

The Challenges of Adapting Trade Policies to the Digital Era

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I. Introduction

This study focuses on digital trade policies that affect the trading of goods and services over the internet. We use the terms digital trade and e-commerce interchangeably. Earlier studies on barriers to digital trade shed light on newly erected barriers to digital trade by country and sector (see, for example, Ferracane et al. 2018). In Jan. 2021, Global Trade Alert began to build public and comprehensive records of policy changes by G20 members that affect cross-border e-commerce. However, it is difficult to find studies that include survey results from active firms conducting digital trade, or any corresponding empirical analyses.

To fill this gap in the literature and inform policy practitioners and policy makers about digital trade, this study provides evidence on barriers to digital trade and the economic effect of digital trade, based on surveys of domestic firms in Korea and data collected from random

sampling. After briefly examining the prospects of e-commerce talks at the WTO and characterizing digital trade rules at the FTA level, the study concludes by providing suggestions for major policy tasks and mid- to long-term directions of Korea's digital trade policy.

II. Key Barriers to Digital Trade

1. Random Sample Survey

For our survey, we construct a population by combining data on import/export confirmation documents for electronic intangible goods, provided by the Korea International Trade Association and Korean Enterprise Data. In order to understand systematically the current state of barriers to digital trade, questions in the survey include organization type, financial information, types of labor, e-commerce performance, and the importance of data-related work.

The survey was designed to ask questions related to digital trade facilitation, digital products, data regulation, and so on. Responding firms belong to major industries such as wholesale and retail (G45–47), information communication and broadcasting services (J58–63), and professional, scientific and technology services (M70–73, M75), at the 2-digit level of Korean Standard Industrial Classification.

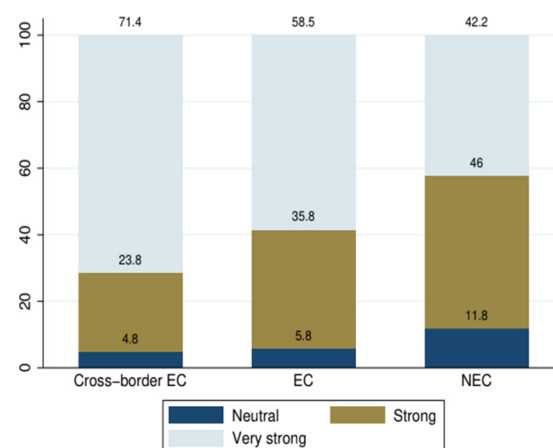
The survey, titled “Status of Digital Trade Barriers and Difficulties,” was performed from January to June 2021. We ended up collecting a total of 1,029 firms responding to the random sample survey. The proportion of responses from firms engaged in the wholesale and retail industry, information communication service, science and technology service were respectively 22.2%, 43.4%, and 27.3%. The number of firms that generate annual sales of less than 5 billion KRW were 512 firms (49.8%) while those that yield more than 50 billion KRW were 43 firms (4.2%). Roughly speaking, even distribution can be found, with 461 firms (44.8%) out of the population employing less than 25 full-time workers. In the collected samples, there are 313 firms (30.4%) conducting e-commerce only in the domestic market and 63 firms (6.1%) engaging in cross-border e-commerce. China, Japan, and the U.S. were listed as significant partners in Korea’s cross-border e-commerce, in that order.

2. Data-related Barriers to Digital Trade

Among the many results, we focus on data-related issues such as restrictive data regulation

since they are a focal point in the discussion of digital trade rules at both the WTO and FTA level. In addition, data-related work is very important in the export process indeed. According to our survey, e-commerce exporting firms responded that data-related tasks were “very important,” accounting for 71.4% but domestic firms that do not engage in e-commerce account for only 42.2% (see Figure 1).

Figure 1. The Importance of Data-related Work



Note: EC and NEC stand for e-commerce and non-e-commerce status, respectively.

Source: Authors’ own calculations based on KIEP survey data.

Second, regardless of industry type, the survey shows that data-related barriers to digital trade are key barriers to digital trade. “Restrictions to cross-border data flows,” “requirement for use and installation of computing facilities,” and “the request to disclose the source code of the software” are the main obstacles for firms that belong to the scientific and technology service industry. The source code issue can become serious when considering the risk of technology leakage such as breaches of intellectual property rights.

Third, firms responding to the survey claim that it is urgent for the government to take immediate policy action to relieve barriers to digital trade. The intensity of response to the questions increases as the size of firms gets smaller, and when the firm engages in digital trade. Small- and medium-sized firms with less than 25 full-time workers and engaged in cross-border e-commerce responded stronger than other firms (see Table 1). This implies that the difficulties caused by digital trade barriers were more burdensome to smaller sized firms.

Table 1. Data-related Barriers to Digital Trade: Urgent Action of Government

Type of Firms	Restriction on data flows				Restrictive personal data policy			
	NEC		EC		NEC		EC	
	No	Yes	No	Yes	No	Yes	No	Yes
≤ 25 workers	43.4	56.6	26.6	71.4	23.4	76.6	18.0	82.0
> 25 workers	51.1	49.9	45.7	54.3	26.9	73.1	29.5	70.5

Type of Firms	Data localization				Source code			
	NEC		EC		NEC		EC	
	No	Yes	No	Yes	No	Yes	No	Yes
≤ 25 workers	43.0	57.0	39.6	60.4	41.1	58.9	29.6	70.4
> 25 workers	42.7	57.3	51.4	48.6	44.8	55.2	42.8	57.2

Note: EC and NEC stand for e-commerce and non-e-commerce status, respectively.

Source: Authors' own calculations based on KIEP survey data.

3. Economic Effect of E-commerce

We further study how digital trade affects Korean firms by matching the survey data and Korean Enterprise Data. We focused on estimating the sales effect of firms that engage in domestic or cross-border e-commerce. We applied the Difference-in-Difference estimation using the propensity score matching technique (Manjon

et al. 2013) in order to further control for a selection bias that can affect unobservable firm heterogeneity and macro factors. The specification is as follows.

$$\beta_{DID}^s = \frac{1}{N} \sum_{i \in I} [(Y_{it+s}^1 - Y_{it-1}^1) - (Y_{it+s}^0 - Y_{it-1}^0)]$$

where I indicates e-commerce firms in the treatment group and its corresponding control group and N is the number of these firms. Y is the logarithm value of sales per worker and β_{DID}^s is the coefficient that represents the sales (per worker) gap between e-commerce start year and the following year $s \in [0,2]$. The key results from the estimation can be summarized as in Table 2 and Figure 2.

Table 2. Sales Effects of E-commerce (PSM-DID)

S	0	1	2
β_{DID}	0.091	0.128	0.199
	(0.045)**	(0.063)**	(0.087)**
	[0.054]**	[0.062]**	[0.087]**
# of treated firms	164	150	136
# of observation	307	280	216

Note: 1) ** represents significance level of 5%.

2) Industry and year dummies are included.

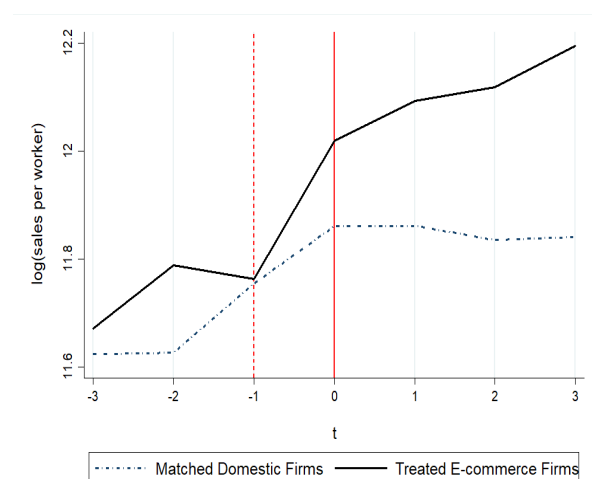
3) Values in brackets and parentheses represent, respectively, robust standard errors and 250 repeated bootstrap standard errors.

Source: Authors' own calculations based on KIEP and KED survey data.

In the first year of entry into the e-commerce market, it was estimated that the per capita sales growth rate of e-commerce firms was about 9.5% higher than that of general domestic firms included in the control group. This result is very robust even if we change matching techniques

from matching without replacement to, for example, radius matching or matching with replacement.

Figure 2. Changes in Sales per Worker of E-commerce by Firm Type



Source: Authors' own calculations based on KIEP and KED survey data

III. Digital Trade Rules at the WTO and FTA Level

1. WTO E-commerce Talks

E-commerce talks have continued since May 2019 to establish rules for digital trade at the WTO level. This includes various topics ranging from trade facilitation issues, like no customs duties and paperless trading, to data issues including free data flows and bans on data localization. As of Dec. 2021, some progress has been made in the issues of spam or unsolicited commercial electronic messages, paperless trading, online consumer protection, e-signature and authentication, open government data, e-contracts, transparency and open internet access.

However, the legal validity of the Joint Statement Initiative on E-commerce, as well as whether it breaches multilateral rules, are currently being contested at the WTO. In short, the prospects for the WTO e-commerce talks are not very much promising. This is mainly because of the heterogeneity of domestic laws related to e-commerce among countries participating in the negotiations, differences in terms and areas of interest, data-related provisions guaranteeing free data flows and prohibition of data localization, and customs duties moratorium for electronic transmission. Conflicts arising from data-related issues and China's strong digital protectionism will also contribute to these issues, posing major obstacles to the progress of the WTO e-commerce negotiations.

2. Digital Trade Rules at the FTA Level

Digital trade rules at the FTA level have been strengthened by upgrading the e-commerce chapters of free trade agreements and/or signing digital economy agreements. To derive the characteristics of digital trade rules that have appeared in bilateral and regional FTAs, we used the Trade Agreement Provisions on Electronic Commerce and Data (TAPED) and reviewed 113 trade agreements that have e-commerce (digital trade) provisions or chapters. For the purpose of this study, we only provide two characteristics of the TAPED dataset.

First, the majority of trade agreements containing digital trade provisions or chapters were signed between continents, as well as between developed and developing countries. Among

the 113 trade agreements between 2000 and 2020 that contained digital trade provisions or chapters, 68 (60.18%) were intercontinental, 23 (20.35%) were between countries in the Americas, 18 (15.93%) were Asian countries, and 4 cases (3.54%) were signed between European countries. During the same period, out of 113 trade agreements, 67 (59.29%) were between developed and developing countries, 39 (34.51%) were between developing countries, and only 7 cases (6.19%) were signed between developed countries.

Second, trade agreements that include data-related provisions tied to strong obligations have increased. We take a look at just two provisions,

one that guarantees free data flows and another that prohibits data localization requirements. As shown in Table 3, between 2000 and 2010, most of the trade agreements (51 cases, 89.47%) included the guarantee of free data flows as a cooperative provision without obligation and no trade agreements contained a provision prohibiting data localization requests. One trade agreement stipulating a strong obligation for the free movement of data across borders was observed for the period of 2011–15, after which the number of such trade agreements increased significantly to 12 in 2016–20. Also, there were only two trade agreements with strong mandatory provisions for data localization in 2011–15, but the number increased to 14 during 2016–20.

Table 3. Changes in Obligation Intensity of Data-related Provisions of FTAs

		2000-20	2000-10	2011-15	2016-20
# of FTAs		113	57	29	27
Free data flows	No	81	51	20	10
	Soft	11	4	7	-
	Mixed	8	2	1	5
	Hard	13	-	1	12
Data localization	No	96	57	27	12
	Soft	1	-	-	1
	Mixed	-	-	-	-
	Hard	16	-	2	14

Notes: 1) # of FTAs indicates the number of FTAs that include digital trade provisions or chapter.

2) “No” means “no obligation.” From “Soft” through “Mixed” to “Hard,” the intensity of obligation becomes stronger.

Source: Author’s calculation using TAPED

IV. Recommendations for Korea’s Trade Policy

The evidence reported in this study provides a basis for dialogue and policy guidance for digital trade practitioners and policy makers who

aim to stimulate digital trade and economy for the benefit of both consumers and firms. The study suggests several tasks for digital trade policy of Korea (and possibly other countries as well).

First, the Korean government needs to be more active in pursuing digital trade agreements, including upgrading e-commerce chapters in existing FTAs. Korea enacted a Digital Partnership Agreement with Singapore in Dec. 2021 and started talks to join the Digital Economic Partnership Agreement in Oct. 2021. As time goes by, however, newly built barriers to digital trade continue to affect exporting partners via global value chains that are intertwined in the trade structure among countries, making it difficult for domestic firms to access foreign markets due to increasing trade costs. In particular, excessive data regulation raises trade frictions with exporting partners, and changes in global digital trade rules can constrain policy choices in implementing domestic and foreign trade policies. It is necessary for the Korean government to take immediate policy actions to relieve barriers to digital trade.

Second, digital trade policy with economic cooperation is also critical. In particular, it will be necessary to strengthen medium-to long-term cooperation with leading economies such as the U.S. and the EU in digital infrastructure, digital technology, digital technological standards, and data regulation. Another possible approach would be to set up digital policies targeting countries and regions where need for digital infrastructure is increasing, such as China, the New Southern Region, and Africa. We look forward to continuing cooperation with partner countries with a view to invigorating the digital economy to enable better digital trade and economy.

Third, the Korean government should establish a mid- to long-term digital trade policy roadmap. This roadmap needs to lay out the goals and directions of participation in the WTO e-commerce negotiations, upgrading digital trade chapters of FTAs, digital trade agreements, and the revision of data regulations (including basic principles on data transfer to foreign countries and data localization requirements). It also needs to deal with how to amplify the policy effects of the Digital New Deal in consideration of linkage with digital trade. Having a roadmap describing the mid- to long-term direction of digital trade policy can help firms and ultimately consumers as well.

Finally, this study suggests that digital trade policy of Korea should be more open and rule-based, meaning that it should raise the level of liberalization and embrace global digital trade norms to expand digital trade by introducing a minimum number of domestic data regulations. It is worth noting that Korea's digital trade environment scores in the middle range of the Digital Trade Restrictiveness Index of the European Centre of International Political Economy, the Digital Services Trade Restrictiveness Index of the OECD, and the Global Cloud Computing Index of the Software Alliance in the U.S. We believe that by implementing open, rule-based, and active digital trade policies, Korea can maximize the positive impact of digital trade that benefits firms and consumers and enhances long-run economic growth. **KIEP**