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DISCUSSION PAPER

Revisiting the relevance of economic theory to hotel revenue management education and practice in the era of Big Data

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This paper explores the role of economics in hospitality education and industry practice, with a particular focus on revenue management, and puts forward an argument for a return to the inclusion of economic theory in UK hospitality education, not seen since the 1990s. Given the increasing amounts of pricing data available to both managers and customers and the consequent market complexities now seen, developing economic literacy is demonstrated to be a crucial skill required for future hospitality graduates, allowing them to make successful revenue decisions and sense-check with confidence the decisions made by automated revenue systems. Economic literacy is defined as a balanced understanding of economic theory that can be applied in real-life business scenarios, extending beyond simple consideration of supply and demand to a mixture of neoclassical and behavioural approaches to economics.

Keywords: economic theory, hotels, revenue management, Big Data, hospitality education

Introduction

After an interview in 1986, United States economist, Milton Friedman commented that "what makes economics most fascinating is that its fundamental principles are so simple, that they can be written on one page, that anyone can understand them, and yet few do". This paper is a reflection on this statement and, after over thirty years, considers to what degree hospitality professionals need to gain an understanding of economic theories through their study of hospitality in educational programmes and later as practitioners in the industry, especially in the commercially important area of revenue management. Currently, it appears that attempting to develop an understanding of economics by hospitality students has fallen out of favour with hospitality educators over recent years, and also in the industry, hospitality professionals are stressing the need for soft skills rather than theoretical and technical knowledge (Sisson & Adams, 2013; Weber et al., 2013). A detailed search of Google Scholar, the university library and the British Library lead to the discovery that the last dedicated publication on economics in hospitality management dates back twenty years. This is concerning as it may well lead to a new generation of hospitality students and managers who fail to understand basic economic theories and principles, as Friedman suggests, and who are unequipped to deal with the commercial and financial pressures of the industry in the 21st century, where protecting the bottom-line is crucial.

Within the field of revenue management, the argument over the need for economic understanding to underpin pricing decisions is perhaps even more complex, as it is now dominated by technology and automated revenue decision-making (Anderson & Xie, 2016; Mauri, 2016). The argument would be that if computers can give revenue managers the answer to room pricing dilemmas using complex, pre-set algorithms, why would managers need to understand the underpinning economic theory behind those pricing decisions? The easy answer to this might be that there is no problem at all as the computers know more than us. However, our belief is that a lack of economic understanding does pose a problem as without it managers cannot sense-check what the computers are proposing. In the light of this, the paper elaborates on these reflections, taking the stance that an understanding of economics is vital in creating profitable revenue management strategies and that this understanding for future revenue and hotel managers must begin with hospitality education, crucially through the development of economic literacy. It considers the major gap in contemporary hospitality research literature and UK educational programmes as a missed opportunity to recognise the importance of underpinning revenue decisions with economic principles linked to detailed market analysis, and not merely simplistic theories of supply and demand.

The specific aim is to highlight the most successful ways in which an economic understanding could be fostered in hospitality students in order to enable them to deliver profitable revenue management strategies when they reach the industry. This requires not just a basic understanding of supply and demand principles, but actually the consideration and introduction of a wider range of micro-economic principles linked to the working of markets and pricing. Arguably, in the era of Big Data, the amount and complexity of data that hospitality managers need to process in order to make pricing and revenue management decisions are directly driven by economic principles linked to the markets in which they operate. We believe that in the era of Big Data

it is too simplistic to say that economics is just about supply and demand and what is really needed is the development of economic literacy, in order for hospitality managers to be able to work in increasingly dynamic and complex markets. Hotel markets have changed dramatically over recent years and will likely continue to be subject to change and evolution. This is driven on the supply side by changes in the terms of hotel ownership, which has increased the complexity of hotel management through the addition of multiple layers of stakeholders in complex management contracts and franchises (Melissen et al., 2016; Hodari et al., 2017), such as the rising importance of the asset manager (Singh et al., 2012). On the demand side, the increased transparency of price information and the ease and quality in which pricing information is delivered to customers through the internet is increasing the challenge for hotel managers in setting pricing strategies that cannot be accurately anticipated by customers. In essence, this may lessen the potential control they have over pricing tactics. Combine these elements and it becomes clearer how hospitality managers are working in increasingly complex market environments, for which they need economic literacy to help them understand.

Of course, it is first important to understand what is meant by the term economic literacy. There are many different definitions offered from various sources, but the common theme appears to be a focus on the practical application of economic theory and knowledge. Stigler (1970, p. 78) discussed ideas around economic logic that could be likened to economic literacy in the sense that they can be applied to everyday life (Skousen, 2016) and also to business. Stigler (1970, p. 80) went on to argue that "many highly trained professors of economics have only a remote or formal knowledge of economic logic, not as a theoretical construct but as a constantly applicable and deeply illuminating principle". More recent definitions continue with the theme of practical application. Professor Russell Roberts (2005) explains that "economics is mainly about the choices we make in a world where we can't have everything we want and the consequences of those choices", suggesting again real-world applications. Some academics have defined economic literacy as the need for competency in identifying and evaluating economic concepts as they relate to personal finance and how citizens understand economics to make day-to-day decisions (Jappelli, 2010; Johnson, 2013; Varum et al., 2014; Goedde-Menke et al., 2017). These definitions, which, although not written from a business perspective, do again illustrate the need for real-life applications of economics. Finally, from an educational perspective, Salemi (2005) suggested that economic literacy can be claimed to have been achieved when students can apply basic economic concepts years later, in situations relevant to their lives. This follows the argument for the inclusion of economic literacy in hospitality education and its practical use later in the industry, but what follows illustrates the recent lack of focus of UK hospitality education in this area.

Reflections on economics in hospitality education, research and practice

Every decade from 1977 until 1997, one key textbook examining the importance of economics to the field of hospitality was published, from Rogers and Phipps's (1977) Economics for the Hotel and Catering Industry to Hughes' (1986) Economics for Hotel and Catering Students and finally Cullen's (1997) Economics for Hospitality Management. In the late 1990s, Yeoman and Ingold (1997) edited a key text on service sector yield management and dedicated the whole of the second chapter to the economic aspects of yield management. Yet, since then there has been a distinct lack of publications for education focusing specifically on the relevance of economic theory to the hospitality sector in general and perhaps, most surprisingly, to revenue management strategies. One of the leading hospitality revenue management books written by Hayes and Miller (2011) dedicates a mere one and a half pages to economics in a book that extends beyond 500 pages, and only then discusses it loosely within the context of return on investment.

From a further, more detailed review of Mohammed, Guillet and Law's (2015) content analysis of the contributions of economics to hospitality research literature over the past four decades, it is clearly evident that the demand aspects of economic theory on pricing and revenue management have been the main focal point for academics. For instance, Chen and Lin (2013) examined the influence of uncertain demand on hotel capacity, and Maier and Johanson (2013) looked into the relationships between demand and average daily rate. In Tranter, Stuart-Hill and Parker's (2013) text on hospitality revenue management, they again link the chapter on economic principles to discussions on demand. The focus of academic research on the supply side of economic theory is less widely covered and old, for example the content analysis only identified three articles examining this subject, all dating back to the 1980s and 1990s (Lawson, 1980; Lee, 1984; Borooah, 1999).

Interestingly and line with our current argument, the older textbooks cover a wide range of economic principles but all encourage the application of theory to the reality of hospitality business situations. This perhaps reflects the careful balancing act that hospitality education has between the vocational and academic development of its students (Morrison & Barry O'Mahony, 2003; Lashley, 2015; Oktadiana & Chon, 2017). Starting with Rogers and Phipps' text (1977, p. v), they "encourage students and those in the industry alike to approach the study of economics applied within hotel-keeping and catering without that loss of interest all too often induced by 'pure economics' texts". They centre their discussion of economics around using it to develop an understanding of the economic environment and utilising it as a decision-making framework, including knowledge of economic systems, consumers, firms and government actions. They state that "students should not merely be required to learn and restate facts and theories but should be encouraged to participate through the analysis of specific problems and situations" (Rogers & Phipps, 1977, p. 6). Moving to the next publication, Hughes (1986, p. 7) cites the concern that economics be watered down in vocational education, such as hotel and catering courses, but that there is still a "need to provide a meaningful and significant economics input on a highly vocational course". They develop this by going on to to say that it is important that "students appreciate the theoretical underpinnings of the 'real world'", and that "it is impossible to fully comprehend the complexities of reality without recourse to a theoretical framework". The book

focuses on micro-economics, with key sections on price mechanisms, market structures and competition. The final publication by Cullen (1997) focuses on economic analysis for helping deal with change in organisations and industry, which is perhaps a reflection on and a reaction to the recession of the early 1990s in the UK, and as Cullen comments, the changes in industry structure, ownership and products since the late 1980s. Therefore, the book's content focuses more on economic trends, economic fluctuations and how to improve the competitive position of your business. It seems that although these books extend over three separate decades, they cover similar key features of micro-economic theory, but their approach does vary slightly, perhaps reflecting the current challenges of the market at the time from decision-making in the 1970s, to pricing, structures and competition in the 1980s, to economic fluctuations and challenges in the 1990s.

So, given the current complexity of the markets faced by hospitality revenue managers of today, it is interesting to consider why these textbooks that were thought to be useful to students in the 70s, 80s and 90s have not been updated, and since then there has been a dearth of economics-focused hospitality publications. Perhaps the answer lies in the focus of hospitality recruiters and how that impacts upon the development of hospitality educational programmes. The recent focus on the development of soft skills by hospitality graduates in preparation for the work place is clearly evidenced in recent research (Sisson & Adams, 2013; Weber et al., 2013). Sisson and Adams (2013) found that of the competencies deemed essential for careers in hospitality, 86% were soft competencies, for example communication and leadership. Raybould and Wilkins (2005, p. 212) also found that hospitality managers ranked soft skills such as interpersonal skills and self-management as the most important, while discounting what they describe as "skills associated with the conceptual and analytical domain". Finally, Ruetzler et al. (2014) found that educators placed importance on strategic planning skills, whereas these were downplayed by hospitality professionals, who put greater emphasis on skills such as social networking. This is in contrast to research conducted in the late 90s that found that the most common needs of managers in the hospitality industry were softer skills such as human resources, but crucially that these must be complemented by an understanding of marketplace issues such as competition and government regulation, both of which are underpinned by economic theory (Lefever & Withiam, 1998). Interestingly, there have also been publications on economics in the tourism field since the time of the last publication of a hospitality economics textbook, including Tribe (2011), with the "The economics of recreation, leisure and tourism", Stabler, Papatheodorou and Sinclair (2010), with "The economics of tourism", along with several academic papers by Dwyer and Forsyth (1998) and Dwyer et al. (2005; 2006; 2010) on economic significance and policy within tourism. If it is considered of recent importance in tourism, why not hospitality?

The question is whether the textbooks merely represented the needs of the industry at the time and are no longer relevant or if the focus on softer skills potentially ignores a key element of successful hospitality management and in particular revenue management? We believe that due to the fact that the industry continues to face increased competition, complexity of pricing, markets and economic instability and that these remain underpinned by an understanding of micro-economic principles, developing an understanding of economic theory alongside softer skills is still of importance. The dominant areas of interest in the past, as outlined above, were on market analysis of supply and demand, pricing, elasticity of demand, and market segmentation. All these areas are of central importance to revenue management and still impact on hospitality businesses today. In fact, in the era of Big Data, are arguably more important. In addition, these calls are now being considered by researchers in hospitality, in particular, Kimes (2017) in her updated paper on the future of revenue management. She identified that in terms of the key drivers of change in the future, data analytics would be the second most influential. However, in line with the arguments of this paper, the fourth and sixth most important would be economic conditions and competition, respectively. This demonstrates the importance of economics and that there should be a balance between an understanding of demand, through competitor analytics such as supplied by Smith Travel Research (STR) and also supply, in terms of competitor pipelines, competitor pricing and inventory strategies. Kimes (2017) also looked at the future challenges for revenue management, and here economic conditions headed the list, with competitors third and data analytics falling to tenth place.

This suggests that even though improved technology and data analytics will become more proficient at analysing and making decisions based on revenue data, if economic conditions remain a concern, the basic economic principles of markets and pricing will remain crucial in allowing future managers to sense-check the decisions made by revenue and data analytics systems. Kimes (2017) summarises this nicely by stating that while there were some similarities with the 2010 results of her research, respondents in 2016 rated data analytics and economics as significantly more important than in 2010. This may coincide with the increase in interest in the concept of Big Data and the huge increases in data now available to managers. Therefore, perhaps it is Big Data that is also driving a need for economic literacy to allow future managers to navigate the data deluge and use it to make profitable revenue decisions.

Exploring Big Data's impact on the need for economic understanding

The literature concerning Big Data indicates an on-going debate over the origins of the term, which is often based upon a tension between supposedly old and new meanings. When an early mention of Big Data is found, academics tend to argue it does not represent the meaning of the term in the present context. Sociologist Charles Tilly (1980) is often credited for the first published use of the term "big data" when, in a working paper, he wrote that none of the big questions has actually yielded to the bludgeoning of the big data people. Diebold (2012) argues this could not have been a reference to the highly technical Big Data seen today, but actually just the use of creative alliteration. However, the academic literature supports the idea that it was Douglas Laney (2001) who developed the three Vs of Big Data, namely volume, variety and velocity, that encapsulates the modern-day understanding of Big Data (Chen et al., 2012; Kwon et al., 2014; Phillips-Wren & Hoskisson, 2015).

Irrespective of the origins or definitions of the term, the key issue here is that data and knowledge are not the same thing. Having access to huge quantities of data does not make managers instantly knowledgeable, informed decision-makers (Lewis, 2006; Liberatore & Luo, 2010; Biran et al., 2013). Data has to be correctly interpreted and converted into knowledge for this to be the case, and for this to happen in revenue management, underpinning knowledge of economic principles is arguable needed. As revenue and pricing data becomes increasingly unstructured as more data sources are included, such as user-generated content from social media and review sites, this challenge will only intensify. In order to increase the strategic value of knowledge, academics maintain that before any data is collected managers have to ask the right questions in order to source data that will actually provide an accurate answer to those questions, thus supporting accurate decision-making (Liberatore & Luo, 2010; Biran et al., 2013). Again, being able to ask the right questions involves a wider conceptual and theoretical understanding in order to put questions and decisions into context. The concern around Big Data is that managers might rely too much on the increased automation of data collection and turn their backs on intuition and instinct. Although price and revenue management decisions made in hotels are increasingly automated, particularly within major global brands such as Intercontinental Hotel Group (Koushik et al., 2012), the need for managers to understand the driving economic forces influencing the market and pricing are still necessary as a sense-check for the decisions made by automated revenue management systems, as part of the blend of art and science of revenue management (Cross et al., 2009). Some academics would argue that relying on Big Data in decision-making actually removes ambiguity and leads to more accurate decision-making (Davenport & Harris, 2007; Liberatore & Luo, 2010), but possibly in hospitality where human interactions are so central to the process, experience, intuition and instinct can still play a vital part in helping managers and employees make sense of and interpret data. If this is the case, then these managers still need the underpinning of economic knowledge to help guide their intuition and instinct. In fact, we believe that the algorithms used to comprehend the Big Data inputted into automated revenue management systems may not be able to accurately keep pace with the dynamics of the market, as they are mainly based on historic information, such as demand figures from STR. Where they are using future competitor prices such as Perform (Koushik et al., 2012), the system used by Intercontinental Hotel Group, they are still unable to take into account new competitors that may be entering the market as their pricing strategy is not yet available or indeed substitutes, such as Airbnb whose prices may not be available on the platforms reviewed by the systems.

Contributing to these complexities and the need for economic literacy is the increase over recent years in the popularity of the management contracts and the franchise model for ownership and operation of hotels which results in the general manager in individual hotel units having an increasing amount of autonomy over the implementation of the price decision at unit level (Ivankovič & Jerman, 2010). While revenue strategy may be guided by corporate level managers (Hodari & Sturman, 2014), the implementation and final decision of daily price setting is done at a unit level, often overseen, if not led, by hotel general managers. Hotel general managers also face complexity and time pressure (Yan et al., 2013) when implementing daily changes to prices due to the perishable nature of the hotel product. Hotel managers do not get a second chance to sell rooms and neither can they react quickly to changes in demand due to fixed supply. They are also inundated with unusually high levels of pricing data as compared to other industries, especially competitor data, which is gathered and disseminated to managers on a daily basis by industry specialists such as STR Global, third party distributions channels and companies such as Revinate that put together summaries of user-generated content, all of which influence the revenue decisions made. This data represents not just the needs of the hotel industry for knowledge about consumer demand, but also for detailed knowledge of supply factors, as shown in previous research (Haynes, 2016). The service characteristics of perishability and fixed supply, as well as the competitive nature of many hotel markets result in revenue and pricing decisions being extremely time-sensitive and pressurised, which in turn leads to a demand for more complex and timely demand and supply data (Yan et al., 2013). The unusual amount of competitor demand and supply information available in the hospitality industry creates a scenario where the understanding of market dynamics and competitive forces through an understanding of micro-economics is crucial. Airey and Akehurst (1983, p. 44) help confirm that this is in line with why in hospitality education it is important to understand the economic environment of the operation and that economic theory provides a "structured, analytical vehicle for appreciating the structure, dimensions and problems of the hotel and catering industry".

It is also not only the competitor data available on the supply side that makes economic literacy important, but also the amount and quality of pricing information available to consumers. In essence, hotel consumers also have access to Big Data via meta-search engines such as Trivago and Kayak, as well as websites, such as Yapta, that actually track changes in hotel prices after booking, allowing customers to cancel and rebook at lower prices should they be found. Yapta's RoomIQ system tracks room rates right until the point the customer checks into the hotel (Yapta, 2017). Consumers have become better at price hedging and reducing the negative effects of pricing tactics used by hotels. This massively alters the dynamics of the market and increases price volatility, making simplistic views of supply and demand obsolete as the point that price equilibrium is reached becomes harder to calculate due to the many complex factors driving it. Therefore, again, economic literacy is crucial in understanding the changing dynamics of the market, one in which hotels may have less control over their pricing strategy as consumers access increasingly perfect information leading to a more perfect market. The way of thinking about economic principles needs to be more flexible as it will be needed to be applied to increasingly volatile markets as both hotels and consumers try to predict the pricing behaviour of the other.

This perhaps suggests that, for developing economic literacy, behavioural elements of economic theory are also important, in particular, game theory. It is interesting that recent business economics textbooks devote significant space to game theory and the prisoners' dilemma (Baye & Prince, 2017; Sloman & Jones, 2017). Their textbooks on managerial economics and business strategy look at pricing topics such as

predatory pricing, screening and signalling and game theory. However, the interesting thing to observe when reviewing these textbooks is that game theory is often looked at purely as a strategy used between rival firms. For example, Sloman and Jones (2017, p. 117) describe it as the examination of the "best strategy that a firm can adopt, given the assumptions it makes about its behaviour". However, it is possible that game theory could also apply to the decisions made by firms and consumers when viewed as rivals in a dynamic market place due to the increase of consumer knowledge. The academic literature has also looked at the role of game theory in hotel revenue management (Arenoe et al., 2015; Jaureguiberry & Tappata, 2015), suggesting there is a basis for extending this into hospitality education and for the industry. These papers also suggest the need for the application of game theory to study market structures and firm behaviour on the supply side, and consumer behaviour modelling on the demand side. Hence, we believe that economic literacy will come to mean the need for a greater understanding of the complexities of price determination from a behavioural economics viewpoint, not just utilising neoclassical economic theory.

The way forward – the case for behavioural economics in education and practice

So, these discussions have led us to the conclusion that the ability to make successful revenue management decisions must be underpinned by a knowledge of micro-economic principles and that despite hospitality education lagging behind in its promotion of economic teaching, from recent research, revenue professionals are beginning to recognise the need for managers to have an understanding of economics, with specific attention being paid to competitive forces and market analysis. The way to achieve this is through the development of economic literacy which takes into account both neoclassical approaches to economics, but will also lean heavily on behavioural economic approaches. The challenge is ensuring that hospitality students do not just learn the academic theory, but understand how to apply it in practice so that their theoretical understanding is valuable to industry. Taking human behaviours in economic markets into account will work towards achieving this. If economic literacy centres on practical, real-life applications by humans, as seen in earlier definitions, then an understanding of human behaviours and reactions to economic theories must be included. If the reduction of economics content in UK hospitality courses continues, there is a current danger that for graduate finance jobs for major hotel chains, hospitality graduates may lose out to generic business and finance graduates. Hilton (2017) are already requesting that only students with a finance-specific degree can apply for their Finesse Graduate Finance Program. Jiang and Alexakis (2017), in their empirical investigation into entry-level management competencies in the hospitality industry, also found that managers were less satisfied by graduate levels of knowledge of economic and accounting than the soft skills such as time management, and suggested that "students should strengthen their skills in these areas, especially knowledge of marketing, [economics] and accounting, which can be learned in the classroom" (p. 42). This puts emphasis on the responsibility of hospitality educators to develop this knowledge.

Take for instance pricing, a fundamental area of revenue management, and consider that here it is not just neoclassical, but also behavioural economics at play. There are lessons to be learnt on revenue management from both paradigms. In the real world, pricing is no longer static with a single price point, but instead the increase in dynamic pricing has led to multiple, constantly adjusting price points, ensuring that, while equilibrium price points can be calculated, this is more complex and customer behaviours towards price points must be taken into account. This means economic literacy is potentially even more important than it was in the past, and behavioural reactions to pricing both by managers and customers need to be considered. Interestingly, Woodside's (2015) theory of behavioural pricing has begun to make further progress in behavioural economics, making it more applicable to business scenarios as it focuses on individual decision-making by managers, illustrating real-life applications of behavioural economics. It argues that from a behavioural standpoint, knowledge of firm pricing decision processes is lacking, against a backdrop of literature on behavioural economics focusing on the consumer and behavioural finance on high-level corporate decision-making (Barberis & Thaler, 2003; Subrahmanyam, 2007). Woodside (2015, p. 39) describes the theory as a "useful blending of cognitive science, complexity theory, economics, marketing, psychology, and implemented practices in explicit contexts". In comparison to behavioural economics and behavioural finance, the key additions are the attention on practical implementations of price decision-making and complexity theory. The addition of complexity theory (Urry, 2005) highlights the heterogeneity of price decision-making and that there can be sudden changes in the process and that the same causes can result in different effects in different circumstances, making it applicable to the complex markets seen in hospitality.

Of course, returning to the concept of Big Data, the viewpoints of neoclassical economics may appear on the surface to be more applicable than behavioural economics. If the neoclassical economic approaches to pricing are taken to the extreme and the idea of *homo economicus*, rational, economic man, would suggest that revenue managers, given the large amounts of data available to them, would be able to rationally translate revenue strategies into a clear and certain pricing and revenue strategy within their hotels. Becker (1976) describes clearly the expectations of economic man, in that a manager would act rationally, be able to maximise their utility in any given situation from a stable set of preferences, and would accumulate an optimal amount of data to inform those decisions (Heukelom, 2007; Zhang & Kallesen, 2008), thus applying micro-economic principles with certainty in revenue situations. However, many behavioural economists have called these rational approaches into question, claiming that due to human fallibility and bounded rationality, human managers will have restrictions on their ability to make rational decisions and applications of theoretical concepts despite increases in data and information available to them. Even as early as the 1950s, Herbert Simon (1959) was questioning neoclassical economic approaches due to the vision he had of an increasingly complex business world where decision-making would never be as straightforward as neoclassical economics suggested, due to the fact that as long as a human was involved in decision-making, they would be hampered by

the lack of infinite cognitive abilities, limited computational skills and flawed memories. This applies to managers as well as the average human and was extended further by Tversky and Kahneman (1974), often widely credited with the birth of contemporary behavioural economics.

Tversky and Kahneman (1974) believed individuals use rules of thumb and heuristics to simplify the decision-making process when time is short, but that this may lead to non-rational decision-making and the likelihood that not all the available information would be used in the implementation of decisions. Kahneman and Tversky (1979) and Tversky and Kahneman (1992) also found that risk-seeking and loss aversion behaviours existed in decision-making and found this to lead to irrationally formed asymmetries between the way gains and losses were considered in the decision-making process. In addition, Sunstein (1999, p. 122) found individuals to have bounded willpower, which he called "myopia". This causes short-termism as individuals are willing to make decisions that conflict with their longer-term interests in favour of shorter-term gains. Simon (1955) also added bounded self-interest and outsider influencer, where decision-makers will care, or act as if they care about others, which may mean the rational decision, particularly in a business context is not made.

Other behaviour economics literature highlights further approaches humans have towards decision-making. Sunstein (1999) explores the idea of preference reversals, originating from Thaler's (1992) work, that proved individuals make different decisions under different circumstances given the same data, as in a different context they view the information as different when, rationally, it should be regarded as giving an identical message. This is because different framing effects may be applied in different decision-making contexts, but to the same information. More recently, Etzioni (2011) stressed the impact of social norms and culture on decision-making. This is in direct contrast to neoclassical economics, which McQuillin and Sugden (2012) suggest would stress that consistent decisions would always be made across any alternative scenario or context. This all highlights that the reality of decision-making must balance the two main economic paradigms.

This balance can only be achieved if the development of economic literacy is considered as a longitudinal process rather than something that is short-term and tactical. This is because, as already highlighted, customers learn about firms' pricing strategies over time, as they are able to easily view and track price changes. Even if they do not use a tool such as Yapta, most online travel agencies now offer price tracking tools for unconfirmed bookings and will email the customer with automatic updates. If customers are observing the pricing behaviours of hotels over a longer period of time, rather than just doing a once-off price search, hotel managers will have to observe customers' decision-making behaviour over a longer time period as well. This links back to the need for managers to understand game theory and in particular multiple-move games, where in essence there will be multiple reactions by firms and customers to price changes over a period of time. As Sloman and Jones (2017) suggest, this will lead to the need for firms to think more strategically, as if they were playing a game of chess. The rise of the sharing economy may also have an impact. This has resulted in the prevalence of review sites, such as TripAdvisor, where customers do not just learn from observing a firms' pricing strategy, but are also able to learn from other consumers, in a type of social learning, which originates from the Social Learning Theory of Albert Bandura (1977). He argued that it is possible for people to learn from each other through a process of observational learning. If we take TripAdvisor as an example, customers can observe other customers' ratings of value for money and even qualitative comments on how to get the best prices and where to book. Social learning has already been linked to economics (Mobius & Rosenblat, 2014; Bossan et al., 2015) and recently it has also been specifically applied to pricing theory. Aoyagi, Bhalla and Gunay (2016) looked at social learning and price competition, and Crapis et al. (2016) looked at monopoly pricing in the context of social learning. Applying concepts such as social learning and game theory to economic pricing theory, again supports the need for a more inclusive understanding of a range of neoclassical and behavioural economics which, if embraced, will lead to the creation of economic literacy.

Finally, there needs to be recognition of the fact that many customers may be looking beyond price in their decision-making. For some, experience and quality may also be part of the price decision-making process. Take the example of Ryanair, who saw their first quarter profits more than double in 2014 after they put in place improved service quality measures, such as allowing travellers to choose their seats, easing restrictions on hand luggage and cutting penalty charges (Haplin, 2014). In the hotel sector, Travelodge has launched new hotels following the Ryanair model by looking to not just offer cheap prices, but by also focusing on being able to demonstrate value to its customers with the addition of proper pull-out beds for children and king-size double beds with 900 springs in each mattress, as well as special beds for pets. Taking into account the increased complexity of decision-making will allow for a truer picture of the impacts of economics on everyday revenue management decision-making. Standard neoclassical approaches to economics education have already been put under question as Ward-Perkins and Earle (2013) put forward the argument that the 2008 global financial crisis represented the ultimate failing of the economics education system and of the academic discipline as a whole, and that the crisis was not predicted by economists relying on neoclassical approaches. They go on to cite that apparently the Queen, while visiting the London School of Economics, was overheard to ask professors why nobody saw it coming. Tensions between neoclassical economics and behavioural economics are lengthy and on-going, but we call not for polarisation, but for balance between the two approaches as we believe that behavioural economics allows for a better application of neoclassical economic approaches in real-life, business situations. To us, economic literacy is not just about the issues of supply and demand, but how it all links together, incorporating the breadth of things you need to understand, including human behaviour of both customers, managers and competition. This will enable successful decision-making and revenue management.

Conclusion

In summary, the paper suggests that a balanced but dedicated approach to economic theory should be returned to hospitality education, therefore allowing the managers of the future to have an underpinning knowledge of the markets they operate in, and the complex interplay between supply, demand and

behavioural factors. This balanced approach will contain both elements of behavioural economics and neoclassical economic theory to encourage the creation of economic literacy. This will help managers to deal with the complexities of the revenue data that they receive, the challenges of real-time data, and help them to sense-check the pricing decisions made by automated revenue systems. The overall aim is to create a future hospitality manager who is sensitive and aware of the economic theories affecting the decision-making taking place within their business unit and avoiding an over-reliance on technological decision-making which might not always take into account all the necessary features of the workings of complex markets. By bringing these discussions up to date and linking them to the contemporary issues of Big Data, it is hoped that this paper will be of interest to those in hospitality education seeking to better explain revenue management principles to students, to practitioners who wish to have a better understanding of the economic conditions which influence their revenue management decisions, and to hospitality researchers wanting a theoretical underpinning for their research. From the perspective of preparing future hospitality managers, it is felt that course developers should reconsider the re-inclusion of economics within their courses so that hospitality graduates of the future do not miss out on developing the economic literacy skills that will make them attractive for future employment and ensure that they have the commercial acumen required to run profitable units.

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