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## **Measuring E-Commerce in Korea**

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The views expressed herein are those of the author and not necessarily those of the Korea National Statistical Office. The figures quoted herein are not those officially released by the KNSO, either.

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*<Appendices> : Survey Forms (for cyber shopping malls and establishments) - to be provided later*

## ? . Background of development of e-commerce statistics

### 1. Advent of the era of digital economy

With the advance in information technology (IT) and the wide spread of the Internet use, the era of digital economy, which is characterized with electronic commerce (EC), IT industry and contents industry, is near at hand. At this moment, it is of growing consequence to understand and identify the progress of information society and digital economy, from the statistical viewpoint.

Number of Internet Users and Korean domains (.kr)

	1995	1996	1997	1998	1999	Aug.2000
<b>No. of Internet users (in 1,000 persons)</b>	366	731	1,634	3,103	10,860	16,030
<b>No. of .kr's</b>	579	2,664	8,045	26,166	207,023	494,074

### 2. Phenomenal growth in EC

E-commerce, which plays a vital role in the digital economy, has recorded such a remarkable growth for the past couple of years that it is widely believed that EC will be a common mode of conducting business in the near future.

- In the same context, IDC estimates that approximately 1.8 million of the total Internet users in Korea will purchase goods or services via Internet in the year 2001 alone and that the Internet-based sales will reach as much as USD 4.9 billion.

### 3. Changes in economic and social paradigms

As e-commerce emerges as a leading force, as powerful as IT industry, in the digital economy, it has attracted conventional industrial sectors to cyberspace and created new business sectors, bringing profound changes to the existing economic and social paradigms.

- E-commerce enables companies to be more active in marketing, increase productivity and enhance their efficiency in terms of purchase, sale, distribution and inventory control, as the Internet-based commerce guarantees marketing activities almost free from temporal or spatial restrictions; much easier access to customer information; and a reduced number of distribution phases and a consequent reduction of logistic costs.
- In addition, e-commerce has changed the pattern of consumer spending, as consumers can get several benefits from the expansion of e-commerce: they are exposed to a wider range of goods and services, which increases their freedom to choose; can shop in a shorter time; have easy access to shopping information; and can purchase goods and services at lower expenses than before, which results from the Web-based businesses' intense competition for customers.
- The ever-growing e-commerce will also cause changes in the employment structure, as it generates new jobs both directly and indirectly. More precisely, e-commerce not only creates new industries and expands the existing markets, pushing up the demand for workers specialized in designing and maintaining the infrastructure of computer programming and telecommunications, but also helps improve corporate productivity and consumer demand and therefore prompts companies to employ more workers.
- Last but not least, e-commerce will bring changes to the industrial structure, as an increasing number of traditional industries join the cyber business; new industries such as information service, Web portal service and cyber banking come into existence; distribution phases have been shortened; and information is getting easier to produce and exchange.

#### **4. Significance of statistical survey on EC**

Given that e-commerce has grown at a breakneck rate in a short period of time, it can be safely said that the demand for statistical explanations of the rapid expansion of e-commerce and its impact on social and economic paradigms will continue to be on the rise.

However, no definite concepts or notions about e-commerce have not been established yet, nor have any official statistical data been compiled and released by the Government.

- Although several survey agencies and research institutes at home and abroad have conducted independent surveys, the findings and the scope of survey are greatly different among the surveys and, in most cases, those surveys are a one-off event.

In this light, it is necessary to develop e-commerce statistics in a systematic and consistent manner, in order to respond to the demand for statistical information on e-commerce, to submit the statistics possibly requested by OECD and to be more positive in negotiations over Internet-related international trades.

## **? . Strategy for development of e-commerce statistics**

### **1. Systematic and continuous survey**

- Admitting that e-commerce takes up a rather small portion of the whole business at present and, in this transition period, poses some difficulties in survey, it is desirable that the survey on e-commerce should be conducted in a systematic and consistent manner, in order to provide time-series and timely statistics.
- The e-commerce survey is required to take a comprehensive approach which covers various aspects of economic activities of economic players including households, enterprises and the government.

### **2. Early start and high frequency**

- In preparation for the coming years when the need of statistical information on rapidly growing e-business will be sharply increased, the survey should be conducted at the earliest possible.
- In order to keep track of the fast growth of cyber trading and update the data in response to the demand for the information on e-commerce, the survey should be conducted at short intervals.

### 3. Step-by-step expansion of survey items

- At the initial stage, the survey should focus on identifying the size of e-business and status of the physical, personnel and institutional infrastructure for the Internet-based commerce. Then, the reach of the survey shall be extended, on a gradual basis, to include the impact of e-commerce in economic dimension.
- Although the survey should touch on each type of e-commerce, such as business to business (B2B), business to consumer (B2C) and business to government (B2G), from the beginning, the scope of survey shall be expanded, in step with the progress in digitization of the government procurement, the spread of e-commerce in each of the economic activities, and the changing practices in commerce as a whole.

### 4. International cooperation for standard setting

- Although every country is aware of the need to set up international standards for definitions, scopes and classifications of the e-commerce statistics for the purpose of international comparison, such universal standards have not been established yet, due to the difference of economic structures and conditions for statistical surveys among the countries and the short history of e-business.
- At this juncture, the Korean Government will make effort to develop e-commerce statistics which are tailored to the Korean reality but reflecting the common elements widely accepted in the international community, while continuing to participation in the international cooperation for standard setting.

## ? . Framework of Statistical Survey

## 1. Scope of the term 'e-commerce'

There is no established definition of e-business commonly used in the world, and the scope of e-business tends to extend further. In conducting a statistical survey on e-commerce, the Korean Government will first adopt the concept of e-commerce in a narrow sense and extend the scope in step with growing experiences, in accordance with the OECD recommendation.

### ? *E-commerce in a narrow sense*

Refers to activities of buying and selling goods and services via such electronic media as computers and network

### ? *E-commerce in a broad sense ( e-business )*

Refers to the electronic handling of all the processes in transactions among different economic entities or within the same economic entity

## 2. Survey channels

With a view to grasping major types of e-commerce, such as B2C and B2B, the survey is conducted in the following three ways:

### **Survey based on existing statistical surveys**

- This survey is based on the existing statistical surveys (of 10 surveys) which are released by the KNSO, focusing on identifying the size of sales in e-commerce.

### **Cyber shopping malls survey**

- This survey is focused on identifying the trends and patterns in the B2C area.

### **Corporations survey**

- Emphasis is given to understanding the trends and patterns in the B2B area.

### 3. Coverage of survey

Survey based on existing statistical surveys

#### < Establishments >

##### - Monthly surveys

- Current Mining and Manufacturing Survey: approx. 8,000 establishments
- Current Wholesale and Retail Trade Survey : approx. 5,000
- Current Service Industry Survey : approx. 4,000

##### - Annual surveys

- Current Mining and Manufacturing Survey: approx. 28,000 establishments
- Current Wholesale and Retail Trade Survey: approx. 40,000
- Service Industry Statistical Survey : approx. 20,000
- Transportation Statistical Survey : approx. 10,000

#### < Households >

##### - Monthly surveys

- Urban Household Survey : approx. 5,500 households
- Rural Economic Survey : approx. 3,140

#### < Prices >

##### - Consumer Prices Statistical Survey

- As e-commerce takes up a growing share of the total commercial transactions, Internet-based shopping malls will be included in the coverage of this Survey so that the Web-based transactions will be reflected on consumer price indexes.

Cyber shopping malls survey

- This survey covers the businesses which have opened Internet-based cyber shopping malls for the main purpose of B2C or C2C e-commerce.

#### Corporations survey

- Corporations listed on Korea Securities Exchange : 704
- Corporations registered with KOSDAQ : 420
- Public Corporations (state-invested, state-controlled) : 111
- Unlisted or unregistered affiliates of the top 30 business groups : 330

### **4. Survey schedule and interval**

Survey based on 10 existing statistical surveys

- A separate study on each of the 10 existing surveys starts from April in 2000, except that the study on the Consumer Price Statistics will be scheduled later, in view of the trend of the e-commerce growth.
- Survey intervals are equal to those of the existing statistical surveys (monthly or annual)

Cyber shopping malls survey : Starts from April 2000 on a monthly basis.

Corporations survey : Starts from May 2000 on a quarterly basis.

### **5. Survey methods**

Both e-mail contacts and visits in person will be used at the initial stage, but, e-mail will have a growing proportion, with passage of time.

#### **? . Survey Items**

##### **1. Cyber shopping mall survey**

General information included

- Name of shopping mall, name of operating company, time of opening malls, number of monthly visits, number of monthly purchases
- Method of web site operation, type of organization, total amount of investment, composition of products for sale
- Classification of shopping malls : General malls/ specialized malls
- Types of shopping malls : on-line only/ both on-line and off-line

#### Revenue and expenditure

- Composition of sales : sale of products and services, income from advertizing service, rents received, commissions received
- Size of sales, by product category
- Operating costs : labor cost, Web site maintenance expenses, marketing and advertizing expenses, logistic cost, etc.

Composition of consumer price, composition of purchasers, rates of purchase cancellation/return

#### Support systems for e-commerce

- Composition of delivery arrangements, composition of payment settlement systems, security systems, authentication institution

Future plan to facilitate e-commerce

## 2. Corporations **survey**

#### General information included

- Name of corporation, amount of capital stock, date of e-commerce commencement, etc.
- Number of operating workers, type of business, security system, authentication institution, other e-commerce support systems

Sale

- Ratio of e-commerce sales to total sales, sales of major products sold via e-commerce, operating costs
- Sales by customer group, composition of sales by transaction channel, composition of sales by means of payment settlement, composition of sales by means of delivery

#### Purchase

- Ratio of e-commerce purchases to total purchases, purchase amount by type of goods or services purchased, purchase amount by type of seller
- Composition of purchases by transaction channel, composition of purchases by means of payment settlement

Current stumbling blocks in e-commerce, and future plan to promote e-commerce

### **3. Survey based on existing statistical surveys**

Establishment surveys : survey items concerning e-commerce are added to the existing surveys for establishments (except for the survey on prices)

Household surveys : purchases through electronic transactions are additionally surveyed.

#### **? . Survey findings**

##### **? *Cyber shopping mall survey (as of June, 2000)***

#### 1. Number of malls surveyed

The number of cyber shopping malls surveyed is 1,444 in April 2000; 1,631 in May; and 1,707 in June.

- Out of the total numbers of the shopping malls surveyed as above, 1,066 in April; 1,144 in May; and 1,128 in June are found to have recorded any sales.

In terms of size of operating workforce, 64.9% (1,108 in number) of the cyber

shopping malls surveyed employ 1~ 2 workers, while only 2.9% (49 in number) employ 21 workers or more.

- From the viewpoint of operating workforce, a majority of cyber shopping malls are small-sized.

In terms of the establishment year, the biggest proportion (49.0%, or 837 in number) of the shopping malls surveyed were established in 1999.

- The 2nd largest group (35.7%, or 610 in number) is the shopping malls which opened in Jan. to June in 2000.

In terms of the range of products for sale, specialized shopping malls account for as much as 85.9%.

With regard to operating type, 66.7% (1,139 in number) of the cyber shopping malls surveyed do business both on-line and off-line.

By type of business organization, sole proprietorships account for 53.1%, while corporations take up 45.6% (779 in number).

## **2. Sales (revenue)**

The survey shows that monthly e-commerce sales of the cyber shopping malls surveyed is 110.2 billion KRW in April; 124.9 billion KRW in May; and 141.2 billion KRW in June, 2000.

The sales from B2C e-commerce of the shopping malls surveyed stand at 114.2 billion KRW, as of June 2000.

- This amount accounts for 1.1% of the monthly sales in the retail trade sector (10.3 trillion KRW).

Specialized shopping malls occupy 51.7%, while general shopping malls take up 48.3% of the total e-commerce sales.

Shopping malls doing business both on-line and off-line account for 75.7% of

the total e-commerce sales, far surpassing the on-line only shopping malls (24.3%).

### **3. Size of malls, by sales and workforce**

Cyber shopping malls with 100 million KRW or more in sales take up a low 10.1% of the total malls surveyed, but account for 92.9% of the total sales.

- Malls with 500 million KRW or more in sales take up 3.8% (43 in number), but account for 82.6% (116.7 billion KRW in amount) of the total sales.
- Meanwhile, malls with less than 1 million won in sales take up 26.6%, but account for an extremely small 0.1% (113 million KRW in amount) of the total sales.

In terms of operating workforce, cyber shopping malls employing 5 workers or more take up 22.1% of the total surveyed, while accounting for 92.7% of the total sales.

- Malls with 21 employees or more is a fraction (4.4% or 49 malls in number) of the total surveyed, but account for as much as 70.1% (99 billion KRW) of the total sales.

Cyber shopping malls employing 4 workers or less record an average sales of 12 million won, while those employing 5 workers or more record 526 million won in sales on average.

- In terms of per-worker sales, cyber shopping malls with 4 workers or less record 6 million KRW, while those with 5 workers or more record 34 million KRW.

### **4. Others**

In terms of operating costs, labor cost (36.0%) topped the list, followed by logistic cost (33.4%) and advertising cost (19.3%).

In terms of the composition of sales by category of products, computers and peripherals ranked the 1st with 46.0%, followed by electronic household appliances and telecommunication equipment with 24.2% and books, music records and stationery with 8.2%.

In terms of the composition of purchasers, the individual consumers (end-users) took up the biggest portion with 79.5%, followed by industrial purchasers with 13.3% and intermediary distributors (retailers) with 7.0%.

In terms of means of delivery, use of door-to-door delivery services ranked the 1st with 53.5%, followed by self-managed delivery system with 30.6%; and tie-up with off-line distribution networks with 5.9%.

In terms of means of payment settlement, credit cards accounted for the largest 61.4%, followed by online remittance with 35.4%; and others with 3.2%.

## **5. Regional distribution**

By geographical distribution, 68.3% of the cyber shopping malls surveyed are based in Seoul.

- In more details, Seoul where 1,166 cyber shopping malls (68.3%) are based ranked the 1st, followed by Gyeonggi Province with 150 establishments (8.8%); and Pusan with 102 (6.0%).

By operating workforce, Seoul also topped the list with 87.2% (4,783 persons) of the total employees working for the cyber shopping malls surveyed, followed by Gyeonggi Province with 4.7% (257 persons); and Pusan with 1.5% (84 persons).

In terms of sales, Seoul took up almost all (97.1%, or 137.1 billion KRW in amount) of the sales of cyber shopping malls, leaving far behind the second ranking Gyeonggi Province with 2.2 billion KRW or 1.6%.

- In view of this regional distribution of the sales of cyber shopping malls, e-commerce is not a widespread commercial practice in the regional areas other

than Seoul.

## **6. Considerations for stimulating cyber commerce**

Asked the question 'what has contributed to stimulating e-commerce?', the largest number of respondents (18.5%) cited 'low prices' as the biggest contributor.

- Other contributing factors include: easy access to information on products (13.0%); quick response to customer demand (12.9%); an assortment of various goods and services (10.6%); and combination of on-line business with off-line practices (7.9%).

In the meantime, the largest number of respondents (17.6%) chose 'high rate of credit card fees' as the problem to be addressed for an expanded cyber commerce.

- Other problems, such as high logistic costs (11.7%); low public confidence in Internet-based shopping malls (11.2%); and privacy infringement and security risk (9.8%) were also raised by the survey respondents.

### *? Corporations survey (the 1st quarter of 2000)*

#### **1. Number of corporations surveyed**

The corporations survey as of the 1st quarter of 2000 was conducted among 1,518 corporations.

Out of the total corporations surveyed, 147 were found to have done business via electronic channels.

- Out of the 147 corporations with e-commerce records, 33 started their e-business first in the 1st quarter of 2000.

As of the 1st quarter of 2000, the 147 corporations can be broken down, by type of industrial sector, to: 40.5% (60 establishments) in manufacturing; 31.9% (46) in the financial sector; and 11.5% (17) in wholesale and retail trade, as shown in <table 1>.

<Table 1> Composition of corporations with e-commerce experience, by industrial sector (in %)

<b>Total</b>	<b>Fishing/Mini ng</b>	<b>Manu- facturing</b>	<b>Electricity/ Gas/ Water Supply</b>	<b>Const- ruction</b>	<b>Whole- sale/ Retailing/ Hotels/ Restaur- ants</b>	<b>Trans- portation/ Telecoms</b>	<b>Finan- cing</b>	<b>Information processing</b>	<b>Other services</b>
100.0	-	40.5	0.7	2.0	11.5	4.1	31.1	4.7	5.4

By capital size, the corporations with e-commerce records are classed in 57 (38.8%) with 100 billion KRW or more in capital; 42 (28.5%) with 10~ 50 billion KRW; and 17 (11.6%) with 5 billion KRW or less.

- The relatively high representation of mid- or large-sized enterprises as shown in <Table 2> below is attributable to the fact that the corporations survey was mainly conducted among middle or large companies. However, admitting the limited coverage of the survey, it can be concluded that currently B2B e-commerce is much more widespread in larger enterprises.

<Table 2> Composition of enterprises with e-commerce records, by capital size

<b>Capital size</b>	<b>Total</b>	<b>Less than 5 billion KRW</b>	<b>5 ~ 10 billion KRW</b>	<b>10~ 50 billion KRW</b>	<b>50~ 100 billion KRW</b>	<b>100 billion KRW or more</b>
as % of total	100	11.6	10.9	28.5	10.2	38.8

## 2. Purchases via e-commerce in real sector

Purchases via e-commerce in the real sector, as of the 1st quarter of 2000, amounted to 2,486 billion KRW, which is 3.3% of the total purchases of 75,557 billion KRW.

By class of corporations, KSE listed companies accounted for 94.5% (2,350 billion

KRW); public corporations, 3.2% (79 billion KRW); and Top 30 business groups, 2.2% (55 billion KRW).

<Table 3> Composition of e-commerce purchases in the real sector, by corporations class  
(in billion KRW, %)

Corporation class.	Total	KSE listed companies	KOSDAQ companies	Top 30 business groups	Public corporations
Purchase amount	2,486 (100)	2,350 (94.5)	2 (0.1)	55 (2.2)	79 (3.2)

By capital size, corporations with 100 billion KRW or more took up 93.8% (2,332 billion KRW) of the e-commerce purchases in real economy.

- Corporations with 5~ 10 billion KRW ranked the 2nd, with 4.6%.

By industrial sector, manufacturing accounted for as high as 95.8% of the e-commerce purchases in the real sector.

- Within the manufacturing industry, electronic parts and Telecom equipment accounted for 52.1%; chemical compounds and products, 11.4%; automobiles and trailers, 9.2%; other machinery and equipment, 8.0%; other electric machinery and devices, 8.0%; and computers and office equipment, 5.3%.

In terms of the intensity of e-commerce (the ratio of e-commerce purchases to total purchases), the manufacturing sector registered 5.5%; electricity, gas and water supply posted 2.0% and the others were all less than 1%.

- Within the manufacturing, other machinery and equipment recorded 22.6% in e-commerce penetration; other electric machinery and devices, 17.9%; electronic parts and telecom equipment, 13.9%; automobiles and trailers, 10.3%; computers and office equipment, 7.8%; chemical products, 3.8%; and textiles, 3.2%.

By type of products purchased, raw materials and sub materials ranked the 1st with 87.3% of the total purchases, followed by capital goods with 10.3% and MRO with 2.4%.

<Table 4> Composition of e-commerce purchases, by type of products purchased

Type of products purchased	Capital goods	Raw materials/ sub materials	MRO	Information/ services	Utilities	Others
As % of total	10.3	87.3	2.4	0.0	0.0	0.0

In terms of transaction means, Internet-based EDI topped the list with 77.0%.

- By industrial sector, in the manufacturing sector, the largest portion of establishments (77.0%) used the Internet-based EDI; while, in the wholesale and retailing sector, website-based e-commerce and the traditional EDI accounted for 35.6% each.

In terms of means of payment settlement, promissory notes topped the list, with 78.5%, followed by online deposits with 21.5%.

### 3. E-commerce in financial sector

As of the 1st quarter of 2000, the financial sector posted 323,297 billion KRW in e-commerce sales, which accounted for 32.2% of the total e-commerce sales (1,003,781 billion).

Within the financial sector, it is found that e-commerce is performed most extensively in the field of securities, where e-commerce sales took up 52.0% of the total sales.

<Table 5> E-commerce in the financial sector (in billion KRW)

Classification of industrial sector	No. of companies with EC sales	Total sales			
			EC sales	as % of total sales	
Financial sector	Total	46	1,003,781	323,297	32.2
	Banking	15	371,446	787	0.21
	Insurance	6	12,611	123	0.98
	Securities	25	619,724	322,387	52.02

In terms of sales by transaction means, Internet-based EDI accounted for 45.4%, and website-based transactions took up 38.3% of the total e-commerce sales.

#### **4. Others**

In regard to use of security system for e-commerce, 61.7% (82 in number) of the responding companies used a security system, while 38.3% (51) didn't.

- Out of the companies which used EC security system, 81.7% employed the SSL type.

In regard to use of an authentication agency for e-commerce, 56.1% of the respondent companies have not used such agency.

- The largest portion (42.6%) of the respondent companies which have used an authentication agency used VeriSign of the US.
- A fraction of the companies use Korea Securities Computer Corp. or Korea Financial Telecommunications & Clearings Institute.

Asked the question 'What do you think should be improved for the growth in e-commerce?', 31.8% of the respondents answered 'a more safe and convenient arrangement of payment settlement'.

- Other improvements to be made are: more reliable information infrastructure of companies (30.6%); and formation of common logistics systems (16.3%).

<Table 6> Improvements to be made for expansion of e-commerce

<b>Improvements to be made</b>	<b>No. of respondents</b>	<b>As % of total</b>
<b>1. More reliable in-company information infrastructure</b>	343	30.6
<b>2. Development of common brands to increase the brand power</b>	108	9.6
<b>3. Establishment of common logistics systems</b>	183	16.3
<b>4. More safe and convenient arrangement for payment settlement</b>	356	31.8
<b>5. Tax benefits for transparent transactions</b>	117	10.5
<b>6. Others</b>	13	1.2
<b>Total</b>	1,120	100

? *Survey based on existing statistical surveys (Current Mining and Manufacturing Survey)*

Out of the total 7,537 establishments surveyed, 240 establishments (3.1%) had a record of e-commerce sales in April 2000.

E-commerce sales amounted to 1.6 trillion KRW, which is 4.9% of the total sales (33.1 trillion KRW) of the establishments surveyed.

- The e-commerce sales are broken down to 1.1 trillion KRW (68%) in domestic sales; and 520 billion KRW in export.

<Table 7> E-commerce rates

<b>No. of establishments</b>	<b>7,537</b>	<b>240</b>	<b>3.1%</b>
<b>Size of commercial transactions</b>	<b>33,059</b>	<b>1,615</b>	<b>4.9%</b>
<b>Domestic</b>	<b>19,960</b>	<b>1,093</b>	<b>5.5%</b>
<b>Export</b>	<b>13,100</b>	<b>522</b>	<b>4.0%</b>

? . **Future plan**

1. Identification of the entire population (Cyber shopping malls survey)

The search robot needs to be developed to identify all the cyber shopping malls which have registered Internet domains or are listed in search engines.

Large-sized off-line companies and Internet service providers will be thoroughly checked so that large cyber shopping malls may not be dropped from the list of the establishments to be surveyed.

2. Selection of corporations to be surveyed (Corporations survey)

The Corporations Survey, currently in place, is conducted among the companies which meet certain conditions, such as company size. As a result, a large part of small and medium companies are excluded from the survey.

New standards for company selection should be set up so that small and medium companies in the sectors which have a great potential for e-commerce can be included in the survey.

More attention should be paid to newly emerging e-commerce businesses, such as e-marketplace, portal sites and vortal (virtual portal) sites.

3. E-commerce statistical survey is based on 'business entities', while existing surveys are based on 'establishments', which cause some difficulties in using the existing surveys for the purpose of e-commerce study.

The way to link the e-commerce survey based on business entities and existing surveys on establishments should be worked out.

4. The businesses which are surveyed in Cyber Shopping Mall Survey, Corporations Survey, or Survey based on existing statistical surveys are overlapped.

In order to eliminate this overlapping of companies surveyed, the companies

should be filed in a computerized database, and each of them should be posted with 'a serial number for survey'.

5. Given that each of the surveys has a mixture of B2B and B2C elements within its framework and that the tendency is that the distinction between B2B and B2C has been blurred, each survey needs to include an analysis on B2B or B2C elements, in order to project the size of future B2B or B2C e-commerce more precisely.
6. The current surveys are focused on identifying and measuring the intensity of e-commerce and the development of e-commerce infrastructure. In the years to come, those surveys need to extend to the effects of e-commerce in social and economic dimension so that the surveys can be used to measure the digitization of the whole economy.