Abstract: This paper examines the ways in which productivity in tourism businesses can be increased by studying the roles of changes in physical capital, human capital, innovation, and the competitive environment. Comprehensive results are obtained by using questionnaire-based interviews, business survey data analysis, and computable general equilibrium modeling. The results demonstrate the positive contribution that each of the productivity drivers can make to improving efficiency and welfare, notably increases in human capital and innovation. They also indicate that a combined strategy incorporating all of the drivers is more effective than independently formulated policies. Government organizations can collaborate to assist productivity increases, with specifically tailored measures for small businesses. Keywords: productivity drivers, skills, innovation, CGE.

INTRODUCTION

Debates about competitiveness and productivity are high on international agendas, yet this issue is virtually unexplored with respect to tourism businesses. Global league tables provide comparisons of countries’ performance, notably the World Economic Forum’s growth competitiveness index (Blanke, Paua and Sala-i-Martin 2003; McArthur and...
Sachs 2001) and business competitiveness index (Porter 2000), but neither takes explicit account of productivity in tourism, despite its role in underpinning countries’ prosperity. As Porter and Ketels state, “A nation’s standard of living is determined by the productivity of its economy, which is measured by the value of goods and services produced per unit of the nation’s human, capital and natural resources”; thus “True competitiveness ... is measured by productivity” (2003:7), which depends on the resources that businesses use, the efficiency with which they are used, and the environment in which production occurs. The emphasis on productivity is crucial because it implies that businesses do not have to rely on cost reduction and wage restraints as the sole means of increasing competitiveness. In contrast, increases in the quality and quantity of output can be achieved by raising workers’ skills, the level of capital per worker, technology, and innovation.

Although studies of competitiveness in manufacturing have been undertaken, few have examined competitiveness in tourism businesses (Crouch and Ritchie 1999; Dwyer, Forsyth and Rao 2000; Gooroochurn and Sugiyarto, 2005; Mangion, Durbary and Sinclair 2005). The topic of productivity, in particular, has been neglected. The limited research is surprising, since they account for high levels of income and employment and, as Sala-i-Martin stated, “The productivity of a country is ultimately set by the productivity of its companies” (2003: xviii). Hence, this paper will examine competitiveness in tourism from the perspective of productivity, focusing on the contributions of key drivers that generate increases in it: physical capital, human capital involving skills and training, innovation, and the competitive environment. The methods of analysis and types of data that can be used will be illustrated using the case of the United Kingdom but are of general applicability. The market shares and other characteristics of different types of tourism businesses will not be examined, as this would merit a study in its own right.

The paper commences with a discussion of the literature relating to the contribution that each key driver makes to competitiveness. The ways in which productivity can be increased are then examined with respect to the different drivers, using different data and methods. The first method uses information obtained from interviews with managers of a diverse range of accommodation and attractions. The second involves the use of large-scale survey data to examine different tourism-related sectors. The third involves a multisector computable general equilibrium (CGE) model. Such models are particularly suited to examining tourism impacts (Alavalapati and Adamowicz 2000; Blake and Sinclair, 2003; Blake, Sinclair and Sugiyarto 2003; Dwyer, Forsyth and R. Spurr 2003a, 2003b, 2004; Zhou, Yanagida, Chakravorty and Ping Sun 1997). The model is used to quantify the contributions of improvements in the productivity of physical capital, in labor via increasing human capital, and in total factor productivity, to efficiency and welfare, for all tourism-related sectors. The three different methods are used because each provides information that the others do not and is complementary to the others. The policy implications are discussed in the final section, where it is seen that a strategy accounting for all the drivers, for example both training and innovation, is required.
PRODUCTIVITY IN TOURISM

Increases in wages and profits and improvements in public services, growth, and welfare can be achieved by increases in competitiveness, driven by rising productivity (DTI 2002; Porter and Ketels 2003). In tourism, as in other sectors of the economy, productivity refers to the efficiency with which resources are used, by relating the quantity of inputs, notably employment of labor and capital, to outputs. It can be quantified using three main measures. The first is output per worker. The second is output per hour of labor. Its main advantage is that it is not influenced by the number of hours worked over a given period and, consequently, takes account of part-time work and time not spent in paid employment. The third is termed total factor productivity and measures output per unit of inputs. This measure has the advantage of taking account of other inputs aside from labor and capital but must be estimated rather than directly measured. It is a residual that remains after accounting for the contribution of labor and capital and requires measures of the capital stock, which are often problematic in terms of data. Each measure gives different insights. Output per worker is often used as the main measure because it is straightforward to quantify, since the data—total output and employment—are readily available and can be linked to the objective of raising total output growth.

The literature sheds light on the key variables that determine productivity and competitiveness. The methodology of growth accounting explains that increases in productivity result from increases in physical capital, workers’ skills (human capital), and total factor productivity (TFP) (Porter and Ketels 2003). This factor is the part of productivity that cannot be directly attributed to capital and labor, instead reflecting high levels of innovation, effective use of technology, and a high level of entrepreneurship. At the economy-wide level, research has indicated that increases in capital per worker are an important driver in France and Germany, while innovation is more important in providing the United States with a competitive advantage relative to the United Kingdom (Crafts and O’Mahony 2001). The following discussion will focus on each of the drivers—physical capital, skills, and innovation—and the competitive environment. The literature on this area is limited and reference will be made to some of the wider studies that have been undertaken, to provide a context for those related specifically to tourism.

Productivity Drivers

Physical capital plays an important role in raising productivity and competitiveness by providing equipment and infrastructure and facilitating the introduction of new technology. In the manufacturing sector, differences in physical capital intensity between foreign- and domestic-owned businesses within countries are reflected in a productivity gap (Oulton 2000). For example, although investment in the United Kingdom has increased substantially (HM Treasury 2001), the growth of physical capital there has been below that of its main
competitors, resulting in lower capital per worker in nearly all sectors (DTI 2002).

These findings apply to the tourism industry in that low investment has resulted in a considerable amount of old capital stock. In the case of UK hotels, some of the more outdated ones ceased operating during the downward trend in the number of hotels between 1987 and the mid-90s (Morrison 1998), but a substantial number are still in need of renovation. In contrast, the growth of boutique hotels has contributed to improving the quality of accommodation.

Small businesses often face particular problems in raising funds for investment (HM Treasury 2002), tending to have less such experience or in planning for the risk that this financing entails. Credit market imperfections mean that lenders may not obtain accurate assessments of the viability of investment projects proposed by small businesses. Hence, many small businesses are forced to rely on internal funds for capital investment, which may limit their growth (Cosh and Hughes 2000).

Skills and Human Capital

The human capital that workers possess is the second key driver, and includes education, skills, and training that workers acquire both on and off the job. Oulton (2000) found that low levels of human and physical capital in manufacturing account for around 60% of the productivity gap between UK businesses and US-owned businesses located in the United Kingdom. Moreover, there have been large differences between Germany and the two in terms of skill levels (HM Treasury 2000). This country has more workers with intermediate skills and fewer low-skilled workers than the United Kingdom, while the United States has more highly skilled workers.

Skills shortages at the national level are often reflected in tourism. Research has shown that less than 16% of UK managers and supervisors were thought to be appropriately qualified compared with 50% in other sectors (HM Treasury 2003). Training is often under-funded, although more problems are found in small businesses which have smaller budgets and less access to training. Another issue affecting them relates to the inability of some to provide or afford adequate cover for those on training leave. The remoteness of many of these businesses sometimes increases the cost of training, and some are not aware of where and how training can be received. The absence of a traditional career ladder in tourism leads some employees to think that training is not worthwhile, while employers are concerned that once employees are trained, they may be poached by rival businesses. Employees often perceive the industry as being low-paid and low-skilled and not a viable long-term career opportunity (HM Treasury 2003).

It has been argued that training is fundamental in delivering the strategic objectives set by managers in tourism (Eaglen, Lashley and Thomas 2000). High quality training contributes not only to employees’ human capital, enhancing performance, commitment, and retention, but also to customer satisfaction. The development of employee skills
is also a core element of many regeneration strategies for businesses and of impacts on businesses’ performance via improvements in the quality of service (Thomas and Long 2001). However, in practice, training varies in terms of its intensity, quality, and purpose (Baum 1995). Moreover, the development of skilled staff is necessary but not sufficient for improved competitiveness.

The process by which training and wider human resource management is planned and introduced is also important in determining performance outcomes. For example, hotels that introduced their human resource management practices as a mutually supporting package outperformed hotels that introduced such practices individually (Hoque 2000:140). The study also suggested that hotels with an ethos of service quality outperformed those with a strategy based on cost reduction. Similarly, Campos, Gonzalez and Romero (2005) show that the level of returns per hotel room is positively related to quality criteria, including the friendliness of staff and the efficiency of the personal service. Empowering workers to use their knowledge of customers’ needs could also raise competitiveness, but managers are often unaware of or resistant to this strategy, as in the case of the attractions studied by Phillimore (1999).

Technology and Innovation

The third key driver is technology and innovation, including the introduction of best practice techniques. International evidence shows that spending on research and development is associated with a higher rate of productivity growth and produces more innovation (Grossman and Helpman 1991). Moreover, investment in information and communications technology makes a significant contribution to growth (Oulton 2001). However, a firm’s ability to use best practice techniques depends on its employees being familiar with the technology and having the capacity to translate this knowledge into improved work practices.

Innovation in best practice techniques is important. Jacob, Tintore, Aguilo, Bravo and Mulet (2003) found that process delivery and organizational changes were the most common forms of innovation in accommodation in the Balearic Islands, and this included changes in information and communication technologies. A shortage of skilled employees and some resistance to change were the major barriers to the introduction of innovations. They are needed if best practice techniques are to be implemented, and innovative products and practices are required for growing markets such as business, conference, or cultural tourism.

The Competitive Environment

The competitive environment plays a key role, encouraging businesses to innovate, decrease costs, and become more efficient. Studies of businesses from a range of economic sectors found that various measures of competitive pressure had a positive impact on firm efficiency
Entrepreneurial ability is an important source of competitiveness, as entrepreneurs who start up new businesses introduce innovative practices and new technology that challenge incumbents’ performance. There is some evidence that ownership is also important and that businesses experience above-average productivity growth for several years after a change in ownership (McGuckin and Nguyen 1995). However, in the case of tourism, changes in the ownership of small businesses are not common, particularly as running a small-scale business is often a lifestyle choice rather than a purely profit-driven venture (Morrison, Baum and Andrew 2001; Wanhill 1997). Some owners are reliant on the businesses to keep their homes, such as small-scale bed and breakfast establishments.

Research has indicated that many small and medium businesses do not have formal planning and control systems, but are aware of their costs and likely future revenue and undertake “tacit planning” and “self control” (Jones 2003). Jones argues that the key to performance improvement is via a holistic approach, rather than by the introduction of reforms on a piecemeal basis, and that it should be undertaken as a process contingent on the specific history, current position, and future potential of each business. In the context of the hotel sector, Brown and Dev (1999) argued that increases in productivity are related to market niche and type of management (branded management, independent management companies, or independently managed). Sales per employee also vary in accordance with the size of the hotels and the type of ownership.

Overall, past research has provided a range of interesting insights into the different drivers of productivity and competitiveness. However, there is clearly scope for a more comprehensive analysis of their perceived and actual importance. Thus, it is important to examine the main drivers using different data sources and methods for the case of the United Kingdom, by also considering a number of barriers that may prevent the drivers from functioning effectively.

Managers’ Views of Productivity and Competitiveness

Managers have first-hand knowledge and experience of the ways businesses can benefit from improvements in physical capital, human capital, innovation, and the wider environment. They are also aware of the ways limitations in these drivers can act as barriers to competitiveness. Hence, the first method of examining how the drivers can increase productivity and competitiveness uses information from indepth, questionnaire-based interviews with managers. The advantages of this information are that it provides a useful context that complements the quantitative results subsequently given by the CGE.
modeling, and also provides qualitative insights that this analysis is not designed to reveal. The businesses surveyed include different types of accommodation, ranging from small bed-and-breakfast establishments to international hotel chains, and attractions ranging from stately homes to discovery parks and zoos. Each interview lasted approximately one hour, based on a questionnaire but allowing for open-ended discussions. The information obtained provides an important background for the analyses of the published statistical data and for the CGE modeling.

The interview results, given in Tables 1 and 2, show that almost all of the managers view investment as a key driver. Within both the accommodation and attractions sectors in the United Kingdom, investment has occurred in refurbishment, equipment, and computer hardware and software, including company websites and online booking systems. Investment in physical capital did not appear to be deterred significantly by uncertainty, access to funds, a high cost of borrowing, limited information, or planning regulations. Hence, inadequate investment in physical capital by businesses did not appear to be a strong barrier to tourism competitiveness. However, limited government investment in infrastructure was seen as a barrier to competitiveness by many of the respondents. Although private investment was not viewed as a barrier, increases could contribute to enhancing productivity further (discussed later).

As in the case of investment in physical capital, the vast majority of the managers agree that the human capital of employees, acquired by education, skills, and training, is also important as a productivity driver (Table 1). Their agreement contrasts with a common perception of employment in tourism as low-skilled. The results showed that virtually all of the businesses in which interviews took place provided some form of training. Within the accommodation sector, formal training systems were more common among the larger establishments, while the smaller establishments provided training more informally, often as “on-the-job”. The owners of small businesses without employees were not aware of the relevance of training to their business and had not considered the possibility of receiving training themselves. All of the attractions had a formal system of training and almost all required new employees to have some level of it before starting work.

The main barriers to training, in both accommodation and attractions (Table 2), was felt to be the high cost of such courses and the possibility that once trained, employees might leave to work in other businesses. The attractions were more likely to have received assistance in training support from a government organization, in particular from the Local Authority but also from the Regional Development Authority and the Learning Skills Council. Only one hotel had made use of a central government organization for its training requirements, and one had received assistance from the Local Authority. Many businesses were unaware of the role that government organizations can play in assisting training. In general, limited availability of workers with appropriate skills appears to be a problem, particularly for the accommodation sector.
The results relating to the role of innovation and technology as drivers showed that managers believe that both product and process innovations are important in determining competitiveness. The use of the internet is a helpful indicator of the degree of innovation within businesses. Despite the managers’ agreement about the importance of innovation, the results for the accommodation sector showed that only some two-thirds of the establishments used a website for online book-
ings (Table 1). This limited practice was surprising, given its potential for increasing customer reservations. Virtually all (90%) the attractions had their own websites and most also were featured on regional and/or local websites. The results relating to product innovation by the accommodation establishments were also somewhat surprising. Although 75% of the businesses recognized the importance of product innovation in the sector, only 55% had introduced any form of product innovation in the last two years. In contrast, all of the attractions managers had introduced new products during that time.

More of the managers of accommodation and attractions believe that innovation in the form of management and/or organizational changes is important and about half stated that they had engaged in some form of internal role restructuring. Marketing innovation was also felt to be important. The attraction managers almost unanimously regarded it as “very important”, whereas some of the hotel managers viewed it as “quite important”. Innovation in processes, such as new procedures to make more efficient use of staff and/or equipment, was also highly valued. A large majority (90%) of accommodation

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establishments had introduced cost-cutting measures into procedures during the past two years and a smaller percentage (60%) of the attractions had introduced some types of cost-cutting.

The results showed mixed responses to questions concerning the level of competition in the accommodation and attractions sectors. Whereas 83% of the accommodation managers felt that they were under strong competitive pressure from potential new entrants, 8% did not feel that this was important. Similar findings emerged from the interviews at attractions. Some stated that the introduction of low-cost flights to international destinations has caused increasing competition with foreign businesses, and also perceived the growth of home entertainment as a threat to their business. Many (58%) of the managers of accommodation felt that if they spend money on innovations they will be copied by competitors, and 63% of the managers of attractions were also concerned about copying.

The overall conclusion that emerged is that the managers of both accommodation and attractions are aware that increases in tourism productivity can be achieved by investment in physical capital, human capital, and innovation. However, there are also barriers to increases, such as concerns about the level of public investment in infrastructure and the loss of trained labor to competing businesses. Given the managers’ generally positive beliefs about the roles that the drivers can play, it is now useful to examine whether they are reflected in high levels of measured productivity, investment, and innovation in the different sectors in the industry.

Business Analysis of Productivity and Competitiveness

The analysis pursued here uses a further source of information to provide complementary information about investment in physical capital, human capital and innovation, and changes in the competitive environment, as drivers of productivity and competitiveness. Data for businesses were obtained from large-scale surveys, based on a stratified random sample of around 73,000 businesses each year (the Annual Business Inquiry survey of UK businesses, Office for National Statistics 2003a). The data were first used to calculate the levels of productivity in tourism-related sectors. The contributions of each of the drivers to raising productivity were examined subsequently.

The initial stage of the analysis involved calculating the levels of productivity in tourism-related activities relative to the UK average, where all values are indices, based on the average level for all activities. The results, given in Figure 1, show that productivity levels differ considerably among the sectors (the non-tourism results are available from the authors). The differences result, in part, from varied capital intensity among sectors. Those with high levels of part-time work have lower scores than if full-time equivalent employment figures were used, as the data are based on total numbers employed rather than the latter. This also accounts for the low productivity levels in such sectors as hotels relative to the average for the UK economy.
The sector of hotels and restaurants combined (the top seven rows in Figure 1) has the second lowest level in the economy, at 49% of the UK average. The transport, storage, and communication sector has relatively high productivity, at 154% of the UK average. Travel agencies and tour operators (96%) rank only slightly below average, but other scheduled land transport (84%), taxi operation (53%), and other passenger land transport (52%) score relatively low. Among the other tourism-related service activities, only artistic and literary creation and interpretation (126%) and fair and amusement park activities (124%) score significantly higher than average.

The low levels of productivity in some sectors are a cause for concern. Therefore, it is useful to see the data’s implications for each of the drivers. Considering, the role of physical capital, the data show above-average levels of investment in hotels and restaurants (135% of the UK average) and transport, storage and communication (144%). All of the accommodation and catering sectors have investment to gross value added ratios above the all-sector national average. Land and air transport and other supporting transport activities also have above-average rates of investment, but sectors such as rail transport (62%) and travel agencies and tour operators (71%) are below. The results indicate that the low productivity levels do not result from a lack of capital investment by business, yet they do not take account of public investment in infrastructure, which could make a further contribution to increasing productivity and competitiveness.
Low levels of human capital may be a cause of low levels of productivity. Data for wage levels per employee (ONS 2003a) were used to indicate differences in human capital and productivity. Average wages in hotels and restaurants were calculated at around half of the average for all UK sectors. These are characterized by high levels of part-time employment, which is likely to contribute to the low average wages. Transport sectors generally have relatively high wages, although taxi operation (54%) and other land transport (60%) score low. Wages in tourism-related service activities are also relatively low. Thus, the survey data on wages vary across the sectors, indicating significant differences in human capital and productivity.

Increases in training and skills are one means of improving these scores. Government organizations and the industry can respond to this need through initiatives such as the United Kingdom’s Leadership for Productivity scheme, which aims to improve quality, productivity, and performance in tourism, hospitality, and leisure by sharing best practice, particularly among small businesses. Benchmarking is included in the scheme to help businesses compare their performance for such measures as labor turnover, productivity, and profits; master classes, workshops and on-site visits also help businesses improve competitiveness.

Innovation and the competitive environment are further drivers. Businesses that enter the industry with new products and processes can be a particular source of innovations. Specific measures of innovation are not available from this data set; however, innovative activity is indicated by start-up rates for small- and medium-size businesses (HM Treasury, 2002), which can be proxied by data for value added tax (VAT) registrations (ONS, 2003a). Although this measure is not ideal, it provides results that are useful in complementing those obtained from the interviews and the CGE modeling. As businesses may not cross the VAT registration threshold until they have been in operation for a number of years, and VAT registration also depends on the business cycle, it is useful to calculate average registration and deregistration rates over a number of years. Thus, data for 1994–2002 were used, the definition being the ratio of the number of firms registering or deregistering for VAT to the number of firms at the start of the year.

The data indicated that hotels and restaurants have the second highest VAT registration rate (147% of the national average for all sectors). However, this sector also has the highest rate of VAT deregistration (151% of the average), which implies a large number of small businesses may be passing above and below the VAT threshold without any start-up activity. Transport and other service sectors generally have VAT registration rates around the UK average. Overall, the data do not indicate a high level of innovative activity in the industry. These findings support those from the interviews, which also indicated limited introduction of innovations.

The environment as a further driver of competitiveness is sometimes proxied by the use of concentration ratios, given the lack of alternative measures of competitiveness in the data set. The ratios for accommodation and catering, given as the percentage of total output produced by the top five businesses, indicate that there are considerable differences
within the sectors of hotels and restaurants. National chains in some sectors cause the top five businesses to account for large shares of output and gross value added. This is particularly important for lodgings not elsewhere classified (60% of gross value added accounted for by the top five firms), unlicensed restaurants and cafes (58%) and managed public houses and bars (73%). Other services have low concentration ratios, most notably the hotel and motel sectors (between 6% and 26%). Similar disparities exist in other sectors, with railway transport (55%) and travel agencies and tour operators (41%) having relatively high ratios but activities such as entertainment (5%) and sports (7%) having very low ones. Overall, the data indicate that most UK tourism-related sectors are not highly concentrated. This is, in part, a result of national and European Union competition policy, which aims to prevent mergers that would adversely affect the competitive environment.

One proviso relating to the previous findings is that although a low concentration ratio is an indicator of competitiveness, it is not a sufficient condition for high competitiveness and productivity, owing to the differing sizes of the businesses in the industry. A further explanation of the low levels found in some tourism-related sectors is that labor productivity tends to be low in small and medium businesses and that these sectors are dominated by small businesses. In the case of UK hotels and restaurants, 15% of firms have no employees and 83.5% have between 1 and 49. In particular, the hotel/restaurant sector has an above-average proportion of firms in the 50–249 employees bracket (DTI 2003).

Overall, the main results from the survey data analysis are that business investment in physical capital does not appear to be a significant constraint on increases in productivity and competitiveness. However, the level of skills may be a barrier to increases, as indicated by the low wage levels in many tourism-related sectors. Limited rates of innovation may also be an issue. Concentration ratios in tourism-related sectors are generally low, indicating that the competitive environment is not a barrier in the case of large firms. However, small businesses have particular needs which may require the formulation of specifically tailored policy measures.

Modeling of Productivity and Competitiveness

The results obtained from the interviews and the business data analysis are useful in identifying the drivers which could most help to raise productivity. However, the preceding results do not provide fully comprehensive information about the economic effects that would result from changes in physical capital, labor productivity, or innovation. Such information would be useful as it indicates the types of changes that are most beneficial in increasing efficiency or welfare and which could thus be prioritized by policymakers. Hence, modeling is used to complement the previous approaches. It is based on a multisectoral CGE model of tourism. This is used to examine the effects of increases in capital and labor productivity and in total factor productivity (TFP)
on the efficiency of production and welfare for different sectors. CGE models are well suited to such analysis, given their multisectoral basis and ability to examine a wide range of scenarios. In contrast to partial equilibrium approaches, computable general equilibrium models can take account of the interrelationships among tourism, other sectors in the domestic economy, and foreign producers and consumers.

Tourism impact models have traditionally relied on input–output modeling (Fletcher and Archer 1991). This constitutes an advance over partial equilibrium models in that it takes account of the economic interrelationships between all of the sectors of the economy, so that it can estimate the effects of a change in one sector, or of an exogenous change, on each of the other economic sectors. However, input–output modeling incorporates the assumptions of fixed coefficients among the different sectors and of fixed wages, prices, and exchange rates. CGE modeling differs in that it can be tailored to alternative conditions, such as flexible or fixed prices, differences in the degree of mobility of factors of production, and different types of competition. Thus, for example, in the case where an increase in demand gives rise to increases in prices and/or wages in one or more sectors, this modeling takes account of the crowding out that such rises would bring about, thereby preventing the impact effects from being overestimated, as might occur in the case of input–output modeling. Moreover, CGE modeling can now impose fixed prices or wages in specific sectors of the economy, or allow for immobile factors of production in specific sectors. Computable general equilibrium models are particularly helpful to policymakers, who use them to provide guidance about a variety of “what if” questions, concerning the range of domestic or international shocks or policy scenarios that can arise (Blake and Sinclair 2003; Blake et al 2003; Dwyer et al 2004). Thus, they are an informative tool for measuring the effects of tourism in an economy (Dwyer et al 2003a, 2004).

The CGE model of the United Kingdom contains 131 industries and commodities. The database is derived from the 2001 UK supply and use tables (ONS 2003a), Annual Business Inquiry data for 2001 (ONS 2003b) and International Passenger Survey and UK Tourism Survey results for 2001 (ONS 2004; StarUK 2003). Full details of the equations used to estimate the model and the values of the parameters included in it are available from the authors.

The model was used to examine and compare the effects of increases in the key drivers: physical capital, human capital, and innovation (proxied by total factor productivity). The first question was which driver, if raised, would contribute most to increasing the efficiency of production. The effects are calculated as the value of the change in welfare (using an equivalent variation measure which indicates how much the change in welfare is worth to the economy at the pre-simulation set of prices) divided by the value of the change in productivity. A ratio of greater than one indicates that the economy is improved by more than the size of the productivity change. A ratio of less than one indicates that some effects are crowded out, and the economy benefits by less than the full extent of the productivity increase. The results for differ-
ent types of increase (1% in physical capital, human capital and total factor productivity, respectively, across tourism-related sectors) are given in Table 3.

Two main points emerge from the results. First, in the case of tourism-related sectors, although raises in the productivity of physical capital increase efficiency more than those in human capital or in total factor productivity, the differences are not substantial. This indicates that there is not a strong case for prioritizing increases in one type of driver over another. In the case of all economic sectors, growth in human capital (labor productivity) are more beneficial than those for physical capital although, again, the differences are not substantial. Second, the differences in the effects are much greater across different tourism-related sectors. This implies that policies should not be formulated by focusing on one particular sector independently from the others, but should take account of the effects on all of them.

The proportions of the change in gross value added earned in the sector where the increases take place, for capital-related, labor-related, and TFP were also calculated. The results again indicate small differences among different types of increases but substantial differences across economic sectors. These are exemplified by the results that hotels and motels without a restaurant retain 59% of the change in gross value added, whereas restaurants retain 73%. The results for all of the sectors and types of productivity changes are positive, indicating that increases in all types of driver are beneficial for all sectors.

The extent to which increases in productivity contribute to welfare is indicated in Table 4, for total factor productivity (TFP). In each simulation, it is increased by 1% in a single tourism-related sector, except for the last, where growth of 1% occurs in all of the tourism-related sectors.

### Table 3. Efficiency Increases by Type of Productivity Improvement

<table>
<thead>
<tr>
<th>Industry</th>
<th>Capital</th>
<th>Labor</th>
<th>TFP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotels and motels, with restaurant</td>
<td>0.984</td>
<td>0.957</td>
<td>0.962</td>
</tr>
<tr>
<td>Hotels and motels, without restaurant</td>
<td>0.944</td>
<td>0.917</td>
<td>0.928</td>
</tr>
<tr>
<td>Youth hostels and mountain refuges</td>
<td>0.941</td>
<td>0.907</td>
<td>0.913</td>
</tr>
<tr>
<td>Camping sites, including caravan sites</td>
<td>0.950</td>
<td>0.921</td>
<td>0.931</td>
</tr>
<tr>
<td>Other provision of lodgings</td>
<td>0.940</td>
<td>0.910</td>
<td>0.917</td>
</tr>
<tr>
<td>Restaurants</td>
<td>1.156</td>
<td>1.144</td>
<td>1.145</td>
</tr>
<tr>
<td>Bars</td>
<td>1.198</td>
<td>1.191</td>
<td>1.190</td>
</tr>
<tr>
<td>Railway transport</td>
<td>0.830</td>
<td>0.785</td>
<td>0.788</td>
</tr>
<tr>
<td>Road transport</td>
<td>1.195</td>
<td>1.186</td>
<td>1.186</td>
</tr>
<tr>
<td>Water transport</td>
<td>1.150</td>
<td>1.147</td>
<td>1.147</td>
</tr>
<tr>
<td>Air transport</td>
<td>0.940</td>
<td>0.911</td>
<td>0.921</td>
</tr>
<tr>
<td>Ancillary transport services</td>
<td>1.084</td>
<td>1.065</td>
<td>1.067</td>
</tr>
<tr>
<td>Recreational services</td>
<td>1.163</td>
<td>1.160</td>
<td>1.162</td>
</tr>
<tr>
<td>All tourism related sectors</td>
<td>1.123</td>
<td>1.103</td>
<td>1.108</td>
</tr>
<tr>
<td>All economic sectors</td>
<td>1.138</td>
<td>1.168</td>
<td>1.160</td>
</tr>
</tbody>
</table>
sectors. The first two columns show the size of the productivity growth that is assumed in the simulations. In each case, the technical efficiency with which factors of production are used is increased by 1%, but the absolute magnitudes of the total factor productivity changes vary by sector. For the combination of all tourism-related sectors in the last row, this 1% TFP growth is equal to a $1,279.5 million stimulus. In the first simulation, the 1% factor growth in the hotels and motels with restaurant sector has an absolute magnitude of $102.4 million. The absolute size of the TFP change in the first 13 simulations sums to the absolute size of the factor change in the final simulation. The third and fourth columns give the effects of the TFP change on welfare, measured by the equivalent variation. The results show that each simulation makes the UK economy better off, by amounts that are in line with the absolute size of the change in total factor productivity.

One main way TFP increases may be crowded out is through changes in international prices. The terms-of-trade (the ratio of prices that the

<table>
<thead>
<tr>
<th>Industry</th>
<th>Initial TFP Change</th>
<th>Welfare, Equivalent Variation</th>
<th>Welfare Effect of Tourism Prices</th>
<th>Real Price Paid by Foreign Tourists</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ Million Change</td>
<td>% Change</td>
<td>$ Million Change</td>
<td>EV/TFP Ratio</td>
</tr>
<tr>
<td>Hotels, with restaurant</td>
<td>102.4</td>
<td>1</td>
<td>98.5</td>
<td>0.96</td>
</tr>
<tr>
<td>Hotels, without restaurant</td>
<td>1.6</td>
<td>1</td>
<td>1.4</td>
<td>0.93</td>
</tr>
<tr>
<td>Youth hostels</td>
<td>0.6</td>
<td>1</td>
<td>0.4</td>
<td>0.92</td>
</tr>
<tr>
<td>Camping and caravan sites</td>
<td>4.5</td>
<td>1</td>
<td>4.2</td>
<td>0.93</td>
</tr>
<tr>
<td>Other provision of lodging</td>
<td>10.7</td>
<td>1</td>
<td>9.8</td>
<td>0.92</td>
</tr>
<tr>
<td>Restaurants</td>
<td>117.8</td>
<td>1</td>
<td>134.7</td>
<td>1.14</td>
</tr>
<tr>
<td>Bars</td>
<td>113.0</td>
<td>1</td>
<td>134.6</td>
<td>1.19</td>
</tr>
<tr>
<td>Railway transport</td>
<td>37.7</td>
<td>1</td>
<td>29.7</td>
<td>0.79</td>
</tr>
<tr>
<td>Road transport</td>
<td>240.4</td>
<td>1</td>
<td>285.0</td>
<td>1.19</td>
</tr>
<tr>
<td>Water transport</td>
<td>22.5</td>
<td>1</td>
<td>25.8</td>
<td>1.15</td>
</tr>
<tr>
<td>Air transport</td>
<td>71.1</td>
<td>1</td>
<td>65.5</td>
<td>0.92</td>
</tr>
<tr>
<td>Ancillary transport services</td>
<td>222.4</td>
<td>1</td>
<td>237.4</td>
<td>1.07</td>
</tr>
<tr>
<td>Recreational services</td>
<td>335.1</td>
<td>1</td>
<td>389.4</td>
<td>1.16</td>
</tr>
<tr>
<td>All tourism related</td>
<td>1,279.5</td>
<td>1</td>
<td>1,417.4</td>
<td>1.11</td>
</tr>
</tbody>
</table>
country receives for its exports to the ratio of prices it pays for imports) is crucial, as these changes have direct effects on the ability of consumers to purchase imported goods and services and, hence, on welfare. In the case under examination, there are no changes in the price of traded goods and services as the United Kingdom is a small open economy in the world trading system, with one exception which is that foreign tourists can pay different prices for the goods and services that they consume locally, with demand depending on the average price that they pay. The final three columns of Table 4 show the changes in the real price paid by foreign tourists as a result of the simulations. Some of the price changes in the last column are not big because the sector where TFP is changed is relatively small.

The welfare effects of price changes are considerable in the accommodation sectors. Here, the total factor productivity growth reduces the prices that tourists pay, and thus some of the benefits of the factor growth are appropriated by the foreign tourists. In these cases, the welfare loss due to changes in tourism prices is up to 40% of the total net welfare gain from TFP increases. In other tourism-related sectors, changes in tourism price play a smaller role in reducing the effectiveness of the factor increase, as these other sectors play a smaller part in foreign tourist spending. The results from the CGE modeling build on the results from the interview and business data analysis, by demonstrating that all types of productivity increases would contribute to increasing both efficiency and welfare. However, the computable general equilibrium modeling also showed that the effects vary considerably between different tourism-related sectors and that not all of the welfare gains accrue to domestic residents, as significant gains are received by tourists from other countries.

**CONCLUSION**

Governments are seeking means to increase productivity, as they provide an avenue of increasing growth and employment without necessitating cuts in wages and prices. This paper has examined the ways in which productivity can be increased by examining the roles of its underlying drivers, using a range of methods and information from different sources. The first method was based on information obtained from interviews with managers of different types of businesses. The second involved analysis of large-scale survey data for businesses in different tourism-related sectors. The third used a multisectoral CGE model to examine the effects of increases in productivity in physical capital, labor, and innovation. Each of the approaches provides different information and different insights into a complex phenomenon. Together, the approaches present a more comprehensive picture of the roles of the different drivers of productivity and competitiveness.

Considering, first, the role of physical capital, the results indicate that in general, increases in productivity are not constrained by insufficient business investment. Indeed, analysis of data for businesses showed that tourism-related sectors in the United Kingdom tend to
have above average levels of capital investment. However, the interview results indicated that there is scope for more government investment in infrastructure. Further increases in efficiency and welfare would result from the same in the productivity of physical capital, as indicated by the results from the CGE model, the magnitude of the increases differing among sectors.

In the case of human capital, all of the interview respondents agreed that skilled workers are crucial to competitiveness. However, the retention of skilled labor within tourism activities is an issue of concern, as wages are often insufficiently high to prevent employees from moving to work in alternative sectors. Indeed, the data for businesses showed that wages in the hotel and restaurants sectors are below the national average. The possibility of losing employees to other tourism businesses or other sectors tends to limit the amount of training that is provided. The interview results also showed that although most businesses provided some form of training, small properties in the accommodation sector were an exception. Limited use is made of government-related organizations in the provision of training and many respondents were unaware of the assistance that such agencies can provide. The case for further training is supported by the results from the CGE model, which demonstrated that increases in labor productivity result in significantly improved efficiency, as well as welfare.

Low levels of innovation constitute a further barrier to competitiveness. Small businesses are particularly likely to lack the knowledge and means to introduce product and process innovations. Product innovations were more limited in the case of accommodation than attractions, as the managers of attractions recognized the role that internet innovations play in providing information and marketing. The policy implication is that measures to assist the introduction of innovations would be beneficial. Indeed, increased innovation contributes to higher efficiency and welfare, as indicated by the CGE results from modeling increases in total factor productivity.

The interviews showed that productivity growths are more likely to come from innovations that result in increases in product and service quality than from cost-cutting. However, the business data analysis indicated limited entry of large tourism businesses into the industry. This has adverse implications for innovation, as it is often large conglomerates, with an acquired stock of expertise and knowledge, which can effectively utilize and enhance workers’ abilities. In this sense, innovation and training are complementary, as the introduction of new products and processes goes hand in hand with increases in the skills of the employees using them. Similarly, although the competitive environment within which tourism businesses operate does not generally act as a barrier to innovations and productivity increases, neither does it appear to encourage innovations or enhance human capital. Moreover, small businesses have specific needs and usually fail to benefit from knowledge transfers from larger firms or the public sector.

Overall, the results showed that physical capital, human capital, innovation, and the competitive environment are crucial drivers and that in each case, improvements can be made. They also indicated that
a combined strategy, incorporating measures relating to all of the different drivers of tourism, will be more effective in increasing competitiveness than independently formulated policies for each. Hence, partnership between the public and private sectors is vital, as is greater awareness of the role that government organizations can play in assisting businesses.

There are other implications of the analysis of drivers for the role of government. In the context of investment in physical capital, it has an important role in upgrading the infrastructure that underpins the industry. Both small businesses and banks should be given more information about investment opportunities. The former lack the knowledge base available to large corporations and require specifically tailored assistance. Publicity for best practice in small businesses would encourage more investment of self-generated funds and by external lending bodies.

Government policy for training is also required, as businesses tend to under-invest in this area, often afraid of losing employees to other businesses in tourism or other industries. They also tend to under-invest in innovation, so that the increases in human capital that employees would obtain from working with new products or processes are foregone. Many small businesses require assistance in recognizing these needs, the different types of training and innovations available, the advantages that they could provide, and alternative means of financing them.

In the case of both innovation and training, the government can attempt to encourage improvements by means of quality assessment strategies. Useful initiatives can be conducted in partnership with the private sector, for example, the benchmarking and skills auditing that is undertaken as part of the UK Leadership for Productivity scheme. Government organizations can play a useful role in facilitating cooperation among small businesses to help them increase efficiency and compete more effectively. Its many departments need to collaborate, at national, regional, and local levels, to further this objective, as well as to achieve the required improvements in infrastructure, innovation, and training. In this way, a coordinated strategy in the different but complementary sources of productivity might be achieved.

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