

# **Economic literature review**

**Internet shopping – Annexe F**

**June 2007**

**A report for the Office of Fair Trading by  
Europe Economics**

OFT921f

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# 1 EXECUTIVE SUMMARY

## Background

- 1.1 This report provides a review of academic economic literature and related media assessments of the development of internet shopping. This research was commissioned by OFT as a follow up to a study on e-commerce and its implications for competition carried out in 2000 by Frontier Economics.
- 1.2 Over 250 articles were identified in an initial literature search and these were reviewed at a high level on the basis of abstracts or summaries of contents. A shortlist of about 40 articles was identified on the basis of their relevance to the main topics of interest to OFT. These were subject to detailed review and the findings of these articles provide the main input to this report.

### **The development of internet shopping**

- 1.3 Internet shopping has grown almost five-fold since 2000. It still only accounts for just over three per cent of total retail sales but this share is higher in certain sectors. Nearly two-thirds of consumers are internet users and over half of these had used the internet to make purchases. Convenience of use is an important factor in purchasing decisions but concerns about security of payment and delivery arrangements are seen as negative aspects of the internet.
- 1.4 The growth of broadband access has been an important driver of change both for consumers and for business. The speed of response available has been an important factor in the growth of search engines and price comparison sites.
- 1.5 Traditional retailers have responded to the growth of internet sales by successfully developing their own online businesses. There is considerable interaction between the different forms of business model adopted with business models changing in response both to business and consumer behaviour.

## **Consumers and the internet**

- 1.6 Online consumers tend to be younger, better off and better educated than their offline counterparts. Higher computer literacy makes internet shopping more attractive. Their familiarity with the internet also makes them better placed to identify and take advantage of lower priced products. However in 2005 growth in the numbers of people shopping online was highest for the over 55 year old and the lower social classes.
- 1.7 Consumers are most attracted to the internet for products like books, CDs and PCs where the attributes of the product can be clearly identified online. For low priced products such as CDs the convenience offered by the internet is an important factor. For products requiring direct contact – 'high touch products' – or for which service and delivery are important factors the internet is a less attractive shopping channel.
- 1.8 Price is an important factor in buying online but consumers have been found to be willing to trade off convenience and price. Other factors such as reputation, trustworthiness of the retailer and quality of information are also important to consumers. The internet provides an alternative shopping channel to traditional retailing. However, there are also circumstances in which both channels are complementary with each meeting a part of the consumers' needs to acquire information and understand products before making a purchase either on- or offline.
- 1.9 The increased availability of information is generally a significant benefit to consumers. However research has also identified ways in which the information may be distorted, for example through selective provision, and the consumer benefit reduced.
- 1.10 Price search engines are widely used to identify lowest priced retailers but this does not necessarily lead to the lowest priced products being purchased. Research suggests that consumers use the search engines as an initial screening mechanism but then apply other criteria than lowest price in making their purchase.
- 1.11 Because convenience and trust in retailers is important online, regular consumers may limit their searches to suppliers that they have purchased from in the past. There may be a high cost to getting consumers to switch supplier in these circumstances.

- 1.12 Given the quantity of information available and the cost, in time, of making additional searches, it appears that consumers take advantage of additional information up to a certain level but reach a point at which they do not place a value on further information.

### **Company behaviour**

- 1.13 A range of business models have been developed to take advantage of the different cost structures of internet retailing and new opportunities to interact with customers. There appears to be considerable interaction between online and offline retailers and business models are subject to continuous adaptation in the face of market changes. We have not found evidence that any one model of internet retailing has a particular advantage.
- 1.14 Provision of information through various types of search facility has developed as a new commercial activity. Information is provided free and revenue is generated from companies whose details have been accessed in the search process. The way in which such revenue is generated is not well documented in the literature reviewed.
- 1.15 Pure play internet operators have generally (but not always) offered lower prices. At the same time operators with both online and offline outlets have generally been able to maintain higher prices online than their pure play competitors.
- 1.16 Early views that the internet would provide a 'frictionless' competitive market have not been realised. There is a substantial body of evidence to show that there is a considerable degree of price dispersion for similar goods both between internet sites and between on- and offline sales. A number of reasons for continuing price dispersion have been considered. These include quality factors, convenience, variation in consumer awareness and factors affecting consumer trust in particular retailers.
- 1.17 Price dispersion does not necessarily imply that prices are above competitive levels. Further investigation would be necessary to establish the reasons for price variation. Non-price factors may provide a rational explanation but research has also identified market structure and differences in access to information as possible explanations.

- 1.18 The internet allows retailers to obtain a large amount of information about consumer behaviour and preferences. This coupled with the ease with which prices can be changed online provides the opportunity to tailor product offerings to individuals or groups of individuals. This has focused attention on whether the internet offers new opportunities for price discrimination. This is a general concern rather than one based on clear evidence at this stage. It is also possible that some element of price discrimination may expand markets and be of benefit to consumers. Bundling of products, particularly information goods may be used by firms as an alternative to overt price discrimination.
- 1.19 Vertical integration has not been a major feature of internet shopping. However there have been some suggestions that manufacturers might seek to limit the supply of certain goods to internet outlets in order to protect traditional retailers. This is not an issue which is unique to internet shopping but has the potential to restrict competition and should be kept under review.
- 1.20 The internet also provides companies with a significant amount of information about each others behaviour. This provides material which could be used to support price collusion. However collusion generally requires the existence of a wider set of conditions if it is to be sustainable. It is not clear that all of these conditions are satisfied in the circumstances of internet retailing.
- 1.21 Building brand recognition and consumer trust have been recognised as particularly important factors in attracting and retaining internet shoppers. That may require substantial investment which may be higher for online than for offline trading. This could give early entrants an advantage and provide a barrier to entrants at a later stage.

### **Market definition**

- 1.22 Market definition has not been addressed directly in the literature reviewed but a number of general points can be identified particularly from the literature on price dispersion. In general it appears that the internet forms part of the total retail sector. For competition policy purposes this would normally be considered on a product by product basis through an examination of price sensitivity. While there are products which appear more suited to internet trading than others, we

have not identified areas where the internet should be regarded as constituting a separate market. There is no indication that there is any requirement to develop new approaches to market definition in considering the operation of competition.

### **Areas for further work**

- 1.23 Internet shopping continues to grow rapidly and there is evidence that this is beneficial to consumers in terms of lower prices, increased access to information and increased choice. However the continued existence of price dispersion, the way firms may be able to influence information flows and the potential for price discrimination and tacit collusion have all been identified as issues which should be kept under review. Targeted studies of individual products and of the persistence of price differentials could provide a focus for monitoring developments.
- 1.24 There are certain aspects of internet retailing which have not been the subject of the research covered in this review. Concerns were expressed in the past in the Frontier Economics report that network effects could result in dominant players and barriers to entry. This has not emerged from the literature as an issue in the development of internet shopping to date although the related issue of potentially high start up costs has been highlighted as a possible barrier. Network effects are likely to be particularly important in the development of internet auction sites. Further research could be considered to establish if competition is likely to be restricted.
- 1.25 Access to information is one of the defining benefits of the internet but little attention has been given to the way in which search engines and other information sites manage and finance that information. This too could be the subject of further research to establish whether the benefit to consumers from information flows is in any way being restricted.

## 2 INTRODUCTION

### Background

2.1 In 2000 The Office of Fair Trading (OFT) commissioned Frontier Economics to carry out a review of the development of e-commerce and its implications for competition.<sup>1</sup> The report examined three elements, market definition, market power and individual agreements and conduct. It concluded that e-commerce was unlikely to develop entirely new forms of anti-competitive behaviour that could not be dealt with under existing competition law. A number of areas would require careful monitoring and that in some cases detailed application of competition law might require some adjustment.

2.2 Principal findings from that report were that:

- many of the characteristics of e-commerce and associated patterns of behaviour will tend to lower barriers to entry into both B2C and B2B e-commerce, reducing the potential for players to secure and exploit market power
- there are certain characteristics of e-commerce which may tend to raise barriers to entry such as:
  - sunk costs of establishing consumer loyalty - reputation, branding and customer loyalty will become increasingly important and may create significant first-mover advantages. These could be reduced if customers were able to 'port' their own database entries from site to site
  - 'Tippy' markets - Online marketplaces may tend towards being natural monopolies and a second potential entrant may face large barriers to entry. These barriers will be particularly high in markets where liquidity is important and exacerbated where market participants are tied into the market via proprietary supply chain management systems. The 'tippiness' of online marketplaces will be strongly affected by the ability of market participants to monitor different marketplaces and to switch easily between them. Intermediaries could facilitate this

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<sup>1</sup> Frontier Economics, 2000

- even where first mover advantages persist, they need not imply market power if operators compete in a wide product market that includes traditional commerce, and if barriers to entry into the traditional service are low
- increased buyer power will tend to limit the extent to which high market shares and barriers to entry will confer market power.<sup>2</sup>

2.3 Since publication of that report there has been continued development in the use of the internet for business purposes and the elapse of time has provided the opportunity for further research into consumer and business behaviour. In order to provide a basis for assessing the impact of the internet on competition OFT commissioned Europe Economics to carry out a review of the published literature on internet shopping. The overall purpose was to gather and review evidence on how internet shopping is developing and specifically to review the empirical literature to understand how internet shopping has affected:

- the nature of the buying and selling processes
- the process of competition (either positively or negatively)
- the nature of consumer detriment (if at all), in particular what, if any, evidence exists on the scale of the detriment, and
- the nature and scale of any resulting consumer benefits.

2.4 OFT was also interested in understanding key developments which might be expected in these areas.

## **Approach to the Literature Review**

### **General approach**

2.5 The principal focus of this study is on reviewing empirical literature on the impact of internet shopping in order to provide an up-date on key developments in economic theory and analysis relevant to the subject.

2.6 Our initial focus has been on the published economic literature on internet selling, in particular retail sales. We have also looked at a range

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<sup>2</sup> OFT Press Notice, 2000

of economic media reports with a focus on analytical comment rather than news reporting. A number of UK and US government and EU and OECD reports have been reviewed.

- 2.7 Internet and database searches were made using keywords, for example internet shopping, e-commerce and e-tailers. These were used individually and in combination with particular competition issue search words for example price discrimination, IPR, tipping, regulation.
- 2.8 Given the pace of change in the development of the internet as a retail channel there is a danger that the findings of research may have been overtaken by events by the time of publication. We kept this caveat in mind in reviewing the literature. For media and Government material we focused mainly on publications in the last two to five years. That restriction was not applied to the academic literature although in practice direct analysis of the internet only began in the mid 1990s. There are references to seminal earlier articles or books – for example, G Stigler 1961, *The Economics of Information* – which provide a theoretical framework for analysing the internet. These have not been included in the review.

### **The economic literature**

- 2.9 The LSE library provided us with access to a wide range of relevant databases of economic journal articles and working papers. These have been searched using the key words as described above. Some 250 articles were identified in this way. A full list of articles is set out in Appendix 1.

### **Sifting**

- 2.10 The keyword searches provided a crude initial filter for identifying relevant articles. We then narrowed this list down to a short list of key articles which were the subject of more detailed review.
- 2.11 We applied a number of criteria in developing our shortlist. The abstract of each article was used to identify the coverage of issues relevant to the study (using the areas of interest listed by OFT). Articles focused on other aspects of the internet, for example, solely on B2B or on internet taxation, were excluded. We identified whether studies were theoretical or empirical (or a mix). We gave greater weight to empirical studies but

did not automatically exclude the theoretical papers if they addressed relevant issues. We gave preference to more recent articles because these are more likely to be relevant to a rapidly changing area of business. In particular we considered whether the most recent paper by a particular author superseded earlier work. We gave greater weight to articles in peer reviewed journals than to working papers.

- 2.12 However none of these criteria was applied in a rigid way. Nor did we attempt to apply a rigid scoring system. Our selection was based on the team's collective judgment of each article. We then cross-checked the bibliographies in the selected articles to ensure that we were not overlooking seminal papers and as a result identified some additional material to consider.
- 2.13 On this basis we identified a shortlist of 41 priority articles which were subject to detailed review and which form the basis for the findings set out in the rest of this report. These articles are listed in Appendix 2.

### **Quality**

- 2.14 For the economic literature the principal external check on quality was simply whether the article had appeared in a respected peer reviewed journal or was at the earlier stage of working paper or mimeo. Where possible we made our own assessment of the strengths and weaknesses of each article. However given the volume of the material reviewed, some of it using complex modelling, we cannot claim to have carried out a detailed critique of each article.
- 2.15 In looking at media and trade comment it is easier to identify the extent to which each piece is seeking to present an objective analysis. Much of the material, with some exceptions, is clearly written to present a particular point of view or promote an individual company position. While this may provide interesting anecdotal material which can illustrate a point which has emerged from more considered analysis, it must be used with caution. The market research work we examined fell into a middle ground. The major surveys are likely to have been well conducted using appropriate techniques for collection and analysis of data but the commentary on what such data tell us about market development may tend to be short term and may not be set in a clear market framework.

## Summary of coverage

2.16 A summary of the coverage of the articles which were subject to detailed review is set out in Table 2.1 This shows the extent to which particular issues were addressed in this literature. Some issues such as consumer behaviour and effects of quality/quantity of information have reasonably good coverage; others such as tipping and IPR do not feature at all.

**Table 2.1**

Issues	Frequency
Business models for internet retailing.	20
The internet as substitute or complement to traditional shopping and factors affecting use.	15
Effect of quantity and quality of online information on competition.	14
How consumers search for and select suppliers.	13
Rationality of consumer behaviour.	9
Internet retailing and collusion.	7
Price discrimination by internet retailers.	6
Use of vertical restraints.	3
Barriers to entry into internet retailing.	3
Refusal to supply or special conditions for internet retailers.	2
Tipping points in internet markets.	0
Intellectual Property Rights (IPRs) and the development of internet shopping?	0

## Structure of the report

2.17 The following sections of this report set out our findings from the literature review. We provide an overview of the development of internet shopping based on published statistics, market research, industry and media comment. The principal academic research findings and key issues arising are reviewed under the headings of:

- Consumer issues
- Business models
- Pricing developments

- Other aspects of company behaviour.

2.18 The final section brings together main findings and areas for possible further attention.

### 3 THE DEVELOPMENT OF INTERNET SHOPPING

#### Growing use of the internet

- 3.1 Computer ownership and internet access in UK households has increased significantly over the past five years. In January 2005, 62 per cent of households in Great Britain could access the internet at home compared with only nine per cent in 1998-99.<sup>3</sup> Broadband connections now account for about 60 per cent of all connections.<sup>4</sup>
- 3.2 Alongside this growth in household high-speed access to the internet there has been a very rapid growth in internet shopping. In 2004 internet sales made to UK households by UK non-financial sector businesses were valued at £18.1 billion, an increase of 68 per cent on the previous year. This compares with sales of around £3 billion in 2000.<sup>5</sup> Trade comment suggests that rapid growth has continued in 2005.<sup>6</sup> However a recent Mintel survey paints a more cautious picture suggesting that the rate of growth in internet sales, while continuing, has slowed down and is now largely in line with growth in consumer internet connections.<sup>7</sup>
- 3.3 The same Mintel report notes that the Internet has not transformed the face of retailing to quite the extent predicted five years ago but that it is continuing to establish itself as something more than just a niche retail channel. In this respect, it is obviously of more importance to some sectors than others, something that to a large extent is determined by the relative ease or difficulty with which an online order can be fulfilled.
- 3.4 UK internet retail sales in 2005 represented 3.1 per cent of total retail sales of businesses. This share had risen from 0.1 per cent in 1997.<sup>8</sup> Industry projections suggest that retail sales on the internet could rise to £21.5 billion by 2010 and represent over 6.8 per cent of all retail sales.<sup>9</sup>

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<sup>3</sup> Office of National Statistics (ONS), Expenditure and food survey, 2005

<sup>4</sup> ONS Survey of Internet Service Providers, 2005

<sup>5</sup> ONS Annual e commerce survey, 2004

<sup>6</sup> Interactive Media in Retail Group (IMRG), e-retail, 2005

<sup>7</sup> Mintel Internet Quarterly, 2005

<sup>8</sup> Verdict e-Retail Report, 2005

<sup>9</sup> Verdict e-Retail, 2005

3.5 In the US retail e-commerce sales were estimated to total \$81.8 billion in the year to end September 2005, about 25 per cent up on the previous year. This compares with overall annual growth in retail sales of around two per cent. E-commerce sales now represent about two per cent of all US retail sales.<sup>10</sup>

### **Patterns of use**

3.6 A recent survey indicated that over 60 per cent of consumers were regular users of the internet.<sup>11</sup> Nearly all of these respondents had used the internet for finding information about goods and services and over half had used it to make purchases. The internet is now more popular than mail order as a channel for home shopping.<sup>12</sup> The most popular purchases are books and CDs.<sup>13</sup>

3.7 Use of general search engines is the predominant means of acquiring information. Google accounted for 70 per cent of searches for all types of information with Ask, Yahoo and MSN Search accounting for almost all of the remainder.<sup>14</sup>

3.8 In a survey by the Welsh Consumer Council in 2005, the principle reason cited by Welsh shoppers for using the internet was convenience (77 per cent). Forty per cent cited value for money or lower prices and over a quarter said they liked being able to shop around for best buys. More choice or variety was only mentioned by three per cent of internet shoppers.<sup>15</sup> By contrast, in an Oxford Internet Survey in 2005, 78 per cent of British internet users agreed with the statement that 'shopping on the internet offers more choice' and 73 per cent agreed that 'the price of things on the internet are lower'.<sup>16</sup>

3.9 A survey article in The Economist in 2004 noted '... the extraordinary influence the internet is exerting over purchases carried out in the offline world. That influence is becoming an integral part of e-commerce... What is going on is arbitrage between different sales channels.

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<sup>10</sup> US Department of Commerce, Census Bureau, 2005

<sup>11</sup> ONS, 2005

<sup>12</sup> Mintel, 2005

<sup>13</sup> APACS, 2005

<sup>14</sup> Hitwise, 2005

<sup>15</sup> Welsh Consumer Council – Internet Shopping: the consumer perspective - 2005

<sup>16</sup> Oxford Internet Institute, 2005

Consumers are 'unbundling' product information from the transaction itself...Shops are moving to become showrooms.' <sup>17</sup> This trend is confirmed in the IMRG review in October 2005.

3.10 Nonetheless the bulk of internet shopping remains concentrated in a relatively small number of product sectors. Mintel's quarterly survey of internet shoppers indicates that there were only four sectors – books, music, entertainment tickets and travel – where more than one quarter of these shoppers had actually made purchases.

3.11 The principal consumer concerns about internet shopping were:

- security of payments (58 per cent)
- ability to make warranty claim or get refund (37 per cent)
- aspects of delivery (34 per cent).<sup>18</sup>

3.12 In 2005, Consumer Direct received 23,727 complaints in relation to internet purchases, including those bought from internet auctions. This represented 7.6 per cent of all complaints in that period.

## **Market developments**

3.13 In a rapidly growing market there is likely to be considerable scope for innovation. The dot.com boom (and bust) which preceded the major growth in internet commerce is an indication both of the opportunity to innovate and of entrepreneurs' willingness to engage with the new market opportunities. Innovation has continued in recent years, possibly more incremental than radical, and a number of features stand out from media and industry comment.

3.14 The continuing penetration of high-speed broadband internet access has been an important driver of change both for consumers and businesses. Speed of response has made the search for product information much easier and more attractive. This in turn has driven the growth of search engines, notably Google.com, and of price comparison sites (often known as shopbots) such as shopping.com. A number of business

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<sup>17</sup> The Economist, May 2004

<sup>18</sup> European Opinion Research Group, 2004

models have been developed through which search and comparison sites can derive revenue from businesses in return for exposure to potential customers.

- 3.15 A number of pure play (internet only) retail businesses survived the dot.com collapse and have continued to develop. Amazon and eBay are the best known international examples. Both companies are now diversifying away from their original focus to develop wider retailing interests while remaining pure play operators.
- 3.16 Traditional bricks and mortar operators have progressively increased their online activities. Walmart.com is now the fourth largest US internet retailer presence (after Amazon, eBay and Shopping.com).<sup>19</sup> Barnes and Noble has developed a substantial internet book and CD business as a response to Amazon. In the UK, PC World operates in both traditional and online mode and is encouraging customers to make use of both channels, for example by offering buy on line – collect in store options. The counterpart of this latter development is the move towards using traditional shops as showrooms with purchases taking place online. Apple has been a leading exponent of this approach.

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<sup>19</sup> Financial Times, 7 June 2005

## **4 CONSUMERS AND INTERNET SHOPPING**

4.1 This section discusses consumers' use of the internet as a shopping channel.

4.2 Specifically we draw on the reviewed literature to:

- understand factors that drive consumers' use of the internet as opposed to or in conjunction with traditional bricks and mortar shopping routes
- draw lessons on consumers search for and selection of online suppliers, how consumers use information in their search, and what use is made of different kinds of online search engines, and
- consider whether consumers behave rationally in their online shopping.

### **Online — offline decision**

4.3 Various authors have examined the main factors that influence consumers' use of the internet for shopping purposes, as well as the choice between online shopping and shopping in traditional bricks and mortar outlets.

### **Direct investigations of consumer decision making**

4.4 Studies from the late 1990s, such as Smith et al, on the factors leading to online purchasing suggested that online consumers are willing to trade-off convenience and price.<sup>20</sup> Retailers who make it easier to find and evaluate products (for example by better search tools or website design) may be able to charge a price premium to time sensitive consumers.

4.5 More recently it has also been found that on average online shoppers appear to:

- be younger, wealthier and better educated than their offline counterparts

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<sup>20</sup> Smith et al (1999)

- have higher computer literacy, spend more time on their computer and on the internet
  - find online shopping easier and more entertaining, and
  - are less fearful of financial loss from online shopping.<sup>21</sup>
- 4.6 Those who actually purchase online (as opposed to using it for example purely for search purposes) appear to have been using the Internet for a longer time, to be more frequent web uses and to spend more time on the Internet in general. However a recent Verdict e-retail report indicates that in 2005 growth in the numbers of people shopping online was highest for the over 55 year old and the lower social classes.<sup>22</sup>
- 4.7 These studies further compared different categories of benefits and costs of online and offline shopping. The following factors were found to be more important in online than offline context:
- built or perceived reputation and trust in the supplier
  - increased convenience and control over purchases
  - better information, and
  - the general quality of the merchandise.<sup>23</sup>
- 4.8 On the other hand, enjoyment of the experience and service quality has been found to be of less importance to online shoppers compared to offline shoppers. Koyuncy and Bhattacharya found that consumers regarded the longer delivery time for the items bought online and the perceived risks involved in online payment as negative features of internet shopping.<sup>24</sup>
- 4.9 The evidence on the relative importance of price in choosing whether to shop on or offline is ambiguous. There is evidence in research by Keen et al that the availability of lower prices has led individuals to increase their

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<sup>21</sup> For example Bailey (1998), Broekhuizen and Jager (2004) and Brengman et al. (2003).

<sup>22</sup> Verdict e-Retail, 2005.

<sup>23</sup> This could perhaps be because perceived risk associated with products inspected online is lower the higher the quality of the products.

<sup>24</sup> Koyuncy and Bhattacharya, (2004).

shopping from the Internet. Price is undoubtedly an important factor in many decisions to shop online but product and other characteristics have also been found to be important factors.<sup>25</sup>

- 4.10 Keen et al made an assessment of what motivates consumers to shop using a particular retail format. They examined consumers' decision making processes on whether to purchase both CDs and PCs in store, from a catalogue or on the Internet. This study found that for lower cost, lower risk items such as CDs, the convenience offered by the internet retail format may outweigh price differences. With high cost items, consumers prefer to shop around for a better price. The main decision variables in consumers' decision were found to be the retail format (store, catalogue, or Internet) and the product price. The authors found both of these factors twice as important as the possible other factors including ease of use, control over purchase, and retailer attitude (positive or negative). This suggests that the retail format itself and not simply factors such as relative price is one of the main decision factors. Consumers make a positive choice to purchase either online or offline.
- 4.11 Similar analysis, by Levin et al, using a multipart survey of students and an online panel asked respondents to rate their likelihood of shopping online or offline for each of a series of products.<sup>26</sup> They were asked to take into account a number of attributes associated with shopping both at the search stage and at the purchase stage. They were asked to rate the importance of attributes that might be of particular importance for certain products like clothing and books, and to rate the extent to which they thought each attribute was delivered better online or offline.
- 4.12 Several earlier studies had shown that 'high touch' products that consumers feel they need physical experience with require an offline presence, at least at the final purchase stage.<sup>27</sup> At the other extreme, 'low touch' products like airline tickets or computer software are products that favour online services both because of the nature of the product and the importance of shopping quickly. Preference for shopping

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<sup>25</sup> Keen et al (2004).

<sup>26</sup> Levin et al (2005).

<sup>27</sup> This does, however, contrast with suggestions from other studies, described below, that traditional stores may be used as 'show rooms' for high touch products that consumers then purchase online.

online has been found to be particularly strong for products like books and PCs where most attributes can be determined online.<sup>28</sup>

4.13 The findings of the Levin study were consistent with this earlier evidence:

- the respondents rated attributes related to the search process, such as shopping quickly, having a large selection of products and best price as being better delivered online than offline. On the other hand, attributes related to experience with the product (such as the ability to see, touch or handle the product) and attributes related to the delivery process, such as personal service and speedy delivery, were rated as being better delivered offline than online
- based on perceived risk of online transactions, the preference for online shopping was weaker at the purchase stage than at the search stage, so that more shoppers will search for products and information than actually complete purchases online.

4.14 Differences in levels of information held between the consumers may also be a decisive factor in the choice between online and offline shopping, as modelled in Bakos et al.<sup>29</sup> Informed consumers may more readily opt to purchase goods or services cheaply online. Less informed customers may be content to pay more for a bundled offering where research, advice or other forms of service are provided as part of the sales package.

### **Lessons from welfare and pricing studies**

4.15 In general, pricing studies have found both higher and lower prices being charged online than offline, with considerable price dispersion remaining in online (these, and the potential explanations for the dispersion, are discussed further below and in the Section 5). For example, Brynjolfsson and Smith found that Internet retailers charge lower prices than conventional retailers.<sup>30</sup> This held both for prices alone and for prices including the costs of getting the item to the users' homes (for example

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<sup>28</sup> Chiang and Dholskia (2003); Lynch, Kent and Srinivasan (2001); and Girard, Silverblatt and Korgaonkar (2002), all referenced in Levin et al (2005)

<sup>29</sup> Bakos et al (2005)

<sup>30</sup> Brynjolfsson and Smith (2000)

shipping and handling fees, taxes, and mileage costs). Lower overall costs for obtaining the same products, where available, clearly is a reason for shopping online rather than offline.

- 4.16 This is supported by results from a Goolsbee study using survey data from 90,000 US households to examine how offline retail price of computers influences the probability of buying computers online.<sup>31</sup> The study simultaneously controlled for the potential effects of factors such as general cost of living, age, education, number of cars and whether the purchase was made online or offline. It found that the decision to buy computers online was sensitive to the relative price of computers in retail stores.<sup>32</sup>
- 4.17 This would suggest that online and offline computer retailers compete against each other. Changes in online prices themselves, however, were not found to be a significant factor in the decision of whether or not to buy online. The effect was also found to vary by the type of consumer and the type of computer purchased. Experienced computer users and customers purchasing desktop computers were found to be more sensitive to differences in prices between offline and online suppliers. Being more educated was to an extent positively associated with online purchasing, while being older decreased the probability of buying online.
- 4.18 Pricing studies have also explained the existing price dispersion and higher online prices compared to offline counterparts by the existence of the other significant decision factors, such as convenience, discussed in the direct investigations of consumer decisions described above. For example Chun and Kim found that if inconvenience associated with the online purchase decreases, the online price tends to exceed the offline price.<sup>33</sup>
- 4.19 Studies on consumer welfare effects provide further evidence on why consumers shop online rather than offline. Analysis of relative welfare effects of online book retailers by Brynjolfsson and Smith found that the Internet improves the welfare of consumers by allowing them to locate

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<sup>31</sup> Goolsbee (2001)

<sup>32</sup> The cross-price elasticity between offline and online retailers was found to be 1.5

<sup>33</sup> Chun and Kim (2005)

and buy speciality books they otherwise would not have purchased due to high transaction costs or low product awareness.<sup>34</sup>

- 4.20 Estimating the value that consumers place on increased product variety for obscure book titles, the study finds that increased online availability of previously hard-to-find products represents a very significant positive impact on consumer welfare. The increased online availability of previously hard-to-find products represents a positive impact on consumer welfare that is seven to ten times larger than that found by the authors' previous research.
- 4.21 Ability to search for and gain access to a larger variety of goods, including obscure and rare items, may therefore be a major factor in the decision to shop online.
- 4.22 These findings broadly support the findings in the Frontier Economics report that open access to information on products was beneficial to consumers but that the complexity involved on product information could lead to some loss of price transparency.

### **Complementary use of the online and offline channels**

- 4.23 The discussion above considered the use of online and offline channels as substitutes for one another. The two however are also being used by consumers in conjunction with each other.
- 4.24 The Internet can play an information discovery and price comparison role so that consumers enter traditional retailers more informed. Consumers can educate themselves about features and prices online, or use referral services, potentially leading to final price improvements. For example an investigation of the effect of internet car referral services on dealer pricing of automobiles in California by Scott-Morton et al suggested that users of internet purchase referral sites to buy a car paid on average two per cent less than offline customers.<sup>35</sup> Dealer margins on the sale of a vehicle through the referral service were significantly lower than margins earned selling the vehicle in the traditional way. A quarter of consumer savings came from purchasing at low-price dealerships affiliated with the

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<sup>34</sup> Brynjolfsson and Smith (2003)

<sup>35</sup> Scott-Morton et al (2001)

online service. The remaining reduction came from the information provision by the online service, bargaining by the referral service on behalf of customers and cost efficiencies.

- 4.25 The Internet has been also been found to play a role in price discovery and affected the prices of life insurance. Increases in Internet use significantly reduced the price of term life insurance.<sup>36</sup> A survey in *The Economist* discussed how the Internet is changing consumer behaviour with an increasing number of consumers researching their purchases online before buying them in conventional stores.<sup>37</sup> A study by Zmud et al concluded that internet shopping was not necessarily a substitute for traditional shopping and could even lead to an increase in the number of trips for shopping purposes.<sup>38</sup>
- 4.26 Complementarity between the online and offline formats of shopping can also work in the other direction, where traditional stores may be used as 'show rooms' by companies whose consumers then buy online, as suggested by Borenstein and Saloner.<sup>39</sup> In this case online suppliers can free ride on the experience provided by the showrooms and traditional retailers may seek to respond by restricting the availability of their products to online suppliers. This issue is considered further in Section 5.
- 4.27 It seems therefore that consumers can use traditional retailers to learn about 'touch' and experience products, while ultimately purchasing online. Alternatively, consumers may search for product information and make price comparisons online, placing themselves in a more informed position when purchasing from traditional outlets.

### **Online – offline decision – key points**

- 4.28 The literature reviewed suggests that online consumers tend to be younger, wealthier and better educated than their offline counterparts, have higher computer literacy, spend more time on their computer and on the internet, find online shopping easier and more entertaining and are less fearful of financial loss from online shopping. There is however

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<sup>36</sup> Brown and Goolsbee (2002)

<sup>37</sup> *The Economist* (May 2004)

<sup>38</sup> Zmud et al (2001)

<sup>39</sup> Borenstein and Saloner (2001)

some recent evidence of rapid growth in use by older shoppers and in lower social classes.

- 4.29 Further, those that actually purchase online (as opposed to using the Internet purely for search purposes) appear to have been using the Internet for a longer time, to be more frequent web uses and to spend more time on the Internet in general. These better informed consumers can purchase specific products on the Internet without for example additional bundled research services from traditional suppliers.
- 4.30 The products most suited to online purchasing seem to be products, like books and PCs, where most attributes of the products can be determined online. For lower cost, lower risk items such as CDs, the convenience offered by the internet retail format may be important. Low touch products like airline tickets or computer software are products that favour online services because of the additional importance of shopping quickly. Overall consumers feel that products with attributes that can be easily identified through the search process can be better delivered online and are therefore more frequently purchased online. Products requiring personal experience process or for which service and delivery are important factors are viewed as better purchased from offline sources.
- 4.31 While price is clearly an important decision factor consumers have been found willing to trade off convenience and price, and the relative importance of price has sometimes been found to be ambiguous. Factors, other than convenience, that lessen the importance of relative prices particularly in the online context include built or perceived reputation and trust in the supplier; increased control over purchases and better information availability about attributes other than price.
- 4.32 Also the availability of and access to an increased range of products online are factors creating significant consumer welfare benefits, possibly greater than the consumer benefit from reduced prices through competition.
- 4.33 Online shopping has proved itself as an alternative to traditional retailing but the two channels can also be complementary. Consumers can take advantage of each channel's capacity to convey different types of information (hard information and prices from online sources, or experience with products from offline sources) in the buying process.

4.34 Frontier Economics expressed concern about complexity of the information available to consumers but the evidence cited here suggests that consumers operate flexibly in managing and responding to the range of information that is available to them.

### **Search and use of information**

4.35 Two main approaches have been used to model consumer search in general. Search models assume that consumers incur a positive cost of obtaining additional information, such as price quotes. After obtaining each quote consumers then decide whether or not to incur the cost of further searching for a potential improvement to the quote. In information clearing house models, the distinguishing feature is that only a proportion of consumers choose to gain access to a list of prices charged by all firms, for example, through a price comparison site and purchase at the lowest listed price. For other consumers factors such as loyalty to a trusted retailer may be more important.<sup>40</sup>

4.36 Most of the models considered have been put forward as possible ways of explaining continuing price dispersion online. Consideration of different models has found that reduction in search costs does not necessarily eliminate price dispersion. This is examined further in section 5.

4.37 These predictions and observations may be explained by the different characteristics that consumers search for in different products. Beginning from the premise that consumers assess a range of characteristics of a product before making the decision whether to purchase, Bar-Isaac et al have found that if information about product characteristics becomes more easily available this would have an unambiguous benefit to consumers.<sup>41</sup> However, increased availability of information may create distortionary incentives for sellers, either in information provision, or such that firms focus investment on the characteristics that are now easier to assess. Consumers could then lose out on benefits from other characteristics that are downgraded. The overall consumer welfare effect is then ambiguous.

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<sup>40</sup> For example Baye and Morgan (2001, 2003)

<sup>41</sup> Bar-Isaac et al (2005)

- 4.38 The prediction that consumers search for various product attributes besides price is supported by empirical findings that retailers with the lowest prices do not make the most sales – there must be other attributes at play. Brynjolfsson and Smith comment that price dispersion is lower on the Internet than in conventional outlets. These two observations in combination could reflect dominance by heavily branded retailers that are able to charge a premium.<sup>42</sup> This could have a negative impact on consumer welfare, though the authors do not address the question.
- 4.39 Tests of how changes in search costs affect price sensitivity have revealed that lowering the cost of searching for quality information as well as the cost of searching for prices does not lead to an unambiguous fall in prices. In fact, the effects of easier quality search may outweigh those of easier price search in retail markets where quality information is important. A study of wine purchasing by Ariely and Lynch (2000) found that increasing access to price information had no clear effect, but increasing access to quality information decreased price sensitivity. The main point the authors make is that research should not only look at search costs for price, but that other product characteristics should also be taken into account.
- 4.40 The authors comment that there can also be a time dimension in learning about product qualities, so that the relative weight of different search criteria changes through time. One might find that shoppers may be less price-sensitive when they first shop electronically than when they shop in brick-and mortar stores. Once real product differences are learned, the potential of electronic shopping to achieve further differentiation would diminish while consumers' ability to track and compare volatile prices would remain. Thus, one might expect that with the introduction of full-featured electronic shopping, price sensitivity would initially decrease and then increase over time compared with prices in brick-and-mortar retail environments.
- 4.41 Ellison and Ellison have found the empirical observation that charging a low price for a low quality product increases online retailers' sales of medium and high quality products to carry interesting implications about

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<sup>42</sup> Brynjolfsson and Smith (2000)

consumers' actual search behaviour.<sup>43</sup> The reason given for this is that one cannot ask a search engine to find 'decent quality memory modules sold with reasonable shipping, warrant and other terms'. Hence, many consumers use a price comparison site to identify a list of suppliers and then search within a few of these websites to find other products that better fit their preferences. If a retailer tries to advertise a decent quality product on a shopbot with reasonable contractual terms at a fair price, it will be buried behind dozens of lower price offers on the search engine's list.

- 4.42 Other evidence on actual use of search tools and information sources used suggests that the internet leads to a reduction in the total amount of time spent on searching. Simulations of behaviour in the presence and absence of the internet by Lee et al indicate that the presence of the internet leads to substantial reductions in time with dealer or manufacturer sources, with information sought from either independent providers or comparison sites.<sup>44</sup>
- 4.43 Since consumers value convenience, perceived reliability and trust in online purchasing, those factors may also function as search features in Internet shopping. For example, Smith and Brynjolfsson refer to the impact of switching costs and online brand loyalty. They found consumers' past purchase experience had significant predictive power over future online store choice, with customers willing to pay premium prices to retailers they had successfully purchased previously from.<sup>45</sup> This would imply that past good experiences with particular retailers reduces the scope of consumers' subsequent searches, perhaps more than in offline contexts.

### **Search and use of information – key points**

- 4.44 Various models of consumer search behaviour have been put forward as part of price discrimination and dispersion investigations. In particular it is important to recognise that consumers search for various product attributes besides price.

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<sup>43</sup> Ellison and Ellison (2004)

<sup>44</sup> Lee et al (2002)

<sup>45</sup> Smith and Brynjolfsson (2001)

- 4.45 It has been found that if information about product characteristics becomes more easily available this would have an unambiguous benefit to consumers. However, increased availability of information may also lead to distortions in the provision of information. The overall consumer welfare effect is then ambiguous.
- 4.46 Lowering the cost of searching for quality information alongside the provision of price information does not lead to an unambiguous fall in prices. This is consistent with price not being the only dimension of competition.
- 4.47 There could also be a time dimension in learning about product qualities, so that the relative weight of different search criteria may change through time. As additional information is provided online price sensitivity may first decrease and then increase over time compared with prices in brick-and-mortar retail environments.
- 4.48 Price search engines are used as initial screening devices to identify a subset of suppliers but this does not necessarily lead to the lowest priced products being purchased.
- 4.49 Because convenience of the process and trust in suppliers is important online, consumers might limit their search to suppliers that they have purchased from previously, perhaps more than in an offline context.
- 4.50 These research findings generally confirm the factors identified by Frontier Economics as facilitating the growth of online retailing but there are indications that the interaction between information and consumer behaviour may change over time.

### **Are online consumers rational?**

- 4.51 It is very difficult to make robust conclusions about consumer rationality in general, because of the multitude of factors including company strategies affecting observed outcomes as well as the definition of 'rationality' itself. For the most part the literature we reviewed focuses on modelling certain types of behaviour and seeing whether that is a potential explanation of, for example, observed pricing outcomes, or investigates aspects of consumer behaviour without commenting on rationality implications.

- 4.52 One of the factors to consider is the level of information possessed by consumers, and whether consumers search until obtaining (somehow defined) 'correct' level of information. For example, a finding that consumers pay more attention to direct costs than to shipping costs and evidence of hidden qualities of products may or may not be evidence for or against rationality, depending on the costs and benefits of obtaining that additional information. As Gabaix and Laibson point out, some consumers may rationally choose to deal with companies with high additional hidden costs.<sup>46</sup> Better informed consumers able to avoid the hidden costs (for example in the form of higher prices at a hotel restaurant to compensate the hotel for discount rooms) get a cheaper product at the expense of less informed consumers unaware of the extra costs.
- 4.53 Some observed outcomes do, however, have clear rationality implications, such as lower search costs leading to lower profits — implying that consumers utilise the search cost savings to find better prices. Or that the higher the relative price of purchase, the more consumers will search - the cost of search is matched against the benefit from potentially material price improvements.<sup>47</sup>
- 4.54 Consumers might also behave rationally up to some level of information acquisition and processing. Investigation by Dellaert et al on how consumers' shopping decisions alter after disclosure of additional pieces of information shows that increasing information about current and future prices improve consumers' shopping performance through time.<sup>48</sup> However, additional information also makes it harder for consumers to 'live up' to a theoretical decision making model. Increased information requires consumers to take into account a greater number of decision factors so as to fully benefit from this information. As expected, the test subjects' expenditure on a basket of goods decreased as information levels increased. However, in moving on to a scenario where more and more future prices were disclosed to the shoppers, the test subjects' actual reduction in spending was less than that predicted by the theoretical behavioural model.

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<sup>46</sup> Gabaix and Laibson (2005)

<sup>47</sup> Bakos (1997) and Janssen et al (2005)

<sup>48</sup> Dellaert et al (2005)

## **Consumer rationality – key points**

- 4.55 It is very difficult to come to conclusions about consumer rationality, due to difficulty of both definition and measurement given the range of other factors which can affect observed outcomes. Much of the reviewed literature did not directly address the question of rationality. There is some evidence to suggest that when rationality is defined as best possible use of information at hand, consumers behave rationally up to a level of information provision, after which they fall short of theoretical models. The review did not find evidence to suggest that online consumers are inherently less rational than their offline counterparts.

## **5 COMPANY BEHAVIOUR**

5.1 This section considers various aspects of company behaviour in the context of internet shopping. We draw on the literature to comment on:

- the different business models adopted and their effect on the market
- the way in which internet shopping has affected prices and the possibility of price discrimination, and
- a range of structural and behavioural features of the market place including vertical links, collusion and barriers to entry.

### **Business models**

#### **Introduction**

5.2 There are a number of different business models which have been adopted in the development of internet shopping. These include pure play (firms selling solely online), on-line manifestations of high street stores (sometimes referred to as clicks and mortar) and auctions. There is also a range of internet intermediaries such as online referral services which put consumers who submit online purchase requests in touch with conventional retailers and price comparison sites. These sites act as 'information intermediaries' between consumers and businesses. The impact of different approaches to internet shopping on final prices and interactions between business models has been the subject of research and media comment and this is reviewed here.

#### **Choice of model**

5.3 Choice of business model will depend on a number of factors. Pure play internet businesses may face lower staff, infrastructure and inventory costs than offline retailers but incur additional costs in establishing brand loyalty and retaining customers. For some products, for example, newspapers and other 'information' goods, delivery costs online may be reduced, while for 'physical' goods delivery costs may be higher. For auction sites, which provide a market place but are not responsible for handling the goods traded on the site, operational costs may be relatively low. However significant costs may still be incurred in establishing brand recognition and scale of operation. For intermediaries,

where the information provided is free to users, the challenge is to identify and lock in revenue streams which will support a viable business.

### **Online versus offline**

- 5.4 There have been a number of studies which have attempted to model the competition between online and conventional retailers and identify factors influencing the choice of model. These indicate that, on the one hand, pure play internet providers are able to offer lower prices than conventional or clicks and mortar operators. However the latter are able to maintain higher prices in both their online and offline manifestations.
- 5.5 A study by Friberg in 2000 using data on the sale of books and CDs in Sweden, estimated that prices were on average 15 per cent cheaper on the internet but that this saving was partly eroded by transport costs if only a few items were bought.<sup>49</sup> The model used suggested that firms which sell both online and in conventional stores have higher online prices than firms who sell only online. The reason given for this was that such firms wish to avoid competition between different retail channels and are wary of 'cannibalization' that is, losing profits offline if they set prices too low in their online operations.
- 5.6 A more recent study of share dealing services by Bakos in 2005 examined the impact of e-commerce on sectors where established firms face competition from internet-based entrants with focussed offerings.<sup>50</sup> This study compared incumbent (offline) firms offering a full service of research and share trade execution with online firms offering just trade execution. As customer willingness-to-pay declined, the incumbent found it best to unbundle the research and execution services when competing with the online entrant. However, Bakos also found that the differences in commissions charged by offline and online brokerages could not be fully accounted for by differences in execution qualities. These continuing differentials indicate that traditional brokers were successful in differentiating themselves from low-cost rivals.

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<sup>49</sup> Friberg et al (2000)

<sup>50</sup> Bakos et al (2005)

- 5.7 Although this study focused on share brokerage there are similarities with markets such as estate agency, insurance, home mortgages, travel services and car retailing. The results from the study may therefore be applicable in industries where agents act on behalf of clients and where it is difficult for consumers to assess the quality of a bundled package of services. In these circumstances agents may be better informed than consumers and be able to keep prices above the competitive level.

## Developments

- 5.8 There are also indications that business models are subject to continuing adaptation in the face of changing consumer behaviour. The UK's biggest selling website is Amazon which is essentially a pure play operator,<sup>51</sup> but online sales are now generating substantial revenues for traditional bricks and mortar retailers. The UK's second biggest retail website is [www.argos.co.uk](http://www.argos.co.uk) and department store group John Lewis predicted that its online sales for 2005 would be over £100m, equivalent to the sales of one of its largest offline department stores.<sup>52</sup>
- 5.9 A survey in *The Economist* discussed how the internet is changing consumer behaviour with an increasing number of consumers researching their purchases online before buying them in conventional stores.<sup>53</sup> According to the article three out of four Americans start shopping for new cars online, even though most end up buying them from traditional dealers. The difference is that these consumers arrive at the showroom with better information about the car and best available deals. Other industry comment suggest that conventional stores may move more towards becoming showrooms for goods with actual purchases being made online.<sup>54</sup>
- 5.10 The development of online auctions has opened up new marketing opportunities. EBay has been one of the fastest growing internet companies and now has 181 million registered users worldwide. Although it originated as a site for consumers to sell direct to other

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<sup>51</sup> Although Amazon does not operate its own bricks and mortar outlets, the site is increasingly being used by conventional retailers as an additional online platform providing Amazon customers with direct links to their products.

<sup>52</sup> *The Guardian*, November.2005

<sup>53</sup> *The Economist* (May 2004)

<sup>54</sup> IMRG, 2005

consumers, eBay has become increasingly popular as a forum for the development of online businesses. EBay estimates that there are currently 68,000 small businesses in the UK which derive a quarter or more of their income from sales on the site.<sup>55</sup>

- 5.11 Auction sites such as eBay are more valuable to both buyers and sellers the more people participate on both sides of the market. EBay as early entrant into this form of business has benefited from this network effect and remains the leading auction site despite the attempts of other players, including Microsoft to enter the market.<sup>56</sup>

### **Business models - key points**

- 5.12 The growth of the internet has created opportunities to develop new business models which build on the different cost structure of internet retailing and the new opportunities to make contact and interact with customers. In the process some totally new streams of business, notably search engines and price comparison sites, have emerged. As providers of free information these do not fit easily into the conventional framework for analysing market interactions on the basis of price.
- 5.13 In adopting a particular business model a firm will be looking to gain some advantage over its competitors, to find ways of avoiding the direct pressures of price competition and, if possible, to lock in any advantages over the longer term. However such ambitions will be vulnerable to the responses both of competing firms and of customers. The balance between these forces will determine the extent to which any one firm is able to shift the market structure away from the competitive outcome to its own benefit and the detriment of consumers.
- 5.14 We have not found evidence to suggest that any one model of internet retailing has a particular advantage. Pure play internet businesses operate alongside online manifestations of high street stores and auction sites. Pure play operators have been able to offer lower prices in many cases but there is also some evidence of higher prices being maintained online.

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<sup>55</sup> The Guardian. February 2006

<sup>56</sup> The Economist, May 2004

- 5.15 Operators with both online and offline outlets have generally been able to maintain higher prices online than their pure play competitors. The extent to which this reflects added value in the online service or is just a leveraging of their offline market position, for example, brand loyalty, has not been established. In general it appears that there is a considerable degree of interaction between online and offline trading and that business models are subject to continuous adaptation in the face of changing business and consumer behaviour.
- 5.16 Provision of information has developed as a new activity with information provided free to users and revenue being generated from the companies whose details have been accessed. Information in this context has many of the features of a public good – its use by one person does not reduce the amount available to others. With public goods there is generally a concern that they may be underprovided if this is left to market forces. Given the extent of information available on the internet it is not apparent that this is an immediate issue. However, the way in which such sites generate revenue is not well documented in the literature and could be an aspect which merits further research.

## **Pricing**

### **Introduction**

- 5.17 The impact of internet shopping on pricing has been the focus of much attention in the literature we have reviewed. This section considers evidence both on price levels and continuing price differences between retailers. It also considers factors affecting consumers' responses to posted prices and reviews a number of approaches put forward to explain observed behaviour. Price discrimination is considered as a separate issue.

### **Price dispersion**

- 5.18 In the early days of the development of internet commerce some grand claims were made for the impact of this new approach to trading. In particular the scope for rapid processing of large volumes of information and the freedom of access to such information was seen as a sea change in the operation of markets which would alter the behaviour both of firms and consumers and lead to increased competition.

- 5.19 As the internet began to develop this vision was enthusiastically adopted by business leaders.<sup>57</sup>

The Internet is a nearly perfect market because information is instantaneous and buyers can compare the offerings of sellers worldwide. The result is fierce price competition, dwindling product differentiation, and vanishing brand loyalty. Robert Kuttner in *Business Week*, May 11, 1998

... industry titans such as Bill Gates, the boss of Microsoft, regale the world's leaders with the promise of 'friction-free capitalism.' *The Economist*, May 10, 1997

'All of this brings you closer and closer to the efficient market.' Robert MacAvoy, President, Eastman Consulting. *Business Week*, May 4, 1998

- 5.20 In this scenario of the development of the new market, prices should be bid down to the competitive market level. This outcome, known to economists as Bertrand competition (see box below), is possible even in oligopolistic markets with a small number of firms.

#### **Bertrand Competition**

Bertrand competition is said to occur in a market where there are two or more firms that sell identical products. Competition is extremely fierce, due to an absence of barriers to entry and no information asymmetries; so much so that price is driven to equal average costs (and marginal costs) in both the short and long run.

Bakos (1991) was one of the first to associate the notion of Bertrand competition with the sale of goods on the internet. He wrote that 'electronic marketplaces are likely to move commodity markets closer to the classical ideal of a Walrasian auctioneer where buyers are costlessly and fully informed about seller prices... we expect that electronic marketplaces typically will sway equilibria in commodity markets to favour the buyers, will promote price competition among sellers, and will reduce sellers' market power.' In theory, it does seem intuitive that the internet will lead to Bertrand competition due to low or close to nil costs of setting up a website, the proliferation of information

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<sup>57</sup> These quotations are cited in Brynjolfsson and Smith (2000)

revealing sites and low overheads (fixed costs). Bakos further predicted that the reduction in customer search costs would allow consumers to easily compare prices, thereby causing a decrease in switching costs. The subsequent result would be Bertrand price competition between identical goods such as books and CDs.

5.21 There is now a substantial body of economic literature which has examined both the theory and practice of retail pricing on the internet. There is significant (although not universal) evidence of considerable dispersion of prices for apparently similar goods or services both between internet sites and between on- and offline sales outlets.<sup>58</sup> This is in contrast to the initial expectations for internet pricing. A number of aspects of pricing have been considered in this literature.

### **Price levels and price dispersion**

5.22 In principle online markets might be expected to be more efficient than conventional ones as a result of a reduction in information asymmetries arising from lower search costs. In addition, where entry costs are low this may limit price premiums sustainable by existing market participants and favourable cost structures should lead to lower equilibrium prices in the long run. However the empirical evidence is mixed.

5.23 An early study by Lee in 1998 of prices for used cars sold in the emerging electronic markets compared with conventional auctions from 1986-1995 found that prices were higher in electronic auctions and had increased over time.<sup>59</sup> Analysis in 1998 by Bailey of prices for matched set of books, CDs and software sold through conventional and internet outlets from 1996-1997 found that prices were higher in internet markets.<sup>60</sup> However Brynjolfsson and Smith also analysed a matched set of books and CDs sold through conventional and internet outlets, for the period 1998-1999, and found that prices were lower in internet markets.<sup>61</sup>

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<sup>58</sup> See, for example, Smith, Bailey and Brynjolfsson (1999).

<sup>59</sup> Lee (1998)

<sup>60</sup> Bailey (1998a and 1998b)

<sup>61</sup> Brynjolfsson and Smith (2000)

5.24 Research by Clemons and others in 1999 using prices quoted by online travel agents for airline tickets in 1997 found substantial price dispersion online.<sup>62</sup> Subsequent research on a range of goods and services has continued to show mixed outcomes. A summary of research findings prepared by Kauffman and Lee is show in the box below. <sup>63</sup>

5.25 The studies we have reviewed suggest that price dispersion may occur for a number of reasons. These include:

- differences between the products being offered on different sites which are not factored into the analysis
- convenience and shopping experience: for example retailers who make it easier to find and evaluate products, perhaps through providing better search tools, may be able to charge a price premium to time sensitive consumers. One research study found find that the characteristics of products encountered early in a shopping experience influenced subsequent purchases made during the same visit<sup>64</sup>
- awareness: Many internet retailers aggressively purchase premium locations on internet portals and spend on advertising through traditional media. Models simulating consumer behaviour have been used to demonstrate how asymmetry of information between consumers and retailers, brand loyalty and network effects can lead to price dispersion and increased levels of concentration<sup>65</sup>
- price comparison shopping: People using shopbots do not necessarily purchase from the retailer with the lowest price. Trust might be signalled through online communities, links from trusted sites, unbiased product information and existing conventional world brand name.

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<sup>62</sup> Clemons, Hann and Hitt (1999)

<sup>63</sup> Kauffman and Lee (2005)

<sup>64</sup> Menon and Kahn (1997)

<sup>65</sup> Greenwald and Kephart (1999) & Ogus, de la Maza and Yuret (1999)

**Overview of pricing studies**

Authors	Data	Results
Ancarani and Shankar (2004)	Prices of books and CDs sold in Internet, bricks and mortar, bricks and clicks	Highest price dispersion in bricks and clicks retailers and lowest prices in pure Internet retailers.
Bailey (1998)	Prices of books, CDs, and software sold online and offline.	Price dispersion not less online and higher prices online
Brynjolfsson and Smith (2000):	Prices of books and CDs sold online and offline.	Less price dispersion online and lower prices online.
Clay et al. (2002a)	Prices of books sold online.	Less price dispersion online and that competition led to lower prices
Clay et al. (2002b)	Prices of books sold online.	Timing and direction of price changes correlated across firms.
Kauffman and Wood (2005)	Prices of books and CDs sold on online.	Evidence of follow-the-leader pricing online
Pan et al. (2001)	Prices of books, CDs, electronics sold online.	More price dispersion online
Smith (2001):	Prices of books sold online.	More price dispersion in IT related goods and higher prices for well-known retailers
Tang and Xing (2001)	Prices of DVDs sold online and in other	Less price dispersion online and lower prices online

	channels.	
Arbatskaya and Baye (2004)	Daily mortgage rates posted online.	Considerable price dispersion online
Brown and Goolsbee (2002)	Prices of life insurance policies.	Less price dispersion online and lower prices online.
Baye and Morgan (2004)	Prices of consumer electronics sold online.	Higher price dispersion online.
Baye et al. (2004)	Prices of consumer electronics sold online.	Higher price dispersion and price levels the smaller the number of firms quoting prices
Carlton and Chevalier (2001)	Prices of fragrances, DVD players and refrigerators.	High price dispersion online and less price dispersion across authorised dealers.
Baylis and Perloff (2002)	Prices of digital cameras and scanners sold online.	Firms that offer good service charge lower prices and high prices firms remain high priced over long periods.
Lee (1998)	Prices of used cars in offline and online auctions.	Higher prices in online auctions
Morton et al. (2001)	Prices of cars sold online and offline.	Less price dispersion online and lower prices online

## Price elasticity

- 5.26 In efficient markets, consumers are more sensitive to small changes in prices, at least as long as substitute vendors or producers exist. To the extent that the internet reduces consumers' search or switching costs this might be expected to result in higher price elasticities. Research findings again provide mixed results.
- 5.27 A survey of internet purchases by 25,000 online users carried out by Goolsbee in late 1997 found that internet purchases were highly sensitive to local tax rates which could be avoided by shopping online.<sup>66</sup> In contrast Degeratu and others study of shopping behaviour for groceries sold online and in conventional outlets from 1996-97 found price sensitivity lower online. This may reflect greater sensitivity to special promotions in-store than online.<sup>67</sup> A simulation study by Ariely and Lynch of behaviour in shopping for wine found that providing better product information combining price and quality information could reduce price sensitivity.<sup>68</sup> Survey data for travellers, examined by Shankar and others, showed that prior positive experience with a brand in the physical world can decrease price sensitivity online.<sup>69</sup>

## Menu costs

- 5.28 A particular feature of internet markets is a significant reduction in the cost of introducing price changes. In an electronic market the cost of changing the 'menu' of prices should be lower than for conventional retailers since this primarily involves only the cost of a single price change in a central database. Lower menu costs may be expected to result in more frequent and smaller changes in internet prices. The studies of prices for matched set of books, CDs and software sold through conventional and internet outlets from 1996-1997 referred to in 5.23 above, found that menu costs were lower in internet markets.<sup>70</sup> Incremental price changes were significantly smaller than in offline stores and price changes occurred more frequently.

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<sup>66</sup> Goolsbee (2000)

<sup>67</sup> Degeratu, Rangaswamy and Wu (1999)

<sup>68</sup> Ariely and Lynch, (2000)

<sup>69</sup> Shankar, Venkatesh and Rangaswamy (1998)

<sup>70</sup> Bailey (1998a and 1998b), Brynjolfsson and Smith (2000)

## Modelling price dispersion

- 5.29 In considering the reduced search costs provided by the internet researchers have identified two paradoxes:
- a price search engine that is so efficient in directing consumers to the lowest priced retailer may thereby force other retailers out of business and undermine the rationale for the search engine's existence
  - if the search engine is efficient and creates a competitive retail market then retailers may not earn any surplus out of which they are able to afford to pay the search engine for its services. Furthermore, consumers will have no incentive to use a search engine because if they know there is no price dispersion, then they can just go directly to any retailer.
- 5.30 These issues have been considered in some detail by Ellison and Ellison.<sup>71</sup> In their view it may be possible for the operators of price comparison sites to avoid the revenue implications of these paradoxes if they have a range of pricing instruments. Charging retailers for advertising on the site and for customer referrals are possibilities. But the possibility of highly efficient price searching driving retailers out of business remains.
- 5.31 One approach to explaining why these paradoxes do not, in practice, undermine the use of the internet for retail information exchange is to introduce the idea that there is a combination of information provision and 'obfuscation' involved in sectors where price search engines play a dominant role. The authors contend that as search technologies improve retail firms will have an incentive to put some 'friction' back into the market by creating an environment in which price search is more difficult or at least less of a threat to profitability.
- 5.32 To test their hypotheses on price obfuscation they used data on a number of small, undifferentiated e-retailers selling computer memory upgrades, CPUs and other computer parts. This analysis confirmed that:

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<sup>71</sup> Ellison and Ellison (2004b)

- price search on the internet can dramatically reduce search friction and lead to extremely elastic demand. They estimate that the firms faced a demand elasticity of between -25 and -40 for its lowest quality memory modules
- setting a low price for a low quality (and low margin) product, the so called 'bait and switch' strategy, has the effect of attracting potential buyers to the site. This then leads to sales of medium and high quality products with higher margins. Many consumers use the search engine to identify lowest cost suppliers and then search within a few of these websites to find other products that better fit their preferences on a wider range of product characteristics
- obfuscation strategies, including variations in delivery charges or in warranty and returns policies, can improve profitability by limiting the ease with which lowest priced products can be identified.

5.33 The wide range of potential influences on internet pricing and price dispersion is brought together in research by Kauffman and Lee which tests a range of propositions (see box below) which might explain pricing behaviour and considers the empirical evidence in support.<sup>72</sup> Using data from a number of earlier articles, this research finds limited evidence in support of the price flexibility and consumer demand related propositions. The propositions that price is related to market structure and differences in the levels of consumer access to information received stronger support.

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<sup>72</sup> Kauffman and Lee (2005)

### Pricing propositions tested by Kauffman and Lee

- **Information quality proposition:** if consumers have more information on the quality of a product sold on the Internet, then Internet-based sellers will change product prices more frequently, resulting in less price rigidity.
- **Quality Signalling proposition:** to signal high quality store images successfully, higher-quality, higher-priced Internet-based firms change the prices of products less frequently than lower-quality, lower prices Internet-based sellers.
- **Price Points proposition:** Internet-based sellers change their prices with 9-endings less frequently than those with other price endings because they have an incentive to make the price endings equal to \$9 or 9c.
- **Flexible Price Adjustment proposition:** due to very low menu costs Internet based sellers have the capability to change prices flexibly by any amount at any time.
- **Access-store price staggering proposition:** Internet-based sellers stagger price changes of the same product across firms due to managerial cost and the interdependence on the actions of their competitors.
- **Product Demand proposition:** Internet based sellers have an incentive to frequently change the prices of highly-demanded products due to consumers' higher price sensitivity caused by lower search costs.
- **Holiday season delivery lag proposition:** during the holiday season, Internet-based sellers will offer free shipping more often to avoid antagonising their customers due to delivery lags instead of direct price changes.
- **Internet market concentration proposition:** on the Internet, high industry concentration leads to greater price rigidity due to consumers' enhanced search capabilities; the more highly concentrated an industry is, the less rapidly will the industry's firms adjust prices in response to changes in market conditions.

- **Tacit collusion proposition:** to avoid intense price competition caused by search capabilities which both consumers and sellers can use, Internet-based sellers will tend to tacitly collude with other, leading to rigid (higher) prices on the internet.

5.34 Kauffman and Lee conclude cautiously that one should probably not expect less price rigidity in e-commerce. They argue that price rigidity should be reconsidered in terms of a range of factors including non-price elements and other competitive considerations including managerial capabilities, the sophistication of the competition and a firm's chosen price/quality/service profile in the sector.

### **Pricing – key points**

- 5.35 Early views that the internet would develop as a 'frictionless' perfectly competitive market have not been realised. The balance of evidence suggests that lower prices are available online but that prices offered by retailers operating both on and offline are higher than those offered by pure online operators.
- 5.36 A substantial body of research now exists which demonstrates that there is a considerable degree of price dispersion for similar goods both between internet sites and between online and offline sales. A number of reasons for price dispersion have been considered. These include:
- product differences, for example, quality factors, which are not factored into the comparison
  - convenience and shopping 'experience' aspects for which consumers may be willing to pay a premium
  - consumer awareness may be affected by factors such as advertising expenditure to encourage brand recognition
  - the use of price comparison sites is not necessarily used to identify the lowest possible price; other 'trust' factors are also important to consumers.

- 5.37 Price dispersion does not necessarily imply that prices are above the competitive level. There is no clear indication of the development of excessive pricing as suggested in the Frontier Economics report. Further investigation would be necessary to establish whether higher prices reflected the cost of providing the additional characteristics of the products or service which consumers valued or whether this was a reflection of market segmentation designed to reduce competition.
- 5.38 One feature of the internet is a significant reduction in the cost of introducing price changes. This should allow retailers to introduce more frequent and smaller price changes in response to competitors' prices. A further area for investigation would be the extent to which retailers are able to maintain any price differentials over a period of time.
- 5.39 The internet allows consumers to search for product information at a much reduced cost. There is evidence that this does increase consumers' sensitivity to prices but, at the same time, this may encourage firms to adopt strategies which put some 'friction' back into the search process to prevent prices being driven down below sustainable levels.
- 5.40 In general research has found that internet prices are less flexible than might be expected on the basis of costs and that any assessment needs to take into account a range of non-price factors which may provide a rational explanation for price differences and for price rigidity. However research has also identified market structure and differences in consumer access to information as relevant factors in explaining price differences.

### **Price discrimination**

- 5.41 One interpretation of the evidence of the existence of price dispersion is that this reflects the existence of price discrimination on the part of internet retailers. Price discrimination which can take various forms (see box below) exists when two 'similar' products with the same marginal cost are sold by a firm at different prices.

#### **Types of price discrimination**

- First degree (or perfect) price discrimination is where the price is exactly equal to the maximum the consumer is willing to pay

- Second degree price discrimination involves the establishment of a pricing structure for a particular good based on the number of units sold (quantity discounts are a common example), and
- Third degree price discrimination is based on setting different prices for different groups of consumers.

5.42 A number of characteristics of internet shopping may mean that there is more potential for online retailers to price discriminate than conventional retailers. These include the ease of changing prices (low menu costs), the large amount of information regarding shopping behaviour that online retailers can collect and the ability to single out individual consumers. However the literature on internet price discrimination has focused more on theoretical possibilities, than on actual empirical evidence of price discrimination being practiced.

5.43 A survey of the recent literature on price discrimination by Armstrong focused on three aspects of pricing decisions where the development of the internet might present new or enhanced opportunities for discrimination:<sup>73</sup>

- the information about customers available to firms
- the instruments firms can use in the design of their tariffs, and
- the ability of firms to commit to their pricing plans.

5.44 With monopoly supply, an ability to engage in price discrimination will boost profits unless the firm cannot commit to its pricing policy. With competition the effects of price discrimination depend on the kinds of information and/or instruments available to firms. The focus of this article was on developing the theoretical framework within which price discrimination could be analysed.

5.45 A simulation experiment by Deck and Wilson in 2005 investigated the impact of firms tracking customers and offering discriminatory prices

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<sup>73</sup> Armstrong (2005)

based on search history.<sup>74</sup> The authors conducted an experiment using students who competed as sellers of a fictitious good in a posted offer market.

- 5.46 This simulation showed that consumers on average faced the same prices when sellers had the ability to track customers and price discriminate as when sellers posted a single price for all buyers. However, different types of buyers were affected differently by tracking – informed buyers receive lower prices when sellers could detect buyer search, whereas uninformed buyers received lower prices when sellers could not track their behaviour.
- 5.47 An earlier study by Koch and Cebula used search theory and a survey of the empirical evidence to analyse the prices paid on the internet, the quality of goods purchased and the nature of goods received.<sup>75</sup>
- 5.48 The authors stated that third degree price discrimination was ubiquitous on the internet with customers with less elastic demands paying higher prices. They gave the example of one major US retailer which used the internet to analyse consumer buying behaviour store by store and change its inventory and prices accordingly.
- 5.49 Although the authors state that data mining has enabled e-commerce firms to accumulate large amounts of consumer information which they use to engage in price discrimination, they argue that this outcome is probably not adverse from the standpoint of consumer welfare. This is because price discrimination increases welfare if total output increases. Internet retailers who charge all customers the same price may make society worse off because it may result in some customers not being served at all.
- 5.50 Concerns about the erosion of individuals' privacy as a result of internet transactions have also been linked to the development of price discrimination.<sup>76</sup> Collection of information about individuals and their use of the internet provides the information that allows sellers to determine buyers' willingness to pay. It also allows monitoring of usage to ensure that arbitrage is not used to bypass discriminatory pricing. Price

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<sup>74</sup> Deck and Wilson (2005)

<sup>75</sup> Koch and Cebula (2002)

<sup>76</sup> Odlyzko, (2003)

discrimination offers a much higher payoff to sellers than any targeted marketing campaign particularly where there are one off fixed costs and low marginal costs. However there are also strong countervailing factors operating. Consumers have the opportunity and the information to switch to lower priced suppliers. There is also evidence that people do not like being subjected to dynamic pricing. This may lead suppliers to disguise their price discrimination, for example through bundling of products.

## **Bundling**

- 5.51 Bundling may provide firms with an alternative to conventional price discrimination. Price discrimination requires that the seller can accurately identify consumer valuations and prevent consumers from buying goods at prices meant for others. Thus, the conventional approach to price discrimination operates by increasing the number of prices charged to accommodate the diversity of consumer valuations. In contrast, bundling reduces the incentive to respond to the diversity of consumer valuations. Sellers charge only one price without seeking to identify different types of consumers and do not need to enforce any restrictions on which prices consumers pay.
- 5.52 One important effect of the development of the internet has been the radical reduction in the marginal cost of reproducing and distributing information goods such as consumer software. This has led to the development of bundling strategies by internet companies seeking to make their product more attractive to a wider range of consumers.
- 5.53 Bundling can create 'economies of aggregation' for information goods if their marginal costs are very low. A seller typically can extract more value from each information good when it is part of a bundle than when it is sold separately. Moreover, at the optimal price, more consumers will find the bundle worth buying than would have bought the same goods sold separately.
- 5.54 Modelling of bundling strategies by Bakos and Brynjolfsson suggests that these will benefit firms offering larger bundles of goods.<sup>77</sup> Large scale bundlers will be willing to pay more for access to upstream content

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<sup>77</sup> Bakos and Brynjolfsson, (2000)

because bundling makes demand for their products less price sensitive and allows them to obtain more profit from new items as they are added. Because the benefits of aggregation increase with the number of goods included in the bundle, large bundlers may enjoy a competitive advantage in purchasing or developing new information goods.

- 5.55 This analysis suggests that where the marginal cost of the information good is very low bundling can provide a significant advantage in competition for upstream information content. Adopting a bundling strategy may make a firm appear 'tougher' to competitors and potential market entrants and may allow a firm to dislodge an established incumbent or deter entry.
- 5.56 However the development of online trading may also undermine traditionally bundled products. This can be seen from the research on competition between online and offline brokerage referred to in paragraph 5.6 above.
- 5.57 The results indicate that ecommerce has had a significant impact on the retail brokerage industry. It triggered market expansion and an industry transition to a new pricing equilibrium with the development of a wider range of bundled and unbundled services.

### **Price discrimination – key points**

- 5.58 The internet allows online retailers to acquire a large amount of information about the shopping behaviour of individual consumers. This, coupled with the ease with which online prices can be varied, provides the opportunity to provide product offerings which are tailored to the perceived requirements of individual consumers or groups of consumers. This has led to concern that the internet will offer new opportunities for price discrimination.
- 5.59 Much of the literature on this topic has focused on theoretical modelling of possible price discrimination. There is empirical evidence that third degree price discrimination (between consumer groups) is widespread and that consumers with less elastic demand pay higher prices. There is also research which suggests increased opportunities for bundling of products as an alternative to direct price discrimination. Successful bundlers of low cost information goods may gain a competitive advantage which could deter later entry.

- 5.60 However the impact of price discrimination on consumer welfare is unclear. If the outcome is an increase in output with more consumers acquiring goods or services that they value then consumer welfare should increase. Clear cut anti-competitive effects of price discrimination, for example predatory price targeting or the earning of supra-normal profits, identified as possibilities in the Frontier Economics report, have not been highlighted.

## **Vertical links**

### **Introduction**

- 5.61 This section considers a limited amount of literature commenting on vertical integration issues including both integration at the corporate level and attempts to exert control in other ways along the vertical supply chain.

### **Vertical integration**

- 5.62 It has been suggested that in the early stages of electronic commerce, the firms that dominate the gateways to commerce and channels, in particular the portals, but also to a lesser degree the shopping bots and search engines, are able, through the fees they charge, to extract some of the value created by the positioning they give to competing sites.<sup>78</sup>
- 5.63 Vertical integration can offer a firm the possibility of reduced costs and increased control over profit margins. It may also provide an opportunity to hedge against risks and uncertainties at different stages in the supply chain. Vertical integration is particularly a feature of sectors where there is a requirement for significant levels of long life capital expenditure in order to maintain a place in the market as is seen, for example, in energy and chemicals production. To date vertical integration of this sort has not been a feature of the internet. The investment required to develop an internet shopping site is not great and the opportunities to make cost savings through closer control of the supply chain appear limited.
- 5.64 Development of search engines may require greater up front investment which, once incurred, may largely be a sunk cost. That will particularly

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<sup>78</sup> Borenstein and Saloner (2001)

be true of investment to establish brand recognition. However the opportunity to buy into downstream activities may be limited. Restricting searches to information owned in-house, for example to particular retail chains, could seriously reduce the attractions of the search engine.

- 5.65 One example of vertical integration having some impact on internet shopping can be seen in the study of the garment industry by Gertner and Stillman.<sup>79</sup> Clothing is one of the leading products on the internet and it is also a sector in which there is significant variance within the industry in company organisational form. Some brands are distributed through vertically integrated specialist retailers and catalogue companies, whereas other brands are distributed primarily on a non-exclusive basis through department stores and other non-integrated retailers.
- 5.66 The authors of the study argue that vertically integrated firms in the apparel industry, such as Gap, had a greater ability and incentive to adapt to the internet than non-integrated department stores and vendors. A number of reasons are given for this. Integrated retailers have lower transaction costs, in particular they have better control over the costs of transaction at each stage in the supply chain. They also avoid the 'channel conflict' problem between retailers and brand owners where brand owners may be unwilling to supply for online sales if this is seen as a threat to their offline sales in other outlets.
- 5.67 A sample of 30 firms in the apparel industry was used to investigate whether vertically integrated speciality retailers tended to start online sales sooner, even after controlling for pre-existing catalogue operations and whether the products of vertically integrated speciality retailers and catalogue companies were more available online than the products of non-integrated vendors. The empirical study confirmed these hypotheses.

### **Vertical restraints**

- 5.68 Manufacturers of certain goods attach particular value to the promotional effort which traditional retailers provide as part of their in-store service. For such products customers can free ride off the promotional effort of the traditional offline retailers acquiring information about products

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<sup>79</sup> Gertner and Stillman, (2001)

which they then purchase more cheaply on the internet. This can lead to manufacturers attempting to control the availability and pricing of their products over the Internet. This is not an issue limited to internet shopping. It applies to all attempts to sell such products at a discount to high street prices. However the development of the internet may have increased consumers' opportunities to obtain access to discounted prices.

- 5.69 Empirical investigation by Carlton and Chevalier in 2001 found that manufacturers of three types of branded goods — fragrances, DVD players and side-by-side refrigerators — appeared to control the pricing and availability of their products over the Internet. Each of these products relies on retail support; fragrances because consumers typically prefer to try them on prior to purchase, DVD players because of their complexity; and side-by-side refrigerators because they tend to be high end refrigerators and consumers generally like to examine the attractiveness of high-end appliances and inspect their features. In terminology discussed earlier, all three of the products could be called 'high touch' goods, at least at the time of the study.<sup>80</sup>
- 5.70 The study found that fragrance and DVD manufacturers both appeared to attempt to keep their products from being sold at discount sites, or attempted to control the extent of price discounting on the Internet. The two most common restraints used by manufacturers were pricing (with no discounts allowed) and, less frequently, the restriction of available supply to only certain internet websites (such as only the manufacturer's or a selected retailer's website). Manufacturers also can charge high prices at their own site and those of authorised retailers.
- 5.71 More recently consumer electronic companies have been accused of just such a dual pricing strategy – designed to narrow the price differential between the web and high street – by offering lower discounts to online traders than their high street rivals.<sup>81</sup>
- 5.72 The US Federal Trade Commission (FTC) has looked at similar complaints in respect of wine, contact lenses and caskets (coffins). Much of the

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<sup>80</sup> Carlton and Chevalier (2001) — since then DVD players have become much more common and may not require the same level of retail support

<sup>81</sup> Mintel Internet Quarterly, December 2005

FTC's concern has been with State level requirements being used to restrict the development of e commerce in these products. The FTC has sought to persuade State legislatures to adopt pro competitive measures rather than using direct enforcement powers.<sup>82</sup>

### **Vertical links– key points**

- 5.73 Vertical integration up or down the supply chain has not been a significant feature of the development of internet retailing to date. There have been some examples of manufacturers or retailers seeking to restrict the ability of internet outlets to offer products at discounted prices. This practice does not appear to have been widespread but clearly has the potential to limit online operators' ability to compete, as was identified in the Frontier Economics report. It is something which should be kept under review.

## **Collusion**

### **Introduction**

- 5.74 It has long been recognised that given appropriate market conditions collusion between businesses either to raise prices or to restrict the supply of goods or services can result in higher levels of profit and lower consumer welfare. Explicit collusion, involving direct contact between companies, is now illegal under both UK and European law although that in itself does not mean that it has been eliminated. The circumstances that make explicit collusion attractive to businesses may also mean that firms have a high degree of awareness of each others activities. They will have the incentive and the ability to set prices above competitive levels without fear of those prices being undercut or of losing market share. This section considers how these considerations operate in the context of internet shopping.

### **Tacit collusion**

- 5.75 The possibility of 'tacit collusion' has been the subject of considerable attention from competition authorities and a number of general conditions have been identified which make such collusion possible and

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<sup>82</sup> Ohlhausen (2005)

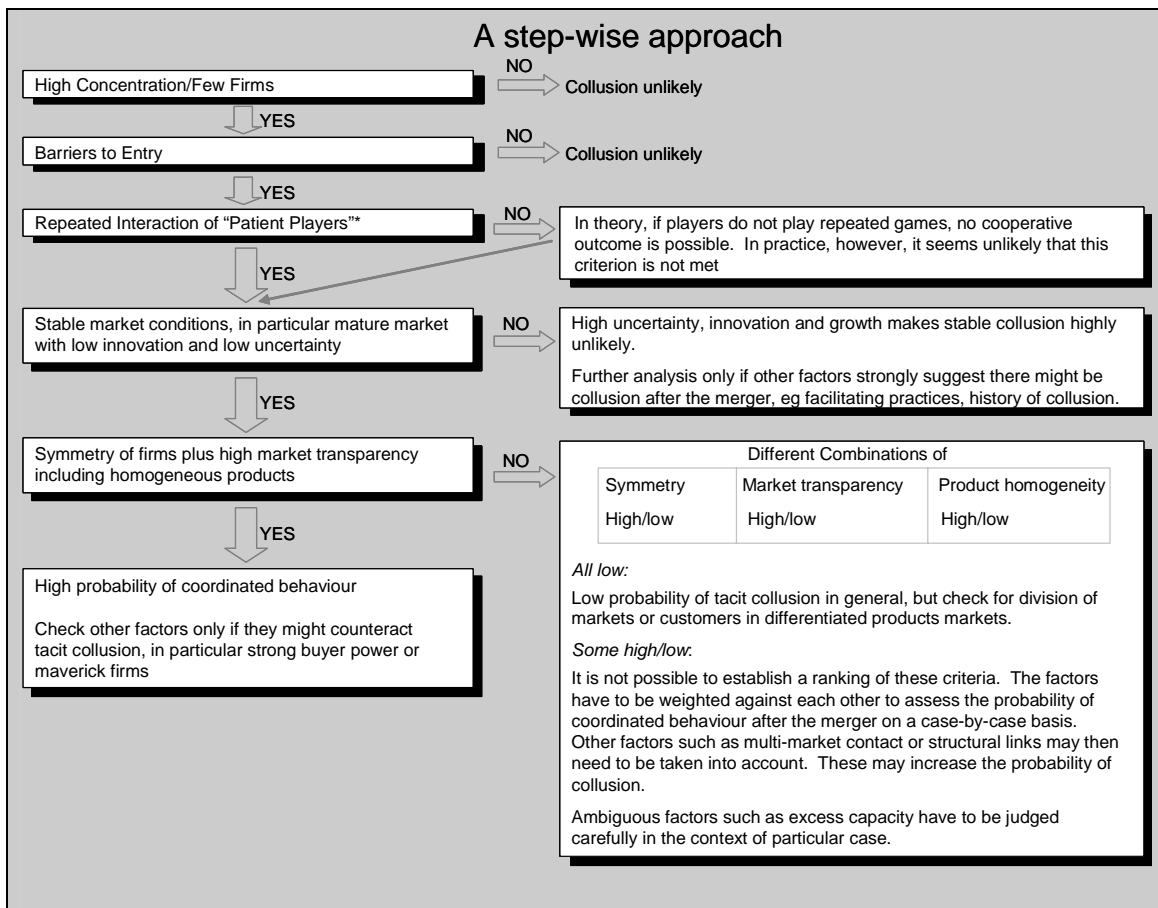
in the absence of which collusion is unlikely to be sustainable.<sup>83</sup> These include:

- a small number of firms
- regular and repeated contacts between firms
- barriers to entry
- capacity to reach a mutually acceptable equilibrium
- ease of detection of breaking away from the tacit agreement
- ability to enforce agreement.

5.76 A simple flow diagram approach to assessing whether collusion is likely in a particular industry is set out in the Box below.

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<sup>83</sup> For a detailed review of the conditions which may support collusion see Study on Assessment Criteria for Distinguishing Between Competitive and Dominant Oligopolies in Merger Control. Study for the European Commission, DG Enterprise, Europe Economics 2001.



## Internet experience

- 5.77 Early internet shopping literature predicted that the internet would facilitate convergence towards perfect competition and collusion would be impossible (see paragraphs 5.18 -5.20 above). As described above there is some evidence in certain internet retail sectors to support this view. However more recent analysis by Campbell and others taking into account the informational impacts of the internet suggests that collusion may actually be easier on the internet.<sup>84</sup>
- 5.78 The relationship between online retailers and search portals is less discussed. The literature tends to refer to price search engines (or shopbots) when discussing search in relation to internet shopping. The impact of the conventional search engines (Google, Yahoo, etc.) is not

<sup>84</sup> Campbell et al (2005)

generally considered. The December 2005 Mintel report does note that Yahoo! Recently introduced a programme of paid for inclusion, but quickly claimed it was committed to maintaining an 'iron wall' between the process of paying to be included in the index and the algorithmic decision about how high to rank a particular page on any given search query.

- 5.79 In considering the possibility of collusion between internet retailers the focus has been on the increased provision of information about retail prices both through company internet sites and through price comparison sites. The counterpart of reduced search costs for consumers is increased visibility of pricing behaviour between firms. This provides essential material for any tacit collusion and also allows firms to identify any players that are deviating from the 'collusive' price level.
- 5.80 The research by Campbell and others uses a modelling approach to examine the impact of reduced search costs on the prices of commodity products in electronic marketplaces. The authors show that less costly consumer search can facilitate firms' ability to collude leading to higher prices even with no monitoring of each others prices by sellers. The technology that allows consumers to search for the lowest prices also allows firms to monitor each others prices more easily. Firms can more easily detect cheating on a collusive price arrangement, allowing even greater scope for collusion. The authors suggest that in the absence of an appropriate legal and regulatory remedy to deter such collusion, at least some of the anticipated gains in market efficiency from electronic markets may be difficult to realise.
- 5.81 An earlier study by Kauffman and Wood sought to test the validity of four hypotheses about collusion on the internet (see Box).<sup>85</sup> The model suggests how electronic commerce technology enables firms to be extremely responsive to pricing changes for products. This responsiveness ultimately enables firms to collude tacitly with each other to help ensure higher profits for all.

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<sup>85</sup> Kauffman and Wood, (2000a)

### Collusion hypotheses

- **Modified tit-for-tat:** internet-based sellers will tend to react collusively if the competitors that they are responding to tend to act collusively. Conversely, internet-based sellers will tend to act competitively (that is, non collusively) if competing internet-based sellers that they are responding to refuse to tacitly collude. A corollary of this is that levels of collusion and competition will vary among different industries for which internet-based selling is observed.
- **Asymmetric competition hypothesis:** the more market power on internet-based seller has in relation to another internet based seller, the more likely that the former will respond with a competitive price.
- **Competitor response time hypothesis:** the less time, on average, that a firm takes to respond to its competitors, the more likely its competitors will tend to act collusively toward that firm. Conversely, the more time, on average, that a competitor takes to respond to its competitors, the more likely its competitors will tend to act competitively toward that firm.
- **Firm response time hypothesis:** the more quickly a firm responds to its competitors, the more likely that firm will tend to act competitively.

5.82 Kauffman and Wood carried out an econometric analysis of data on online sales of books and music CDs in 2000. The results indicate that:

- an increase in a competitor's response causes a firm to act more competitively. Firms tend to collude with a colluder and compete with a competitor
- the more market power a firm has the more likely it is to act collusively. The actions of smaller firms have little impact on the sales and revenue of market leaders
- the ability of competitors to respond rapidly is more likely to encourage collusion than competition.

5.83 This paper shows how the same firms can act differently in different environments, and that the competitive choices of the market leaders in an industry can determine the nature of competitive interactions throughout the industry. It is this interaction that decides whether the environment is collusive or competitive. The econometric estimates of collusion and competition show that firms are influenced by the actions of the competitor to whom the firm is responding, by the market power of that firm relative to the market power of the competitor, and by competitors' ability to immediately respond. They also show that a firm may choose to compete intensely rather than collude to drive current and future competitors from the market, but this strategy is deemed risky.

### **Collusion – key points**

5.84 Explicit or tacit collusion between firms will generally only occur if certain market conditions are met. Regular and repeated contacts between firms, ready availability of pricing information and the ability of firms to respond rapidly to price changes are all necessary (although not necessarily sufficient) conditions for collusion to be feasible and sustainable.

5.85 The increased provision of information about retail prices both through company sites and through price comparison sites provides essential material for collusion and reduces the cost to firms of acting in this way. This ease of information flow also allows firms to detect any attempts to cheat on the collusive price level. The low cost of changing prices allows firms to respond quickly to any cheating and 'punish' such deviation.

5.86 Research into alternative explanations of internet firm behaviour suggests that the ability of competitors to respond quickly to any price change is a significant factor in encouraging tacit collusion.

5.87 This is in line with concerns raised in the Frontier Economics report. However there are also other features of market structure which are generally considered as necessary if collusion is to be sustainable. These include a small number of players and significant barriers to entry. Further research into the potential or presence of collusion in internet shopping would need to consider the full range of relevant factors.

## **Barriers to entry**

### **Intellectual Property Rights**

- 5.88 One might expect that IPR issues may be significant for the development of Internet shopping either in respect of replication of products, or of proprietary technology. For example, the fact that ebay.com owns PayPal and has recently acquired Skype (both of which could be considered as part of the transaction infrastructure of the internet) might pose competitive issues for internet shopping through network effects or the level of licensing fees for competitors. The literature search did not, however, find analysis of these types of issues for the review.
- 5.89 Most fundamentally from the point of view of intellectual property rights on products, the Internet provides a means of perfect duplication and easy distribution of works such as texts, pictures, audio-visual material, and other authorship for which copyright law provides certain exclusive rights to owners. This would be a question of upholding the existing copyright laws — fundamental patent law norms are not subject to challenge by the Internet.<sup>86</sup> Copyright protection has been used as a means of challenging the sale of counterfeit goods on auction sites.<sup>87</sup>

### **Network effects and returns to scale**

- 5.90 The possibility that online marketplaces might develop as natural monopolies and might develop as the preserve of a dominant provider was raised in the Frontier Economics report in 2000. The concern was that some markets might be increasingly effective the more participants that could be attracted. At some 'tipping' point the scale of an operation could make it difficult for the incumbent to be challenged by a new entrant.
- 5.91 While the possibility of network effects of this sort is acknowledged in the literature, particularly in relation to the development of auction based markets and the success of eBay, we have not identified any analysis of the operation of network effects in the development of internet shopping.

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<sup>86</sup> Meyer (1998)

<sup>87</sup> MSNBC, September 2004

## **Other barriers to entry**

- 5.92 Section 4 discussed how reputation is a significant factor when consumers decide which online seller to purchase from, with brand recognition mattering when there is no personal contact. Successfully establishing brand loyalty may also be important in retaining online customers. This is likely to lead to aggressive advertising and promotions to establish reputation and charge a higher price.<sup>88</sup> Successful early entrants to internet shopping may then have an advantage over later entrants.
- 5.93 It may be that potential for barriers created by consumer attitudes about internet purchasing in general will lessen over time as consumers become more educated, and the user demographic of internet shopping becomes more and more mainstream.
- 5.94 The internet has opened up new opportunities for bundling of products, particularly information goods. It is possible that early success in assembling attractive product bundles may provide a cost advantage which is a deterrent to later entrants.

## **Regulation**

- 5.95 The European Commission has introduced a number of Directives applicable to e-commerce. These include Directives on distance selling, data protection and electronic signatures. The Electronic Commerce Directive 2000 built on these earlier initiatives to provide harmonised rules but only in those areas where intervention is strictly necessary to ensure the free operation of electronic services between Member States. The main objective of the Directive is to bolster the single market by ensuring the free movement of so-called 'information society services' (ISS) across the EEA and to encourage the greater use of e-commerce by clarifying the rights and obligations of businesses and consumers. This Directive applies to a wide range of internet services including internet shopping.
- 5.96 The Electronic Commerce (EC Directive) Regulations 2002 which implemented this Directive in the UK covers the issues of applicable law,

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<sup>88</sup> Wiseman (2000)

provision of information by internet operators, provisions governing online contracts, extent of and limitations on liability. The Directive and its implementation have been criticised for leaving ambiguities in definitions which may lead to inconsistencies between Member States and encourage service providers to seek out locations with the least restrictive regulatory environment.<sup>89</sup> This high level regulatory framework is clearly relevant to the issues of consumer trust and security identified in Section 4.

### **Barriers to entry – key points**

- 5.97 The investment required to establish brand recognition and consumer trust may be higher for online than for offline trading. This may provide a barrier to entry for new entrants facing established incumbents. A regulatory framework which increases consumer confidence in online shopping may help to counteract this concern.
- 5.98 Barriers resulting from lack of access to relevant intellectual property or from network effects favouring an incumbent have not been highlighted in the literature.

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<sup>89</sup> Turner and Traynor (2002)

## **6 CONCLUSIONS**

- 6.1 The development of internet shopping has been the subject of a growing body of economic research. The main focus has been on the responses of consumers and businesses to the opportunities offered by the internet with particular attention to effects on prices and to interactions between online and offline retailing.

### **Business models**

- 6.2 The growth of the internet has created opportunities to develop new ways of operating retail businesses which build on the different cost structures and consumer interactions which are available. These include new streams of business like search engines and price comparison sites.
- 6.3 We have not found evidence to suggest that any one model of internet retailing has a particular advantage. Pure play operators exist alongside online outlets of high street stores and auction sites. Pure play sites have been able to offer lower prices but there is also evidence of higher prices being maintained online. In general operators with both online and offline outlets have been able to maintain higher prices on line than their pure play competitors. This may be a reflection of consumer preferences or of brand loyalty. For the most part there is considerable interaction between online and offline trading and business models are subject to continuous adaptation.
- 6.4 Provision of information on the internet, free to users, is a relatively new commercial activity. The way in which revenue is generated by these information sites is not well documented and could be the subject of further investigation.

### **Prices and competition**

- 6.5 There are indications that the internet has provided benefits to consumers in the form of lower prices, particularly where well defined standard products such as books and CDs are involved. There are also indications that internet retailers are capable of offering a wider range of particular products than is normally available from traditional retailers. This, too, is a benefit to consumers.

- 6.6 However early predictions that the internet would provide a 'frictionless' and highly competitive market have not been borne out by this research. There is a substantial body of evidence showing the continued existence of a range of prices for similar products. This price dispersion has been observed both between online and offline outlets and between online retailers.
- 6.7 Various explanations have been advanced to explain the continuing existence of price dispersion. The evidence on consumer attitudes to internet shopping suggests that a variety of factors other than price are important in deciding whether to shop on-or offline. These include product quality information and the types of service being offered in alternative shopping channels. Consumers are prepared to make a trade off between price and other factors such as convenience, site or retailer reputation, detail of information and trustworthiness.
- 6.8 These factors may provide a good explanation for observed price differences but there is also some evidence to suggest that price differences can be linked to levels of market concentration. Further investigation would be necessary to establish whether price difference reflect the cost of providing the additional characteristics valued by consumers or whether this is the result of market segmentation designed to reduce competition. A particular aspect which could be investigated is whether price differentials are sustained over a significant period of time.
- 6.9 A further consideration is that the characteristics that consumers look for if they are to feel confident in shopping online, for example related to trust, security and convenience, may require significant up-front investment by internet retailers. This may provide a basis for market segmentation and first mover advantage which could deter subsequent entry.

### **Availability of information**

- 6.10 The internet provides consumers with access to substantially more information than was previously available and this is generally beneficial. This is accessible in a variety of ways, for example, from retailers own sites, search engines and price comparison sites. Price comparison sites are widely used by consumers in searching for goods but this does not necessarily lead to the lowest priced products being purchased.

- 6.11 There is evidence to suggest that internet retailers may be able to manage the information flows on their sites. The use of low priced offers as a means of attracting potential buyers to a site with the objective of selling higher value products is one example. Consumers have a limited appetite for acquiring additional pricing information and may also limit their purchasing to trusted suppliers. As a result consumers do not extract the full benefit of lower prices.
- 6.12 In practice consumers appear to adopt a flexible approach to sourcing information. The products that consumers are most willing to buy on line are those with well defined attributes which can easily be researched online and which do not require direct contact. Books, CDs and travel tickets all fall into this category. Where a wider range of such products can be made available online for example, a longer book catalogue or wine list, this is of particular value. Consumers prefer offline retailing for products requiring personal experience or where service and delivery are important.
- 6.13 Depending on the circumstances and the products involved consumers may see online and offline retail outlets either as substitutes or as complements. The use of traditional retail outlets to acquire information about products which are then purchased online at lower prices can raise free-rider concerns which in the extreme may lead to attempts to restrict online retailers' access to products. This is not an issue which is unique to internet shopping and there is only a limited amount of evidence of it occurring in practice. However it has the potential to restrict competition and is an aspect which should be kept under review.

### **Price discrimination and collusion**

- 6.14 The internet provides new opportunities to acquire information about consumers' shopping preferences. This coupled to the ease with which prices can be varied provides internet retailers with new opportunities to tailor their products to individuals' preferences and to apply differential prices which increase business profits and reduce consumer benefits.
- 6.15 Much of the discussion of this issue has been based around theoretical modelling although there is some evidence that retailers are able to charge higher prices to customers who are less sensitive to price changes. Differences in prices also need to take into consideration the

points discussed above concerning non-price characteristics. Product bundling may also be used as an alternative to price discrimination.

- 6.16 The effect of price discrimination, if it could be proved, on consumer welfare is not clear cut. It is possible for price discrimination to result in an increase in welfare.
- 6.17 There has also been discussion about the potential for the internet to lead to an increase in actual or tacit collusion between retailers. The provision of information on prices which, in the first instance, is beneficial to consumers also provides essential information on which collusion can be based and may also make it difficult for an individual competitor to gain from offering lower prices.
- 6.18 At the same time the flow of information is only one of a number of features which would generally need to be present if collusion is to succeed. These other aspects, which include there being only a small number of players, would need to be taken into account in any further investigation.

### **Market definition**

- 6.19 Any assessment of the impact of internet shopping on competition and on consumer welfare would need to start with an assessment of the relevant market as set out in OFT's Guidelines. Market definition has not been addressed directly in the literature reviewed although the range of studies on pricing and price dispersion are relevant
- 6.20 The rapid growth of internet shopping has largely been at the expense of traditional retailing but the internet still only accounts for a small, if growing, proportion of retail sales. Some products, particularly those with characteristics which can be fully identified online and/or are relatively low priced, are more suited to internet trading than others.
- 6.21 Lower prices have been an important but not the only factor in the growth of internet sales and there appear to be opportunities for price differentials to be maintained. This reflects some form of product differentiation even with products such as books and CDs which are particularly suited to internet trading.

- 6.22 There is no indication from these findings that there is any requirement to develop new approaches to market definition in considering the operation of competition. In general it appears that the internet trading forms part of the wider retail sector. This would normally be considered on a product by product basis through an examination of price sensitivity. While there are products which appear more suited to internet trading than others we have not identified areas where the internet should be regarded as constituting a separate market.

### **Areas for further work**

- 6.23 Internet shopping continues to grow rapidly and there is evidence that this is beneficial to consumer in terms of lower prices, increased access to information and increased choice. However the continued existence of price dispersion, the way firms may be able to influence information flows and the potential for price discrimination and tacit collusion have all been identified as issues which should be kept under review. Targeted studies of individual products and of the persistence of price differentials would provide a focus for monitoring developments.
- 6.24 There are certain aspects of internet retailing which have not been the subject of the research covered in this review. Concerns have been expressed in the past that network effects could result in dominant players and barriers to entry. This has not emerged from the literature as an issue in the development of internet shopping to date although the related issue of potentially high start up costs has been highlighted as a possible barrier. Network effects are likely to be particularly important in the development of internet auction sites. This is an area where further research could be considered to establish if competition is likely to be restricted.
- 6.25 Access to information is one of the defining benefits of the internet but little attention has been given to the way in which search engines and other information sites manage and finance that information. This too could be the subject of further research to establish whether the benefits to consumers from information flows is in any way being restricted.

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