2007 MEETING OF VOORBURG GROUP

Seoul, Korea

September 2007

PRODUCER PRICE INDEX FOR COMPUTER SERVICES AND RELATED ACTIVITIES IN KOREA

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PPI for Computer Services and Related Activities in Korea

1. Introduction

Korea started to compile the PPI for the service sector in 1995, and with base year 2000 has compiled service sector PPI for 77 items. In the PPI for services, there are five items related to computer services. Three of them are computer software- and hardware-related items - data processing fees, computer programming fees, and computer repair charges. The other two are the computer communication-related items of Internet access charges and information service charges, which are involved in the communication industry. The latter two items are included in the PPI for computer services because they are Internet-related services, even though they are not included in the service sector in the industrial classification. The total weight of these five items is 22.4, and they account for 7.6% of the total service sector weight of 294.2. Among these five items, the computer software-related items are the most important and have the biggest transaction volume in the computer-related service industry in Korea. Korea announces PPI for both commodities and services.

1.1 Classification

The KSIC (Korean Standard Industry Classification) based on the ISIC is used as the basic classification system for compilation of the PPI for services. Three of the items mentioned above are included in ISIC Rev. 3.1 Code 72, Computer Services and Related Activities, and two items are included in Code 64.2, Telecommunications.

PPI items for computer services and related activities, telecommunications

ISIC classification Rev. 3.1	Item	Weight
72.20 Software publishing, consultancy and supply	Computer programming fees	14.5
72.30 Data processing	Data processing fees	0.3
72.50 Maintenance and repair of computing machinery	Computer repair charges	3.9
64.20 Telecommunications	Internet access charges	2.1
	Information service charges	1.3

1.2 Weighting

Korea's PPI for services was compiled on a trial basis at first, using the intermediate demand of the Input-Output Tables as the universe of the weighting, because it was derived from the CSPI (Corporate Service Price Index) of the U. K. and Japan. Since then, however, the PPI for services has also been compiled using service sector output of the Input-Output Tables as the weighting universe, because output is used as the weighting universe in the process of compiling the PPI for commodities. Of course, only commercial services are included in the PPI system.

1.3 Sample selection

In large economies such as that of the U. S., it is possible to survey prices by the general sampling method, because each industry has numerous enterprises (establishments). However, because the number of enterprises constituting one service industry is not sufficient for use of the general sampling method in small and medium-sized economies like Korea's, the BOK uses the cutoff sample method to select the surveyed objects.

2. Computer service and related activities

2.1 Computer programming fees

In Korea, the computer software program development industry is the most important in the computer-related service industries. Computer programming fees are surveyed to compile the PPI for services of this industry. Computer programming fees are generally divided into two parts - customized software development fees and prepackaged software development fees. However, there is a problem in that it is not easy to survey the programming fees. It is hard to set a constant quality specification for customized software, since it is mainly produced in accordance with the orders of the purchasing companies. ERP (Enterprise Resource Planning) is a typical example of such customized software. On the other hand, prepackaged software is general-purpose software usually used for enterprise management: for example, computer operating

systems (MS Windows XP, etc.), spread sheets, word processors and PC security systems. It is generally packaged item-by-item for sale to buyers like companies or individuals.

	Prices	Specifications
Customized software	pricing by model = labor costs + technology fees + other related costs	C language (small size) for business management C language (large size) for business management COBOL (small size) for business management COBOL (large size) for business management C language (large size) for science and technology C language (small size) for the manufacturing process
Prepackaged software	market contract price or producers' price	operating systems, spread sheets, word processors, PC security systems (anti-virus SW, adware)

Customized software development depends upon long-term contracts between the ordering company and the software development company (SI: System Integration). When the development scale is large, it often takes more than one year to complete the software. The types of software consist of personnel management, financial management, production management, and accounting system software. It is hard to set a constant quality specification, since software provided differs in accordance with buyers' business types or business conditions. Therefore, the BOK uses model pricing, and the prices calculated in this way are considered as the standard prices. In model pricing, labor costs for programmers, technology fees, and other related costs are reflected. The pricing model in use is provided by the KOSA (Korea Software Industry Association), and the price data are also collected from the KOSA. However, basic data like labor costs are calculated based on the *Standard of Compensation for Software-related Businesses* announced by the Ministry of Information and Communication. For example, SI companies developing software mainly use ASP or ORACLE as their software systems and C or COBOL as their programming languages.

In the case of prepackaged software, the products of Microsoft are commonly used when it comes to computer operating systems or spread sheets. As Korean software, word processors, anti-virus software, and adware are also commonly used. The main

problem when surveying prices is that publishers are highly uncooperative. In particular, there are many cases in which foreign companies are uncooperative because they worry about the possibility of leakage of confidential management information. For this reason, market prices, which can be easily obtained from Internet shopping malls, are used instead.

2.2 Data processing fees

Data processing services comprise data input, data output, computer rental fees, costs of checking input, and fees for dispatch of staff for data input. Data input, the greatest part of data processing, is the work of inputting large amounts of data consisting of numbers and English and Korean letters. The price of data processing services is decided by unit cost per stroke. Input of statistical data at the Korea National Statistical Office and National Tax Service and printing of customer bills by credit card and communication companies make up the greatest part. The unit prices of data processing services are announced by the Ministry of Information and Communication every year and are used in the relevant business fields.

	Prices	Specifications
Data processing fees	actual contraction price	Inputting numbers, inputting English and Korean letters, printing customer bills by credit card and communication companies

Recently, however, with the decrease in input data work following the development of network technology, input data work dependent on employees scarcely occurs; reporters or surveyors are able to input data as soon as it is collected themselves, through computer networks. In addition, data output work dependent on outside workers is also rare nowadays, as it has become possible with the development of computer printing technology for enterprises to do such work directly using their own office machines. Accordingly, it is expected that data processing fees will be removed from the product basket in the upcoming revision of the PPI with base year 2005.

2.3 Computer repair charges

Computer repair services are after-sale services done by the large domestic PC manufacturers such as Samsung, LG, and Trigem. The computer repair service workload is growing as the number of domestic computers in offices and homes increases. The penetration rate of PCs in Korea is estimated to be above 90 percent, since in many companies each worker has his/her own computer, and the number of households possessing more than one computer is increasing. One reason for the increasing provision of PCs is the fact that anyone with some knowledge of PCs can assemble their own PC with parts bought in the market and use it after installing an operating system, since it does not require high-level specialized technology. Even though the computer was used mainly for professional office work in the past, with the spread of PCs into homes it is widely used for a variety of domestic living purposes these days: obtaining domestic living-related information, managing housekeeping books, educational purposes, internet shopping and banking, etc.

	Prices	Specifications
Computer repair services	actual contract price	basic traveling expenses, part replacement costs, OS installation costs

Not only desktop and laptop computers, but also printers and display monitors are included in the objects of repair. There are two ways of after-sale service provision. Customers can go to the service center in person, or they can request an engineer to visit their offices or homes to conduct repairs. Specifications of computer repair services can be subclassified as basic traveling expenses, replacement costs for broken parts, and OS installation costs. There is no difficulty in surveying prices, since the price of computer repair services is openly announced on the web and customers are charged in accordance with previously announced prices.

2.4 Internet access charges

The reason Korea has become one of the strong countries in use of the Internet is based on the construction of a solid nationwide telecommunications network with the development in the 1980s of the TDX1 wired telephone exchange system. Locally-developed electronic switchboards with various capacities were installed all over the country. Korea had the strong points of a wired telephone system and up-to-date switchboard facilities. From the 1990s, optical fiber cables were laid, with the widespread diffusion of PCs, and played a role as backbone of the information and communication network. Recently, the communication network has become more varied as wireless Internet by use of CDMA cellular phones is also available. In 2006, the Internet penetration rate of Korea was 70.5 percent, one of the highest in the world. Pointing to another reason for Korea becoming one of the strong countries in Internet usage, there is a mechanical superiority of Hangeul (the Korean alphabet). In the case of Hangeul vowels, it is possible to express every one by using combinations of only three keys (ㅣ ㅡ ·), and this is very useful for sending text messages via cellular phone. In addition, because vowels and consonants can be clearly discriminated in Hangeul, which is a phonetic system like the English alphabet, Hangeul is very convenient for efficient keyboard use. Therefore, any Korean can use a PC well with little effort.

	Prices	Specifications
Internet access charges	actual contract price (discount rate)	For businesses: 1.5 mbps, 2.0 mbps, 1,024 mbps, 1,544 mbps For Internet cafes: similar to for businesses For homes: 10 mbps, 50 mbps, 100 mbps

The specifications of Internet access charges are broadly subclassified into three types - for business, for Internet cafe, and for home use. Each type is subclassified again according to capacity. The specifications for businesses are 1.5 mbps (megabits per second), 2.0 mbps, 1,024 mbps, 1,544 mbps, and so on. The specifications for Internet cafes are similar to those for businesses, and those for home use are 10 mbps, 50 mbps, and 100 mbps. KT, Hanaro Telecom, and LG Powercom are the broadband carriers. Having the backbone networks in Korea, KT maintains the largest market

share. Internet access charges are announced on the web sites of the communication network companies. However, it is true that there is some difficulty in measuring price changes, as the rate structure is rather complicated due to the variety of discount rates (for long-term contracts of more than three years, for group contracts at multi-family housing units like apartments, for automated account transfer of charges, etc.)

2.5 Information service charges

Information service charges are charges for entertainment-related services, such as provision of access to music, movies and games, and for conduct of business-related activities - through the Internet, cellular phones, and other online networks. Charges for services provided through the Internet maintain the largest share here, because of the Internet's strong points in allowing stable receipt of information and data due to its nationwide diffusion and fast connection speed. Charges for services accessed through cellular phones maintain the next largest share. Cellular phones showed a penetration rate of 82% last year, owing to the increasing number of cellular phones per user. Services accessed through cellular phones tend to be concentrated mainly around use for personal hobbies and entertainment.

	Prices	Specifications
Information service charges	actual contract price	Internet: music, movies, on-line games, personal web site operation, movie reservations, Internet commercial transactions, enterprise-related activities cellular phones : music, games, pictures other on-line networks: checking financial status, making payment by credit card

The specifications of information service charges are broadly subdivided into the internet, cellular phones, and other on-online communications. Internet service charges are again subdivided into the categories of music, movies, on-line games, operation of personal web sites, movie reservations, Internet commercial transactions, and enterprise-related activities. In the case of cellular phones, the specifications mainly comprise personal entertainment services that do not require great capacity, like access

to music, games, and pictures, since cellular phone charges are higher than Internet charges. Other on-line communication networks are commonly used for checking users' financial statuses and making payments by credit card. The price structure of information service charges is subclassified into two types. Per-item fees are levied when downloading music and movie files like MP3. On the other hand, monthly fees are levied in the cases of on-line commercial transactions and using of information through credit card.

3. Function as a GDP deflator

The PPI is widely used as a deflator for changing various nominal macro-economic indicators, such as output and value-added in the service sector, into real indicators. In this regard, it is usefully applied as a deflator of GDP, which is the most important macro-economic indicator in a country. However, there has been demand for enlargement of the coverage of the PPI, because the number of items in the service sector is not sufficient in comparison to the commodity sector, and the PPI is not compiled in the non-market service sectors including public administration, defense, and social welfare services. Especially because Korean economic conditions have not been good recently, there is much concern about the growth rate of the economy. Therefore, reflecting the increasing concerns about the PPI for services so as to facilitate exact calculation of the economic growth rate, the following methods are demanded: compiling long-term time series of price indexes at the service specification- and price-levels, below the item-level; application of internal weighting for each specification; survey of the real prices on items for which model pricing is now used, and adoption of the cost estimation method for non-market services.