

Reflecting Trends in E-commerce in the CPI

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1. Introduction

Although Internet development enabled wholesalers to operate Internet shopping malls, only a few consumers began purchasing goods through the Internet during its initial stage. However, e-commerce has recently become one of the most popular ways to buy and sell goods for both consumers and producers because faster broadband and cheaper computers have lead to increase in an Internet users. Rapid developments in information technology and improvement in security systems have also assisted in greatly expanding e-commerce in Korea.

Table 1 shows the transaction value amounted to 25,155 billion won in 2010. The compound annual growth rate(CAGR) is 18.7% from 2005 to 2010. Specially, the transaction values of clothes and fashion related goods, goods for infants and children and food and beverages greatly increased. Table 2 illustrates that noticeable sales in these groups are related with the fact that 7 out of 10 female users are more likely to utilize the service of Internet shopping than male users. Since 2005, to reflect e-commerce trend in the CPI, the Price Statistics Division (PSD) of Statistics Korea (KOSTAT) has been collecting the prices of 19 items including books, cosmetic products, and household appliances sold through the Internet shopping malls.

In order to reflect changes in consumption pattern, the PSD revises the Korean CPI every five years ending 0 or 5. In preparation for the 2010-rebase, the PSD studied which items would be selected for e-commerce items.

Table 1: Transaction Values by Commodity

(Unit: billion won)

Commodity group	2005		2010 ^P		CAGR(%)
	Value	percent	Value	percent	
Total	10,676	100.0	25,155	100.0	18.7
Clothes and fashion related goods	1,583	14.8	4,248	16.9	21.8
Related service for travel	1,604	15.0	3,397	13.5	16.2
Household appliances	1,786	16.7	3,117	12.4	11.8
Household goods & accessories	1,056	9.9	2,572	10.2	19.5
Computer and other appliances	1,027	9.6	2,388	9.5	18.4
Goods for infants and children	406	3.8	1,512	6.0	30.1
Food and beverages	531	5.0	1,641	6.5	25.3
Cosmetics	587	5.5	1,414	5.6	19.2
Books	496	4.6	1,169	4.6	18.7
Sports and leisure appliances	396	3.7	1,076	4.3	22.1
Agricultural and fishery products	285	2.7	681	2.7	19.0
Office appliances and stationery	106	1.0	340	1.4	26.3

Software	98	0.9	132	0.5	6.1
Music CDs, musical instrument	95	0.9	154	0.6	10.1
Miscellaneous services	70	0.7	81	0.3	3.0
Flowers	41	0.4	54	0.2	5.7
Others	509	4.8	1,179	4.7	18.3

Source: the E-commerce and Cyber Shopping Survey in 2010

Table2: Experience of Internet shopping

	Internet Users	Experience of Internet shopping	No Experience of Internet shopping
Total	100.0	62.3	37.7
Male	100.0	55.6	44.4
Female	100.0	70.3	29.7

Sources: the Survey on the Internet Usage in 2009

2. Items for E-commerce

In selecting e-commerce items for the Korean CPI, the items must meet three criteria: 1) high transaction volume, 2) survey availability on shopping malls, and 3) varying price trends between Internet shopping malls and those of off-line local stores.

According to table 1, the PSD chose 59 items which were representative of each commodity group. Washing machines, cameras, refrigerators and vacuum cleaners were selected for the household appliances group, while college textbooks and magazines for the book group. Second, the PSD examined the survey availability on shopping malls. The product specifications in the CPI are described in detail and each product has its own popular shopping malls from which it can be purchased. For example, books sell well in certain shopping malls, while household appliances sell well in other shopping malls. By collecting the prices from various shopping malls during six months, the PSD monitored the survey availability of both items and shopping malls, and determined which items were to be collected from certain shopping malls. Because inconsistent sellers in open markets frequently change goods and their prices, the PSD excludes them.

The last condition is a varying price trend. To produce the Korean CPI, the PSD collects prices from 148 representative stores located in 37 different cities. The stores consist of department stores, large-scale outlets, medium-scale outlets and small stores. The PSD selects stores proportionally according to their volume of sales. The PSD classifies Internet shopping malls as an outlet. If the prices of goods on Internet shopping malls have the identical price trends as the 148 local off-line shops, the products are deleted as an e-commerce item based on redundancy. The PSD dose the t-test of the means of two kinds of prices and also examines different standard deviations. Figure 1 and 2 show that the local index and Internet index move differently.

According to the three criteria, the PSD chose 41 preliminary items among 59 items for the 2010-rebase as represented below in table 3. Some items were excluded due to special circumstances. For example, seasonal appliances like air conditioners, fans and stoves were deleted because their selling periods on the Internet shopping malls are shorter than in off-line stores. To calculate the item index, the PSD collects the prices of the identical products from both the Internet shopping malls and local off-line stores. Given the extreme difficulty in matching clothing models on both the Internet shopping malls and in local store, clothing is excluded. In a second example, many Internet shopping malls sell stationery goods and beverages packaged in bulk, while local off-line stores sell them packaged in small quantities. Additionally,

Internet shopping malls tend to change often their package sizes. Because of this quantity adjustment, the PSD did not select them as e-commerce items.

Figure 1: Washing machine

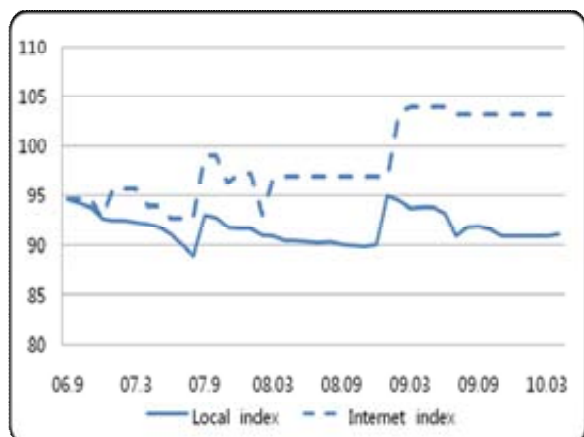


Figure 2: Bidet

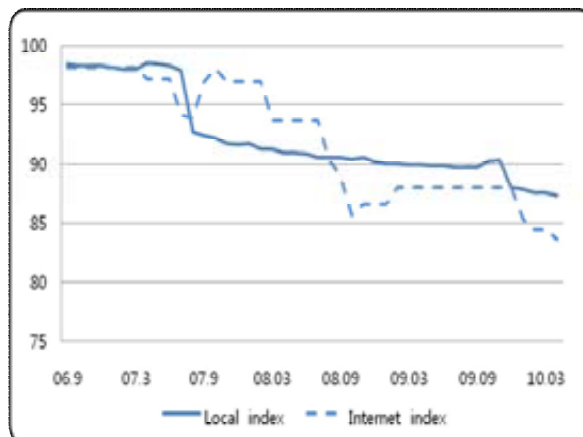


Table 3: Preliminary Items of E-commerce for 2010-rebase

Commodity group	Items
Household appliances	Refrigerator, vacuum cleaner, washing machine, blender, camera, etc.
Computer and other appliances	Computer, monitor, etc
Cosmetic	Lipstick, toner, facial power, sun block, etc
Musical instrument	Guitar
Books	Middle and high school text books, college text books, etc.

Table 4: Transaction Value and Weight

(Unit: billion won)

Commodity Group	Weight for 2005-base	Preliminary weight for 2010-rebase		
		Value(A)	Value(B)	(B/A)*100
Household’s appliances	10.6	18,202	2,466	13.5
Books	15.0	5,989	1,137	19.0
Cosmetics	8.9	8,329	917	11.0

A is the Wholesale and Retail Trade Survey and B is E-commerce and Cyber Shopping Survey

3. Index of E-commerce

After the PSD collects prices of an item from Internet shopping malls and produces an item index using two kinds of prices; prices from Internet shopping malls and those of 148 off-line local stores. To calculate the item index, the PSD requires the weight of the prices from the Internet shopping malls.

The CPI weight for each item is derived from the Households Income and Expenditure Survey (HIES) which is conducted monthly in 9,000 households by KOSTAT. The standard results of the HIES fail to provide location information, specifically whether goods were purchased from off-line stores or Internet shopping malls. In order to compute the weight for e-commerce items, the PSD utilizes the Wholesale and Retail Trade Survey and the E-commerce and Cyber Shopping Survey.

The transaction values of the E-commerce and Cyber Shopping Survey divided by the trade values of the Wholesale and Retail Trade Survey offer the weight for an item within each commodity group. All items in the same group have the same weight. For example, refrigerators and washing machines belong to the household appliances group and therefore have the identical weight of 13.5 percent as seen in table 4.

The PSD weights the two relative prices to produce an item index. If the relative price of the refrigerator on Internet shopping malls is 120.5 and the relative price in 148 local stores is 125.4, the refrigerator index comes to $124.8(=120.5*0.135+125.4*0.865)$.

4. Future Plan

The PSD will finalize the items and weights for e-commerce in June 2011 after examining the ad hoc survey and the latest results of the Wholesale and Retail Trade Survey and E-commerce and Cyber Shopping Survey. Given the increase in values and weights in table 4 for e-commerce items, their impact on the 2010-rebase will be greater than on the 2005-rebase.

Since Internet shopping malls have made extreme efforts to satisfy consumer expectations and expanded the variety of not only goods but also services, e-commerce will continue as a dominant purchasing tool for both producers and consumers in the future. However, e-commerce items were limited to goods. There is a need for service items to be examined as an element of e-commerce in the next revision.

References

- International Labor Office, Consumer Price Index Manual, 2004.
- Ministry of Public Administration and Security, Survey on the Internet Usage, 2009.
- Statistics Korea, the E-commerce and Cyber Shopping Survey, 2010.
- , Report of Wholesale and Retail Trade Survey, 2009.