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ABSTRACT

Intermediaries as Bundlers, Traders and Quality Assessors: The Case of UK Tour Operators*

We study the intermediary role of tour operators in the market for package tourism. Intermediaries often arise in order to facilitate trade in markets characterized by asymmetric information. In the travel industry policy-makers have tried to address information asymmetries by providing hotel ratings. We argue that those ratings are not accurate indicators of quality. Ratings provided by tour operators are more informative and allow for international comparisons. Intermediation by tour operators provides a better matching of quality with price and therefore leads to a more efficient market outcome. There is, nonetheless, scope for government intervention to improve information provision.

JEL Classification: L15 and L83
Keywords: asymmetric information, intermediaries, middlemen, tour operators and tourism industry

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1 Introduction

Imperfect information is an important feature of many markets. Its simplest and most widely-studied forms is the asymmetric information case where the seller of an object knows its true value while potential buyers do not. Akerlof (1970) pointed out how this informational asymmetry can hinder the proper functioning of markets and lead to suboptimal levels of exchange. In extreme cases, the buyer's inability to assess quality can kill markets for high quality goods.

This gloomy prediction is often overcome in practice through various mechanisms such as the provision of warranties and the building of reputations. Additionally, in some markets information asymmetries give rise to a new class of agents whose purpose is to ascertain the quality of an object and make that information available to potential buyers. By providing that service the intermediary, or middleman, mitigates the information problem and facilitates trade. Buyers and sellers can both benefit from the presence of an intermediary and they are willing to pay for his services. Thus the intermediary has an incentive to invest resources in acquiring the skills that enable him to assess quality. Well-known intermediaries include firms like Moody's and Standard & Poor's, whose rating services play a crucial role in the proper functioning of financial markets. Other agencies rate consumer products or services: *Consumer Reports* evaluates consumer products, while the American Automobile Association rates hotels. Governments often take on the role of the rater; for example, they provide hygiene certification for restaurants and quality ratings for hotels.

In all of the examples above the intermediary is a third party who facilitates a transaction but is not directly involved in it. This is not always the case. In some markets, information providers are also traders. Retailers are an obvious example. Consider a retailer who sells several brands of consumer electronics. When a consumer walks into the store, the retailer provides information about each of the products. In addition to technical features and specifications, the retailer may also relay to the prospective buyer the experience of other customers who have previously purchased the product. The rise of the internet has formalized this process by allowing consumers to rate products they have bought or merchants they have transacted with. Internet retailers such as `amazon.com`, auction sites like `eBay.com` and opinion sites like `epinions.com` are excellent sources of information about products and merchants. Retailers may also engage in other practices such as bundling together the products of different manufacturers or promoting some products more than others. Retailers implicitly act as quality certifiers by stocking goods of a certain minimum quality.[1] Typically, however, they will stop short of explicitly rating the products themselves.

In this paper we study a market where intermediaries play the multiple roles of bundlers, traders and quality certifiers. The tourism industry is characterized by a large degree of asymmetric information. Prospective tourists typically need to transact with agents such as hotels and car rental agencies who are located in faraway destinations, often in foreign countries.

[1] This point was made by Marvel and McCafferty (1984); they use this insight as an explanation for resale price maintenance. Chu and Chu (1994) build on that argument to show how manufacturers of high quality products can signal their quality by distributing through reputable retailers.

The quality of the accommodation and the surrounding locality is difficult to ascertain without first-hand experience. In choosing a destination the tourist needs to search for information on numerous available options, a process that can be costly and time-consuming. He also needs to arrange transportation to his desired destination on his preferred dates; this is not always easy to do. Tour operators step in and perform four vital intermediary functions. First, they collect objective information about alternative destinations and present it in brochures suitable for comparison shopping. Second, they provide subjective ratings of the different destinations based on both customer feedback and their own assessment of the facility. Third, they minimize transaction costs by selling bundles of transportation, accommodation and other services. And fourth, they exploit scale economies by pooling together tourists headed to the same destination.[2]

We are interested in evaluating the intermediary role of tour operators in the international travel industry. Our analysis utilizes data on the prices and characteristics of holiday packages from the United Kingdom to various Mediterranean holiday destinations. Importantly, the data include two quality ratings for each hotel. One is the "official" rating given by the hotel's national rating agency. Many governments – particularly of countries that try to promote tourism – have entered the business of rating hotels in an effort to address the information problem faced by prospective tourists. A second rating is provided by tour operators themselves. Although the two ratings coincide in most cases, there is a substantial number of hotels where tour operators give either higher or lower ratings than the national agency.

The fact that tour operators feel the need to intervene in the market by providing their own ratings could be interpreted as an indication that government-provided ratings do not accurately convey quality and fail to adequately address the information problem. Tour operators are in a better position to provide accurate quality ratings for at least two reasons. First, each national rating agency sets its own standards, so national ratings are not comparable across countries. Second, national ratings are typically based on checklists of objective and easily verifiable criteria. Unlike tour operator ratings, they rarely incorporate additional information such as consumer feedback. Our data show that operator ratings are indeed less country-dependent than nationally provided ratings. They do, therefore, go at least some way towards resolving the information asymmetry. We also show that operator ratings are much more tightly correlated with prices. Thus operator ratings provide a better matching of quality with price and therefore lead to a more efficient market outcome.

We also explore cross-country differences in price and quality. We find that systematic price differences exist across the nine Mediterranean destinations covered in our dataset. This prompts us to ask whether cross-country quality differences are just random outcomes or the result of conscious national policies. We observe that some countries have higher standards than others in assigning hotels to categories. We conjecture that this may indicate that some countries use the hotel rating system as a means of manipulating hotel quality and thus the quality of their national tourist product. Finally, we discuss the policy implications of our findings and in particular whether further government intervention is warranted to improve information availability to potential tourists.

[2]The first two tasks are also performed by other entities, such as travel magazines, but on a much smaller scale.

2 Related literature

A substantial theoretical literature has analyzed the performance of markets when information is incomplete. We focus on the asymmetric information case where consumers cannot precisely assess a product's quality before purchasing it. A series of papers starting with Klein and Leffler (1981) explores ways in which such market environments can sustain equilibria with a positive price-quality relationship, signifying that price serves as a (correct) signal of quality. The main idea behind these papers is that an equilibrium with both high and low quality producers can only be sustained if high-quality producers can set prices above competitive levels and earn a positive stream of profits. Otherwise, they will be tempted to cut quality (and thus cost) and increase short-run profits as unsuspecting consumers will purchase the damaged good at the premium price. The mechanism that delivers this equilibrium varies from paper to paper. In Klein and Leffler (1981) firms add credibility to their quality promises by making sunk investments in nonsalvageable capital (such as advertising). In Shapiro (1983) firms build a reputation by selling high-quality products at the low-quality price upon entering the market, while in Allen (1984) consumers can infer product quality from the firm's choice of price and quantity.

A different strand of the literature has explored the conditions under which intermediaries (middlemen) emerge. In one branch of the literature (Rubinstein and Wolinsky 1987, Fingleton 1997) intermediaries facilitate exchange by speeding up the time-consuming matching process between buyers and sellers. A second branch examines the scope for intermediation in markets where product quality is unobserved. In Biglaiser (1993) and Biglaiser and Friedman (1994), middlemen arise for two reasons. First, they buy more goods than an ordinary buyer and thus have a greater incentive to invest in skills that enable them to detect the true quality of a good. Second, because they are in the market for a long time they may place a higher value on maintaining a reputation and thus be more likely to report the true quality of a good.

The empirical literature on the value of information has only began to blossom fairly recently. Jin and Leslie (2003) study the impact of government provided information in the case of restaurant hygiene report cards. The find that the report card system has led to an improvement in hygiene. In a follow-up paper (Jin and Leslie 2004) they argue that an effective reputation mechanism provided incentives for a substantial number of restaurants to maintain high quality standards even before the report card system was implemented. Dewally and Ederington (2006) compare the effectiveness of four different strategies (reputation building, certification, warranties, information disclosure) in resolving seller-buyer information asymmetries in the online comic book market. They find that certification by a third party is the strongest signal. Reputation is also important, while warranties and information disclosure are less effective. Jin and Kato (2004) study the online market for baseball cards. Sellers can either send their card to professionals to have it graded or they can make their own (unverifiable before purchase) claim about the card's quality. Both graded and ungraded cards are traded on the market. The authors make two interesting observations. First, many high quality cards are sold without being graded even though graded cards are sold at a premium that is much greater than the cost of having a card graded. Second, a surprisingly large number of low-quality ungraded cards are

sold at premium prices, apparently because buyers take the seller's quality claim as accurate. This example is a good illustration of the extent of the information problem in many markets and the important role of intermediary rating services. Finally, we note the existence of a large literature in finance which tries to evaluate the information content of bond ratings.[3]

3 Industry and data

Millions of North Americans and northern Europeans flock to southern beach resorts every summer. Geography dictates that Americans congregate in the Caribbean while Europeans prefer the Mediterranean. The typical tourist is interested in a comfortable hotel, a sandy beach, lots of sunshine, and plentiful food and drink. Package holidays that include all of the above are designed with this tourist in mind. Tour operators provide centralized information about holiday packages to different destinations. This information has traditionally been distributed in glossy printed brochures, while recently it is becoming increasingly available on the internet. It includes the details of the package (length of stay, services included, price, etc); hotel characteristics (quality rating, amenities such as swimming pools, restaurants, athletic facilities, cultural activities); and characteristics of the locality (distance to beach, distance to a town, etc.). The large number of available destinations and easy access to centralized information give the consumer a wide range of choices.

3.1 The UK market for package tourism

The UK holiday industry is a mature market that goes back many decades. A long history of consolidation has left the industry with four major players: Thomson Holidays (part of The World of TUI group), Thomas Cook, MyTravel Group (formerly Airtours) and First Choice. In 1996 they held about 56% of the market, while the remainder was split among hundreds of small tour operators, none of which had more than 2% of the market.[4] The four major operators are vertically integrated both upstream into air transportation (charter airline operation) and downstream into retail distribution (ownership of travel agencies). The trend towards vertical integration, which was completed in the 1990s, prompted an extensive investigation by the UK Monopolies and Mergers Commission (MMC) regarding possible anti-competitive effects. The investigation concluded that the anti-competitive impact of vertical integration was slight.

In 1999 Airtours and First Choice announced their intention to merge. The merger, which would have made them the largest tour operator in the UK, was blocked by the European Commission.[5] Contrary to the position taken by the MMC, the European Commission ruled that the relevant market for the evaluation of the merger was the *short-haul* foreign package holiday market. Short-haul holidays include mostly Mediterranean destinations, while destinations such

[3]For a recent example see Kliger and Sarig (2000).

[4]Source: Monopolies and Mergers Commission (1997).

[5]The decision was later overturned by the European Court of First Instance, but the merger was abandoned anyway.

as Thailand, Florida and the Caribbean are considered long-haul. The Commission's ruling suggests that we can focus on one of the two market segments. We chose to concentrate on the short-haul market for a number of reasons. First, the short-haul market is more concentrated into the hands of the four major operators. Second, the relative homogeneity of short-haul destinations facilitates cross-country comparisons. And third, the large number of destinations per country gives us enough degrees of freedom to support inference at the country level. In 1998 the four major tour operators held a combined 85.5% of the UK short-haul foreign package holiday market: Thomson had 30.7%; Thomas Cook, 20.4%, Airtours 19.4% and First Choice 15.0%.[6]

3.2 Data

Our data were taken from the 2003 catalogues of the two biggest tour operators, Thomson and Thomas Cook. Each operator publishes a large catalogue (with an enticing name like "Summer Sun") that lists all packages available to various destinations. Several different packages are available for each hotel. The traveler can choose the number of days he will be staying (usually 7, 10 or 14) and the meal option he prefers (self-catering, bed and breakfast, half-board, full-board). For each hotel-year we focus on the seven-day, half-board package in high and low season.[7] Whenever a half-board package was not available we took the price of an alternative package, usually the full-board one. The data for each package include the price, official star rating, dates and duration of stay, and several hotel and locality characteristics. In addition, Thomson reports satisfaction scores that it collects from its customers. Four ratings are available for each hotel: one for accommodation quality, one for food quality, one for location, and overall satisfaction.

There are 229 hotels in the Thomson catalogue and 151 hotels in the Thomas Cook catalogue. Eighteen hotels are included in both catalogues, leaving us with 362 unique hotels. The overlap between the two catalogues is surprisingly limited. It might indicate that agents specialize in different niches of the market, or that hotels prefer to deal with only one operator.[8] Hotels are located in the following Mediterranean regions: Cyprus, Egypt, Greece, Italy, Malta, Spain (which is divided into Mainland, the Balearic Islands and Canary Islands), Tunisia and Turkey. Table 1 shows the distribution of hotels by official star rating in each region.[9] Four-star hotels are the most popular with both agents, but Thomson has more three- and two-stars hotels in its portfolio.

[6]Source: AC Nielsen data reported in European Commission (1999).

[7]We chose the second week of August for our high-season package and the second week in May for the low-season package. We carried out our analysis on high and low season prices separately and got very similar results. Consequently, in the paper we only report results using high season prices.

[8]The bargaining process between hotels and TOs raises many interesting issues that go beyond the scope of this paper. Our analysis is conditional on the existence of agreements between TOs and selected hotels.

[9]Greece presents a problem because it does not rate its hotels according to the usual star system. Instead, it has categories called Deluxe, A, B, and C. We translated this into stars by assigning five stars to Deluxe hotels, four stars to category A hotels and 3 stars to category B and C hotels.

Table 1: Distribution of hotels by country and star rating

Country	2-star	3-star	4-star	5-star	Total
Balearics	5	39	26	0	70
Canaries	0	8	43	1	52
Cyprus	1	9	24	2	36
Greece	0	19	35	10	64
Italy	0	9	35	1	45
Malta	0	2	12	1	15
Spain	2	20	34	0	56
Tunisia	0	2	15	3	20
Turkey	1	5	9	7	22
Total	9	113	233	25	380
Of which:					
Thomson	7	77	132	13	229
Thomas Cook	2	36	101	12	151

3.3 Hotel quality ratings

Most countries, especially those that try to promote themselves as tourist destinations, have established agencies whose role it is to rate hotels according to a star system. National ratings are typically based on objective and easily verifiable criteria. Essentially, the rating agency compiles sets of features that are necessary for each star category. Such features may include the number of restaurants and swimming pools, availability of sports facilities (tennis courts, volleyball courts, gym, aerobics instructors, etc.), number of wait and cleaning staff, whether rooms have private bath (as opposed to shower), satellite TV, etc.

The obvious shortcoming of national ratings is that they do not lend themselves to cross-country comparisons. Every country's national rating agency has its own set of criteria for awarding stars, hence four-star hotels in one country may on average be of higher or lower quality than four-star hotels in a different country. There are other reasons to question the usefulness of national ratings. Aspects of quality that are not easily quantifiable are often left out of the process in order to avoid controversy. Moreover, it is easy to imagine that indifference and corruption among the civil servants that carry out the inspections could taint the ratings (at least in some countries). Finally, even if the ratings are correct when the stars are first awarded, it is not clear how meticulous national authorities are about revisiting hotel establishments and reassessing their star-worthiness.

Tour operators are well aware of these limitations and many of them have devised their own rating system. The TO's rating of each hotel is provided in the brochures, alongside the official rating. Thus the consumer is able to use the tour operator's rating as an objective indicator of quality that is comparable across countries. The agent's rating is an extremely useful benchmark that we will make extensive use of in this paper. Operators' ratings are based

on objective criteria similar to those used by national rating agencies but also – critically – on information they collect from past customers and their own experience with the establishment. Given their improved information content, these ratings should reflect quality better than those provided by national rating agencies.

On the other hand, it is possible that operators are not objective in their ratings. For example, they may systematically upgrade hotels in order to justify higher prices. One could also imagine scenarios where tour operators use the threat of downgrading a hotel as a bargaining tool in price negotiations. From a theoretical standpoint, it is hard to imagine that operators can give misleading ratings on a systematic basis. Such behavior may successfully mislead consumers in the short run, but it is unlikely to be sustainable in the long run. This is especially true in the case of some operators (such as Thomson), who publish separate customer feedback scores in addition to their own rating. This allows readers to separate out the impact of the operator's assessment of the facility on the overall rating. Such transparency makes it difficult for the operator to manipulate ratings. Indeed, the ensuing analysis reveals no evidence of systematic bias in operator ratings.

Table 2: Summary statistics for customer satisfaction ratings

Rated item	Mean	Std dev.	Min.	Max.	N
Location	0.889	0.108	0.365	1	183
Accommodation	0.918	0.075	0.595	1	183
Food	0.819	0.135	0.311	1	172
Overall holiday satisfaction	0.966	0.029	0.811	1	183

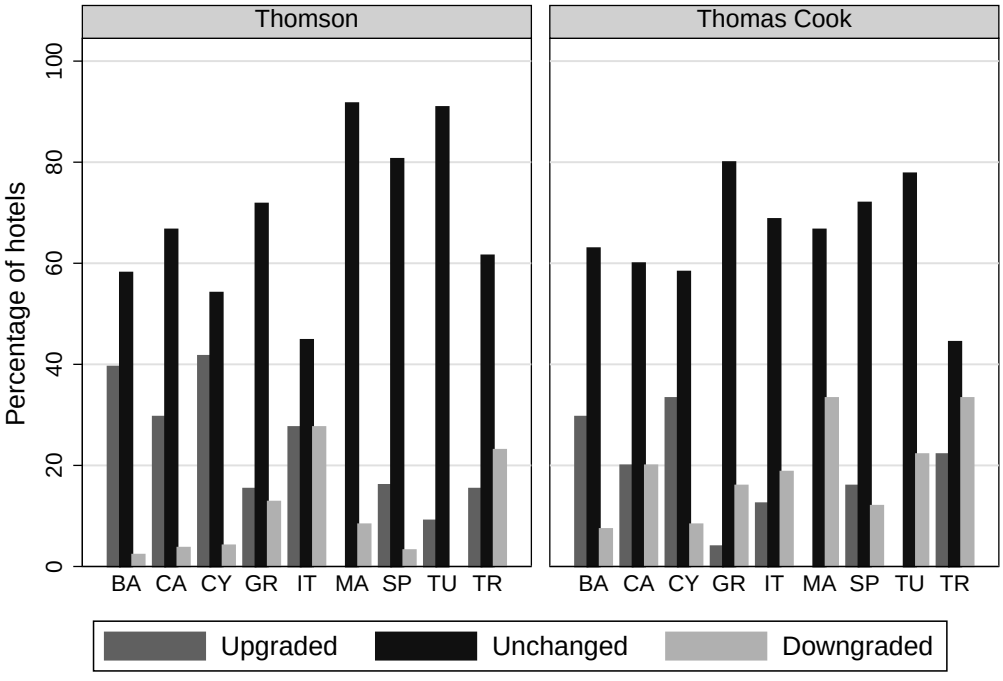
Summary statistics for consumer satisfaction scores are provided in Table 2. Such scores are provided for 183 out of the 229 hotels (172 for food). Note that although the overall holiday satisfaction score exhibits little variation, the other three indices vary by a fair amount. Table 3 displays a frequency cross-tabulation of official versus operator ratings separately for each operator. The number in each cell is a count of hotels with the corresponding ratings. The cross-diagonal (in boldface) indicates agreement between national and agent ratings. Although the majority of ratings coincide, a substantial number of hotels are off the diagonal, meaning that they get a different rating from the agent than they do from their national agency. Moreover, discrepancies go in both directions: some hotels are upgraded by the agent while others are downgraded. Three-star hotels are more likely to be upgraded by both agents. Thomson is also more likely to upgrade four-star hotels, while Thomas Cook is roughly equally likely to upgrade or downgrade them. Note also that Thomas Cook creates intermediate categories by giving out pluses ("+").

Thomson is much more likely to upgrade hotels rather than to downgrade them. One interpretation may be that the operator has low standards and upgrades hotels in order to justify higher prices. An alternative interpretation is that in selecting hotels to include in its catalogue Thomson targets undervalued destinations which it then goes on to upgrade. The latter interpretation is consistent with Thomson being the more downmarket operator; more evidence in support of that picture will be provided later on.

Table 3: Cross-tabulation of national versus operator ratings

		National Rating				
		2-star	3-star	4-star	5-star	Total
	2-star	**2**	9	0	0	11
Thomson's	3-star	5	**46**	9	0	60
Rating	4-star	0	22	**93**	3	118
	5-star	0	0	30	**10**	40
Total		7	77	132	13	229
	2+ -star	1	1	0	0	2
Thomas	3-star	1	**22**	5	0	28
Cook's	3+ -star	0	12	11	0	23
Rating	4-star	0	1	**74**	4	79
	4+ -star	0	0	8	3	11
	5-star	0	0	3	**5**	8
Total		2	36	101	12	151

Figure 1: Hotel upgrading and downgrading by agent and region



Regions: BAlearics, CAnaries, CYprus, GReece, ITaly, MAlta, SPain, TUnisia, TuRkey

Table 4: Rating differences among travel agents

	Thomas Cook			
Thomson	Downgrade	Same	Upgrade	Total
Downgrade	**1**	0	0	1
Same	1	**9**	3	13
Upgrade	0	2	**2**	4
Total	2	11	5	18

In Figure 1 we report the frequency of upgrading and downgrading of hotels by each agent in each country. The dark middle bar for each country represents the proportion of hotels that received the same rating by both the national agency and the tour operator. The bar to the left represents hotels that were upgraded by the operator, while the bar to the right represents those hotels that were downgraded. A visual examination of this picture suggests that Thomson mostly upgrades hotels in Spain (all regions), Cyprus and – to a smaller extent – Tunisia, while it downgrades to a small degree Maltese and Turkish holiday establishments. Thomson Cook also upgrades hotels in the Balearics and Cyprus, but it seems more likely to downgrade hotels, mostly in Malta and Tunisia but also in Greece, Italy and Turkey.[10]

The fact that 18 hotels appear in both catalogues gives us the opportunity to check whether the two operators' ratings are consistent with each other. The number of hotels is too small to support statistical inference, but we can at least look for blatant discrepancies. A summary of the ratings is provided in Table 4. Half of the 18 hotels maintain their official rating in both catalogues. Thomas Cook provided a different rating more often, probably because it has intermediate categories. It downgraded two hotels, one of which was also downgraded by Thomson, and upgraded five hotels, two of which were also upgraded by Thomson. Thomson upgraded two other hotels that Thomas Cook did not upgrade. Reassuringly, there is no case of a hotel that was upgraded by one agent but downgraded by the other. Some of the differences can be attributed to the fact that Thomson takes into account customer feedback in formulating its ratings, while Thomas Cook bases its ratings on "the views of its own managers in the UK and overseas". Overall, we could find no evidence that operators provide biased ratings.

[10] We tested this formally with an ordered logit regression. The dependent variable took the value of 1 if the hotel was upgraded by the TO, 0 if the two ratings coincided, and -1 if it was downgraded. The explanatory variables were country dummies. The results confirmed that hotels in Cyprus and Spain are systematically upgraded, while those in Turkey are downgraded. Greek, Italian, Tunisian and Maltese hotels are also downgraded, but the significance of those estimates is marginal.

4 Empirical analysis

4.1 Conceptual framework

We start by sketching a conceptual framework that will guide and motivate our empirical analysis. The relevant market is package tourism; a product in this market is a vacation package that includes – at the very least – accommodation at and transportation to a pre-specified hotel. In addition the package may include meals, excursions, and other services. Products are inherently differentiated and consumers will choose at most one of the numerous options available to them. Hence a discrete choice representation is a natural way to conceptualize this market. Product attributes can be categorized as general, national (or regional) and hotel-specific. General attributes include contract terms that are not specific to the destination, such as the length of stay, transportation to and from the departing airport, time of departure, meals included, level of service. National characteristics include weather, cleanliness, safety, interesting sites, cultural activities, and quality of other local services such as restaurants. Hotel attributes include the various services and amenities being offered and the hotel's official star rating. Because we are interested in differences across destinations, we abstract from general characteristics by considering a package of fixed contract terms. We denote hotel-specific characteristics by H and national characteristics by N.

National rating agencies observe a subset $H^n \subset H$ of hotel characteristics. Each country n has its own rating system, which is a function $\mathcal{S}^n(H^n)$ that maps hotel characteristics onto a star rating $S_n \in \{2, 3, 4, 5\}$. Tour operators observe a set of hotel characteristics $H^o \subset H$, a set of national characteristics $N^o \subset N$, and the national rating S_n. Some operators may also observe a customer satisfaction score for each hotel, which is denoted by CS. Each operator has his own rating system $\mathcal{S}^o(H^o, CS^o, S_n)$. There is no n superscript because the operator applies uniform criteria across all countries. Moreover, national characteristics do not enter as an argument in the rating function because a rating system is strictly an assessment of the hotel. We impose no a priori restrictions on the relationship between H^n and H^o. It is possible that operators observe some characteristics that national agencies do not, and vice versa.

We think of consumers as having preferences over characteristics H and N and over the star ratings S_n and S_o. Consumers value the ratings because they can not observe all elements in H, so the ratings may incorporate additional information. Tour operators take consumer preferences into account in order to formulate a pricing function $\mathcal{P}^o(H^o, N^o, S_n, S_o)$. Consequently, the price of a package depends on the characteristics of the region as well as the quality of the individual hotel. We note also that the assumption that operators first choose a rating and then a price is a reflection of our earlier claim that operators do not manipulate ratings.

4.2 National and operator ratings

We begin our empirical analysis by estimating empirical analogues of the rating functions $\mathcal{S}^n(H^n)$ and $\mathcal{S}^o(H^o, CS^o, S_n)$. Let S_i^n and S_i^o be the national and operator ratings of hotel i whose

characteristics are described in vector H_i. The hotel's location (region) is encoded in the vector of dummies D_i and customer satisfaction scores are included in vector CS_i. The general form of the equations to be estimated is:

$$S_i^n = \alpha^n + H_i'\beta_h^n + D_i'\beta_d^n + CS_i'\beta_{cs}^n + \varepsilon_i^n \quad (1)$$

$$S_i^o = \alpha^o + H_i'\beta_h^o + D_i'\beta_d^o + CS_i'\beta_{cs}^o + \beta_s S_i^n + \varepsilon_i^o \quad (2)$$

The equations were estimated using an ordered logit specification as the dependent variables are discrete. In columns 1-3 of Table 5 we present the results of estimating equations (1) and (2) with just hotel characteristics and country dummies (omitting satisfaction scores and the official rating). We do not report the specific coefficients on each characteristic as they are not of interest. Instead, at the bottom of the table we report the results of testing the null hypothesis that all coefficients on characteristics are zero ($\beta_h = 0$). The hypothesis is easily rejected in both cases, indicating that characteristics are important determinants of ratings.

Coefficients on country dummies can tell us whether operator ratings are successful in making their ratings comparable across countries. We know that country effects should be important in the national rating function in (1) because each country has its own rating system. We therefore expect that country dummy coefficients (β_d^n) will be statistically different from zero. On the other hand, country effects should not in principle affect tour operator ratings; we should have $\beta_d^o = 0$. But this will only be true if both we and the tour operators observe all relevant attributes; that is, if $H_i = H^o = H$. If there are unobserved elements in H that are correlated within countries, this will show up in our regression as country effects ($\beta_d^o \neq 0$).

As expected, most country dummies come out significant in the national rating regression. Some of them are also statistically different from zero in the operator regression. This means that operators are not successful in making ratings completely comparable. On the other hand, the coefficients in the operator regression are smaller than the ones in the national regression and they contribute less to the likelihood function. In the last row of the table we present test statistics for the null hypothesis that the country dummies are all zero. The null is rejected for both regressions, but more strongly so in the national regression. We interpret this as evidence that operators are successful in mitigating the information problem by providing ratings that are more suitable – albeit not perfect – for international comparisons.[11]

In columns 4-6 we present results from the full specification. In the case of Thomas Cook hotels (column 4), this involves adding just one variable, the national rating (no customer satisfaction scores are available).[12] Doing so is enough to remove all statistical significance from the country dummies. Only one coefficient remains significant at anything better than the 10% level, and the hypothesis that all coefficients are zero cannot be rejected.

[11] We also implemented more formal tests by stacking the data and estimating the rating function while allowing coefficients on characteristics and country dummies to differ. The hypothesis that coefficients on country dummies are the same was rejected at the 5% level.

[12] Alternatively, we could have moved the national rating to the left-hand side and used the *difference between the ratings* as the dependent variable. The results were very similar in that case.

Table 5: Ordered logit estimates of rating functions

Variable	Nat'l	Thomson	ThCook	ThCook	Thomson	Nat'l
	(1)	(2)	(3)	(4)	(5)	(6)
Balearics	-0.879*	0.472	-0.980†	-0.199	-0.022	-1.420*
	(0.389)	(0.428)	(0.568)	(0.674)	(0.826)	(0.702)
Canaries	0.988*	1.078†	0.095	-0.151	0.230	1.211†
	(0.441)	(0.642)	(0.606)	(0.739)	(0.886)	(0.663)
Cyprus	-0.258	0.026	1.912*	1.399	1.569	-1.384
	(0.638)	(0.569)	(0.829)	(0.862)	(0.990)	(1.016)
Greece	2.484**	1.803**	1.608*	0.28	-0.123	2.142**
	(0.479)	(0.515)	(0.650)	(0.636)	(0.996)	(0.805)
Italy	2.916**	2.303**	1.996**	0.585	0.352	3.032**
	(0.531)	(0.878)	(0.757)	(0.837)	(1.211)	(0.864)
Malta	1.881**	1.016	-0.105	-1.454†	-0.994	1.978*
	(0.728)	(0.889)	(0.712)	(0.865)	(0.993)	(0.910)
Tunisia	1.331*	0.479	-0.185	-0.871	0.678	1.253
	(0.740)	(0.792)	(0.944)	(1.055)	(1.059)	(1.313)
Turkey	2.834**	1.921**	2.872*	1.17	-1.339	2.841**
	(0.660)	(0.591)	(1.280)	(1.429)	(1.319)	(1.048)
Official rating				3.451**	4.043**	
				(0.440)	(0.627)	
Customer satisfaction scores for:						
Accommodation					12.07*	10.61**
					(5.992)	(3.865)
Food					6.637**	1.933
					(1.964)	(1.623)
Location					-1.237	4.500*
					(2.567)	(2.271)
Overall					-12.44	-20.64†
					(12.68)	(11.13)
N	362	229	151	151	172	156
Log-likelihood	-247.9	-196.9	-165.0	-129.5	-94.01	-107.3
Tests (p-values in parentheses):						
H_0 : All coeffs = 0, $\chi^2_{(18)}$	148.6 (.000)	108.0 (.000)	60.8 (.000)	126.0 (.000)	89.95 (.000)	87.64 (.000)
$H_0 : \beta_h = 0$, $\chi^2_{(10)}$	102.3 (.000)	91.54 (.000)	46.02 (.000)	14.08 (.170)	14.45 (.153)	28.00 (.002)
$H_0 : \beta_d = 0$, $\chi^2_{(8)}$	74.13 (.000)	20.54 (.009)	28.22 (.000)	11.31 (.185)	8.20 (.415)	37.91 (.000)

Robust standard errors are reported. Significance levels: † : 10%, ∗ : 5%, ∗∗ : 1%.
Set of ten hotel attributes also included.

In the case of Thomson hotels the full specification includes customer satisfaction scores.[13] The results reported in column 5 are reassuring. First, as in the Thomas Cook case, country dummy coefficients become statistically insignificant.[14] Second, the impact of customer satisfaction scores is consistent with conventional wisdom and with some of our earlier assumptions. A hotel's rating depends on the quality of accommodation and food, as it should. It does not depend on location and on the customer's overall satisfaction with his vacation, as it should not.

In column 6 we present the results from adding Thomson's customer satisfaction scores to the national rating function. The rating agency does not have access to the scores, but they may be correlated with some hotel attributes that the agency observes and we do not. Indeed, the satisfaction score for accommodation comes out strongly significant, suggesting that national rating agencies do take into account some of the things that make consumers happy. Food is more difficult to assess and consequently does not seem to matter. Location, on the other hand, turns out to be important; apparently at least some national raters consider location a relevant aspect of a hotel's quality.

Many country dummies remain significant even after we control for these additional aspects of quality. A positive coefficient means that the country is relatively liberal in giving out stars. A question that arises is whether countries choose standards strategically. For example, a country may set low standards and give out stars liberally if it believes it can fool the market and give its hotels an advantage. At the other extreme, another country may deliberately set high standards in order to increase the overall quality of its national tourist product. For example, tourism authorities in small and/or highly developed tourist destinations may wish to encourage high quality tourism in order to minimize the external costs of congestion. By being strict in awarding stars to their hotels, the tourist authorities force producers to raise the quality of their tourist packages, thereby keeping congestion down. At the same time, this policy discourages low quality tourism which may have a higher externality cost than high quality tourism. By contrast, countries targeting low-budget tourists may not be as strict in handing out stars.[15] Note that countries would only choose to enforce stricter standards if they believed that the market would recognize higher quality and reward them with an appropriate price. Circumstantial evidence from our conversations with industry people lend support to this argument but we leave a more detailed analysis of this issue to future work.[16]

Summing up the analysis in this section, we have shown that national hotel ratings are not comparable across countries and that operators go a long way towards remedying that problem

[13] Note that this reduces our sample to 172 observations.

[14] This does not, of course, mean that country effects go away completely. They could reappear, for example, if we had more data. The main point is that their magnitude is substantially reduced.

[15] Negative externalities related to tourism include congestion, environmental degradation and natural resource exhaustion. Some people also attribute the spread of social problems like drug and alcohol abuse to foreign influences. On the positive externality side, tourism encourages cultural exchange and the preservation of cultural and historical heritage. Overall, it is probably fair to say that low-quality tourists impart a higher negative externality cost and a lower positive externality benefit than high-quality tourists.

[16] It is also worth noting that quality assessments may be country-specific: British tourists may value different attributes than Russian tourists and therefore a UK tour operator's rating may not be very helpful to a prospective Russian tourist. Nonetheless, it is still useful to British tourists.

by providing their own ratings. In addition, operators improve ratings by incorporating into the ratings their own private information about the quality of different establishments. They are providing a valuable service to consumers by improving the information available to them.

4.3 Ratings and prices

Our next task is to explore the relationship between ratings and prices. We must first note an important distinction between the two catalogues. In addition to the standard services, each operator offers a number of additional options such as allowance for extra luggage, transportation to and from the departing airport, better check-in times, in-flight service, and so on. In addition, the price travelers have to pay depends on their flight's departure time; day flights are more expensive. Our two operators take different approaches to pricing those options. Thomas Cook offers a menu of four preset packages (extra, standard, economy and basic) that travelers can choose from. The price listed in the catalogue is the price of the extra package, and discounts for lesser packages are reported in footnotes. Thomson, on the other hand, allows its customers to choose any combination of options they like. The catalogue reports the price of the basic package and the price of each option. One might interpret this as an indication that Thomas Cook tries to steer its customers towards the high-quality package, while Thomson takes a less targeted approach.

Since quality ratings are discrete, each category covers a range of quality levels. Hence, two holiday packages allocated the same star rating can differ substantially in terms of price. This phenomenon is not observed only between destinations but also within a particular region, where the two packages are rated by the same authority. The distribution of prices by agent and hotel category is summarized in the box-and-whiskers plot in Figure 2.[17] The large difference in prices between operators reflects the fact that for Thomas Cook we have the price of the extra (high quality) package, while for Thomson we have the price of the basic package. We note that there is considerable within-agent overlap between categories. For example, the price range of three-star Thomas Cook packages is a subset of the price range of the same agent's four-star packages. These distributions suggest that the official rating is not a very accurate descriptor of quality.

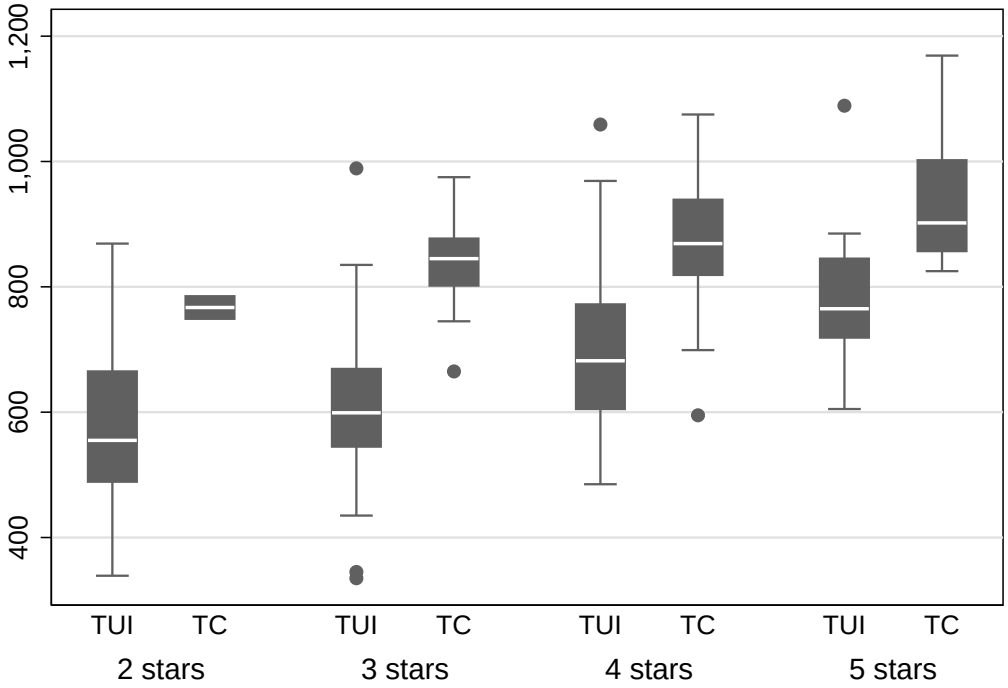
Pricing patterns of holiday packages can be explored in more detail using hedonic regression. We specify the empirical analogue of the operator's pricing function as:

$$\ln P_i = \alpha + S_i^{n\prime}\gamma_n + S_i^{o\prime}\gamma_o + H_i{}'\gamma_h + D_i{}'\gamma_d + \varepsilon_i. \tag{3}$$

S_i^n and S_i^o are vectors of dummy variables representing hotel i's national and operator rating respectively. The set of country dummies D_i captures national characteristics N. Our aim is to use equation (3) to answer two questions. First, are national or operator ratings better determinants of price? Second, how important are country effects in the determination of price? We perform our analysis separately for each agent and present the results in Table 6. We present

[17] The "box" indicates the inter-quartile range (from the 25th to the 75th percentile) and the "whiskers" indicate the whole range. Outliers are plotted individually.

Figure 2: Distribution of package prices by agent and hotel category



Note: TUI=Thomson; TC=Thomas Cook. Hotels are classified by their official (national) rating.

results from different specifications, suppressing coefficients that are not directly relevant. In column 1 we estimate equation (3) without the operator's rating (S_i^o). National ratings are statistically significant and take on reasonable values.[18] In column 2 we add the operator's rating to the regression (that is, we estimate the full equation (3)). This addition dampens the coefficients on national ratings substantially, rendering them statistically insignificant. Their explanatory power seems to have been taken over by operator ratings, which take on reasonable size and statistical significance. This indicates that agent ratings are more tightly correlated with prices than official national ratings. As a further test, in column 3 we present the results from estimating the following variant of equation (3):

$$\ln P_i = \alpha + \gamma_s \cdot \text{sgn}[S_i^n - S_i^o] + S_i^{o\prime}\gamma_o + H_i{}'\gamma_h + D_i{}'\gamma_d + \varepsilon_i. \tag{4}$$

The function $\text{sgn}[S_i^n - S_i^o]$ takes the value of 1 if hotel i is upgraded by the operator (or underrated by the national agency), -1 if the hotel is downgraded (overrated) and 0 if the two ratings are the same.[19] In the case of Thomson, upgraded hotels command a 7.9% premium over hotels of the same national category that are "correctly" rated, while downgraded hotels are 17.7% cheaper. Similar results but on a smaller scale are observed in the case of Thomas Cook: upgraded hotels

[18] Interestingly, Thomas Cook features less price variation than Thomson.

[19] Equation (4) is slightly less general than equation (3) in that it restricts the difference $\gamma_n - \gamma_o \equiv \gamma_s$ to be the same for all star categories.

are 2.8% more expensive while downgraded hotels are 5.1% cheaper.

The finding that prices are better correlated with operator ratings than with national ratings is hardly surprising, even though the strength of the correlation may be noteworthy. Prices are set by operators after all. The significance of the finding lies in that it highlights the value of improved information provision by operators. In the absence of operator ratings, we would expect that prices in the market would correlate more closely with national ratings. Therefore prices would not reflect quality as well as they do in the presence of operator ratings. A better matching of price with quality leads to a more efficient market outcome.

We now turn our attention to price variation across regions.[20] Even after we control for all available information, country dummies have a lot of explanatory power. Coefficients on country dummies represent percentage price differences between hotels of similar quality in different countries. The estimates show substantial price variation across countries, but also across agents. In Thomson's catalogue, Italian hotels are substantially more expensive than those of any other country. In Thomas Cook, on the other hand, Italian hotels do not command such a premium. Cyprus, Turkey, Greece and the Spanish island groups enjoy a premium over the Spanish mainland from both agents.[21] Mainland Spain is in fact the cheapest region in the Thomas Cook catalogue, while Malta and Tunisia are cheaper in the Thomson catalogue.

The magnitude of the estimated country premia is substantial and in some cases striking. Presumably they are picking up quality attributes that we do not account for and are shared by all packages to a specific destination. For example, they will pick up any systematic differences in hotel quality that are not corrected by operator ratings. More likely, country premia represent national characteristics (tourism production inputs) that make the vacationer's stay more pleasurable and thus increase the quality of the service being offered. These characteristics could include weather, distance, auxiliary attractions, infrastructure, cleanliness, hospitality, and security. Some destinations may also have linguistic, cultural, or historical ties to different origin countries.[22] It is also possible that some countries may have higher prices because of high domestic demand for tourism; Italy may be an example of that.

5 Concluding remarks

In this paper we address two questions. First, how valuable are independent tour operators in providing information about competing tourist destinations? Second, how does the quality of tourist accommodations vary across countries? Our analysis suggests that tour operators play a valuable part in disseminating information in the market for tourism. They provide ratings that are better quality indicators than official ratings and thus improve on government-provided

[20] Recall that, with the exception of Spain, regions are countries. Spain is divided into three regions: the mainland, the Balearic Islands and the Canary Islands; mainland Spain is the excluded region in the regressions.

[21] We remind the reader that the case of Greece should be interpreted with some caution because of its unique rating system; see footnote 9.

[22] For example, Cyprus and Malta are former British colonies and they maintain close ties with their former rulers.

Table 6: Estimates of pricing functions

	Thomson			Thomas Cook		
	(1)	(2)	(3)	(1′)	(2′)	(3′)
National 2-star	-0.091	-0.031	-0.157*	-0.122**	-0.126**	-0.143**
	(0.070)	(0.065)	(0.066)	(0.033)	(0.035)	(0.033)
National 4-star	0.088**	0.015	0.109**	0.033*	0.031	0.052**
	(0.023)	(0.023)	(0.021)	(0.016)	(0.020)	(0.018)
National 5-star	0.196**	0.074†	0.267**	0.071**	0.045†	0.122**
	(0.039)	(0.039)	(0.037)	(0.025)	(0.026)	(0.031)
Operator 2-star		-0.278**				
		(0.060)				
Operator 4-star		0.065**			0.003	
		(0.023)			(0.023)	
Operator 5-star		0.159**			0.081*	
		(0.031)			(0.035)	
Half star					0.001	
					(0.022)	
Upgraded			0.079**			0.028
			(0.020)			(0.017)
Downgraded			-0.177**			-0.051**
			(0.035)			(0.017)
Balearics	0.066†	0.038	0.045	0.111**	0.112**	0.113**
	(0.038)	(0.036)	(0.035)	(0.018)	(0.018)	(0.018)
Canaries	0.041	0.031	0.033	0.080**	0.078**	0.084**
	(0.039)	(0.040)	(0.039)	(0.020)	(0.020)	(0.020)
Cyprus	0.119*	0.092*	0.112*	0.115**	0.121**	0.107**
	(0.048)	(0.042)	(0.045)	(0.037)	(0.039)	(0.036)
Greece	0.049	0.040	0.036	0.065*	0.068*	0.062*
	(0.040)	(0.037)	(0.036)	(0.026)	(0.027)	(0.026)
Italy	0.252**	0.257**	0.254**	0.054	0.050	0.046
	(0.054)	(0.047)	(0.047)	(0.035)	(0.036)	(0.036)
Malta	-0.087*	-0.094*	-0.089*	0.073	0.089	0.093*
	(0.043)	(0.043)	(0.043)	(0.047)	(0.054)	(0.041)
Tunisia	-0.129*	-0.136**	-0.137**	0.031	0.031	0.039†
	(0.052)	(0.050)	(0.050)	(0.025)	(0.026)	(0.022)
Turkey	0.071	0.032	0.059	0.103**	0.086*	0.094**
	(0.053)	(0.046)	(0.047)	(0.037)	(0.036)	(0.035)
N	229	229	229	151	151	151
R^2	0.516	0.631	0.610	0.535	0.553	0.575
$F_{(N-K,N-1)}$	10.39	13.29	13.10	6.41	6.18	6.41

Significance levels: † : 10%, ∗ : 5%, ∗∗ : 1%. Robust standard errors are reported. In addition to reported variables, all regressions include hotel characteristics, half- and full-board identifiers and intercept.

information. Tour operator ratings go a long way towards explaining price variation in holiday packages. Nonetheless, substantial variation across countries remains even after controlling for quality. We conjecture that this may be part of a conscious national policy to control the quality of the national tourist product.

Tourism is a rare example of an industry where intermediaries provide ratings for products they themselves sell. One might wonder why we do not see independent hotel rating agencies, like we see them for banks, bonds, or even baseball cards. The answer likely has to do with the cost of rating a hotel: providing an accurate assessment of a hotel's quality requires visiting the hotel and spending some time there. It is reasonable to incur such a cost when rating a large bank, but it may not be in the case of a much smaller operation, such as a hotel. Tour operators, through their repeated interaction with hotels, are well placed to providing an accurate assessment of the establishment's quality.

Our analysis suggests that UK tour operators are more effective than governments in mitigating the information problem in the market for package tourism. Does this mean that there is no room for improved government intervention in information provision? Not necessarily. Tour operators' ratings are not complete – they only rate hotels they do business with – and they are generally only accessible to their UK customers (although the internet is changing that). Smaller markets may not be able to support intermediaries because the rents to be extracted are small. Improved information provision may serve well governments aiming to attract tourism from new countries that do not have well-developed tour operator industries.

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