1 Campsites

Cointegration tests make on differents estimations of the long-run relation (4) indicate that for all cases, there is a cointegration relation. Hence, for the five origin countries, we can to estimate (5). Table 1 show the results of the estimations.

Table 1. Results for the length of stays in campsites

Country	c	$\mathrm{BNI_{t-1}}$	$\mathrm{ARV_t}$	$\mathrm{ARV_{t-1}}$	$\varepsilon_{\mathbf{t-1}}$
Germany	0,008	0,2	$1,06^*$	$-0,15$	$-1,13^*$
England	0,006	0,08	$1,67^*$	$-0,17$	$-1,25^*$
Belgium	0,003	$-0,22$	$1,14^*$	$0,36^*$	$-0,52^*$
France	0,01	$-0,15$	$1,17^*$	0,25	$-0,45^*$
The Netherlands	$-0,002$	0,15	$1,16^*$	$-0,14$	$-1,08^*$

* Significant at 5%.

Notice that all coefficients associated with the spring back force are significant. Hence the error correction models are valid. As far as the explanatory variables, in all cases the growth rate of bed-nights is explained by growth rate of arrivals in the same period, except the Belgian model where the growth rate of arrivals lagged is also explanatory.

4.2 Hotels

As far as length of stays in hotels, cointegration tests make on long-run relation (4) indicate that we have a spurious regression for the Dutch case. Hence it is not possible to estimate an error correction model for this case. Results of estimations of model (5) for the others cases are reported in Table 2.

Here, all error correction models are valid too. Only the growth rate of arrivals in t explains the growth rate of bed-nights in t.

[19] That is to say seasonality is removed.

Table 2. Results for the length of stays in hotels

Country	c	BNI_{t-1}	ARV_t	ARV_{t-1}	ε_{t-1}
Germany	$-0,0005$	$-0,27$	$1,09^*$	0,33	$-0,39^*$
England	0,006	0,08	$0,72^*$	$-0,17$	$-1,25^*$
Belgium	0,002	$-0,12$	$1,16^*$	0,17	$-0,7^*$
France	0,0002	$-0,09$	$1,18^*$	0,13	$-0,42^*$

* Significant at 5%.

4.3 Interpretation of Results[20]

Following the results of the econometric estimations, several remarks can be formulated. The length of stay of the Belgian tourists is characterized by a “memory” effect. That is to say, they consider the region Languedoc-Roussillon as an “E-attraction”. This result confirms the analysis in Sect. 3 for the Belgian length of stay. Moreover, these results confirm the “Eurêma” survey which indicates that 80% of Belgian tourists choice the region because they already came.

The English length of stay is characterized by a height coefficient (1.67) for the campsites. It is a confirmation that the English tourists consider the region as an “E-attraction”. Moreover, this means that the number of bed-nights of the English is very sensitive to the presence of tourists of the same nationality. In others words, they adapt their length of stay according to the arrival of other English tourists.

As far as the Dutch, German and French length of stay, nothing particular has to be mentioned. The coefficients are small, which corresponds to a “D-attraction”. In others words, they consider that the region presents characteristics of a “D-attraction”.

Finally, only the Dutch model in campsites and the English model in hotels do not confirm the analysis of Sect. 3, but these error correction models are not valid.

5 Summary and Discussion

This paper has presented a panorama of the length of stays in Languedoc-Roussillon through various parameters, namely the accommodation basis (hotels and campsites), tourist nationalities (German,

[20] We interpret only the results corresponding to the models which are good statistically (see Appendix)

English, Belgian, French and Dutch) and concepts of "attractions" ("E-attraction and "D-attraction"). The analysis based on accommodation brings out the backwardness of the hotels compared to the campsites and the recent falling trend of bed-nights and arrival numbers. The analysis based on nationality underlines the differences in the tourists' behavior. It is evident from this that the region of L-R appeals more and more to English tourists, wins the loyalty of Belgian and Dutch tourists and fairly interests German and French tourists. The crosschecking of these different analyses allows for an interpretation in terms of "tourism attraction". The majority of the tourists consider that the region is an "E-attraction". Moreover, we have remarked that the error correction model that explains bed-nights by arrivals is a good tool to analyze tourist behavior and the different types of attractions. More precisely, it appears that the memory effect can be considered as an indicator of the repetition of stay, and therefore, as an indicator of "E-attraction".

The fact that the region is classified by tourists as an "E-attraction" favors a prolongation and/or a repetition of the length of the stays. The importance in terms of economic repercussions of the tourism industry is not inconsiderable for Languedoc-Roussillon, which can improve its economy through this industry. Indeed, through tourist arrivals and bed-nights, tourism expenditures are an important source of revenue. Now, it is necessary to improve tourism policy. For this effort, it is necessary to take tourist behaviors into consideration in order to take advantage of the tourist flow. Finally, if we consider the last results of the regional department of tourism in L-R (2004) regarding the propensity of tourists' expenditures, the region must continue to attract English and Belgian tourists, because they spend respectively 85 Euro and 60 Euros per tourist.

Disregarding tourists' nationalities, the length of stays in campsites is longer than hotels. Hence we can equally make a classification in terms of "attraction" on an accommodation-by-accommodation basis selected by the tourist. Thus, it seems that tourists in campsites consider the region as an "E-attraction" when those in hotels see it as a "D-attraction".

By way of conclusion, the concept of tourism attraction is a good tool in order to analyze tourists' behaviors, which is at the root of the length of stay. Notice equally that it is possible to combine the "D-attraction" and "E-attraction". For example, the mean length of stay will be extended transforming a "D-attraction" into an "E-attraction", or attaching together different "D-attractions" in the same trip. The stakes are high because an additional bed-night made by millions of tourists represents noticeable tourism receipts for the domestic economy.

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Appendix

Table 3 shows the results of the statistics tests for the length of stays in Languedoc-Roussillon.

Table 3. Statistics tests

	Belgium	England	France	Germany	The Netherlands
Fisher$^{\mathbf{c}}$	859	19,43	2250	99,87	949
Fisher$^{\mathbf{h}}$	651	84,96	1249	1174	–
D-W$^{\mathbf{c}}$	1,91	1,97	1,79	2,12	1,88
D-W$^{\mathbf{h}}$	2,06	1,996	2,03	2,04	–
White$^{\mathbf{c}}$	1,71	0,48	0,32	0,54	2,62
White$^{\mathbf{h}}$	0,5	26,41	1,14	0,78	–
J-B$^{\mathbf{c}}$	85,36	2858	0,36	24,67	0,52
J-B$^{\mathbf{h}}$	58,24	1790	3,61	4,26	–

where Fisher is the Fisher test; D-W is the Durbin-Watson test; White is the White test and J-B is the Jarque-Bera test. The exponent c and h represent campsites and hotels respectively.

These tests inform in particular about the global validity and robustness of the models. The Fisher tests show that all the models are very explanatory. The Durbin-Watson[21] test does not predict of autocorrelation of the residuals for all cases. The White test indicates that the Dutch model for the campsites like the English model for the hotels is heteroscedastic. We conclude that all the models are relatively robust. Hence the estimators are consistent and efficient. Notice that the assumption of normality of errors is not always checked; however, we know that is not important as far as the quality of the estimators.

[21] We use the D-W statistic with the interpretation of Kenkel (1974) because we have an autoregressive model.

The Use of the Internet in the Hotel Sector of the Balearic Islands: Evolution and Perceptions

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1 Introduction

Since the middle of the nineties, both the Internet and its users have dramatically changed. The number of companies buying and selling products, and people searching for the best offers have experienced a terrific growth in number. Thus the Internet has provided evidence that it can be a good marketing channel for tourist products. This fact motivated both hotel companies and tourists to use it as a market where to buy and to sell.

This new commercial scenario seems to be very important for tourist companies, especially for those developing their activities located in mature tourism destinations. This type of tourism destinations have had experienced increasing problems to market their tourist product, due to their maturity. The Internet has offered them a new scenario, a new marketplace where they can easier work to find new customers.

This was the situation of the Balearic Islands, one of the most important mass tourist destinations in Europe.[3] Now, it has been almost for ten years since the main hotel companies in the Balearic Islands started to use the Internet with commercial objectives. It is time now

[3] See the study by Aguiló, Alegre and Sard (2005) for an extensive exposition of the main facts of the Balearic Islands as a tourist destination.

to know their evolution in use and the change of the perceptions about the Internet as a marketing channel they may have experienced.

The purpose of this paper is then to analyse the use of the internet as a commercial tool by the hotel companies in the Balearic Islands, as well as their perception as a marketing channel between year 2000 and year 2004. The case of the Balearic Islands is interesting because it is a leading mature mass Mediterranean tourist destination, with a high competition from alternative destinations. In this context, the analysis of the level of adoption by its hotel companies, as well as the perception their managers had about it could be thought as representative of many other tourist destinations.

This paper is structured as follows. Section 2 reviews the literature on the internet as a marketing channel. Section 3 presents the hypotheses and the methodology applied. The results are discussed in Sect. 4. The concluding remarks are summarised in Sect. 5.

2 Literature Review

In recent years the growth of the Internet has been spectacular. According to the last Nua Survey published in 2002 (Nua, 2002) there were 605 million people using the Internet, 190 million of them in Europe and 182 million in the US and Canada. According to the Computer Industry Almanac (CIA 2004) the number of world-wide people using the Internet in 2004 was of 934 million, 33 million in the UK and 41 million in Germany. It is thought that the main reason for the growth of the Internet in the tourism industry is the vast potential for the 'direct-to-the-consumer' marketing and sales opportunities it offers (Cahill, 1996).

Timely and accurate information relevant to consumer's needs is often the key to the satisfaction of tourism demand, and information technologies that fulfil that need can facilitate tourism (Sheldon, 1997). In order to satisfy tourist demand and survive in the long run, there is no choice but to incorporate this new technology and increase the interactivity with the marketplace (Buhalis, Jafari, Werthner, 1997). These technologies enable travellers to access reliable information as well as to make reservations in a fraction of the time, cost and inconvenience required by conventional methods. Therefore, consumers increasingly rely on the Internet for travel information and they visit commercial and non-commercial Internet websites for researching, planning, purchasing and making last minute changes to their trips (Buhalis, 1998).

According to the Travel Industry Association of America (TIA), 57% of online travel bookers purchased accommodations on the Internet in 2002, and according to 'My AvantGo' survey of April 2003, 52% of Internet users purchased more than half of their travel needs online, and more than 66% booked a hotel room (Clickz.com, 2003).

E-commerce in tourism is an irreversible trend. By using the Internet as a marketing tool, tourism companies gain some advantages in cost reduction, revenue growth, marketing database development and customer retention (Morrison et al. 1999). This seems to be specially important for a tourist destination like the Balearic Islands, highly controlled by non-local tour operators.[4] They traditionally contract hotel rooms one year in advance and then market them together with a travel ticket in the tourist's home country, mainly Germany and Great Britain (Vich-i-Martorell, 2002). Nowadays the Internet offers all these hotel companies a new way to directly contact the final customer. The Internet offers the supply side of the market a means to sell to the final consumer at a reasonable price, without it being necessary to open offices, shops or points of sale in each country and city where the potential tourists are living. Therefore, it is an alternative channel where companies can market and distribute their products, which may lead to a new situation where the bargaining power of foreign tour operators could be reduced. This might be specially significant for small and medium size companies, especially in peripheral or insular destinations (Buhalis, 1998).

3 Hypothesis and Methodology

Taking into account all the evidences about the development of the Internet as a marketing channel, it was of our interest to know more about its adoption by the hotel sector in the Balearic Islands. In detail, the main objectives of the paper were the following:

- The use of the Internet by the hotel companies
- The perception hotel companies had of the Internet as a marketing instrument
- Which type of companies used it more for their marketing objectives

[4] See Alegre and Sard (2006).

– The influence a marketing department could have upon the use and perceptions of the Internet.

These main objectives of the research where transformed into the following hypothesis for the research purposes:

H1: **Internet is positively perceived as a marketing channel**
H2: **Hotel companies with a Marketing department use more Internet.**
H3: **Internet is more used for e-commerce by hotel chains than by single hotels**
H4: **Hotel companies have a better perception of the Internet in 2004 than in 2000**

Obviously the first task to perform was to find out whether there were secondary data that could provide us of an appropriate solution to the questions analysed. Unfortunately, the information available was not sufficient to give answer to our research hypothesis. Therefore, it was necessary to carry out a primary research. The survey developed was conducted in two years (the year 2000 and year 2004), in order to find out the evolution of use and perception of the Internet.

The first wave was conducted between January and July 2000. A specific questionnaire was designed to shed light concerning the situation about the use of the Internet in the Hotel Sector of the Balearic Islands. It was sent by mail to the 70 hotel chains and the 420 single hotels that were identified. The hotel chains list was obtained from the hotel entrepreneurs' federation of the Balearic Islands and from other previous studies about tourism developed at the University of the Balearic Islands. The single hotels list proceeded from the official hotel guide published by 'Turespaña'. The second wave was conducted between January and March 2004. For the sake of homogeneity, the questionnaire was sent to the same hotel chains and single hotels.

The first questionnaire was responded by 31 hotel chains (44.28%) and by 103 single hotels (24.5%), whereas the second one was responded by 40 hotel chains (57.14%) and by 80 single hotels (19.04%).

4 Results

The presentation of the results follows the order of the hypotheses above stated. Thus we initially discuss the results concerning the use of the Internet. Later the influence of the marketing department and the hotel size on the probability of developing e-commerce is examined. Finally we analyse the perception of the Internet as a marketing tool.

4.1 Use of the Internet

The following tables summarise the main results obtained about the use of the Internet in the Hotel Sector of the Balearic Islands. It can be seen in Table 1 that the number of single hotels that were connected to the Internet has increased from a 70.87% in 2000 up to 96.25% in 2004. Therefore, nowadays only a 3.75% of all the single hotels remain without connection to the Internet.

Despite the good connectivity figures, especially in year 2004, there are single hotels and hotel chains that do not have developed their own website yet. Table 2 shows that 5% of the hotel chains and 19.48% of the single hotels do not have such a website in 2004. However, it must be mentioned that these companies are many less of those than they were in 2000.

Probably one of the most important findings when comparing the results of the two data waves is the huge increase in the use of the Internet for tourist e-commerce. In fact, the number of hotel chains with e-commerce has more than doubled (from 41.94% in 2000 to 84.21% in 2004) and the number of single hotels has been increased from 43.69% to 79.03% (see Table 3). It is also important to notice that in year 2000 the proportion of single hotels having e-commerce was higher than the

Table 1. Connectivity

		2000		2004	
		Single Hotels	Hotel Chains	Single Hotels	Hotel Chains
Connection	Yes	70.87%	100.00%	96.25%	100.00%
	No	29.13%	0.00%	3.75%	0.00%

Table 2. Hotels with website

		2000		2004	
		Single Hotels	Hotel Chains	Single Hotels	Hotel Chains
	Yes	53.40%	83.87%	80.52%	95.00%
Website	No	46.60%	16.13%	19.48%	5.00%

Table 3. Companies with e-commerce

		2000		2004	
		Single Hotels	Hotel Chains	Single Hotels	Hotel Chains
E-commerce	Yes	43.69%	41.94%	79.03%	84.21%
	No	56.31%	58.06%	20.97%	15.79%

hotel chains. In year 2004 the hotel chains use it slightly more than the single hotels.

The hotel companies were also asked to provide information about the percentage of bookings done through the Internet, and the percentage they represented of the total company sales. In year 2000 nearly no companies responded to that question. That situation made the results totally unreliable. The results obtained in 2004 were that 7.42% of the bookings were made through the Internet, which represented a 6.84% of the total sales. However, the variance levels are still very high (119.59% and 78.85% respectively).

It is worth mentioning that nowadays single hotels seem to proportionally benefit more of the development of e-commerce solutions. In detail, Table 4 shows that they get a higher proportion of bookings and company sales from the Internet than the hotel chains.

4.2 The Marketing Influence

The fact of having a Marketing department was found in the 2000 research to be a determinant variable for the development of e-commerce in the hotel companies (Vich-i-Martorell, 2002). The comparison of the results from the two waves show that there have been nearly no change in the proportion of hotel chains and single hotels having it (see Table 5). The most important issue here is the small number of companies having a marketing department. Only 60% of the hotel chains and 13.75% of the single hotels had it in 2004.

Table 4. Internet bookings and sales by company type

	Single Hotels	Hotel Chains
Bookings	9.02%	4.05%
Sales	8.42%	3.60%

Table 5. Marketing department

		2000		2004	
		Single Hotel	Hotel Chain	Single Hotel	Hotel Chain
Marketing	Yes	13.59%	58.06%	13.75%	60.00%
Dep.	No	86.41%	41.94%	86.25%	40.00%

The results obtained from both surveys have shown that the contribution made by a Marketing Department to the development of higher levels of use of the Internet seems to be of crucial importance.

It can be seen in Table 6 that in year 2000 there was a difference of 21.04% in the connectivity level between the companies when segmented according to the fact of having a Marketing department. In year 2004 all the companies with a Marketing department were already connected.

The same type of relationship seems to exist between the Marketing department and the development of a company website. For the 2000 wave 82.35% of the companies having the department have developed a website. This figure rose up to 100% in year 2004 (see Table 7).

Finally, it is important to say that a relation seems to exist between the fact of having a Marketing department and the development of e-commerce by the hotel companies. In year 2000, 58.82% of the

Table 6. Marketing department influence on connectivity

Connection	2000		2004	
	Marketing Dep.	No Marketing Dep.	Marketing Dep.	No Marketing Dep.
Yes	94.12%	73.08%	100.00%	96.47%
No	5.88%	26.92%	0.00%	3.53%

Table 7. Company website and marketing department

Website	2000		2004	
	Marketing Dep.	No Marketing Dep.	Marketing Dep.	No Marketing Dep.
Yes	82.35%	52.88%	100.00%	79.27%
No	17.65%	47.12%	0.00%	20.73%

companies with that department had developed e-commerce, and in year 2004 that number had risen for hotel companies with marketing department to 85.71% (see Table 8).

The main conclusion to be drawn from the above tables is that two main characteristics, the fact of being a hotel chain and the fact of having a Marketing department, seem to be determinant for the adoption of e-commerce by the hotel companies in the Balearic Islands. However, it seems that there is a lack of interest by the hotel entrepreneurs about the Marketing area, as it has been found evidence that too few companies have a Marketing department.

4.3 Perception of the Internet as a Marketing Tool

The perception of the Internet as a Marketing tool was measured using 23 different variables, each one of them applying to a different attribute. All these variables were the same in both questionnaires, in order to assure direct comparability. The perception of each attribute was measured using a 1 to 7 points Likert scale. Hotel managers were required to qualify every attribute according to the following meanings:

The concepts of the variables used to measure the perception of the Internet are shown in the Appendix.

Punctuation	Meaning
1	Not important at all
2	Not very important
3	Indifferent
4	Very important
5	Extremely important

Table 8. Marketing department and e-commerce

		2000		2004	
		Marketing Dep.	No Marketing Dep.	Marketing Dep.	No Marketing Dep.
e-commerce	Yes	58.82%	38.46%	85.71%	78.46%
	No	41.18%	61.54%	14.29%	21.54%

4.3.1 Overall Perception

The overall perception of the Internet as a Marketing tool is quite positive. There are no variables having an average punctuation below 3, and the worst qualified concept (i.e. the perception of the importance of the Internet to reduce the bargaining power of tour operators) has a valuation of 3.32 points. The rest of the variables have average values above 4 or very close to 4. The results are stable for the two years. Interestingly enough, as commented below the comparison of the punctuations for the two years show an increase of the positive perception of the opportunities that Internet offers as a marketing tool.

It is worth noting that in 2004 the attribute of the Internet with a better valuation is its capability as a means of communication, followed by its characteristic as a market where increase sales. In year 2000 it was also very well considered as a means of communication, but preceded by its ability to reach new markets. Interestingly the last three positions are the same for the two years: Internet as a tool that would increase competition, the Internet as a marketing channel that would eliminate the dependence on tour operators, and the Internet as a market for offering lower prices.

Comparing the results of the two different surveys, it is interesting to have a look at what variables have increased their perception of importance, and which ones have decreased (see Table 9).

Notice from Table 9 that the variables with a higher increase in their perception of importance relate to the Internet as a market where increasing sales (variable 21), followed by the variable related to the importance of the Internet as a means of communication (variable 31). Both variables are not only those with a higher increase, but also have become those with higher punctuation.

On the other hand, Table 10 shows the variables that have decreased their level of importance for the hotel managers. It can be seen that the most important reduction of importance relate to the Internet as a Marketing channel that would eliminate the dependence on tour operators, and to the need employees have to learn more about the Internet. It is also interesting to mention that the lowest value of all in 2004 is for the Internet as a market for offering lower prices.

Table 9. Variables that increased their importance

V.	Concept	2000 (a)	2004 (b)	Diff. (a-b)
21	Importance of the Internet as a market for increasing sales	4.07	**4.42**	0.35
23	Importance of the Internet as a channel for direct marketing activities	4.20	4.27	0.07
24	Importance of the Internet as a tool to increase profits	4.16	4.27	0.11
25	Importance of the Internet as a tool to better control the selling process	3.95	3.95	0.00
28	Importance of the Internet as a means to increase the number of customers	4.14	4.24	0.10
30	Importance of the security level of the transactions on the Internet	4.13	4.15	0.02
31	Importance of the Internet as a means of communication	4.29	**4.59**	0.30
32	Importance of the Internet as a distribution channel for tourist products	4.01	4.26	0.25
33	Importance of the Internet as a way to contact customers directly	4.14	4.38	0.24
34	Importance of the Internet as a tool to access new markets	4.32	4.39	0.07
35	Importance of the Internet as a tool to reach new market segments	4.25	4.29	0.04
36	Importance of the Internet as a tool to receive bookings throughout the whole year	4.17	4.19	0.02
37	Importance of the Internet as a tool to control the message communicated to customers	4.11	4.21	0.10
38	Importance of the Internet as a channel to send and receive communications	4.28	4.35	0.07
39	Importance of the Internet as a tool for multimedia communications	3.85	4.06	0.21
40	Importance of the Internet as a tool that allows a quick change of prices	4.01	4.16	0.15
41	Importance of the Internet as a way to differentiate oneself from competitors	3.89	3.94	0.05

4.3.2 Current Perception by Type of Companies

E-commerce and Perceptions in 2004

The first interesting distinction to be made is to analyse the differences in the perception of the importance of the Internet between the com-

Table 10. Variables that decreased their importance

V.	Concept	2000 (a)	2004 (b)	Diff. (a-b)
22	Importance of the Internet as a market for offering lower prices	3.37	**3.30**	–0.07
26	Importance of the Internet as a marketing channel that would eliminate the dependence on tour operators	3.55	**3.32**	**–0.23**
27	Importance of the Internet as a tool that would increase competition	3.81	3.70	–0.11
29	Importance of the Internet as a tool that requires low investment	4.12	4.05	–0.07
42	Importance of the need managers have to learn more about the Internet	4.25	4.10	–0.15
43	Importance of the need employees have to learn more about the Internet	4.20	3.90	**–0.30**

panies that do e-commerce and those that do not. The value of their perceptions and their differences are shown in Table 11.

Although the results about the perceptions of the companies that have e-commerce and those that do not could seem quite similar, there are some interesting differences between them. In fact those hotel companies that have e-commerce consider that both managers and employees have to learn more about the Internet. These companies also have a higher perception of importance of the Internet as a means to increase the number of customers.

On the other hand, the companies that do not have e-commerce consider highly more important the security level of the transactions than the companies that sell through the Internet. Another interesting difference in perception relates to the importance of the Internet as a distribution channel for tourist products. The results highlight that it is much better considered for those companies that do not have e-commerce yet.

Perceptions by Type of Hotel Company

It also important to see whether there are differences in perceptions depending on the type of company (i.e. hotel chains opposed to single hotels). The results of this analysis can be seen in Table 12.

As shown in Table 12, single hotels give quite a higher punctuation to two different Internet attributes related to competition and prices.

Table 11. E-commerce and perceptions

V.	Concept	e-commerce 2004		
		Yes (a)	No (b)	Diff. (a-b)
21	Importance of the Internet as a market for increasing sales	4.45	4.52	–0.07
22	Importance of the Internet as a market for offering lower prices	3.32	3.31	0.01
23	Importance of the Internet as a channel for direct marketing activities	4.32	4.26	0.06
24	Importance of the Internet as a tool to increase profits	4.33	4.05	0.28
25	Importance of the Internet as a tool to better control the selling process	3.91	4.05	–0.14
26	Importance of the Internet as a marketing channel that would eliminate the dependence on tour operators	3.30	3.21	0.09
27	Importance of the Internet as a tool that would increase competition	3.62	3.73	–0.11
28	Importance of the Internet as a means to increase the number of customers	4.30	4.00	**0.30**
29	Importance of the Internet as a tool that requires low investment	4.02	4.21	–0.19
30	Importance of the security level of the transactions on the Internet	4.18	4.52	**–0.34**
31	Importance of the Internet as a means of communication	4.59	4.89	–0.30
32	Importance of the Internet as a distribution channel for tourist products	4.23	4.52	**–0.29**
33	Importance of the Internet as a way to contact customers directly	4.45	4.47	–0.02
34	Importance of the Internet as a tool to access new markets	4.46	4.42	0.04
35	Importance of the Internet as a tool to reach new market segments	4.33	4.26	0.07
36	Importance of the Internet as a tool to receive bookings throughout the whole year	4.33	4.10	0.23
37	Importance of the Internet as a tool to control the message communicated to customers	4.27	4.36	–0.09
38	Importance of the Internet as a channel to send and receive communications	4.38	4.42	–0.04
39	Importance of the Internet as a tool for multimedia communications	4.14	4.15	–0.01

Table 11. (Cont.)

V.	Concept	e-commerce 2004		
		Yes (a)	No (b)	Diff. (a-b)
40	Importance of the Internet as a tool that allows a quick change of prices	4.14	4.42	–0.28
41	Importance of the Internet as a way to differentiate oneself from competitors	3.96	4.15	–0.19
42	Importance of the need managers have to learn more about the Internet	4.19	3.89	**0.30**
43	Importance of the need employees have to learn more about the Internet	4.01	3.63	**0.38**

Table 12. Perceptions by hotel company type

V.	Concept	2004		
		Hotel Chains (a)	Single Hotels (b)	Diff. (a-b)
21	Importance of the Internet as a market for increasing sales	4.47	4.40	0.07
22	Importance of the Internet as a market for offering lower prices	3.15	3.37	**–0.22**
23	Importance of the Internet as a channel for direct marketing activities	4.32	4.25	0.07
24	Importance of the Internet as a tool to increase profits	4.30	4.26	0.04
25	Importance of the Internet as a tool to better control the selling process	3.95	3.96	–0.01
26	Importance of the Internet as a marketing channel that would eliminate the dependence on tour operators	3.27	3.35	–0.08
27	Importance of the Internet as a tool that would increase competition	3.55	3.77	**–0.22**
28	Importance of the Internet as a means to increase the number of customers	4.20	4.26	–0.06
29	Importance of the Internet as a tool that requires low investment	3.97	4.10	–0.13
30	Importance of the security level of the transactions on the Internet	4.52	3.97	**0.55**
31	Importance of the Internet as a means of communication	4.72	4.52	0.20

Table 12. (Cont.)

V.	Concept	2004 Hotel Chains (a)	2004 Single Hotels (b)	Diff. (a-b)
32	Importance of the Internet as a distribution channel for tourist products	4.30	4.25	0.05
33	Importance of the Internet as a way to contact customers directly	4.40	4.37	0.03
34	Importance of the Internet as a tool to access new markets	4.47	4.35	0.12
35	Importance of the Internet as a tool to reach new market segments	4.30	4.28	0.02
36	Importance of the Internet as a tool to receive bookings throughout the whole year	4.45	4.06	0.39
37	Importance of the Internet as a tool to control the message communicated to customers	4.25	4.20	0.05
38	Importance of the Internet as a channel to send and receive communications	4.37	4.33	0.04
39	Importance of the Internet as a tool for multimedia communications	4.02	4.08	–0.06
40	Importance of the Internet as a tool that allows a quick change of prices	4.17	4.16	0.01
41	Importance of the Internet as a way to differentiate oneself from competitors	4.00	3.91	0.09
42	Importance of the need managers have to learn more about the Internet	4.27	4.02	0.25
43	Importance of the need employees have to learn more about the Internet	4.07	3.81	0.26

Opposed to hotel chains, single hotels give much higher importance to Internet as a tool to increase competition (variable 27) and as a market for offering lower prices (variable 22). On the other hand, the hotel chains consider much more important the level of security for the transactions.

Marketing Department Presence and Perceptions

The presence of a Marketing department seems to have also an influence in the perceptions of the different companies. Table 13 shows the different perceptions they have, as well as their difference in punctuation.

Table 13. Marketing department and perceptions

V.	Concept	Mk Department 2004		
		Yes (a)	No (b)	Diff. (a-b)
21	Importance of the Internet as a market for increasing sales	4.51	4.38	0.13
22	Importance of the Internet as a market for offering lower prices	2.85	3.48	**–0.63**
23	Importance of the Internet as a channel for direct marketing activities	4.37	4.23	0.14
24	Importance of the Internet as a tool to increase profits	4.37	4.23	0.14
25	Importance of the Internet as a tool to better control the selling process	3.82	4.01	–0.19
26	Importance of the Internet as a marketing channel that would eliminate the dependence on tour operators	3.00	3.45	**–0.45**
27	Importance of the Internet as a tool that would increase competition	3.54	3.76	–0.22
28	Importance of the Internet as a means to increase the number of customers	4.22	4.24	–0.02
29	Importance of the Internet as a tool that requires low investment	4.00	4.08	–0.08
30	Importance of the security level of the transactions on the Internet	4.37	4.07	0.30
31	Importance of the Internet as a means of communication	4.80	4.50	0.30
32	Importance of the Internet as a distribution channel for tourist products	4.37	4.22	0.15
33	Importance of the Internet as a way to contact customers directly	4.40	4.37	0.03
34	Importance of the Internet as a tool to access new markets	4.45	4.36	0.09
35	Importance of the Internet as a tool to reach new market segments	4.34	4.27	0.07
36	Importance of the Internet as a tool to receive bookings throughout the whole year	4.42	4.09	**0.33**
37	Importance of the Internet as a tool to control the message communicated to customers	4.20	4.22	–0.02
38	Importance of the Internet as a channel to send and receive communications	4.37	4.34	0.03

Table 13. (Cont.)

V.	Concept	Mk Department 2004 Yes (a)	No (b)	Diff. (a-b)
39	Importance of the Internet as a tool for multimedia communications	4.02	4.08	–0.06
40	Importance of the Internet as a tool that allows a quick change of prices	4.25	4.12	0.13
41	Importance of the Internet as a way to differentiate oneself from competitors	4.14	3.85	0.29
42	Importance of the need managers have to learn more about the Internet	4.37	4.00	**0.37**
43	Importance of the need employees have to learn more about the Internet	4.22	3.76	**0.46**

5 Conclusions

As the Internet has commercially evolved in recent years, it has become an important means of communication and sales for hotel companies. This paper has analysed the importance of the Internet as a marketing channel in the hotel sector. The empirical approach has focused on data form a mature tourism destination, the Balearic Islands. The interest of the case of the Balearic Islands is because it is a mature mass tourist destination, with a high competition from alternative destinations. In this context, the analysis of the level of adoption by its hotel companies, as well as the perception their managers had about it could be thought as representative of many other tourist destinations.

The paper shows that hotel managers in the Balearic Islands have a very good perception of the Internet as a Marketing tool. It has also been found that hotel companies with a Marketing department use more Internet than those that do not have it. However, the huge number of single hotels that do not have a Marketing department is an important drawback for this hypothesis.

It is important to notice that in the 2000 wave, single hotels relatively used more Internet for e-commerce than hotel chains. However, this situation changed, and seems to be no longer true. There are now proportionally more hotel chains than single hotels using the Internet for marketing.

Finally, it has been found that nowadays hotel companies have a better perception of the Internet in general. Nevertheless the comparison of the results from years 2000 and 2004 show that not all the attributes analysed have obtained better results in 2004. Some of them have worse valuations today.

Having an overall look at the results, it seems that the different perceptions of the Internet correspond with differences in company size. The evidence described here suggests a quite clear distinction between 'big' companies and 'small' companies. Big companies are usually hotel chains, where more often a marketing department is found, and therefore they have more use of the Internet including e-commerce. Small hotel companies are often single hotels, where very few marketing departments are found, and therefore they have a lower use of the Internet as a marketing channel.

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Appendix

Concepts of the perception variables used in the questionnaire

Variable	Concept
21	Importance of the Internet as a market for increasing sales
22	Importance of the Internet as a market for offering lower prices
23	Importance of the Internet as a channel for direct marketing activities
24	Importance of the Internet as a tool to increase profits
25	Importance of the Internet as a tool to better control the selling process
26	Importance of the Internet as a marketing channel that would eliminate the dependence on tour operators
27	Importance of the Internet as a tool that would increase competition
28	Importance of the Internet as a means to increase the number of customers
29	Importance of the Internet as a tool that requires low investment
30	Importance of the security level of the transactions on the Internet
31	Importance of the Internet as a means of communication
32	Importance of the Internet as a distribution channel for tourist products
33	Importance of the Internet as a way to contact customers directly
34	Importance of the Internet as a tool to access new markets
35	Importance of the Internet as a tool to reach new market segments
36	Importance of the Internet as a tool to receive bookings throughout the whole year
37	Importance of the Internet as a tool to control the message communicated to customers
38	Importance of the Internet as a channel to send and receive communications
39	Importance of the Internet as a tool for multimedia communications
40	Importance of the Internet as a tool that allows a quick change of prices
41	Importance of the Internet as a way to differentiate oneself from competitors
42	Importance of the need managers have to learn more about the Internet
43	Importance of the need employees have to learn more about the Internet

Efficiency and Productivity of Italian Tourist Destinations: A Quantitative Estimation Based on Data Envelopment Analysis and the Malmquist Method

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1 Introduction

The rising importance of tourism and its expected positive impacts on economic growth have put tourist policy in the center of development strategies of many countries and regions. With more international openness, more geographical mobility, cheap air fares and rising income levels in many countries, tourism is expected to become an important growth engine. The permanent rise in tourism has prompted innovative ideas on growth and marketing strategies of tourist destinations (niche marketing, e-tourism, etc.) with the aim to attract a maximum share of relevant tourist flows to a particular region (see e.g. Giaoutzi and Nijkamp, 2006; and Wall and Mathieson, 2006). Consequently, tourism policy tends to become a fierce competition effort between alternative tourist destinations.

Which tourist sites have been very successful in attracting a significant – increasing – flow of tourists? And why? These questions call for solid theoretical and applied work to identify the critical success factors for regional or national tourist policy. Tourist research should of course, provide insights into the determining factors of tourist behaviour, on both the demand and the supply side. An optimal matching of demand and supply attractiveness will guarantee an optimal use of tourist capacities, both quantitative and qualitative, in destination areas. An important element here is the great heterogeneity in terms of tourist needs on the demand side and tourist attraction profiles on the supply side (see also Poon, 2002; Swarbrooke and Honner, 2001; and Uysel, 1998). Furthermore, an optimal use of a tourist destinations' capacity should also respect the social, ecological, cultural or artistic carrying capacity of a destination area, as violation of a carrying capacity may erode the future growth potential of the area concerned (see e.g. Butler, 1999; Fayos-Solà, 1996; Giaoutzi and Nijkamp 1995; and Poon, 2003).

In assessing a proper usage of existing tourist capacity or infrastructure, it would ideally be important to look into different socio-economic categories of tourists, into the attractiveness features of tourist sites as well as into the transport and communication characteristics between origin and destination. The overall economic estimation of benefits accruing from tourism to a certain area requires the use of consistent tourist statistics. In recent years, the Tourism Satellite Accounts – incorporating a systematic collection of numerical data on tourism supply and demand – have played a pivotal role in properly assessing the economic importance of the tourist industry for given region.

Tourism tends to become a competitive activity among regions who are forced to enhance their performance in order to attract more tourists and to increase their revenues (see e.g. Crouch and Ritchie, 1999; Dwyer et al. 2000; Enright and Newton, 2004; Pearce, 1997; and Ritchie and Crouch, 2000, 2001). A tourist destination (e.g. city, region or site) is often no longer seen as a set of distinct natural, cultural, artistic or environmental resources, but as an overall appealing product available in a certain area: a complex and integrated portfolio of services offered by a destination that supplies a holiday experience which meets the needs of the tourist. A tourist destination thus produces a compound package of tourist services based on its indigenous supply potential (see Buhalis, 2000; and Murphy et al. 2000). In this context Dwyer et al. (2000) claimed that "it is useful for the industry and government to understand where a country's competitive position is weakest and strongest..." (p.10), while Enright and Newton (2004, p.777) reinforced this view, stating that "...it is important to know how and why competitiveness is changing" (p.777).

The previous observations call for solid applied research, but unfortunately there is a serious limitation in statistical data and empirical modelling work, at both a micro and macro level (e.g. Alavi and Yasin, 2000; Enright and Newton, 2004; Kozak and Rimmington, 1999; and Kozak, 2002).

The present study intends to enrich the tourism literature in this specific aspect by focussing on destination competitiveness and by providing a measure of competitiveness at regional level in terms of technical efficiency and total factor productivity (TFP). Our aim is to investigate whether tourist destinations operate efficiently, i.e. are able to deploy the inputs at their disposal in an efficient manner in order to attract a maximum share of tourist demand and to be competitive against key competitors. Most literature on tourism efficiency considers as statistical units hotels and restaurants, but we will perform our analysis on territorial areas (or tourist destinations). In other words, we hypothesize that tourist destinations are heterogeneous multi-product, multi-client business organisations. In the light of the competitive behaviour on the tourism market, they have to maximize their market share, given the available resources. Consequently, industry-oriented models (such as frontier analysis) may be applied at territorial level as well[4] A concise illustrative summary of industry-oriented models used in tourism economics is offered.

In the tourism literature, the analysis of efficiency is limited to a small number of studies, which focus the analysis on micro-units (e.g. hotels, corporate travel departments, etc.). Among the earliest, Morey and Dittman (1995) – using data envelopment analysis with 7 inputs and 4 outputs – evaluated the general-manager performance of 54 hotels of an American tourism chain – geographically dispersed over continental United States – for the year 1993. Hwang and Chang (2003), using data envelopment analysis and the Malmquist productivity index, measured the managerial performance of 45 hotels in 1998 and the efficiency change of 45 hotels from 1994 to 1998. They found there was a significant difference in efficiency change due to a difference in sources of customers and management styles. Barros and Mascarenhas (2005), again using data envelopment analysis with 3 inputs and outputs, analysed the technical and allocative efficiency of 43 hotels in Portugal for the year 2001. Anderson et al. (1999a) proposed an

[4] In recent years, several regional applications of frontier analysis in other economic sectors have emerged; see Macmillan (1986); Charnes et al. (1989); Susiluoto and Loikaanen (2001); Martić and Savić (2001); and Cuffaro and Vassallo (2002).

evaluation of managerial efficiency levels in the hotel industry by using the stochastic frontier technique. An overview of efficiency analysis on the restaurant industry can be found in Reynolds (2003). For other applications on efficiency measures at micro level in the tourism field, we refer to Baker and Riley (1994); Bell and Morey (1995); Anderson et al. (1999b); Barros (2004); and Barros (2005).

Using a non-parametric (d*ata envelopment analysis*, DEA) method, the present paper aims to assess production frontiers and efficiency coefficients of alternative tourist destinations. The analysis concerns 103 Italian regions for the year 2001. Moreover, we will also use the Malmquist productivity approach (see Färe et al. 1992) to measure the efficiency change of Italian regions between 1998 and 2001.

The chapter is structured as follows. Sect. 2 introduces the DEA model foundations by offering, synthetically, a description of production frontier analysis. Then, Sect. 3 contains a description of the study area and the characteristic of the variables used in our study. In Sect. 4, the empirical findings are presented and discussed, while Sect. 6 offers concluding remarks.

2 Analytical Framework for Assessing the Performance of Tourist Destinations

The analysis of the economic performance of tourist areas has already a long history. Using Porter's model (1990), Crouch and Ritchie (1999) have developed a conceptual model of tourist competitiveness that allowed to extend the previous studies that focussed on destination image or attractiveness (see Chon et al. 1991; and Hu and Ritchie, 1993). Crouch and Ritchie argue that tourist destination competitiveness fits into the national industry competition level. They provide a detailed framework in which the different perspectives on competitiveness are coherently organized, by making a distinction into two interrelated environments: micro and macro. The micro-environment incorporates the details of the tourist destination and travel to it which have to be compared with the competitors. The macro-environment includes elements outside the micro-environment which nevertheless influence it, such as the increasing attention for the natural environment; the economic restructuring of economies occurring worldwide; the shifting demographics of the marketplace; the increasingly complex technology-human resource interface, etc. We will use their framework for an empirical work. In particular, we will provide an evaluation of tourist site competitiveness in terms of efficiency.

For our aim we use a non-parametric method (a DEA and a Malmquist approach) of production analysis – generally used to evaluate the efficiency of firms or non-profit organizations – in order to assess empirically the production frontiers and efficiency coefficients for tourist destinations (and their change in efficiency). We will now concisely present the DEA and the Malmquist method.

In order to estimate the efficiency and the productivity change, we assume that the tourist site's production technology can be characterised by a production function, which provides the maximum possible output (i.e. output target), given the proper inputs (see also, Cracolici, 2004, 2005; and Cracolici and Nijkamp, 2006). For our aim, the following 'visitor production function' for tourism is deployed:

$$\text{Tourist output} = \text{f(material capital, cultural heritage, human capital, labour).} \quad (1)$$

As the functional form of the production function is not known, while we have to manage multiple inputs and outputs, a non-parametric method (i.e. DEA) is used. The main advantage of the DEA over a parametric approach is that it does not require any assumption concerning the production technology, while DEA can also easily accommodate multiple outputs[5] DEA is a non-parametric linear programming method of measuring efficiency to assess a production frontier. The efficiency of each tourist destination is evaluated against this frontier. In other words, the efficiency of a destination is evaluated in comparison with the performance of other destinations.

DEA is based on Farrell's (1957) original work, further elaborated by Charnes et al.'s (1978) CCR model, and Banker et al.'s (1984) BCC Model. Generally, DEA can be applied to efficiency problems in public sector agencies (e.g. schools, hospitals, airports, courts, etc.) and private sector agencies (banks, hotels, etc). Here, we apply DEA to tourist sites considering them as a generic private tourist unit (e.g. hotels and restaurant), which use proper inputs to reach multiple outputs. For this purpose, we adopt an output-oriented DEA model, because we want to

[5] For details on frontier techniques and their strength and weakness, we refer to Coelli (1995), Førsund and Lovell (1980); Bauer (1990); Bjurek et al. (1990); Seiford and Thrall (1990); Battese (1992); Bravo-Ureta and Pinheiro (1993); and Fried et al. (1993).

explore how well the regions in Italy deploy their input resources for tourism. In other words, given a stock of tourist resources, the aim of a tourist area is to maximize tourist flows.

DEA models assess efficiency by using the actual economic distance to the production frontier giving the highest possible efficiency. The efficiency measure proposed by Charnes et al. (1978) maximizes efficiency in terms of the ratio of total weighted output to total weighted input, subject to the condition that, for every destination, this efficiency measure is smaller than or equal to 1. Given J destinations with I inputs and R outputs, the measure of efficiency of a destination k can then be specified as:

$$\begin{aligned} &\operatorname*{Max}_{u,v} \frac{\sum_{r=1}^{R} u_r y_{rk}}{\sum_{i=1}^{I} v_i x_{ik}} \\ &\text{s.t. } \frac{\sum_{r=1}^{R} u_r y_{rj}}{\sum_{i=1}^{I} v_i x_{ij}} \le 1; \text{ for j} = 1, \ldots, \text{J} \\ &\quad v_i, u_r \ge 0 \,, \end{aligned} \tag{2}$$

where x_{ij} is the amount of input i to destination j; y_{rj} the amount of output r from destination j; u_r the weight given to output r; and v_i the weight given to input i.

The maximization problem in (2) can, in principle, have an infinite number of solutions. Charnes et al. (1978) show that the above fractional programming problem has the following equivalent linear programming formulation, which avoids this problem:

$$\begin{aligned} &\operatorname*{Max}_{u,v} \sum_{r=1}^{R} u_r y_{rk} \\ &\text{s.t. } \sum_{i=1}^{I} v_i x_{ij} - \sum_{r=1}^{R} u_r y_{rj} \ge 0; \text{ for j} = 1, \ldots, \text{J} \,, \\ &\quad \sum_{i=1}^{I} v_i x_{ik} = 1 \,; \\ &\quad u_r \ge 0; \quad \text{for r} = 1, \ldots, \text{R} \,, \\ &\quad v_i \ge 0; \quad \text{for i} = 1, \ldots, \text{I} \,. \end{aligned} \tag{3}$$

The dual specification of this linear programming model can be written as follows:

$$\begin{aligned} &\underset{\theta,\ \lambda}{\text{Min}} \quad \theta_k \\ &\text{s.t.} \ \sum_{j=1}^{J} \lambda_j y_{rj} \geq y_{rk}; \ \text{for r} = 1, \ldots, \text{R}, \\ &\qquad \theta_k x_{ik} - \sum_{j=1}^{J} \lambda_j x_{ij} \geq 0; \ \text{for i} = 1, \ldots, \text{I}, \\ &\qquad \lambda_j \geq 0; \ \text{for j} = 1, \ldots, \text{J}. \end{aligned} \tag{4}$$

The destination, j, is efficient, if $\theta^* = 1$, where an asterisk to a variable denotes its optimal solution. If this condition is not satisfied, the destination j is inefficient $(\theta^* > 1)$.

The efficiency coefficient can be either output-oriented (as in (4)) or input-oriented. If the output-oriented coefficient is greater than 1 in (4), it is possible to increase all outputs keeping the inputs constant. Likewise, if the input coefficient is smaller than 1, it is possible to reduce the inputs keeping the outputs constant. Besides, the DEA model can be different in the assumption on returns to scale (constant or variable). The above DEA model (2)–(4) assumes a constant returns to scale (CRS) technology; a VRS technology (variable returns to scale) can be obtained adding to (2)–(4) the constraint: $\sum_{j=1}^{J} \lambda_j = 1$ (Banker et al. 1984). The estimate of technical efficiency of each unit (in our case, tourist destination) in the output-oriented VRS DEA model (θ_j^{VRS}) will be higher than or equal to that in an output-oriented CRS DEA model (θ_j^{CRS}), as the VRS DEA is more flexible than the CRS DEA. The scale efficiency measure for the jth tourist destination, denoted by, θ_j^{SE}, can be derived from this relationship:

$$\theta_j^{SE} = \frac{\theta_j^{CRS}}{\theta_j^{VRS}}\ . \tag{5}$$

If the sum of weights $\sum_{j=1}^{J} \lambda_j > 1$, decreasing returns to scale are prevailing; if $\sum_{j=1}^{J} \lambda_j < 1$, increasing returns to scale are prevailing (see Banker, 1984).

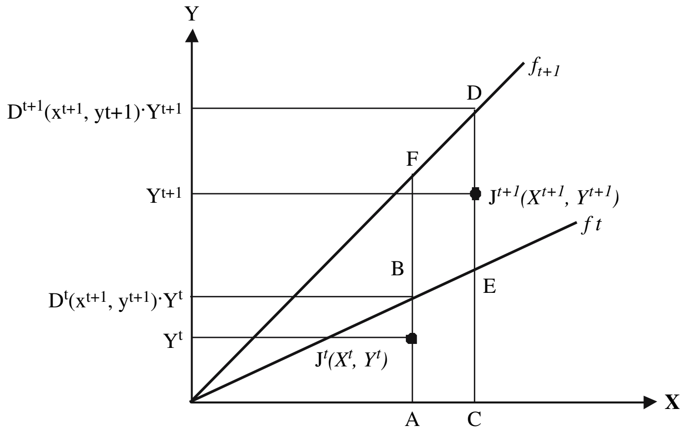

Fig. 1 The output based measurement of efficiency change

DEA can be used to evaluate the distant functions for measuring the Malmquist productivity index (MPI) introduced by Caves et al. (1982). The Malmquist productivity is a normative measure in the sense that it is measured by the ratio of distance functions pertaining to some benchmark technology. This index can be interpreted as follows.

Given a set of units for different times, the MPI allows to measure total productivity change over time. As shown in Fig. 1, f^t represents the efficiency frontier in period t, and f^{t+1} the efficiency frontier in period $t+1$. $J^t(x^t, y^t)$ and $J^{t+1}(x^{t+1}, y^{t+1})$ represent the inputs-outputs vector of a destination j at time t and $t+1$, respectively.

To deploy this method for measuring the efficiency change from time t to $t+1$, the efficiency distance function $D^{t+1}(x^t, y^t)$ is defined as the following linear programming problem:

$$\begin{aligned} & D^{t+1}(x^t, y^t) = \underset{\theta,\ \lambda}{\text{Min}}\ \ \theta_k \\ & \text{s.t.}\ \sum_{j=1}^{J} \lambda_j^{t+1} y_{rj}^{t+1} \geq y_{rk}^t;\ \text{ for r} = 1, \dots, \text{R}\ , \\ & \theta_k x_{ik}^t - \sum_{j=1}^{J} \lambda_j^{t+1} x_{ij}^{t+1} \geq 0;\ \text{ for i} = 1, \dots, \text{I}\ , \\ & \lambda_j^{t+1} \geq 0;\ \text{ for j} = 1, \dots, \text{J}\ . \end{aligned} \tag{6}$$

$D^{t+1}(x^t, y^t)$ measures the efficiency of a destination j at the period $t+1$ with respect to the efficiency frontier at period t. Similarly,$D^t(x^{t+1}, y^{t+1})$ measures the efficiency of a destination j at time

t using the efficiency frontier at time $t+1$ as a reference set; it may be defined in the following way:

$$\begin{aligned} & D^t(x^{t+1}, y^{t+1}) = \underset{\theta,\ \lambda}{\text{Min}}\ \theta_k \\ & \text{s.t.}\ \sum_{j=1}^{J} \lambda_j^t y_{rj}^t \geq y_{rk}^{t+1};\ \text{for r} = 1, \ldots, \text{R}\ , \\ & \theta_k x_{ik}^{t+1} - \sum_{j=1}^{J} \lambda_j^t x_{ij}^t \geq 0;\ \text{for i} = 1, \ldots, \text{I}\ , \\ & \lambda_j^t \geq 0;\ \text{for j} = 1, \ldots, \text{J}\ . \end{aligned} \tag{7}$$

Both $D^t(x^{t+1}, y^{t+1})$ and $D^{t+1}(x^t, y^t)$ are an output-oriented model with constant returns to scale (i.e. a CCR model) as (2)–(4).

From the geometric meaning of a distance function (see Fig. 1), we know that:

$$\begin{aligned} & D^t(x^t, y^t) = AB/AJ^t \\ & D^{t+1}(x^{t+1}, y^{t+1}) = CD/CJ^{t+1} \\ & D^t(x^{t+1}, y^{t+1}) = CE/CJ^{t+1} \\ & D^{t+1}(x^t, y^t) = AJ^t/AF\ . \end{aligned} \tag{8}$$

The MPI allows us to compare, for each observed unit, the real production at period t (or $t+1$) with the potential production in period $t+1$ (or t). In other words, we can evaluate two Malmquist indices, because we have two different technologies; viz. the technology in period t and in $t+1$. So, the MPIs are calculated in the following way:

$$MPI^t = D^t(x^{t+1}, y^{t+1})/D^t(x^t, y^t) = (CJ^{t+1}/CE)/(AJ^t/AB) \tag{9}$$

and:

$$MPI^{t+1} = D^{t+1}(x^{t+1}, y^{t+1})/D^{t+1}(x^t, y^t) = (CJ^{t+1}/CD)/(AJ^t/CJ^{t+1})\ . \tag{10}$$

Using the geometric mean of the alternative expression of MPI^t and MPI^{t+1}, we obtain:

$$MPI^{t,t+1} = \frac{D^{t+1}(x^{t+1}, y^{t+1})}{D^t(x^t, y^t)} \left[\frac{D^t(x^{t+1}, y^{t+1})}{D^{t+1}(x^{t+1}, y^{t+1})} \frac{D^t(x^t, y^t)}{D^{t+1}(x^t, y^t)} \right]^{1/2}\ . \tag{11}$$

$MPI^{t,t+1}$ is now the Malmquist productivity index; it is used to measure the total efficiency change. According to the Malmquist productivity index developed by Färe et al. (1992), the first term in (11) is merely the ratio of technical efficiencies of the observed input-output set in the two periods considered. It shows the contribution of technical efficiency change. The second term represents the contribution of technical change (for details, see Ray, 2004). An extension of MPI from constant to variable returns to scale was offered by Färe et al. (1994).

In Sect. 4, the DEA CRS and VRS results and the efficiency change obtained by the Malmquist index will be presented and discussed. But first, we will introduce briefly our study area and the variables used in our empirical analysis.

3 The Study Area and Summary Characteristics of Variables

For our application, we have used data for two tourist outputs and five inputs, evaluated on the basis of non-financial measures. The analysis concerns 103 Italian regions for the years 1998 and 2001.

Tourist output is evaluated here by two non-financial measures: international and national bed-nights. According to the destination concept, the empirical findings and the availability of data, the following inputs were chosen: number of beds in hotels as well as in complementary accommodations divided by population (BH and BCC); the regional state-owned cultural patrimony and heritage (CPH) (number of museums, monuments and archaeological sites) standardized for population; tourist school graduates divided by working age population (TSG); and the labour units (ULAs) employed in the tourism sector divided by the total regional ULA[6]

Table 1 gives a summary description of input and output variables and highlights that there are no strong disparities in each of the inputs

[6] Data on output has been obtained from ISTAT (National Statistics Institute) (1998a, 2001a), while the data on inputs has been obtained from different sources: number of beds in the hotels and in complementary accommodation from ISTAT (1998a, 2001a); provincial state-owned cultural patrimony and heritage (number of museums, monuments and archaeological areas) from the Ministry of Cultural Heritage; tourist school graduates from the Ministry of Education; and labour units (ULA) employed in the tourism sector from ISTAT (1998 b, 2001b). Because the statistics from the Ministry of Cultural Heritage do not provide the data of regions and provinces with special statute status (Sicily, Aosta, Trento and Bolzano), for these data we have used as a proxy for cultural heritage the region and province-owned cultural heritage (museums, monuments and archaeological areas) supplied by the Regional and Provincial Bureaus of Cultural Heritage. Finally, ULA includes the following economic sectors: commerce, repairs, hotels, restaurants, transport and communication. If the indirect impact of tourism on commerce and repairs is considered, any error with this variable may be neglected.

Table 1. Characteristics of the input and output variables (1998 and 2001)

Variables	Mean	S.D.
	1998	
Input		
BH	4.0373	6.2397
BCC	4.4470	5.1810
CPH	0.0016	0.0052
TSG	0.0950	0.0513
ULA	26.6058	4.8435
Output		
BN	425.0783	584.8067
BI	222.2886	435.2840
	2001	
Input		
BH	4.2951	6.5181
BCC	5.2469	6.8086
CPH	0.0016	0.0052
TSG	0.0949	0.0509
ULA	26.9824	4.7095
Output		
BN	475.6755	633.7207
BI	266.3281	473.7531

considered, whereas the output shows a greater variability. These results indicate that the mean value of CPH is 1.6 monuments per 1000 inhabitant in Italian regions; the mean TSG is about 0.9% as a share of working population, while ULA is about 27%. The mean value for national tourist bed-nights over time has increased from 425.07 to 475.67, while the mean of international tourist bed-nights increases from 222.28 to 266.32. All these data have been deployed in our DEA and Malmquist approach. The findings will now be presented in Sect. 4.

4 Results and Discussion

Both our CRS and VRS models are estimated for the same Italian regions using the same output and input variables. The frequency distribution of efficiency scores and their summary statistics are presented in Tables 2 and 3.

Table 2. Frequency distribution of technical and scale efficiency estimates from the DEA models (1998 and 2001)

Efficiency Score	CRS				VRS				SE			
	1998		2001		1998		2001		1998		2001	
	No. of Regions	% of Regions	No. of Regions	% of Regions	No. of Regions	% of Regions	No. of Regions	% of Regions	No. of Regions	% of Regions	No. of Regions	% of Regions
1–48	11	10.68	13	12.62	5	4.85	8	7.77	1	0.97	0	0.00
48–50	0	0.00	3	2.91	2	1.94	1	0.97	0	0.00	1	0.97
50–52	2	1.94	1	0.97	0	0.00	1	0.97	1	0.97	0	0.00
52–54	2	1.94	1	0.97	0	0.00	2	1.94	0	0.00	0	0.00
54–56	1	0.97	0	0.00	2	1.94	1	0.97	0	0.00	0	0.00
56–58	1	0.97	4	3.88	0	0.00	0	0.00	0	0.00	1	0.97
58–60	1	0.97	5	4.85	2	1.94	1	0.97	0	0.00	2	1.94
60–62	7	6.80	2	1.94	3	2.91	1	0.97	2	1.94	2	1.94
62–64	3	2.91	3	2.91	1	0.97	4	3.88	0	0.00	0	0.00
64–66	5	4.85	4	3.88	2	1.94	4	3.88	2	1.94	1	0.97
66–68	4	3.88	2	1.94	1	0.97	3	2.91	2	1.94	3	2.91
68–70	3	2.91	4	3.88	3	2.91	2	1.94	0	0.00	4	3.88
70–72	3	2.91	2	1.94	4	3.88	2	1.94	3	2.91	0	0.00
72–74	4	3.88	2	1.94	1	0.97	2	1.94	1	0.97	0	0.00
74–76	3	2.91	3	2.91	2	1.94	2	1.94	2	1.94	1	0.97
76–78	2	1.94	2	1.94	3	2.91	0	0.00	0	0.00	0	0.00
78–80	1	0.97	1	0.97	3	2.91	1	0.97	2	1.94	3	2.91
80–82	2	1.94	2	1.94	2	1.94	2	1.94	2	1.94	2	1.94
82–84	2	1.94	4	3.88	3	2.91	2	1.94	0	0.00	2	1.94
84–86	2	1.94	1	0.97	0	0.00	1	0.97	2	1.94	0	0.00
86–88	3	2.91	3	2.91	0	0.00	1	0.97	0	0.00	2	1.94
88–90	2	1.94	2	1.94	1	0.97	3	2.91	2	1.94	2	1.94
90–92	1	0.97	2	1.94	2	1.94	3	2.91	4	3.88	6	5.83
92–94	3	2.91	4	3.88	0	0.00	1	0.97	4	3.88	8	7.77
94–96	1	0.97	1	0.97	0	0.00	1	0.97	5	4.85	7	6.80
96–98	1	0.97	2	1.94	3	2.91	1	0.97	11	10.68	7	6.80
98–100	33	32.04	30	29.13	58	56.31	53	51.46	57	55.34	49	47.57
	103	100.00	103	100.00	103	100.00	103	100.00	103	100.00	103	100.00
100	32	31.07	29	28.16	55	53.40	51	49.51	35	33.98	32	31.07

Table 3. Summary statistics of efficiency estimates from DEA models

Efficiency Score	CRS		VRS		SE	
	1998	2001	1998	2001	1998	2001
Mean	0.777	0.762	0.845	0.837	0.927	0.914
Minimun	0.319	0.237	0.323	0.237	0.419	0.486
Maximun	1.000	1.000	1.000	1.000	1.000	1.000
Variance	0.041	0.049	0.040	0.045	0.015	0.016
Coefficient of Variation	16.412	15.717	16.784	17.063	38.492	32.412

In the year 1998, the means of technical efficiency scores estimated by the CRS and VRS approaches appear to be 0.77 and 0.84, respectively. In the year 2001, the mean technical scores are lower than or equal to 0.76 and 0.84, respectively. For both years, the high values of the coefficient of variation highlight a great variability of efficiency among regions. In fact, in 1998, the efficiency scores range from 0.32 to 1, for both the CRS and VRS technology. In 2001, the efficiency varies between 0.24 and 1 (see Table 3).

In the years 1998 and 2001, the scale efficiency index, estimated using (5), presents a mean value equal to 0.93 and 0.91, respectively. The share of regions with a full scale efficiency (equal to 100) decreases from 33.98 to 31.07.

With regard to the CRS model, the comparison between the two years shows that the percentage of full efficient destinations decreases from 31.07% to 28.16%; the same observation can be made with respect to the VRS model (53.40% and 49.51% for 1998 and 2001, respectively).

These results are confirmed by the Malmquist analysis. We computed the Malmquist index based on the CRS technology, because by using this model the estimation problem has always a feasible solution (Ray, 2004). The Malmquist results are presented in Table 4.

The frequency distribution of the Malmquist model shows there were only 10 regions (9.7%) with an efficiency change greater than 1. This means that over the 5 years, the tourism strategies in these tourist sites have been effective in order to improve their attractiveness or competitiveness against their competitors. The cluster of areas that improved their productivity is mainly composed by regions with a business orientation (i.e. Milan, Pordenone, Prato).

It is noteworthy that the greater part of regions (93) – with a prevalent coastal and cultural image – possesses a Malmquist index less than 1. This means that the productivity of these tourist areas has been de-

Table 4. Frequency distribution of efficiency change from 1998 to 2001

Efficiency distance value	$D^{1998}(1998)$		$D^{2001}(2001)$		$D^{1998}(2001)$		$D^{2001}(1998)$		Malmquist Index	No. of Regions	% of Regions
	No. of Regions	% of Regions	No. of Regions	% of Regions	No. of Regions	% of Regions	No. of Regions	% of Regions			
1–1.10	39	37.86	38	36.89	41	39.81	28	27.18	0.68.0.75	2	1.94
1.10–1.20	7	6.80	9	8.74	11	10.68	12	11.65	0.75–0.78	1	0.97
1.20–1.30	7	6.80	7	6.80	7	6.80	4	3.88	0.78.0.80	1	0.97
1.30–1.40	9	8.74	5	4.85	8	7.77	8	7.77	0.80–0.82	2	1.94
1.40–1.50	6	5.83	8	7.77	10	9.71	6	5.83	0.82–0.84	1	0.97
1.50–1.60	10	9.71	6	5.83	5	4.85	7	6.80	0.84–0.86	6	5.83
1.60–1.70	8	7.77	7	6.80	3	2.91	9	8.74	0.86–0.88	2	1.94
1.70–1.80	1	0.97	5	4.85	5	4.85	7	6.80	0.88–0.90	7	6.80
1.80–1.90	2	1.94	1	0.97	2	1.94	3	2.91	0.90–0.92	13	12.62
1.90–2.00	3	2.91	1	0.97	1	0.97	2	1.94	0.92–0.94	8	7.77
2.00–2.10	2	1.94	6	5.83	3	2.91	5	4.85	0.94–0.96	13	12.62
2.10–2.20	3	2.91	1	0.97	0	0.00	0	0.00	0.96–0.98	17	16.50
2.20–2.30	1	0.97	1	0.97	0	0.00	3	2.91	0.98–1.00	20	19.42
2.30–2.40	0	0.00	0	0.00	1	0.97	2	1.94	1.00–1.02	5	4.85
2.40–2.50	0	0.00	2	1.94	0	0.00	0	0.00	1.02–1.04	5	4.85
2.50–2.60	0	0.00	0	0.00	1	0.97	1	0.97			
2.60–2.70	3	2.91	0	0.00	0	0.00	1	0.97			
2.70–2.80	1	0.97	0	0.00	1	0.97	1	0.97			
2.80–2.90	0	0.00	2	1.94	0	0.00	1	0.97			
2.90–3.00	0	0.00	0	0.00	1	0.97	1	0.97			
3.00–3.10	1	0.97	0	0.00	0	0.00	0	0.00			
3.10–3.20	0	0.00	4	3.88	3	2.91	2	1.94			
>3.20	0	0.00	0	0.00	0	0.00	0	0.00			
	103	100.00	103	100.00	103	100.00	103	100.00		103	100.00
1	37	35.92	29	28.16	28	27.18	37	35.92	>1	10	0.097

creasing over the time. Regarding the inefficiency of numerous regions, several hypotheses can be envisaged for the inefficient use of the inputs with a view to enhancing the production potential for a maximum possible output.

A more thorough analysis showed that the inefficiency of many Italian provinces may be caused by an imbalance between inputs and outputs. In particular, for many traditional tourist destinations this striking result can be interpreted as an under-utilisation of their productive capability in relation to their tourist resources due to an inability to manage resources (or as an expression of the phase of maturity of the tourist life cycle of the Italian product). This may be caused by various deficiencies. Destination management organizations (DMOs) do perhaps not know which is the phase of their tourist destination life-cycle (e.g. growth, maturity and etc.) and may thus be unable to adopt the correct strategy. Moreover, uncontrollable factors or unexpected events can be causes of technical inefficiency (e.g. the Twin Towers dramatic event on September 11, 2001).

5 Conclusions

The aim of this paper has been to explore the tourist competitiveness of Italian regions for the years 1998 and 2001 and their change over these years. The performance of these regions has been evaluated through the assessment of their efficiency. Tourist sites are considered like traditional tourist profit units (e.g. hotels, restaurants, etc.). That is, they manage the proper inputs (e.g. artistic and cultural, labour units) in order to reach more outputs (i.e. national and international tourist bed-nights). In particular, we have analyzed one of the five elements that characterize the competitive advantage of tourist destinations, i.e. their efficient resource management.

For our purpose, DEA models were applied in order to evaluate the tourist efficiency or competitiveness of different regions in Italy. For both years, 1998 and 2001, with respectively constant and variable returns to scale models (CRS and VRS models), the empirical analysis showed that the number of fully efficient regions has decreased, even though slightly.

In summary, a cluster of efficient regions is able to maintain its position over the years. This result is supported by the Malmquist index which showed that only 10 regions have improved their productivity. In other words, the Italian regions do not show a significant change in efficiency over the years considered. This means that, because the tourist inputs vary slowly over time, regional tourist managers should increase the production of tourist output (bed-nights) in order to improve the territorial efficiency. This has not occurred in the period analyzed, and we may thus hypothesize that there has been the lack of strategic and planning action from public agencies in Italy to improve the attractiveness of tourist sites.

The general conclusion following from the inefficiency of the majority of Italian regions is that local destination management organizations must work hard in order to improve the tourist performance of Italian destinations by focusing more attention on the balance inputs/outputs. They must also give due attention to promoting the territorial (or regional) tourist brands, to supporting the development of "local tourist districts", and to addressing financial resources in tourist infrastructures.

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A Night at the Opera Festival: The Economics of Opera

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1 Introduction

The Savonlinna Opera Festival is an annual event that takes place every July in Olavinlinna Castle, which adjoins the town of Savonlinna that is situated in the lake regions of Eastern Finland. This article examines the economics of opera in general and goes on to discuss how the Savonlinna Opera Festival goes about the business of sustaining itself financially and achieving its objectives.

As a charitable organisation, the underlying philosophy of the Festival is one of service to the public at large through offering a quality experience that is comparable to any other world class venues. However, the experience is constrained by the requirement to break-even 'one year with another' from a variety of revenue sources, of which some 60% comes from ticket sales. The accounting information is used to inform the management team when selecting the repertoire and fixing seat prices for the next season, which is done well in advance of the start of the current festival, so that bookings can be taken when the latter opens. The research undertaken here goes on to develop a revenue management model of the Festival in order to improve decision-making, by enabling assessment to be made of the 'downside' risk of making a loss. The model has general applicability and can be used to highlight the validity of different pricing strategies.

2 The Organisation of Opera

There are essentially four ways in which opera is organised:

1. The Italian Stagione (season), which normally runs from late Autumn to Spring;

2. Repertory system of alternating nightly performances;
3. Festivals that run for a short period, normally in the summer when the major houses are closed;
4. Touring that uses a guest company so venues are receiving theatres only.

The Italian Stagione offers a number of performances of a given opera (Towse, 2003), between six and ten, over a few weeks, which is then followed by rehearsals for the next opera. The in-between-time is taken up with ballet and orchestral pieces, after which the new opera runs, and then the process is repeated so as to offer up to eight operas in the season. This is common in the major opera houses in the world, as carried out in one of the most famous, the Sydney Opera House. However, the latter title is a misnomer since it is actually a performing arts venue presenting opera, ballet, theatre, musicals, contemporary dance, and every form of music from symphony concerts to jazz, as well as exhibitions and films.

The Repertory system has been commonly found in state owned companies, as in Germany and the countries belonging to the old Eastern Europe block. The effort that this imposes on the cast requires greater planning and more use of guest artists to supplement principal singers. Some of the world's opera houses undertake both the Italian Stagione and Repertory.

There are several well known opera festivals and they all follow a similar pattern of making use of performers from regular houses during their off-season (the summer months) and may include a guest company (Frey and Vautravers, 2000). Examples, apart from Savonlinna and Dalhalla, are Bayreuth, Glyndebourne, Pesaro, Santa Fe, Utah, Verona and Wexford. Touring has been practised by some major houses and is increasingly a common activity of Eastern European companies and those from minority countries. In principle, with the object of filling seats, opera venues are willing to exercise any combination of these options, as well as touring their company to other houses.

3 The Savonlinna Opera Festival

3.1 Historical Context

The history of the Savonlinna Opera Festival dates back to 1912 when it was founded by the famous Finnish soprano Aino Ackté (1876–1944). What determine the establishment of most opera festivals are the place and the setting. In this case, the setting is the courtyard of a medieval castle, with exceptional acoustics, that juts out into a lake. One can compare this to the Dalhalla Opera Festival in Mid Sweden, which is located in an old quarry that has its own natural lake and, again, first class acoustics. Unfortunately, the Savonlinna Festival was swallowed up in the maelstrom of WWI and then caught up in the political turmoil between Finland and Russia, so it did not appear again until 1930. In the recessionary period of the 1930s and with war clouds again on the horizon, this revival was short-lived. But memories of the Festival lingered on in the town, and after a period of close on four decades, it was started again in 1967 with the production of Beethoven's *Fidelio*.

It will be appreciated that the early foundations of the Festival, in common with many visitor attractions today, had little to do with promoting tourism. At that time Finland was still a Grand Duchy subordinate to the Russian Tsar and the object was to promote Finnish national culture, a universal way in which small nations can make themselves distinctive. However, over the last thirty years, culture as expressed in the arts and heritage institutions has been used to promote positive images of a destination, to the extent that it is difficult for a city to claim it is world class without an acknowledged cultural centre. This is the outcome of an increasingly sophisticated tourist demand, though in his work on the 'European City of Culture' event, Richards (2000) observes that visitors to cultural attractions and events were not always motivated to visit a destination by those events, but there is an implicit assumption in the form of an option demand that these activities will be present at the destination.

This same perspective may be found in the town of Savonlinna. The town has some 28,000 inhabitants, but being a popular tourist resort, the population rises to around 100,000 during the main season when the Festival is running. It is located some 335 kilometres from the capital, Helsinki, by road, which is a five-hour journey by coach and can also be reached by train for about the same journey time. It takes between forty and fifty minutes to reach Savonlinna from Helsinki by air and, depending on demand, there are up to five flights per day during the period of the Festival, dropping to two flights per day afterwards, which is an indirect measure of the importance of the Festival the town's tourism sector.

The success of the Opera Festival witnessed the establishment of a summer ballet event in 2002 and the opening of a new concert and conference centre and a holiday home fair, all in the same year. From the perspective of the municipality, cultural tourism has become the catalyst for the establishment of arts amenities for the town, as well as drawing in new businesses through building a successful image of the area as a place to live and work. The economic approach to events and festivals using Input-Output Tables and CGE modelling has been well covered in the literature (Dwyer et al. 2000; Tyrrell and Johnston, 2001), where it is important to distinguish between the direct economic impact, that is the net increase in local expenditure related to the event, and the total spending of all event visitors and participants, so as to identify additional visitor numbers generated by the event and discount any displacement effects. The approach here concerns itself with the microeconomic aspects of staging the Opera Festival rather than measuring its wider economic impact on the local area. This latter task still remains to be undertaken: the municipality knows how important the Festival is to the town, but has yet to quantify it.

3.2 Organisation of the Savonlinna Opera Festival

The Festival was incorporated as a not-for-profit organisation in 1972, and its artistic director at that time, the renowned Finnish singer Martti Talvela committed himself to raising standards to an international level, so that it has subsequently become on a par with the other top festivals in this domain. The Festival is now a corporation made up of a charitable foundation, the Patrons' Association, and a commercial subsidiary, Savonlinna Opera Festival Ltd. The Patrons' Association is the parent company and is responsible for producing the Festival, ticket sales and marketing. Since it was founded in 1972, the number of patrons has grown to 587, mostly private individuals (552) but also some public corporations (35).

The subsidiary, Savonlinna Opera Festival Ltd., was founded in 1986 to support and finance the Opera Festival through sponsorship and a range of commercial operations, such as the export and hiring out of productions. The chief shareholder in the company is the Patrons' Association, along with the town of Savonlinna and a number of major Finnish companies and private individuals: about 170 in all. Its first export was *The Flying Dutchman* to Spain in 1997 and the company now exports two operas per year, to as far a field as Chile.

The artistic revival of the Festival is considered by the management team to date from the production of Magic Flute during the 1973 season. At that time the Festival was only one week, but it has progressed now to a stable formula of three weeks own production of four to five operas over 24–26 performances, some concerts and one week where it receives a guest company (initiated in 1987 with the Estonian Theatre Company from Tallin). To accomplish this task, the Festival has a full-time staff of 12 and three craftsmen in its workshop, with total employment rising to some 660 persons during the season, including its own chorus and orchestra.

4 Opera Repertoire

Dating from the early 1990s, opera has been enjoying unprecedented audiences and attention. This is in a large part due to recitals on television and well-publicised commercial recordings of the classics. The range of performances covered has varied from the grand operas of Wagner, such as *The Ring Cycle*, down to programmes of operatic highlights given by only a handful of singers and musicians, the latter contributing particularly to the popularisation of opera. However, despite the many operas that exist, in order to meet revenue targets, most opera houses position the bulk of their work around a popular few, either in the form of new productions or revivals, as may be gleaned from Table 1. These are the operas that are popular with audiences worldwide and can be relied on to fill seats. Audiences tend to fall dramatically for contemporary opera even at reduced ticket prices, and Table 1 is indicative of the study by Heilbrun (2001), showing that with commercial pressures in mind, the repertoire of US opera houses was shrinking.

Table 1. Most-produced operas in North America 1993–2003

Opera	Composer	Number of productions
La Bohème	Puccini	192
Madama Butterfly	Puccini	176
La Traviata	Verdi	165
Carmen	Bizet	159
The Barber of Seville	Rossini	137
Tosca	Puccini	136
The Marriage of Figaro	Mozart	135
The Magic Flute	Mozart	134
Don Giovanni	Mozart	122
Rigoletto	Verdi	121

Source: Opera America

4.1 Repertoire of the Savonlinna Opera Festival

Much of what has been said above lies behind the repertoire policy of the Savonlinna Festival. As a charitable organisation, its underlying philosophy is one of national, regional and public service that offers high artistic quality at world standard. This is reflected in the artistic policy:

- One new production every year;
- One new opera every three years;
- Carry over of some (popular) operas from previous years;
- A guest company performing two operas in the last week.

In this the Festival Office is attempting to balance artistic endeavour against prudential financial management. The potential monetary risks from changing the repertoire are high; hence the marketing concentrates on retaining existing customers, bringing in around 70%–75% repeat business every Festival. The management is cautious about experimenting with tradition and new ventures. For example, some years back the Festival launched a winter season for one week, which proved to be very damaging financially.

5 Opera Festival Economics

Opera is 'a 19 Century art form that has built into it 19 Century cost assumptions' (Lord Guthrie, English Arts Council, 1995). By this is meant that costs are dictated by the composer and his/her librettist, and there is little the artistic director can do about this without radically changing the experience, which would be self-defeating if it fails to attract audiences. Thus the traditions and conventions in the repertoire lead to high costs and prices in today's market, despite relatively high amounts of public subsidy given to enable the art form to survive. Towse (2001) reports that in the UK, opera received five times the amount of subsidy per attendance compared to other Arts Council supported performing arts organisations, though it was one of the least attended (only 7% of the population). This is further complicated by the limited seating capacity of many famous old opera houses.

In opera, as with other performing arts, when there is little change in the nature of the performance, then it is only to be expected that relative costs will vary but little overtime, irrespective of the size of budgets, save where the latter permit the hiring of 'superstars'. Although within the repertoire, the costs will vary by opera in accordance with stage direction, sets, costumes, soloists, orchestra, and performing rights and royalties. For example, the production of *Turendot* is costly as it requires a large orchestra, many soloists, extravagant sets and has protected music. *Rigoletto*, on the other hand, is quite the opposite and has the further advantage of being considered as one of Verdi's best works. In addition, there are popular operas that will always be rather special, such as the principal works of Wagner because of the requirement they impose on the size of the orchestra, *Aida* because of the casting demands or operas that have difficult roles and can only be produced by hiring the top international stars, for example, Donizetti's *Daughter of the Regiment*. All these aspects add to costs and therefore the ticket price, limiting the frequency of performances. On the other hand, while repeats of popular operas sell well, venues do not get the same critical acclaim as they would for new productions or totally new operas (Frank and Wrigley, 2001). It may thus be appreciated that the art of opera management is about maintaining a balance between filling seats, controlling costs and artistic integrity.

Thus all opera companies are under pressure to reduce costs and the Savonlinna Opera Festival does this by hiring, in the main, artists from the Finnish National Opera, in the same manner as its competitors. It has the added advantage that many of the principals have lakeside holiday homes in the area. As the National Opera in Helsinki is state owned, so the cast are salaried, as in German state owned houses, which makes them technically 'civil servants'. By participating in the Festival, they augment their income through fees per performance. The Festival also draws in world-class Finnish singers who are independents singing in concerts and recitals around the globe, as well as international stars, for some main roles. Guest artists are all paid the same rate per performance – there are no superstars! By this means, the Festival is able to keep productions cost down to around two-thirds of the main houses and ensure competitive ticket prices.

The disadvantage of this mode of festival operation is the constraint it imposes on the length of the season. The Finnish National Opera season ends by June and so the Savonlinna Festival cannot start hiring until early June. Rehearsals commence in the middle of June in order to open in the second week of July. The ending of the Festival in the first week of August is determined by the market: costs of international access restrict the market mix to 80% domestic and the remainder made up largely of visitors from neighbouring European countries, principally Germany and Sweden, with a few visitors from the USA and Japan. The domestic market falls away in August when the school term starts, making it uneconomic to continue the Festival, as well as harder to sell seats during the last week.

5.1 Financing the Savonlinna Opera Festival

In operating the Festival, the management team are attempting to balance artistic endeavour against breaking even 'one year with another', so as to keep the capital reserve of €2.25 million (on a total revenue stream that is nearly three times the size) intact. The precarious nature of this may be seen in Table 2, which presents aggregate revenue and expenditure accounts at constant 2003 prices. Although performance costs are some way below those in the major houses, even with inflation netted out, it may be seen that the Festival is suffering from Baumol's disease (Baumol and Bowen, 1965). In the main costs are having an upward trend per performance caused by payroll expenses rising faster than the rate of inflation, with little scope for productivity improvements and cost trimming, other than changing the repertoire, to counterbalance this effect. Combining this aspect with the charitable status of the Festival, leads to an overall pricing strategy based upon the expected costs of next year's repertoire adjusted for inflation. However, Baumol's cost disease does not justify public subsidy: in a market

Table 2. Savonlinna festival finances - 2003 prices

Funding (000s)	1996	1997	1998	1999	2000	2001	2002	2003
Total Revenue	€4,759	€5,232	€5,771	€5,322	€5,726	€6,520	€6,579	€6,270
Total Cost	€4,792	€5,191	€5,900	€5,240	€5,792	€6,458	€6,543	€6,385
Total Net Income/Loss	-€33	€40	-€129	€82	-€66	€63	€36	-€115
Opera Performances	23	25	26	23	24	25	25	26
Cost per Performance	€208	€226	€257	€228	€241	€258	€262	€246

Source: Festival Office

Table 3. Savonlinna festival revenue sources - percentages

Revenue Item	1996	1997	1998	1999	2000	2001	2002	2003
Ticket sales	62%	65%	60%	64%	59%	60%	60%	62%
Govt grants	12%	12%	11%	12%	11%	9%	9%	10%
Govt rent subsidy	0%	0%	0%	1%	4%	7%	4%	4%
Savonlinna City grant	8%	7%	6%	7%	6%	5%	5%	6%
Other income	18%	16%	23%	17%	20%	19%	22%	19%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Source: Festival Office

economy industries that do not progress cease production if they become too expensive. The argument for public support in Table 2 rests on market failure in that the Finnish Government wishes to encourage the consumption of opera and the external benefits of the Festival to the resort town of Savonlinna.

Table 3 presents a breakdown of revenue sources for the Festival. The major item is ticket sales, with 'Other income' representing the activities of Savonlinna Opera Festival Ltd, approximately evenly split between sponsorship and commercial trading. Unlike the Royal Opera House in Covent Garden, where government subsidy is conditional on a policy of offering low priced tickets for certain seats and product development, the Finnish Government does not impose terms on grant support. This difference can be attributed to the fact that Covent Garden receives 50% government subsidy and raises just over 40% of its revenue from ticket sales (Frank and Wrigley, 2001). The Savonlinna Opera Festival may be compared to more commercial houses, such as the New York Metropolitan Opera, in raising 60% or more of its revenue through the Box Office.

6 Pricing Opera Seats

All arts venues offer a range of prices according to seat location, night of the week, guest artists and particular shows. Viewing position in relation to the stage normally constitutes the main basis for segmenting demand. For opera this is no different, with prices also being raised generally for superstars, premieres or operas that are costly to produce. Prices may also be reduced to attract audiences to contemporary opera (Blaug, 1997). Establishing a patrons' association that allows seasonal subscriptions is a revenue management tactic that enables the cross-subsidisation of the repertoire mix, so as to enhance the creative freedom of the artistic director to put on contemporary and lesser-known works (Towse, 2003).

6.1 Savonlinna Opera Pricing

Table 4 shows the price panel for the Festival repertoire for 2003. Seats in the Brown (Box) zone include interval refreshments, while those in the Green zone have a restricted vision of the stage. The bulk of the seats are in the main well of the Castle's courtyard in direct view of the stage and are the main focus for ticket sales. Members of the Patrons' Association are entitled to a 15% discount on seats and groups, which include tour packages, are allowed 5% for ten or more international visitors and twenty or more domestic customers. The price panel shown is well below the major locations such as London, New York, Saltsburg, Verona and Vienna, but, as noted long ago by Hall and Hitch (1939), the structure has evolved as a matter of custom and reflects the judgement of the Festival Office as to the limits of market affordability. In the language of economics, the Festival Office is gradually 'feeling' its way to the point where demand for the repertoire becomes elastic. There is considerable anecdotal evidence that the demand for the performing arts, as with other visitor attractions, is inelastic: what matters is the quality of the experience. Felton (1992) tested this assumption using data from US companies and was able to show that on average the thesis was true but there were variations between organisations. For opera companies the price elasticities were well below one for most of them, with the remainder having price elastities not far above one.

Table 4. Savonlinna festival price panel - 2003

Seat Zone Colour	Brown Box 1–3	Brown Box 4–8	Blue	Yellow	Pink	Green	Wheelchairs
Premieres	€180	€145	€105	€98	€80	€47	€105
Other Nights	€171	€135	€95	€88	€72	€37	€95
Number of Seats	42	54	1463	388	198	112	3

Source: Festival Office

For the Savonlinna Festival the price panel is constrained by a self-imposed target to sell, on average, 90% of the 2,260 seats available for every performance, commensurate with the 'public service' objectives of the Festival. Included in this judgement is the likely strength of demand as witnessed by repeat visit rates, public subsidy and other sources of revenue, and external factors, such as the costs of access and the fact that accommodation establishments move to full-rate tariff during the Festival season, but it does leave a low margin of safety, given the variability of bookings and revenue flows, as the results for 2003 in Table 2 show.

7 Revenue Management

The above exposition of seat pricing does not conform to the textbook model of equating marginal revenue to marginal cost, which assumes knowledge of the demand curve and its elasticity, although the price panel in Table 4 does give notional acknowledgement to the demand schedule in terms of 'what the market will bear' as derived from past information on the level of sales. However, it does have theoretical underpinnings in the more recent concepts of revenue or yield management (Yeoman and Ingold, 1997). The latter is concerned with contribution per unit sold, whereas the former looks at revenue per unit sold.

The theory of revenue management has its origins in Baumol's sales maximisation model (1958 and 1967), which has been made a practical proposition with the advent of modern computing power allowing firms to process sales information and handle many different price sets much more rapidly than before. It is seen as applicable and of interest to businesses where the following six conditions prevail:

- Relatively fixed capacity;
- Product can be sold in advance;
- Demand fluctuates substantially;
- High operating leverage (low variable costs and high fixed costs);
- Demand can be separated;
- Inventory is perishable.

In the case of the Savonlinna Opera Festival, the repertoire is chosen to ensure that demand does not fluctuate widely and capacity is fixed by safety concerns due to the nature of the venue. With a full house, it takes nearly a half-hour to evacuate the castle and adding, say, a second tier of seating would not be allowed without cutting in new entrances and exits. Such alterations to an ancient monument are not currently within the bounds of possibility. The remaining four other conditions are applicable to the Festival.

The theoretical problem for the Festival is to maximise revenue (R) per performance over the, say, k different categories of seating (S_{i}) at the appropriate ticket prices (P_i), that is to maximise $R = \sum P_i S_i (i = 1, \ldots\ldots, k)$, given a common cost function that is established by the opera performance $C = f(\sum S_i)$, subject to a specified level of profit or net income (N), say N^*. This is the classical Lagrange optimisation problem requiring the maximisation of

$$\begin{aligned} L(S;\lambda) &= R + \lambda(N\text{-}N^*) \\ &= R + \lambda(R\text{-}C\text{-}N^*). \end{aligned} \tag{1}$$

Maximisation requires the following conditions (Kuhn and Tucker, 1951) to hold:

$$\frac{\partial L}{\partial Si} = \frac{\partial R}{\partial Si} + \lambda\left(\frac{\partial R}{\partial Si} - \frac{\partial C}{\partial Si}\right) \leq 0, \text{ for all } i = 1, \ldots\ldots, k \tag{2}$$

$$\frac{\partial L}{\partial \lambda} = R - C - N^* \geq 0 \tag{3}$$

As the supply of seats is positive, then the equality conditions in (2) hold so that it is possible to solve for the maximum revenue position subject to the constraint. This will occur when the marginal revenue per seat sold in all categories is equated to a value that is a fraction below the common marginal cost (since λ is positive), in the following manner

$$\frac{\partial R}{\partial Si} = \frac{\lambda}{1+\lambda} \cdot \frac{\partial C}{\partial Si} < \frac{\partial C}{\partial Si} \text{ for all } i = 1, \ldots\ldots, k. \tag{4}$$

As all costs are common, the marginal cost per seat is the same 'across the board', which therefore equates marginal revenue over all seat categories. If there were separate cost functions for each batch of seats then the marginal revenue at the optimum would vary by seat category: this only applies in the case of Box seats at the Festival where interval refreshments are included. Thus from (4), revenue maximisation is not the same in this case as net income or contribution maximisation. The latter requires marginal revenues to be brought into line with marginal costs. In theory, this implies that sales under revenue management applications will be greater than those under net income maximisation. However, an important condition of revenue management is that capacity is relatively fixed so that marginal costs in (4) are approximately zero, hence the revenue maximisation position is

$$\frac{\partial R}{\partial Si} = 0 \text{ for all } i = 1, \ldots\ldots, k\ , \tag{5}$$

and so it is now the same as net income maximisation, which is the appeal of revenue management to the service sector where a high operating leverage is the usual rule for the cost structure. Equation (5) implies that the Festival marketing department should identify the demand schedule for each category of seat and price to the point at which the absolute value of the elasticity of demand by category($|e_i|$) is equal to one, since this is both the revenue and net income maximising position. For

$$\frac{\partial R}{\partial Si} = Pi\left(1 + \frac{1}{ei}\right), e_i < 0 \text{ for all } i = 1, \ldots\ldots, k \tag{6}$$

which from (6) at the maximum gives

$$Pi\left(1 + \frac{1}{ei}\right) = 0 \text{ or } e_i = -1\ . \tag{7}$$

A diagrammatic exposition of the above is shown in Fig. 1. If the Festival management team were to charge one ticket price, they would sell S_1 seats at the point where the marginal revenue schedule (MR in Fig. 1) is equal to zero, and hence the marginal cost per seat. The ticket price would be set at P_1 to maximise revenue and hence net income. However, simply by segmenting demand into, say, three seat categories they could sell S_2 at a price P_2, then $S_1 - S_2$ at a price P_1 and finally $S_3 - S_1$ at a price P_3. The revenue generated, $\mathrm{P_2S_2} + P_1(S_1 - S_2) + \mathrm{P_3}(S_3 - S_1)$ is greater than P_1S_1. Thus, the principles of revenue management are about 'breaking' the demand curve in Fig. 1 into separate parts and maximising the revenue from each part.

It would be somewhat of a coincidence if (7) exactly matched the available supply of seats in that category. Either there would be excess demand, which would imply that all seats are sold out in that area of the Castle, but $|e_i| > 1$, which means that marginal revenue per seat is positive so there is untapped revenue to be gained if more seats were available, or there are unsold seats and price would have

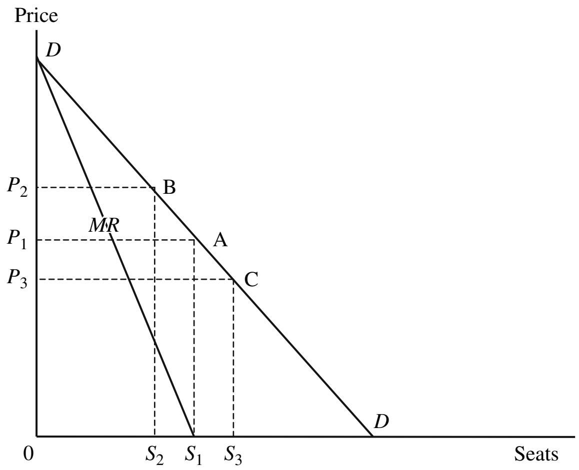

Fig. 1. Savonlinna festival seat pricing

to fall in this section to fill up available capacity. A general price fall would not be welcome in this category as $|e_i| < 1$, so the marginal revenue per seat is negative and overall revenue will fall. But in the fixed capacity situation, every sale is a contribution to costs hence it pays to introduce a further level of price segmentation by operating 'last minute' discount ticket policies for unsold seats, as, for example, the half-price ticket booth in London's West End. However, to succeed in such a venture there is need to have a high 'passing trade' in terms of visitors and local residents, something that the town of Savonlinna does not have. Furthermore, the management team for the Festival is against experimenting with 'last minute' discounts on the basis that this may affect existing bookings. Part of the market may trade-off the risk of not being able to obtain a ticket through not booking, against the opportunity of buying a highly discounted seat. There is a potential student market for such tickets on the Savonlinna Campus of the University of Joensuu, but the preferred route to meet this demand is to obtain ticket sponsorship for the youth market from a corporate donor, as in Salzburg.

7.1 Revenue Management at Savonlinna

As noted above the long run strategy is to break-even 'one year with another' by selling (on average per performance) 2,034 seats out of a possible 2,260 so as to allow for the 'roundaboutness' in demand arising from a mismatch of bookings and availability. This policy is shown on

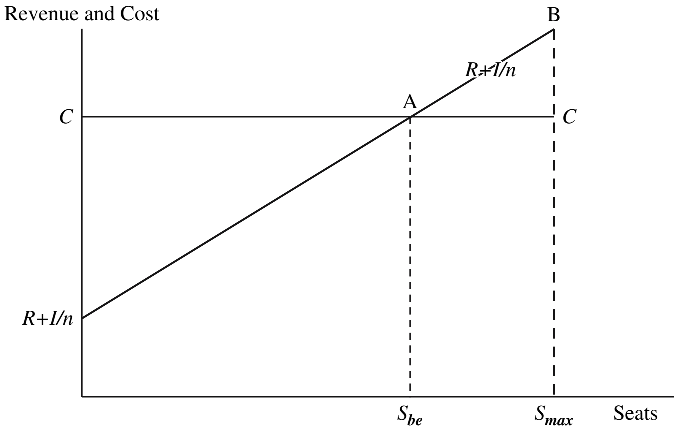

Fig. 2. Savonlinna festival break-even chart

the break-even chart in Fig. 2, where $R = \sum P_i S_i$, C is the total cost per performance, which is fixed by the repertoire, and I/n represents all other (non-box office) income averaged across n performances. Given $S_{be} = 2,034$ and $S_{max} = 2,260$, then the theoretical margin of safety is 226 seats, and the target is to set $R + I/n$ somewhere in the triangle ABC, on average for all opera performances to ensure that the Festival remains solvent.

Let N be net income for each opera performance, then from Fig. 2 the basic income model is

$$N = R + I/n - C \tag{8}$$

Given that C is fixed a priori by the repertoire, it follows that the break-even revenue, say, R^* is

$$R^* = I/n - C \tag{9}$$

and for a specified price panel as in Table 4

$$S_{be} = (I/n - C)/P \tag{10}$$

where P is the average ticket yield. The overall results for the Festival may be derived by multiplying (8) through (10) by the number of opera performances (n). At any one time, actual average seat sales (S) may fall below the required break-even sales, thus generating a net loss, as shown in Table 5 for the years 2000 and 2003.

Table 5. Savonlinna festival operating data – 2003 prices

Item	2000	2001	2002	2003
Average Ticket Yield (P)	€71	€74	€76	€73
Opera Performances (n)	24	25	25	26
Average Seat Sales per Performance (S)	1,997	2,104	2,074	2,048
Total Seat Sales (nS)	**47,930**	**52,604**	**51,852**	**53,249**
Total Ticket Sales (nR) (000s)	€3,383	€3,913	€3,947	€3,887
All Other Income (I) (000s)	€2,343	€2,607	€2,631	€2,383
Total Revenue (nR+I) (000s)	**€5,726**	**€6,520**	**€6,579**	**€6,270**
Cost per Performance (C) (000s)	€241	€258	€262	€246
Total Cost (nC) (000s)	**€5,792**	**€6,458**	**€6,543**	**€6,385**
Total Net Income/Loss (nN) (000s)	-€66	€63	€36	-€115
B-E Seat Sales per Performance (S_{be})	2,036	2,070	2,055	2,108
Available Seats per Performance (S_{max})	2,260	2,260	2,260	2,260
B-E Utilisation Rate (S_{be}/S_{max})	90%	92%	91%	93%
Actual Utilisation Rate (S/S_{max})	88%	93%	92%	91%

Source: Festival Office

What is apparent from Table 5 is that once the repertoire and price panel have been set, and granted some variation in non-box office earnings, then S_{be} is a shifting value according to the 'roundaboutness' of demand, which exposes the Festival to the 'downside' risk of failing to break-even, despite a high seat occupancy rate. The 90% rule is insufficient to account for the nature of the risk, which may be best explored by redefining (8) within a probabilistic framework as follows:

$$\begin{aligned} \mathrm{E}(N) &= \mathrm{E}(R) + I/n\text{-}C \\ &= \mathrm{E}(S)P + I/n\text{-}C \end{aligned} \tag{11}$$

and the variance is

$$\sigma_N^2 = \sigma_S^2 P^2 \tag{12}$$

Equation (12) shows that net income volatility is directly proportional to the variance in seat sales and the square of the average ticket yield. From the most recent 2000-2003 data shown in Table 5, the value of $\mathrm{E}(S) = 2,056$ and $\sigma_S = 45$, thus the expected margin of safety with the 90% rule is only 22 seats per performance and not the theoretical 226.

No probabilistic information about the range of outcomes for (11) may be conveyed without something being said about the distribution of the demand for seats, S. It is assumed that S is distributed with only one mode and is symmetrical about the mean. From this it follows that the mean and mode coincide, so that possible outcomes may be determined from $E(S)$ and σ_S alone, or from another standard distribution with a known degree of skewness. The most common distribution used in pricing models that fits the assumed pattern is the Normal (Gabor, 1980), but from statistical quality control theory, the Camp-Meidell inequality shows that for symmetrical distributions the probability of an outcome that is greater than, say, x standard deviations from the mean is $1/(4.5x^2)$ even if the exact probability distribution is unknown.

The tabulated results for the Camp-Meidell cumulative inequality function (CIF) and the cumulative distribution function of the Normal are presented in Table 6. Since the Camp-Meidell CIF is undefined for standard deviations below one, results in the range -1 to $+1$ are calculated by interpolation. It may easily be seen that the 2,034 seat sales break-even target is only $-0.48\sigma_S$ from the mean, which, at best, has a probability of 68% success. By moving the target to $-1.00\sigma_S$ below the mean at 2,010 seats, the chances of breaking even increase to somewhere between 78% and 84%. Clearly, this would involve recalculating the price panel to determine average yield at 2,010 seats per performance rather than 2,034.

Table 6. Savonlinna festival demand outcomes

Seat Sales per Performance	No. of Standard Deviations from Mean	Camp-Meidell Cumulative Inequality Function	Normal Cumulative Distribution Function
2,169	2.50	4%	1%
2,147	2.00	6%	2%
2,124	1.50	10%	7%
2,101	1.00	22%	16%
2,056	0.00	50%	50%
2,034	**-0.48**	**63%**	**68%**
2,010	–1.00	78%	84%
1,988	–1.50	90%	93%
1,965	–2.00	94%	98%
1,942	–2.50	96%	99%

Table 7. Savonlinna festival revenue model - Camp-Meidell CIF

Average Ticket Yield (P)	Break-Even Probability	Net Income €50,000 Probability	Net Income €100,000 Probability
€70	3%	2%	2%
€71	6%	4%	2%
€72	14%	6%	4%
€73	33%	15%	7%
€74	50%	34%	16%
€75	67%	51%	35%
€76	85%	67%	51%
€77	93%	85%	68%
€78	96%	93%	85%
€79	97%	96%	93%
€80	98%	97%	96%

Table 7 draws up the yield schedule for the Festival using the Camp-Meidell CIF. It is based on average seat sales, 25 opera performances at an average cost of €252,000 each, and all other income, including various grant aid, amounting to around €2.5 million. As P rises so S_{be} declines in relation to $\mathrm{E}(S)$ and the probability of breaking even, as well as making the specified net income surpluses, escalates.

By using a probability model rather than simply the reporting of accounting information, the Festival Office is better able to incorporate the 'roundaboutness' of demand in its pricing decisions. If 2,010 seats were designated as the target per performance, then this would require the price panel to be set so that $P =$ €75.62. This may be met singularly or by a combination of 'across the board' rises in the price set, greater differentials between the various seating zones shown in Table 4, or increased demand segmentation, particularly for the Blue zone, which has 1,463 seats. In other words, the revenue model in Table 7 does not dispense with decision-making by the management team, but serves to elucidate the various options. Should the Festival Office make the judgement that it is unable to raise average ticket yield, then shrinkage of the repertoire is a way of avoiding the possibility of making a net loss, as in the case of US opera houses. Alternatively, other options are to seek greater public subsidy (considered unlikely in this instance) and sponsorship, in common with most not-for-profit organisations.

8 Concluding Discussion

In a theoretical world, perfect price segmentation requires each ticket sale to be negotiated with every customer so as to extract the maximum willingness to pay. By this means the marginal revenue curve becomes coterminous with the demand (average revenue) schedule and revenue from all sales is maximised. As with other arts venues, the Savonlinna Opera Festival operates a practical solution to the theory by segmenting the market offer according to seat location and whether the opera performances are premieres or not. This generates greater revenue than could be achieved by a 'one price only' policy and allows the surplus achieved on the better seats to compensate for lower prices on the poorer seats.

Since 1972 the Festival has grown incrementally to reach its current 'steady-state' mode of operation. Strength of sales is used as an indicator of the demand schedule and having a 70%–75% repeat visit rate gives assurance that the overall target of 90 % seat utilisation is achievable. However, as Table 5 indicates this target is insufficient to eliminate the 'downside' risk of loss, which is largely attributable to 'turbulence' in bookings and a more robust model of revenue management should be considered.

The Festival manages to earn some 60% of its revenue from ticket sales, which is comparable to the financial performance of the best opera houses. However, it has been shown that its operations exist on a low margin of safety that curtails the ability of the Festival to take risks with new artistic ventures. On the Festival's 'wish list' for the future is greater public sector investment in marketing the Savonlinna area and lower access costs to enable it to shift its audience mix from 80:20 domestic to foreign to 70:30. Commensurate with this is an improvement in hotel quality to attract foreign guests, but the short season constrains the level of investment required to accomplish this.

8.1 Postscript

Since this research was undertaken, the Festival Office has pursued a more aggressive stance on its pricing policy. Average ticket yields have risen by about 13% in real terms and 374 seats have been taken out of the Blue zone to form a new premium price market segment. The years 2004 and 2006 were some of the best seasons ever for the Festival. On the downside, the results for 2005 were greatly affected by relatively poor bookings for the production of *The Tales of Hoffman*, which was carried over from the previous year, and the objective of shifting the audience mix has yet to be reached.

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