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An Analysis of the Effects of Brexit on Korean SMEs

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ABSTRACT

The purpose of this paper is to examine the impact on Korean SMEs after the Brexit . . The research method used an industry association analysis. The results of the study are as follows. First, total exports in 2015 were $ 519.9 billion, while exports to the UK were $ 7.4 billion. Exports to the UK are about 1.4% of Korea's total exports. The amount of damage to the total gross domestic product of Korea is estimated to be about 1.6 trillion won. SMEs account for about 56% of the total manufacturing output in Korea and about 12% of UK exports. Second, the loss estimate for SMEs is estimated to be W940bn. The amount of about 1 trillion won is a large amount, so anyone potentially affected will have to prepare. Policy implications are as follows: First, SMEs should move from export-oriented management to domestic-oriented management. Second, the export window should be unified to help SMEs export. The significance of this paper is to analyze the impact of small firms on SMEs.

Keywords: Brexit, FTA, SMEs, international input output analysis
JEL Classifications: F13, F14

INTRODUCTION

The brake seat was confirmed. In the next two years, the UK will withdraw from the EU. France and Germany are urging Britain to withdraw as soon as possible. British citizens also demanded a resurgence, saying that Bretsch was deceived by the inconvenience of his people traveling to Europe and his false promises in the opposition.

However, it is impossible to retake the election, and the new prime minister has been elected as the leader of the Brexit. This paper is an empirical analysis of how the Brexit affects the Korean economy. In this paper, we examine the economic effect and the influence of Korean SMEs on the balance sheet by analyzing the international input and output.

The academic background of this paper is analyzed by using a CGE model and gravity equation. However, this paper can use an international input output model to ascertain which industry contributes to GDP growth through trade. GDP growth due to total trade in Korea can be seen.

The purpose of this study is to examine the effect on Korean banks, how much small businesses suffer, which industries are vulnerable, and to urge the government to take preemptive measures against vulnerable sectors. Industry-related analysis tables are used for various studies such as the total output of each country, the amount of exports, the amount of imports, employment, and the analysis of intermediate inputs.

The composition of this paper is as follows. Section II reviews existing literature. Chapter 3 explains the industry-related analysis model and explains the ripple effect. Ⅳ. Data and statistics show the data of the Bank of Korea and Small and Medium Business Administration. In Section Ⅴ, empirical analysis results, we analyze the results of industry association analysis and basic statistics. Chapter VI summarizes this paper and mentions policy implications. We discuss the limitations of research and future research themes.

RESEARCH OF EXISTING LITERATURE

From most of the previous research on the CPTPP between the Korea and China FTA, etc., there are no scholarly papers related to this issue because it is a recent issue. However, SC First Bank claimed that exports to the UK accounted for 4% of domestic exports on June 6, 2016, and that the proportion of FDI was only 1%. And that the impact will be great in the market. SC Bank lowered its gross domestic product growth rate by 0.1% to 2.4%. The figure is expected to reach 2.7 % in 2018, down 0.3 percent. Previous studies on CPTPP and Korea-China FTA, which have been studied previously, are supplemented

A study by Sung Hye-kyung (2015) discussest the dynamic economic effects of CPTPP and TTIP on Korea, China and Japan. This paper explains that if the CPTPP is put into effect, it is estimated that the GDP is about -0.1~4% when Korea participates, -0.1% ~0.06% in China, and 0.5-0.6% in Japan. Korea's participation not only requires CPTPP participation but also shows that Korea's participation can be positive for Northeast Asian countries. Han Min-jeong (2013) noted that the CPTPP, which started with four regional trade agreements, expanded to a large-scale trade agreement with the active involvement of the United States' and Japan's willingness to participate. The paper is thought to be based on the steady demand of the United States and the size of the Asia - Pacific region, and the US - led CPTPP agreement is expected to be based on an existing FTA. He also explained that the United States, which is leading the way in the field of e-commerce, is expected to positively prove its advantages. Hong Un-seong (2013) And to influence trade rights. He noted that Korea is considering joining the Pacific Rim partnership agreement. "China has shown strong support for ASEAN + 3, and negotiations are underway between ASEAN + 3 and ASEAN + 6. Korea's accession will have a major impact on East Asian economic integration and trade rights. " This paper is a study on the effect of trade creation on the entry of other trade rights in Korea. Using empirical research and a gravity model, it was analyzed that between 1990 and 2011, it would be beneficial for Korea to join other trade territories using trade data from 22 countries.

Kim Gyu-hwan (2013) pointed out that Korea's real GDP will increase by 2.5 ~ 2.6% when it joins the CPTPP, and it will decrease by 0.11 ~ 0.19% if it does not join. Petri, Zhai and Plummer (2011) argued that the total welfare level of the United States at the time of the CPTPP would increase to about $ 150- $ 307 billion by 2025. They analyzed this using the CGE model. Kim Dae-jong (2014) argued that Korea's CPTPP subscription would increase US and Japanese GDP by about 2.1%. He pointed out that Korea needs to participate in the economic blockade led by the United States, and that CPTPP is the nature of the US - Japan FTA from the US perspective. By Choi Byung-il (2013), they referred to the Korea-China FTA and The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) as the pending issues of the new government, and presented basic directions for each issue. He insisted that the Korea-China FTA should be concluded at a "comprehensive and high level" in order to secure future growth engines through China's preemption ,and protect the interests of Korean companies in China. Also, early participation in the CPTPP is desirable to maximize the benefits of CPTPP participation and to avoid costs associated with delayed participation. Song et al. (2008) pointed out that the symmetry of the relative size of the trading partner, which has been found to have a strongest effect on trade volume in estimating the gravity equation, has no significant effect on economic cohesion. In this paper, we have found that the number of gravitational units used in gravity theory, rather than trade concentration, is more appropriate as a determinant of economic cointegration.

RESEARCH MODEL

This paper used the Korean Banking Industry Association Analysis (2011) and International Input and Output Analysis (WIOD), which are issued once every five years (2012), Choi, Nam-gyun (2013), and Lee, Heung-bae (2014). The method of industrial association analysis is as follows:

This paper employed the 2011 Inter industry Analysis issued only every 5 years by Bank of Korea and the papers by Kim Dae-Jong (2014) and Choi Nak-Gyun (2013). The analytical method is as follows. The inter industry relations table illustrates the final demand and the form by which the gross output is distributed to other industries. For example, the total output, X1, of Industry 1 is distributed to Industry 1 through Industry n. The rest is distributed to fulfill the final demand, Y1, but M1 must be included in total output to fulfill intermediate and final demands. In other words, the following is true for Industry 1.

$$X_1 = \sum_{k=1}^{n} x_{1k} + Y_1 - M_1 \quad (1)$$

Table 1. Basic Structure of Inter-Industrial Analysis of Korea and uk

40 countries, in current prices			Industry 1	Industry 2	Industry 3	Industry 4	Total Output
(industry-by-industry)			uk	uk	uk	uk	uk
(millions of US$)	Country	Industry Classification	c1	c2	c3	c4	c5
Industry 1	KOR	c12	3	7	154	2	
Industry 2	KOR	c24	102	145	128	6	
Industry 3	KOR	c8	229	145	160	22	
Tariff	KOR		2	1	7	1	
Total Input	KOR	c20					

Source: World InputOutput Database(WIOD) Inter-country Input-Output Table for 2011

To express production activities of each industry, generic production factors, including intermediate goods, purchased from other industries were expressed as expenditure. In Industry 1, intermediate goods in quantities of , to were required from Industry 1, Industry 2 to Industry n.

Any residuals became part of added value, v1, created from Industry 1 as generic production factors such as labor and capital. In other words, they are expenditures to produce quantity x1 in Industry 1. However, since this is an interindustry analysis between two countries, added values are perceived as tariff. Consequently, the following equation was attained.

$$X_1 = \sum_{k=1}^{n} x_{k1} + V_1 \quad (2)$$

In domestic interindustry analysis, the section illustrating intermediate demand and input is an internal sector. Later, the section that records final demand is divided into external sectors. Then, the impact variance of external sector on the entire industry can be analyzed with the mutual interrelationship in the internal sector. Here, the approach was an interindustry analysis between Japan and Korea.

In equation, $X_i = \sum_{k=1}^{n} x_{ik} + Y_i - M_i$ if d is denoted as industries imported from Japan and m as Korea's industries, the following equation would be the result.

$$x_{ij} = (a_{ij}^d + a_{ij}^m)X_j,\ Y_i = Y_i^d + Y_i^m \text{ where } M_i = \sum_{i=1}^{n} a_{ij}^m X_j + Y_i^m \quad (3)$$

Substituting Equation (3) in $X_i = \sum_{k=1}^{n} x_{ik} + Y_i - M_i$ gives the following supply and demand balance equation.

$$a_{11}^d X_1 + a_{12}^d X_2 + \cdots + a_{1n}^d X_n + Y_1^d = X_1$$
$$a_{21}^d X_1 + a_{12}^d X_2 + \cdots + a_{2n}^d X_n + Y_2^d = X_2$$
$$a_{n1}^d X_1 + a_{n2}^d X_2 + \cdots + a_{nn}^d X_n + Y_n^d = X_n \quad (4)$$

In vector form, there is $A^d X + Y^d = X$ The solution to equation of x becomes inverse matrix $X = (I - A^d)^{-1} Y^d$, and this result could be exploited to calculate the production effect of each industry based on $\triangle Y$ with the equation. $\Delta X = (I - A^d)^{-1} \Delta Y$

One increment of the industry is denoted as increase in, and therefore, the effect by each industry can be estimated.

This study employed international interindustry analysis method announced in 2013, i.e. Intercountry input-output analysis. As mentioned before, is assumed to be added value, and in between X_i and V_i is the equation . $V_i = v_i X_i$ In vector form, the equation would be as follows.

$$V = A^v X \quad (5)$$

Here, is a diagonal coefficient matrix, where the coefficient is a diagonal element.

Unlike interindustry analysis, international input-output analysis divides industries into 35 types and sectors. The 35 industries are arranged in horizontal and vertical alignment and the impact of each industry on the aggregate industries was analyzed. In other words, $\triangle Y$ induces output $\triangle X$ from each industry, and $\Delta V = A^v \Delta X$ calculates the series of development by $\triangle X$.

Substituting $\Delta X = (I - A^d)^{-1} \Delta Y$, the production effect of $\triangle Y$, we arrive at the following equation.

$$\Delta V = A^v \Delta X = A^v (I - A^d)^{-1} \Delta Y \quad (6)$$

Using Equation (6), the induced amount of input, $\triangle Y$, in other industries can be calculated.

When measuring the effect of one industry on other nation, the exogenous specification technique could be used. Production induced effect is the impact of the industry of a nation on the total output of another nation.

DATA AND STATISTICS

2013 BOE input table and the proportion of SMEs

<Table 1> Bank of Korea Industry Input output Table(one million won, %)

Product	Total Exports	Total Product	Small Business The Total Revenue Ratio	Small Product	Large Product
Chemicals	88,587,165	335,498,008	60.3%	202,305,299	133,192,709
Electrical and electronic equipment	221,639,523	460,066,695	16.5%	75,911,005	384,155,690
Textiles & Leather Products	31,230,017	103,421,687	90.8%	93,896,550	9,525,137
Machinery and equipment	45,946,600	160,033,221	74.9%	119,928,896	40,104,325
Coal and oil products	64,194,215	204,911,807	10.0%	20,491,181	184,420,626
Primary metal products	43,143,587	268,771,923	41.6%	111,728,488	157,043,435
Transportation Equipment	131,170,274	267,051,642	33.4%	89,195,248	177,856,394
Metal products	14,393,250	104,461,768	86.3%	90,150,506	14,311,262
Other manufacturing products and foundry	5,981,149	72,766,151	95.0%	69,127,843	3,638,308
Wholesale and retail services	24,846,209	235,295,318	89.4%	210,354,014	24,941,304
Food and beverages	8,158,525	124,172,001	84.5%	104,925,341	19,246,660
Transportation Equipment	36,717,574	151,385,911	66.5%	100,671,631	50,714,280
Professional, scientific and technical services	11,652,837	140,580,412	75.7%	106,419,372	34,161,040
Wood and Paper, Printing	4,265,061	45,996,627	93.0%	42,776,863	3,219,764
Business Support Services	7,484,033	53,739,833	78.8%	42,352,362	11,387,471
Precision Instruments	11,065,777	45,061,543	65.0%	29,290,003	15,771,540
Restaurant and accommodation services	8,019,964	105,976,685	90.0%	95,379,017	10,597,669
Agriculture, forestry and marine products	795,439	69,241,562	85.0%	58,855,328	10,386,234
Financial and insurance services	2,363,873	139,506,359	80.4%	112,177,063	27,329,296
Telecommunications and broadcast service	4,669,154	122,041,614	66.2%	80,791,548	41,250,066
Cultural and other services	1,703,480	78,693,326	74.4%	58,547,835	20,145,491
Real Estate & Leasing	2,648,664	161,239,826	69.1%	111,368,348	49,871,478
Non-metallic mineral products	2,770,787	50,382,978	71.8%	36,174,978	14,208,000
Electricity, gas and steam	130,194	101,098,884	59.9%	60,558,232	40,540,652
Education Services	290,370	104,342,343	85.2%	88,899,676	15,442,667
Health and social services	128,161	105,514,387	73.8%	77,837,963	27,676,424
Coal	230,627	179,819,502	96.0%	172,626,722	7,192,780
Water, Waste and Recycling Services	59,149	22,365,076	87.0%	19,457,616	2,907,460
Public administration and defense	124,258	112,147,797	30.9%	34,597,595	77,550,202
Construction industry	294,501	190,630,663	59.4%	113,196,488	77,434,175
Subtotal	774,704,417	4,316,215,549	56.0%	2,435,526,302	1,880,689,247

Source: Bank of Korea (2015), Industry Association

<Table 1> shows the total sales and exports of the Bank of Korea 's industry table as small and medium enterprises. The Federation of Small and Medium Businesses annually announces the amount of production, the number of enterprises, the number of employees, and the value added value of SMEs. This is the author's summary. In the back, the export statistics of the Bank of Korea and the Korea Customs and Trade Development Agency, which is an affiliate of the Korea Customs Service, are slightly different. The reason is that the Customs and Trade Development Agency deals with manufacturing exports only, and is a customs clearance standard. The Bank of Korea, however, includes both the card amount used by foreigners in Korea and the service industry. Particularly, exports include all goods and services such as processing trade and intermediary trade. Chemicals, electrical and electronic equipment; textiles and leather goods, machinery and equipment; and coal and petroleum products, account for the largest share of SMEs' exports, based on the exports of SMEs in 2013. According to the Bank of Korea, 19% of manufacturing exports are small and medium enterprises, and 81% are large and medium enterprises. 56% of sales are produced by SMEs, but considering that exports account for 19% of SMEs, SMEs are more dominant than exports. Excluding this portion of SMEs, the remainder is the proportion of large and mid-sized companies. In the case of chemical products, 60% of the total sales are SMEs, and the remaining 40% are large enterprises.

Export and import statistics with each country

<Table 2> shows the trade volume between Korea and other countries. There was a total of 559.6 billion won in exports as of 2013, with imports total 515.6 billion won. China exported $145.8 billion in 2013 and spent $83 billion on imports (2.2 times of the US). Here, the trade volume between Korea and each country can be known. It can be seen that Korea is trading in the following order: China, USA, Japan, Hong Kong, Singapore, Vietnam, and Taiwan.

<Table 2>. South Korea's Exports and Imports by Country

	2013		2012		2011	
	Exports	Imports	Exports	Imports	Exports	Imports
TOTAL	559,648,708	515,560,844	548,075,929	519,581,584	555,213,656	524,413,090
CHINA	145,836,767	83,037,429	134,331,099	80,777,791	134,185,009	86,432,238
USA	62,056,025	41,510,611	58,523,678	43,337,402	56,207,703	44,569,029
JAPAN	34,693,728	60,015,980	38,850,174	64,350,837	39,679,706	68,320,170
HONG KONG	27,761,650	1,929,579	32,609,163	2,058,600	30,968,405	2,315,073
SINGAPORE	22,279,598	10,365,523	22,891,805	9,675,466	20,839,005	8,966,683
VIETNAM	21,087,589	7,170,311	15,954,023	5,718,017	13,464,922	5,084,246
TAIWAN	15,701,955	14,630,837	14,819,337	14,011,115	18,205,965	14,693,589
INDONESIA	11,574,115	13,188,478	13,945,845	15,678,327	13,564,498	17,216,374
INDIA	11,385,053	6,182,544	11,921,074	6,923,868	12,654,078	7,893,573
RUSSIA	11,150,209	11,496,259	11,098,724	11,355,073	10,304,880	10,852,171
MEXICO	9,727,492	2,301,580	9,041,384	2,595,100	9,729,059	2,315,698
BRAZIL	9,688,914	5,572,421	10,287,973	6,084,048	11,821,399	6,342,934
AUSTRALIA	9,563,658	20,767,694	9,268,572	22,978,398	8,163,845	26,316,304
SAUDI ARABIA	8,824,019	37,664,947	9,122,144	39,722,358	6,964,299	36,972,612
PHILIPPINES	8,783,009	3,705,004	8,229,194	3,282,160	7,338,902	3,571,472
MALAYSIA	8,589,828	11,096,723	7,802,551	9,796,003	6,275,131	10,467,817
THAILAND	8,073,603	5,229,504	8,216,964	5,352,025	8,458,966	5,413,360
GERMANY	7,907,891	19,333,437	7,511,299	17,640,703	9,500,927	16,962,579
MARSHALL ISLANDS	7,436,578	186,878	3,934,176	119,637	7,053,544	58,895
UNITED ARAB EMIRATES	5,741,036	18,124,004	6,852,113	15,115,895	7,267,754	14,759,366
TURKEY	5,658,180	691,835	4,552,344	672,300	5,070,997	804,624

Import and Export Status of Small and Medium-sized Enterprises in Korea

In Table 3, it can be seen that as time passes, the share of exports of SMEs in total exports declines, while the share of exports of large corporations increases. In 1996, SMEs accounted for 41% of total exports and 58% of large corporations. However, in 2012, SMEs accounted for 18%, and large companies accounted for 87%. In 2014, SMEs accounted for 17% of total exports, and large enterprises accounted for 82%. It is estimated that large companies are ahead of manpower and equipment.

<TABLE 3> SMEs, Large Companies, Total Export (Thousand US$, %)

Year	SME	SME ratio %	Large companies	Large companies ratio, %	Total Exports (Thousand US$, %)
1995	49,473,573	0.3956	75,283,273	0.6020	125,057,988
1996	54,205,445	0.4179	75,320,960	0.5807	129,715,137
1997	56,909,984	0.4180	79,090,723	0.5808	136,164,204
1998	41,033,585	0.3101	91,092,856	0.6885	132,313,143
1999	49,045,391	0.3413	94,346,432	0.6566	143,685,459
2000	63,509,345	0.3687	108,627,306	0.6306	172,267,510
2001	64,600,340	0.4294	85,738,010	0.5699	150,439,144
2002	68,307,855	0.4204	94,052,888	0.5789	162,470,528
2003	81,698,654	0.4215	112,015,325	0.5779	193,817,443
2004	90,384,864	0.3561	163,195,487	0.6429	253,844,672
2005	92,128,407	0.3239	192,055,964	0.6753	284,418,743
2006	103,692,602	0.3186	220,966,671	0.6789	325,464,848
2007	113,545,705	0.3057	257,712,319	0.6937	371,489,086
2008	130,524,448	0.3093	291,289,587	0.6902	422,007,328
2009	76,782,726	0.2112	285,632,098	0.7857	363,533,560
2010	98,623,748	0.2115	366,142,285	0.7851	466,383,761
2011	101,559,896	0.1829	452,911,842	0.8157	555,213,656
2012	102,651,000	0.1878	478,64,028	0.8736	547,869,792
2013	95,998,000	0.1720	463634000	0.8280	559,632,000
2014	98,067,000	0.1710	474598000	0.8290	572,665,000

Export and import statistics for the UK

The total exports to the UK in the year 2015 are $ 7.3 billion. The amount and share of SMEs in exports to the UK is 8. $ 700 million (12%) and medium-sized enterprises 8. $ 400 million (11%), large enterprise 5.6 billion US dollars (77%). This is similar to the share of SMEs in Korea's total exports by 15%.

<Table 4> China's and UK's Exports and Their Share by Size (dollar)

year	By Country (2)	China(dollar)	importance	England (dollar)	importance
2013	Small Business (USD)	22,238,916,804	15.2%	870,619,659	18.4%
2013	Medium Enterprise (USD)	24,377,601,613	16.7%	552,840,102	11.7%
2013	Large companies (dollars)	99,184,079,825	68.0%	3,271,517,848	69.2%
2013	Others (dollars)	68,900,031	0.0%	32,107,201	0.7%
2013	Total Exports (USD)	145,869,498,273		4,727,084,810	
2014	Small Business (USD)	22,985,571,978	15.8%	982,585,393	17.0%
2014	Medium Enterprise (USD)	23,986,017,552	16.5%	685,036,726	11.8%
2014	Large companies (dollars)	98,274,084,295	67.6%	4,070,678,489	70.4%
2014	Others (dollars)	42,027,388	0.0%	44,309,230	0.8%
2014	Total Exports (USD)	145,287,701,213		5,782,609,838	
2015	Small Business (USD)	22,056,408,173	16.1%	878,831,947	11.9%
2015	Medium Enterprise (USD)	24,607,801,533	17.9%	845,459,881	11.4%
2015	Large companies (dollars)	90,420,244,225	65.9%	5,632,704,475	76.2%
2015	Others (dollars)	39,479,962	0.0%	33,100,193	0.4%
2015	Total Exports (USD)	137,123,933,893		7,390,096,496	

As of 2015, Korea's total exports to the UK are $ 7.3 billion. Large companies accounted for $ 5.6 billion (76 percent), midsize businesses $ 840 million (11 percent), and SMEs $ 870 million (12 percent). This proportion is about 1.4% of Korea's total exports by 2015.

EMPIRICAL RESULTS

<Table 5> shows the results of the ripple effect of the two countries due to the international input calculation of Korea and Britain published in 2013. The total ripple effect from trade between Korea and the UK is $ 4.8 billion (about 5.2 trillion won, based on the exchange rate of 1100 won). The industries that were most influential in both countries were electric and electronic industries. A total impact of $ 10.7 billion has been achieved. Water transport of $ 890 million, financial intermediation of $ 880 million, and automobile and transportation equipment of $ 300 million. If the Korea-UK FTA is concluded, the expansion of exchanges is expected to further expand, resulting in a greater ripple effect. Korea's electrical and electronic industries have affected the UK's electronics industry and have had a ripple effect of about 1.2 trillion won.

Especially, since the brokerage business brings about 1 trillion won, it is expected to have a big impact on the Korean financial market after the breach.

The impact is expected to reach about $ 7.4 billion by 2015.

<Table 5> Korea-UK industrial relations ripple effect(In millions of dollars)

				N	O	P	
IIntercountryInput-Output Tablefor2011 40 countries, in current prices (millions of US$)				Health and Social Work	Other Community, Social and Personal Services	Private Households with Employed Persons	TOTAL
				GBR	GBR	GBR	
				c33	c34	c35	
30t33	Electrical and Optical Equipment	KOR	c14	16	16	0	1,071
61	Water Transport	KOR	c24	20	22	0	897
J	Financial Intermediation	KOR	c28	2	9	0	882
34t35	Transport Equipment	KOR	c15	8	2	0	309
27t28	Basic Metals and Fabricated Metal	KOR	c12	0	0	0	254
23	Coke, Refined Petroleum and Nuclear Fuel	KOR	c8	9	6	0	233
29	Machinery, Nec	KOR	c13	0	1	0	182
71t74	Renting of M&Eq and Other Business Activities	KOR	c30	13	9	0	176
O	Other Community, Social and Personal Services	KOR	c34	11	80	0	150
51	Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	KOR	c20	22	3	0	147
24	Chemicals and Chemical Products	KOR	c9	57	4	0	145
25	Rubber and Plastics	KOR	c10	4	2	0	137
62	Air Transport	KOR	c25	2	4	0	82
17t18	Textiles and Textile Products	KOR	c4	6	2	0	76
21t22	Pulp, Paper, Paper , Printing and Publishing	KOR	c7	2	1	0	29
				176	163	0	4,832

CONCLUSION

The summary of this paper is as follows. First, Korea will be slightly affected by the brake seat. By 2016, the GDP is expected to fall by about 0.2 percent annually. Secondly, the weakest sectors in SMEs are analyzed by the UK because of the second BREC SEAT, which includes electric and electronic equipment, finance, chemicals, transportation equipment, and primary metal products. Third, according to the results of the international input and output analysis, Korea and the United Kingdom had a $ 4.8 billion ripple effect on the trade side after 2013. If Korea can not establish an FTA with the UK after the EU withdraws from the EU, the average tariff of Korea will be reduced to 12.1%, which will greatly reduce trade between the two countries. The damage to SMEs is estimated to be about 1 trillion won. The total amount of damages in Korea is estimated to be about 1.6 trillion won.

The academic and policy implications of this study are as follows. First, we used the international industry linkage analysis model to study the impact of brexit on SMEs. Ripple effects arising from

trade in each industry were found. In addition, the trade between the two countries showed which industries were influential. Second, it was found that SMEs need to expand their government support to increase exports, not to focus on domestic demand. As of 2013, SMEs account for 56% of Korea's total production, but exports account for only 15%. SMEs are operating exclusively on domestic demand rather than exporting. The future population decline and domestic market contraction will make SMEs more difficult. There is a need for an export-oriented policy to foster small and medium-sized enterprises that are strong in exports. In other words, for industries where SMEs' export competitiveness is weak, the government needs active financial and policy support to support export expansion.

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