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ELECTRONIC COMMERCE AND THE CPI

Invited paper submitted by Australian Bureau of Statistics **

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INTRODUCTION

1. Although the much-lauded vision of the “paperless office” is yet to materialise, the adoption of electronic-commerce has substantially altered business processes across the globe. The new business models present a number of challenges and opportunities for national statistical offices.
2. This paper seeks to identify and discuss the key issues that the rise of e-commerce presents to compilers of consumer price indexes. The intention is not to provide all the answers but to provide a discussion opener leading to a better understanding of those areas where index compilers may profit most from expending scarce research and development resources.
3. The paper is in two parts. Part I describes those elements of e-commerce of most relevance to consumer price indexes and attempts to provide at least some indication of current and future significance. Part II looks at each of the major issues specific to the construction of consumer price indexes.

I. E-COMMERCE DESCRIBED

What is it?

4. The term electronic commerce (e-commerce) is generally used to refer to the buying or selling of goods and services via some computer network. The infrastructure required to support electronic transactions has transformed the production and distribution system from source to final consumer. It makes readily available the information required to better schedule production runs, monitor stock levels and track the location of goods in transit. The Internet is one of the key enablers of e-commerce and, in particular, provides the means by which final household consumers can actively engage in e-commerce.
5. This paper is concerned with that sub-set of e-commerce that covers the purchase or acquisition of goods and services by households over the Internet, including the services of Internet Service Providers (ISP’s).

Internet use by Australian households

6. One of the most visible indicators of the extent to which the Internet has permeated everyday life is the incidence of the inclusion of Internet addresses in advertisements (print and television). Even individuals that do not access the Internet would appear to have a high awareness. The prospect for growth is high – the more households connect to the Internet, the greater the incentive for businesses to develop Internet services, the more attractive the Internet becomes to households.
7. At the present stage of Internet development it is convenient to categorise household use of the Internet into three components:

- i. gaining access to the Internet (primarily via ISP's);
- ii. accessing the "free" services available on the Internet; and
- iii. purchasing or ordering goods and services online.

8. In Australia, 33% of households had home Internet access in 2000 (up from 22% in 1999)¹. An analysis of how adults used the Internet is provided in table 1.

Table 1: Adult home Internet activities, Australia 2000 (a) (b)

<i>Activity</i>	<i>%</i>
Using email or chat sites	68
General browsing	57
Finding information relating to work	36
Finding information relating to studies	26
Finding information on goods or services	26
Finding technical information, patches or shareware	16
Playing games	8

(a) Adults may have done only one or any number of activities.

(b) Proportions are of all adults accessing the Internet at home.

Source: ABS (2001).

9. Home is not the only place from which adults can access the Internet. While 47% of adults accessed the Internet in 2000, only 29% did so from home. Table 2 provides some information on total adult use of the Internet.

¹ See ABS (2001).

Table 2: Adult Internet use in Australia, 2000

	% (a)
Use Internet	47
Accessed from home	29
Accessed from work	23
Accessed from elsewhere	22
Accessed govt services (b)	9
Paid bills (c)	9
Purchased online (d)	7

(a) Proportion of adult population.

(b) For private purposes

(c) Or transferred funds via the Internet.

(d) Purchased or ordered goods or services online. (Spending on average around \$600 each.)

Source: ABS (2001)

10. Taken together, the data in tables 1 and 2 paint a picture of already significant use of the Internet and significant consumption of the services of Internet Service Providers (ISP's) by households.

11. CIE (2001) estimate that the average amount paid by Australian households for Internet access (ISP charges only) was \$21/month or \$5/week. With 33% of households incurring such expenses, ISP charges would account for about 0.2% of the Australian CPI expenditure basket.

12. By definition, accessing the "free" services does not result in any additional expenditure by households so the value of this activity cannot readily be quantified in monetary terms or expressed as some proportion of the CPI basket.

13. It is interesting to note that more adults use the Internet to pay bills or transfer funds (Internet banking) than use the Internet to order or purchase goods or services (9% c.f. 7%). The online purchase of goods and services would account for approximately 0.2% of the Australian CPI basket.

Prospect for growth

14. With the global fall from grace of the 'dot.coms' still fresh in the memory, it is reasonable to question whether commerce on the Internet might meet a similar destiny.

15. The Allen Consulting Group (2001) recently looked at the Internet economy in Australia and commented:

There are very few Internet Economy firms that are 'pure players'. Only 1 percent of businesses surveyed earn the majority, or all of their revenues, with the assistance of the Internet. Meanwhile a further 47 percent of businesses report that they currently earn some of their revenue online. On average, companies in the Internet Economy currently earn 6 percent of their revenue online. These statistics highlight a major characteristic of the change that is underway: the Internet is being used as 'a complement not a cannibal of traditional ways of competing' as Michael Porter says it should be. Business in Australia is taking a mixed approach – 'clicks and mortar' –

rather than being restricted to just one model.
Allen Consulting Group 2001, page vii

16. This mixed model approach implies that Internet ‘sellers’ have strong traditional revenue streams to support their Internet development activities and could thus be expected to be able to weather any short-term losses. A further guide to the future might be provided by a comparison of current and projected online revenue for businesses engaged in wholesale and retail trade (being those most likely to sell to households).

Table 3: Online revenue for businesses engaged in wholesale and retail trade, Australia 2000 (a).

	<i>Proportion of total revenue derived online</i>				
	<i>0%</i>	<i>1-5%</i>	<i>6-10%</i>	<i>11-50%</i>	<i>>50%</i>
Current	46.8	43.0	3.8	6.4	0.0
Forecast for 3 years time.	17.7	39.2	12.7	26.6	3.8

(a) Percentage of industry respondents reporting in each band.

Source: Allen Consulting Group (2001).

17. The proportion of businesses expecting to earn at least some revenue online is projected to increase from 53.2% to 82.3%. Of possibly greater significance is the forecast growth in the proportion of firms earning more than 5% of their revenue online – up from 10.2% to 43.1%. This is indicative of a general level of optimism that online sales will constitute more than a marginal activity.

Global Internet use

18. Due to the infrastructure required to support an Internet community, it is unlikely that the Australian usage patterns would be mirrored in many other countries. The relative immaturity of the various components supporting ecommerce will also tend to result in countries being at different points on the ecommerce path.

19. One of the difficulties in getting a handle on the global use of the Internet by households is obtaining comparable data across countries. The best source of comparable data for cross-country comparisons that the author was able to locate is the *Global eCommerce Report 2001* prepared by Taylor Nelson Sofres Interactive (TNSI 2001). This report covers 36 countries and, among other things, provides measures of aggregate adult Internet use and use of the Internet for online shopping.

20. Table 4 groups the 36 countries according to the intensity of Internet use by adults.

Table 4: Countries grouped by proportion of adult Internet users, 2001 (a)

<i>Low use</i> <i>(less than 20% are users)</i>		<i>Medium use</i> <i>(20% to 40% are users)</i>		<i>High use</i> <i>(more than 40% are users)</i>	
<i>Country</i>	<i>% Internet users</i>	<i>Country</i>	<i>% Internet users</i>	<i>Country</i>	<i>% Internet users</i>
Indonesia	4	China	23	Hong Kong	43
Ukraine	4	Malaysia	24	Finland	45
Lithuania	9	Spain	26	Singapore	48
Philippines	11	Czech	26	Australia	48
India	13	Italy	30	Korea, Republic of	51
Latvia	13	France	33	Netherlands	52
Portugal	15	Belgium	33	USA	57
Poland	15	Estonia	33	Canada	60
Turkey	16	United Kingdom	34	Denmark	62
Argentina	16	Germany	36	Norway	63
Hungary	17	Ireland	39	Japan	68
Thailand	19	Taiwan	40		
		Israel	40		

(a) Proportion of adults that had used the Internet in the month prior to interview.

Source: Taylor Nelson Sofres (2001).

21. Table 5 groups the same countries by intensity of online shopping.

Table 5: Countries grouped by proportion of adult online shoppers, 2001 (a)

<i>Low</i> <i>(less than 1%)</i>		<i>Medium</i> <i>(1% to 5%)</i>		<i>High</i> <i>(more than 5%)</i>	
<i>Country</i>	<i>% online shoppers</i>	<i>Country</i>	<i>% online shoppers</i>	<i>Country</i>	<i>% online shoppers</i>
Indonesia	0.1	Malaysia	1.0	Israel	6.4
Philippines	0.1	China	1.4	Ireland	7.0
Turkey	0.2	Estonia	2.0	Finland	7.7
Ukraine	0.2	Italy	2.1	United Kingdom	8.2
India	0.3	Portugal	2.1	Australia	8.6
Lithuania	0.3	Spain	2.3	Netherlands	9.4
Latvia	0.4	Czech	2.6	Korea, Republic of	9.7
Thailand	0.4	Belgium	3.0	Germany	10.1
Argentina	0.5	Hong Kong	3.0	Canada	10.8
Hungary	0.5	Taiwan	3.2	Denmark	11.2
Poland	0.8	France	4.0	Japan	11.6
		Singapore	4.3	Norway	12.0
				USA	18.8

(a) Proportion of the adult population that bought or ordered goods or services on the Internet during the month prior to interview.

Source: Taylor Nelson Sofres (2001).

22. Although the 'intensity bands' are subjective, and the pictures painted by tables 4 and 5 are broadly consistent, some interesting differences emerge. Portugal, the United Kingdom, Germany, Ireland and Israel are greater online shoppers than their level of overall Internet usage would suggest. While Hong Kong and Singapore engage in less online shopping than their level of overall Internet usage would suggest.

Items purchased online

23. The types of items purchased online also varies by country. The following table presents the 10 most popular categories of online purchases

across the 36 countries in the TNSI report together with the proportion of online shoppers purchasing each. For each category, the country with the highest proportion of online shoppers purchasing is also presented to give a feel for the across country variations.

Table 6: The 10 most popular product categories purchased online, 2001(a)

Product category	% (b)	Top country	
		Country	% (c)
Books	26	Israel	53
Music/CD's	17	Netherlands	27
Clothes	13	Finland	32
Electronics, electrical goods	11	Israel	41
PC hardware	10	Denmark	21
PC software	10	Germany	14
Holidays, leisure travel	9	Australia	19
Groceries/food	8	Australia	21
Tickets to theatre/cinema	7	Korea, Republic of	11
Toys/games	5	USA	12

(a) Based on the percentage of online shoppers buying the category online.

(b) Percentage of online shoppers in the 36 countries buying the category online.

(c) Percentage of online shoppers buying the category online.

Source: Taylor Nelson Sofres (2001).

24. Some of the more dramatic differences are for books (on average, 26% of online shoppers purchased books while in Israel the proportion was 53%); clothes (a global average of 13% c.f. 32% in Finland) and groceries (a global average of 8% c.f. 21% in Australia).

II. ISSUES FOR CPI COMPILERS

25. This part of the paper is concerned with addressing those issues that are considered to be of most significance to national statistical offices in taking an in-principle position on the inclusion or otherwise of Internet transactions in the CPI. There is no doubt that it would be possible to identify many more practical issues associated with the measurement of individual goods and services, however these are considered to be second order issues and beyond the scope of this paper.

In-scope transactions

26. The threshold issue is which, if any, Internet transactions are in-scope. In general, CPI's are constructed to relate to either *prices paid by residents of a region* (city, state or country) or to *prices paid within a region*. The Australian CPI is an example of the former while the European harmonised indexes are examples of the latter.

Internet access fees

27. It would be fair to assume that, in selecting an ISP, households would seek to minimise telecommunication charges by preferring a provider with a local presence (i.e. a provider with whom they can connect for the price of a

local telephone call). It is therefore reasonable to conclude that expenditures on Internet connection fees by residents of a region would be payable to providers located within the same region. In other words, in attempting to construct an expenditure weight, one is likely to arrive at the same result regardless of the particular objective of the CPI. As a consequence, it is difficult to see a case for the exclusion of Internet access fees from a CPI on conceptual grounds.

28. Given the accepted wisdom that the price of Internet access is falling (at least in relative terms if not in absolute terms) while quantities are increasing, the exclusion of access fees from the index is most likely to result in an upward bias. However, given the small weight that this item is likely to have at present in even the most Internet intensive countries, the magnitude of this bias would be small.

Purchasing goods and services online

29. From a CPI coverage point of view, there would not appear to be any cause to regard online purchases any differently from the more traditional means of purchasing the equivalent goods or services – the online supplier should simply be viewed as another outlet. However, the issue of the location of the online supplier is of particular concern for the compilers of those indexes intended to measure changes in prices paid within a region. The Harmonised Indices of Consumer Prices (HICP)², for example, is defined to cover:

“that part of final consumption expenditure which is incurred:

- *by households irrespective of nationality or residence status, and*
- *in monetary transactions, and*
- *on the economic territory of the Member State, and*
- *on goods and services that are used for the direct satisfaction of individual needs or wants, and*
- *in one or both of the time periods being compared”*

COM (2000) 742 final, page 13

As such the HICP's would exclude online purchases from non-resident suppliers.

² The HICP is used as the example here as its coverage is well articulated. However, the issue is equally relevant for those national CPI's that exclude expenditure abroad and even those sub-national (regional or city) indexes that are constructed with implicit acceptance of the “sales within the region” concept.

30. This problem does not arise for compilers of indexes intended to measure the total price experiences of resident households or indexes whose coverage is defined in terms of Household Final Consumption Expenditure (HFCE) according to SNA93.

“Household final consumption expenditure in the System refers to the expenditure incurred by resident households, whether that expenditure is incurred within the economic territory or abroad.”

SNA93, paragraph 9.70

“Expenditure by residents abroad constitutes imports.”

SNA93, paragraph 9.71

31. While it seems reasonable to regard online purchases as expenditure incurred at the physical location of the supplier and hence possibly abroad, this may present additional problems for some index compilers if the amounts become significant.

32. In indexes intended to reflect the experiences of resident households, it is likely that users will want to be able to decompose price changes into domestically sourced and externally driven. There are a number of options for doing this, ranging from the separate identification of each imported item in the index through to using a tradeables non-tradeables approach to classify item indexes.

33. For indexes designed to reflect changes in prices paid within a region, the problems may be greater. Online shopping makes it feasible (for the first time) for consumers to engage in direct importation. To date, it has really only been feasible for businesses to import goods, and then on some reasonable scale. As a result, resident households could be assumed to be transacting with resident businesses for the majority of imported items (exceptions being for goods purchased while the household was abroad). This can no longer be assumed to be the case. In future, households may acquire significant quantities of imported goods directly from foreign suppliers via the Internet.

34. With a limited amount of direct importation by households, a *sales within a region* index would also tend to provide a good approximation of a *residents within a region* index. The more significant direct importation through online shopping becomes, the less likely this will be. Even if the real differences between the two measures remain insignificant, users are likely to have a different perception.

35. Unless the “direct exports” by resident retailers to foreign online shoppers are adequately identified and removed, the domestic index will over-represent sales to non-residents (relative to a “residents” index). Conversely, exclusion of online purchases from non-resident suppliers will result in the domestic index over-representing locally produced goods (under-representing imported goods). The problem may be exacerbated if an aggregate index is to

be produced across regions and it is not possible to ensure symmetry of treatment as some transactions may fall through the cracks.

36. Determining an appropriate response to these issues is not something that can be done by index compilers in isolation. Key users of the index will need to be consulted. However, index compilers will require sufficient data to get a handle on the magnitude of any potential problem. To this end it may be desirable to incorporate some “point-of-purchase” type questions in household expenditure surveys to identify online purchases and whether the supplier was a domestic or foreign business.

Accessing “free” services

37. The inclusion or otherwise of the vast majority of currently “free” Internet services in the CPI is a largely academic issue at present as there is no practical solution to the price measurement problem³. However, consideration of whether inclusion would make a significant difference to index outcomes or not is instructive and may help identify topics for further research.

38. For this purpose it is convenient to leave aside the somewhat special case of CPI’s constructed to measure changes in prices *paid within a region*, and to address the issue from the perspective of the consuming households.

39. There is an increasing view that households place a high value on simply having access to the Internet as they see this as demonstrable participation in the “information age” and that households without Internet access are disadvantaged. In a cost of living context, the acquisition of Internet access places a household on a higher utility curve than before and should be reflected by a fall in the index (all other things being equal). In practice there is no ready, widely accepted methodology for incorporating this effect in the CPI.

40. What may be tractable is the measurement of any time savings and direct money savings through using the Internet as opposed to conventional means. To do this requires quantification of the time taken to use a free Internet service compared with the time taken to use a similar free service through other means (e.g. access to research material available in public libraries) and then placing a monetary value on the difference. Estimates of any direct money savings requires comparing those free Internet services with the cost of equivalent services provided by other suppliers on a charged for basis (e.g. email versus conventional postal services).

41. An exercise of this type was undertaken in respect of Australia by the Centre for International Economics and the results are presented in table 7.

³ Here I’m thinking principally of the measurement of the price effects associated with the expanded choice available to those households with Internet access compared to those without.

Table 7: Benefits of Internet access at home, Australia 2001 (a)

<i>Source</i>	<i>Value</i>
	\$
Time savings(b)	95
Direct money savings(c)	30

(a) Estimated dollars per week for those households reporting savings.

(b) 73% of households reported saving an average of 4hrs/week.

(c) 39% of households reported saving an average of \$30/week.

Source: CIE (2001).

42. While these estimates appear very large (particularly for time savings estimated using an opportunity cost approach) they do indicate that they are unlikely to be insignificant. Even if the median value of the benefit estimated directly by households of \$12/week were used⁴, the price effect would be significant in a CPI basket averaging approximately \$760/week. It should also be noted that these benefit estimates relate to both free and charged-for services.

43. Development of a methodology for adequately incorporating these Internet services in the CPI would appear to be a worthwhile research objective.

44. As an aside, it is worth noting some recently observed changes in the nature of some of the free Internet information services provided by mainstream publishing houses. A number of Internet sites presenting the electronic equivalent of hard-copy newspapers or magazines have adopted two levels of access. A limited range of material is available for general access, while a more comprehensive service is provided to subscribers to the hard-copy version. In some cases the additional services provided to the hard-copy subscriber include material not even available in the hard-copy version (such as news flashes, real-time market updates etc).

45. The end result of these practices is to provide different quality products to consumers of paid-for services. For example, a subscriber to such a newspaper or magazine who also happens to have Internet access receives a higher quality product than either a subscriber who does not have Internet access or a casual (off-the-shelf) purchaser.

46. So even if unable to explicitly include services acquired via the Internet in the CPI, it would seem that the evaluation of quality changes for more conventional goods and services will increasingly require consideration of any Internet “dimension”.

⁴ The authors of the CIE report note that the estimate of \$12/week is not highly reliable due to the very small number of households in their survey who were prepared to estimate such a value.

Classifying Internet transactions

47. The commodity classification used in compiling CPI's serves a number of important purposes:

- It assists in describing the CPI item coverage, weighting patterns and methodology to a broad range of users;
- It provides a framework for defining item coverage and identifying whether new items are within scope of the CPI and, if so, where price observations 'belong'; and
- It facilitates the production of indexes for components of the CPI for analytical and other purposes.

48. There is general agreement among compilers of CPI's that the notions of consumer utility and substitutability should underpin the design of the classification. The general principle is to structure the classification such that the highest levels of the classification represent items between which substitutability is deemed low, with the degree of substitutability increasing at the finer levels. The importance of getting this right was highlighted in the Boskin Report (1996) which stated (page 17, footnote 19) that in order to minimise item substitution and quality adjustment bias, ". . . . *items which are the closest substitutes for each other in terms of how they are used, must be in the lowest levels at which indexes are constructed*".

49. Following these principles implies that Internet services and goods acquired via the Internet be classified according to the utility that they provide rather than according to their method of delivery or access. Some examples of what this would mean in practice are:

- Internet access charges would be classified as a telecommunication service (along with fixed and mobile telephone services);
- Internet newspapers and magazines etc would be classified with their paper equivalents; and
- Goods purchased or ordered online would not be differentiated from those purchased at bricks and mortar establishments.

50. The most problematic issue for goods and services purchased online is how to treat any delivery charges.

51. Elsewhere in the CPI, the most common practice is to combine the delivery with the product being delivered. However, for those traditional items for which delivery is significant, it is also relatively easy to unambiguously associate the delivery service with the item on some per unit basis. Examples are home delivery of items like milk, bread, newspapers etc where the per-item price simply includes a built-in delivery fee (which is generally not dependent on the quantities purchased – at least across the volume ranges relevant to household consumers). Other examples are heavy or bulky consumer durables

like washing machines, refrigerators etc for which the most common practice would be for the consumer to purchase inclusive of a delivery fee – again, an unambiguous per-item delivery fee is measurable.

52. Almost without exception, households ordering or purchasing goods over the Internet will be faced with a separate delivery charge. In relatively few instances will these be set on a per-unit basis; most will be determined by the aggregate size of the order (e.g. groceries). So how should these delivery charges be classified?

53. Take as an example an elementary aggregate covering (say) both a can of beans purchased from a bricks and mortar supermarket and a can purchased online. While the two items are clearly substitutes, what are the equivalent prices (i.e. those prices for which a relative change might cause a consumer to substitute one for the other)? Given that the beans cannot be purchased online without incurring a delivery fee, the obvious preference would be for a price inclusive of delivery⁵. However, delivery charges on items like groceries are more likely to be based on the total order size and allocating the delivery cost over the individual items is likely to prove difficult. A contra argument is that as the store price does not include an element for the cost of travel to and from the store, then neither should the online purchase include the delivery fees⁶.

54. A pragmatic solution is to classify delivery services that cannot be explicitly assigned to individual commodities to a general deliveries category that would also include postal services.

Pricing

55. There are two broad aspects of Internet pricing to consider. One, how to price the Internet related goods and services, and two, whether the Internet provides prices statisticians with opportunities to price traditional goods and services more efficiently.

Internet related goods and services

56. The three components considered here are, Internet access, goods and services purchased online and delivery fees.

⁵ Thus if a change in the online price was exactly offset by a change in the delivery price (and the price of the store item was also unchanged) there would be no catalyst for any price induced substitution – an issue that would assume greater importance if some form of substitution formula was being used.

⁶ While it can also be argued that the notion of consumers making price induced substitutions at the individual grocery item level is unrealistic, the consequences of adopting an alternative view for index construction is beyond the scope of this paper.

Internet access

57. The approach to charging adopted by ISP's is, not unsurprisingly, very similar to that used by telephone companies. Fees can include separate amounts for simply being connected, the amount of time spent online (including the use of peak and off peak rates) and the amount of data downloaded. Some plans or providers charge a fixed amount until some limit (in terms of connect time or data downloads) is exceeded. The total amount paid by an individual subscriber can rarely be determined by reference to some linear price (i.e. a price per unit).

58. Construction of reliable price measures for Internet access would best be done by taking a sample of individual customer bills covering 12 months activity and repricing each period. An alternative would be to derive some customer profiles and for each profile construct representative bills which could also be repriced each period.

Online purchases

58. Once the particular suppliers to be sampled are determined (resident, non-resident or both), obtaining online prices is arguably simpler (or less costly) than obtaining similar prices from bricks and mortar outlets. By definition, the prices charged to online shoppers are readily available on the supplier's website. The data can simply be obtained by the 'price collector' logging-on and replicating the behaviour of any online purchaser – there is no need to even leave the office or place any burden on the respondent.

59. Only two problems arise with online pricing – one, ensuring constant quality and two, converting from foreign currencies in the case of non-resident suppliers. Detecting quality changes over time may require auditing in the case of resident suppliers (where presumably the same goods can be observed at a bricks and mortar outlet) or simply greater diligence in the case of non-resident suppliers. In the case of items priced from non-resident suppliers in a foreign currency, prices will need to be converted to the domestic currency before including in the CPI. Neither of these problems would seem insurmountable.

Delivery fees

60. Internet delivery fees not able to be allocated across individual items are identical in concept to postal charges for parcels and furniture removal fees. The construction of price measures will require establishing a sample of representative 'deliveries' and re-pricing each period. Where representative deliveries cannot be described in purely physical terms (e.g. by weight) they are most likely to be described in value terms (e.g. \$200 of groceries) and therefore it will be necessary to revalue the 'delivery' before pricing each period. This is, of course, a relatively straightforward process.

Opportunities

61. The fact that most online suppliers of goods and services also have a bricks and mortar presence, opens up the prospect for replacing current price collection methods (paper forms, personal visits) with direct collection over the Internet. The key determinant of the viability of this approach will be the extent to which online prices vary from those charged in the physical outlets.

62. In Australia, at least, the evidence on this is mixed. Some suppliers make no distinction between online and store prices (although maybe charging an additional delivery fee for online purchases), while others claim their online prices are cheaper. Nevertheless, even in cases where online prices differ, they may do so in some systematic way (e.g. always 5% cheaper than the store price) that lends itself to replication by the prices statistician.

CONCLUSIONS

63. The take-up of e-commerce by households appears set to increase strongly into the foreseeable future although the absolute significance of this activity in terms of household expenditure is relatively small at the moment.

64. While the measurement of the price effects of some elements of household Internet activity (particularly those elements that would be required for true cost of living indexes) seem to be beyond current measurement techniques, price indexes could be constructed for a significant proportion of household expenditure on or via the Internet.

65. As the exclusion of Internet activity from the CPI is likely to result in the CPI being upwardly biased (admittedly by only a small amount at present) national statistical offices would be well advised to at least commence including these items in their CPI's.

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