

The Effects of Export Diversification on Macroeconomic Stabilization: Evidence from Korea

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This paper studies whether export diversification mitigated the negative effect of the global financial crisis on exports using the Korean case. Specifically, we use annual data on the exports of 24 Korean manufacturing industries from 2000 to 2016 and examine whether the negative effect of the crisis on exports was less prevalent in industries that were more diversified in terms of country and product. We also examine whether export competitiveness, as measured by the revealed comparative advantage index by industry, had a mitigating effect on trade during the crisis. In order to study these issues, we use panel regression with a fixed-effect model for 24 Korean manufacturing industries. From our empirical analysis, we find that country diversification weakened the negative impact of the global financial crisis on Korea's exports, whereas neither product diversification nor export competitiveness did so.

Key Word: Export Diversification, Global Financial Crisis,
Macroeconomic Stabilization
JEL Code: E60, F10, F40

I. Introduction

Exports account for a relatively large share of the Korean economy compared to other countries in the world. For example, Korea's export share of GDP (42.4%) was the second largest among G20 countries¹ in 2016 after that of Germany (46.1%), and was higher than those of Mexico (37.1%), Canada (31.0%), China (19.5%), India (19.2%) and Japan (16.2%). Therefore, it is worthwhile to take a close look at factors that could mitigate a negative impact on the export sector in the case of global real or financial shocks.

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¹The G20 countries include Argentina, Australia, Brazil, Canada, China, the European Union (EU), France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the UK and the US. This group accounted for 80% of global GDP and 77% of trade in 2016 (IMF and WTO).

According to the theory of diversification in the area of finance, the return of a portfolio becomes less volatile if the portfolio is more diversified. Empirical findings in this area are mostly consistent with this theory. In this paper, we analyze whether the same phenomenon can be found in the area of trade. Specifically, we examine whether export diversification in terms of country and product mitigated the negative effect of the global financial crisis on exports using annual data for 24 Korean manufacturing industries from 2000 to 2016.

By examining the annual growth rates of global merchandise and of exported Korean goods from 1991 to 2017 in Figure 1, we find that the global financial crisis had a major negative effect on not only the world's exports but also on Korea's exports. The annual growth rates of global merchandise and Korea's goods exports both decreased, by 22.3% and 15.9%, respectively, in 2009. Hence, our analysis focuses on this period, i.e., when the degree of trade collapse was most serious.

Our methodology basically employs the approach of Neto and Romeu (2011), who explored the effect of export diversification on exports during the global financial crisis (from the fourth quarter of 2008 through the first quarter of 2009) using export data from 14 Latin American countries during the period of 2000-2009. Given the different industrial structure and export competitiveness of Korea compared to Latin American countries, we attempt to derive policy implications for Korea through an empirical analysis. Unlike earlier work, we use industry-level data pertaining to the manufacturing sector in Korea. We also examine whether export competitiveness, as measured by the revealed comparative advantage (RCA) index by industry, had a mitigating effect on exports during the crisis.

From our empirical analysis, we find that country diversification weakened the negative impact of the global financial crisis on Korea's exports, though this was not the case for product diversification or export competitiveness.

The rest of paper is organized as follows. We provide a review of the literature in Section II. In Section III, we describe the data and introduce the methodology used

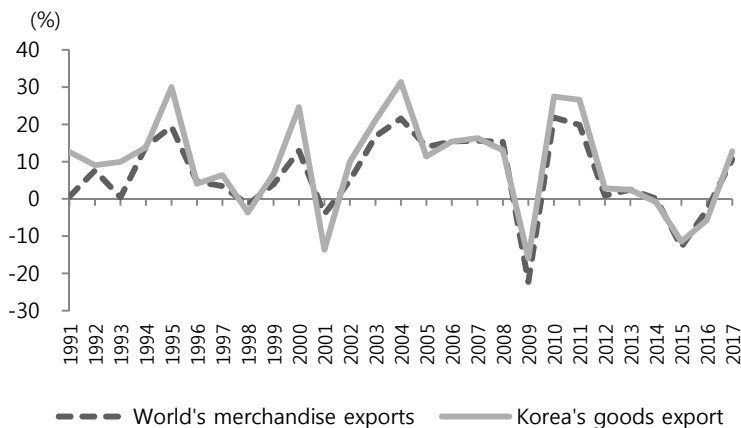


FIGURE 1. COMPARISON OF LABOUR MARKET PERFORMANCES

Note: Annual growth rates are based on US dollar.

Source: WTO and Bank of Korea.

in the analysis. We report the empirical results in Section IV and then conclude the paper in Section V.

II. Literature Review

According to a long-held tradition of trade theory, it is favorable for a country to specialize in a particular industry or product. The absolute and comparative advantage theories of Adam Smith and David Ricardo tell us that a country can benefit by producing items in which it has a comparative advantage and trading them with other countries. This implies that specialization in international trade can be a superior strategy to foster economic growth and to promote exports.

However, numerous studies have emphasized the positive effects of trade diversification on a national economy, disclaiming the above-mentioned theories. Prebisch (1950) and Singer (1950) are the pioneers in this regard. They stress the need for developing countries to diversify their export products, pointing out that specializing in the exports of primary products (raw materials) could have an adverse impact on economic growth in the long run because it can worsen the terms of trade with respect to manufacturing goods. The “Dutch Disease²” is another example highlighting the negative effect of an expansion in a country’s primary sectors into other tradable sectors, such as manufacturing. This phenomenon occurs due to the deterioration of the export competitiveness of the manufacturing sector and decreases in import goods via the appreciation of exchange rates. More recently, there have been various studies focusing on the relationship between export diversification and the stage of economic development. According to the well-known export diversification and nonlinear hypothesis on income level, export diversification has a positive effect on economic growth in developing countries, whereas export specialization is more effective in advanced countries (Imbs and Wacziarg, 2003; Farole *et al.*, 2010; Hesse, 2008; Cadot *et al.*, 2011).

Feenstra and Kee (2004) find that sectoral export diversity was important for country productivity in 34 countries from 1982 to 1997. For example, a 10% increase in export diversity in all industries resulted in a 1.3% increase in national productivity. Rath and Akram (2017) find that export diversification had a positive effect on total factor productivity growth in the South Asian region from 1995 to 2014. Melitz (2003) argues that more productive firms become exporters while less productive firms stay in the domestic market. Thus, causation arises, from productivity to export variety. Hinlo and Arranguéz (2017) study the effect of geographical diversification on the output growth for five ASEAN countries from 1980 to 2014. They stress that the diversification of market destinations is necessary to improve macroeconomic performance outcomes.

Several papers have investigated the effects of export diversification on macroeconomic stability. Jansen (2004) finds that export concentration affects the terms of trade volatility, which in turn increases the standard deviation of GDP

²This term was used by “The Economist” in 1977 to describe the detrimental situation of the manufacturing industry in the Netherlands after the discovery of large natural gas reserves in the North Sea in 1959 and the natural-gas exports that followed.

growth in small and developing economies. Bacchetta *et al.* (2007) document that export product diversification in developing countries lowers output volatility, while geographical diversification is more significant in developed countries. Buch *et al.* (2009) argue that inter-industry diversification is more important than intra-industry diversification in reducing output volatility. Papageorgiou and Spatafora (2012) find that export diversification in low-income countries with better institutions decreases output volatility. Vannoorenberghe *et al.* (2014) argue that the effect of export diversification on the volatility of foreign market sales varies by firm size. Stanley and Bunnag (2001) hold that export diversification can reduce export earnings instability.

A salient study of the effect of export diversification on trade was conducted by Neto and Romeu (2011). They analyze whether export diversification mitigated the effects on exports during the global financial crisis (from the fourth quarter of 2008 to the first quarter of 2009) using export data from 14 Latin American countries during the period of 2000-2009. For the empirical analysis, three Herfindahl indices according to inter-industry products, destinations and intra-industry products were employed as the export concentration measure. They find that product diversification of exports eased the trade-reduction effect of the global financial crisis. However, diversifying the geographical destinations of exports did not significantly mitigate the negative impact on trade during this period.

There are also several noteworthy studies of the various effects of export diversification in Korea. Lee and Wang (2004) analyze the impact of the trade structure on economic growth using panel data from 66 countries during the period of 1991-2001. They find that intra-industry trade has a positive effect on economic growth, whereas an increase in trade concentration negatively affects growth. Hwang *et al.* (2004) use the Gini coefficient to measure the degree of export diversification by country and to examine the relationship between export diversification and competitiveness in the manufacturing industry from 1990 to 1999. They find a negative correlation between the export market intensity and export competitiveness. They argue that export bargaining power and the ability to respond to exchange rate fluctuations could be enhanced under more diversified export market environments.

Kim and Park (2006) use data from 69 countries from 1970 to 2000 to analyze the effects of trade diversification and the economic conditions of trading partners on domestic economic growth. They find that faster economic growth is achieved in countries where import and export goods are highly diversified by product as well as by trading partner. They also discover that the economic growth of trade partners significantly affects a country's own economic growth.

Kim and Oh (2008) find that the export intensity of Korea's IT industry has an upward trend from 1996 to 2006, showing a higher level than that of Japan, the US and China. They also find through a regression analysis that the degree of export concentration has a positive effect on the export growth of the IT industry. Min *et al.* (2011) analyze export diversification patterns and related impacts on exports using data from 1995 to 2008. They find that the diversification indices in terms of both product and destination have U-shaped and non-linear trends and that the extensive margin is more significant than the intensive margin in explaining export diversification. They also argue that export diversification can affect the performance

and volatility of exports.

More recently, Kwon (2017) investigates the effects of diversification in foreign markets (exports) and in domestic markets on firm value as measured by “Tobin’s q” using firm-level data from 2000 to 2010. They find that product diversification in exports positively affects firm value relative to product diversification in domestic markets.

III. Data and Methodology

We collect annual data on Korean exports to foreign countries in US dollars from the UN Comtrade database at the HS 6-digit code level from 2000 to 2016. For the classification of manufacturing industries for Korea, we use the Korean Standard Industrial Classification (KSIC, revision 9) provided by the Korea National Statistical Office following Lee and Yu (2018). There are 24 divisions (industries) for manufacturing in the KSIC (revision 9). Table A1 reports the codes and names for the 24 divisions (industries). We matched HS 6-digit codes to KSIC codes.

We compute the export amounts in US dollars between Korea and foreign countries for the 24 Korean manufacturing industries from 2000 to 2016. We then rank foreign countries according to the proportion of exports during the period and include foreign countries ranked from 1 to 77 in our sample. Exports from Korea to those 77 countries cover 95.0% of all exports of Korean manufacturing industries for the period. Table 1 reports the ranks and proportions of exports for those 77 countries in our sample during the period of 2000 to 2016.

TABLE 1—PROPORTION OF EXPORTS OF KOREAN MANUFACTURING INDUSTRIES TO FOREIGN COUNTRIES FROM 2000 TO 2016

Rank	Country	Proportion (%)	Rank	Country	Proportion (%)
1	China	23.01	21	Marshall Islands	1.07
2	US	12.91	22	Canada	1.00
3	Japan	6.65	23	Turkey	0.94
4	Hong Kong	5.66	24	Iran	0.89
5	Singapore	3.37	25	Italy	0.87
6	Vietnam	2.84	26	Liberia	0.79
7	Germany	2.10	27	France	0.77
8	India	2.00	28	Panama	0.73
9	Indonesia	1.88	29	Poland	0.68
10	Mexico	1.80	30	Slovakia	0.63
11	Australia	1.56	31	Spain	0.60
12	Russia	1.53	32	Belgium	0.52
13	Malaysia	1.48	33	Chile	0.46
14	Philippines	1.44	34	Greece	0.46
15	UK	1.44	35	Norway	0.38
16	Brazil	1.35	36	South Africa	0.35
17	Thailand	1.34	37	Egypt	0.34
18	Saudi Arabia	1.23	38	Hungary	0.32
19	United Arab Emirates	1.18	39	Bahamas	0.29
20	Netherlands	1.09	40	Malta	0.28

TABLE I—PROPORTION OF EXPORTS OF KOREAN MANUFACTURING INDUSTRIES
TO FOREIGN COUNTRIES FROM 2000 TO 2016 (CONT'D)

Rank	Country	Proportion (%)	Rank	Country	Proportion (%)
41	Nigeria	0.28	60	Qatar	0.18
42	Bermuda	0.28	61	Cyprus	0.17
43	Israel	0.26	62	Denmark	0.17
44	Uzbekistan	0.26	63	Ukraine	0.17
45	Czech Rep.	0.26	64	Libya	0.16
46	Bangladesh	0.26	65	Argentina	0.16
47	Finland	0.25	66	Switzerland	0.16
48	Colombia	0.24	67	Oman	0.15
49	Kuwait	0.23	68	Ireland	0.14
50	New Zealand	0.23	69	Ecuador	0.13
51	Angola	0.21	70	Syria	0.13
52	Iraq	0.21	71	Venezuela	0.13
53	Algeria	0.20	72	Kazakhstan	0.12
54	Peru	0.20	73	Myanmar	0.12
55	Jordan	0.19	74	Romania	0.11
56	Sweden	0.19	75	Portugal	0.11
57	Slovenia	0.19	76	Guatemala	0.11
58	Austria	0.18	77	Cambodia	0.09
59	Pakistan	0.18		Total	95.0

In order to examine whether export diversification in terms of country and product by industry had a mitigating effect on Korean manufacturing exports during the global financial crisis, we generally follow the methodology of Neto and Romeu (2011). We also examine the effect of export competitiveness, measured by revealed comparative advantage, on Korean manufacturing exports during the crisis. Specifically, we use panel regressions (1) and (2) with a fixed-effect model for the 24 Korean manufacturing industries as follows:

$$\begin{aligned}
 (1) \quad & \ln[Export_{i,j,t} / (GDP_{Korea,t} \times GDP_{i,t})] \\
 & = \alpha + \beta_{dist} \ln distance_{Korea,i} + \beta_{fx} (R_{fx,i,t} - R_{fx,Korea,t}) \\
 & + \beta_{product} HI_{product,j,t-1} + \beta_{country} HI_{country,j,t-1} \\
 & + \beta_{RCA} RCA_{Korea,j,t-1} + \varepsilon_{i,j,t}
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad & \ln[Export_{i,j,t} / (GDP_{Korea,t} \times GDP_{i,t})] \\
 & = \alpha + \beta_{dist} \ln Distance_{Korea,i} + \beta_{fx} (R_{fx,i,t} - R_{fx,Korea,t}) \\
 & + \beta_{product} HI_{product,j,t-1} + \beta_{country} HI_{country,j,t-1} \\
 & + \beta_{RCA} RCA_{Korea,j,t-1} + \beta_{product,crisis} (HI_{product,j,t-1} \times CRISIS) \\
 & + \beta_{country,crisis} (HI_{country,j,t-1} \times CRISIS) \\
 & + \beta_{RCA,crisis} (RCA_{Korea,j,t-1} \times CRISIS) + \varepsilon_{i,j,t}
 \end{aligned}$$

In (1), $Export_{i,j,t}$ denotes exports from Korea to country i for manufacturing

industry j in year t . $GDP_{Korea,t}$ is the GDP for Korea in year t . $GDP_{i,t}$ is the GDP for country i in year t . $Distance_{Korea,i}$ is the distance in kilometers between the capital city of Korea and that of country i . $R_{fx,i,t}$ is the rate of change for the currency of country i against the US dollar in year t . $R_{fx,Korea,t}$ is the rate of change for the Korean won against the US dollar in year t . Hence, differences between the two rates indicate the degree of relative appreciation of the Korean won against the currency of country i . $HI_{product,j,t-1}$ is the Herfindahl index³ in terms of the HS-6 digit product for Korean manufacturing industry j in year $t-1$. $RCA_{Korea,j,t-1}$ is the revealed comparative advantage index⁴ for Korean manufacturing industry j in year $t-1$. The Herfindahl index and RCA index were used in $t-1$ instead of t in order to consider the time lag in the effect of these variables on exports and to alleviate endogeneity problems.

In (2), we interact $HI_{product,j,t-1}$, $HI_{country,j,t-1}$, and $RCA_{Korea,j,t-1}$ with a dummy variable, $CRISIS$, which takes a value of one for the year 2009 and zero otherwise. As the merchandise exports of the world declined by 22.3% in 2009, the negative effect of the global financial crisis on world trade was greatest among the period of 2000-2016.

We collect GDP data for Korea and the foreign countries from the World Development Indicators provided by the World Bank. Regarding the distance between the capital city of Korea and those of the foreign countries, we use data provided by Prof. Gleditsch of Essex University.⁵ We compute the rates of change for the Korean won and the currencies of the foreign countries against the US dollar using average official exchange rate data provided by the World Development Indicators. The Herfindahl indices in terms of product and country for the Korean manufacturing industries are computed with UN Comtrade data. Lastly, the RCA indices for the Korean manufacturing industries are also computed with UN Comtrade data.

Figure 2 shows the annual Herfindahl indices in terms of product and country for the Korean manufacturing industry for the period of 1999 to 2015. The Herfindahl index in terms of product tends to decline during the period. The Herfindahl index in terms of product decreased from 0.152 in 1999 to 0.125 in 2015. On the other hand, the Herfindahl index in terms of country was stable at around 0.280 during the period. The highest Herfindahl index in terms of country was 0.285, while the lowest one was 0.276 in 2008.

³ $H = \sum_{k=1}^n S_k^2$, where S_k is the share of each product with respect to the industry. The Herfindahl index ranges from 0 (highly diversified) to 1 (highly concentrated).

⁴The RCA index is calculated by dividing exports in an industry of Korea/exports in the manufacturing industry of Korea by exports in an industry of the world/exports in the manufacturing industry of the world. If the value of the RCA index of an industry is greater than 1, the industry has a comparative advantage. On the other hand, if the value of the RCA index of an industry is less than 1, the industry has a comparative disadvantage.

⁵Kristian Skrede Gleditsch (<http://ksgleditsch.com/data-5.html>).

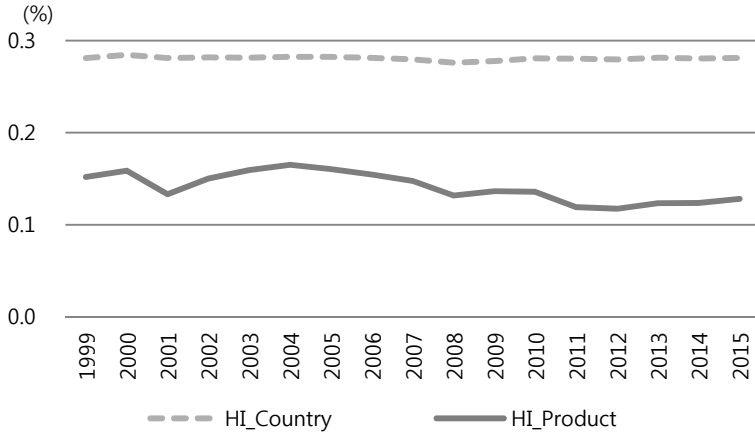


FIGURE 2. ANNUAL HERFINDAHL INDICES FOR KOREAN MANUFACTURING INDUSTRY FROM 1999 TO 2015

Figure 3 shows the annual average Herfindahl indices in terms of product and country for the 24 Korean manufacturing industries for the period of 1999 to 2015. For the Herfindahl indices in terms of product, the tobacco products industry (code 12, Herfindahl index of 0.959) shows the highest value, followed by the industry of coke, hard-coal and lignite fuel briquettes and refined petroleum products (code 19, Herfindahl index of 0.848) and the industry of printing and reproduction of recorded media (code 18, Herfindahl index of 0.598). For the Herfindahl indices in terms of country, the beverages industry (code 11, Herfindahl index of 0.329) exhibits the highest value, followed by the industry of wearing apparel, clothing accessories and fur articles (code 14, Herfindahl index of 0.208) and then the industry of chemicals and chemical products, except pharmaceuticals and medicinal chemicals (code 20, Herfindahl index of 0.202) with the second and third highest values, respectively.

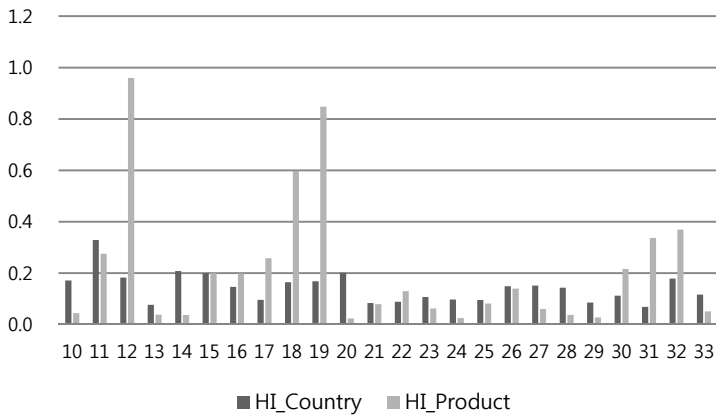


FIGURE 3. ANNUAL AVERAGE HERFINDAHL INDICES FOR KOREAN MANUFACTURING INDUSTRIES FROM 1999 TO 2015

Note: For industry code numbers, refer to Table A1.

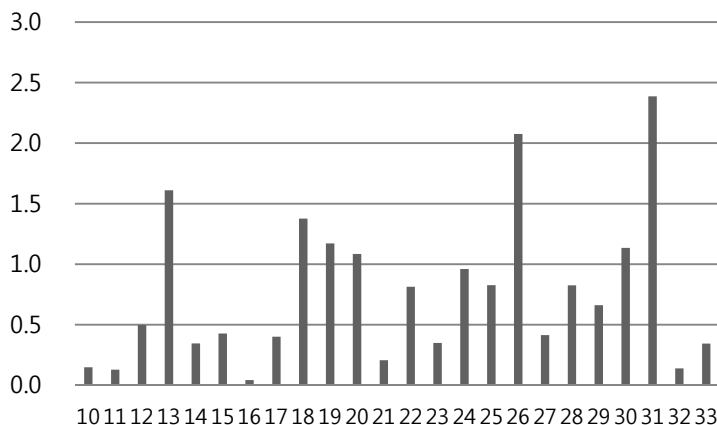


FIGURE 4. ANNUAL AVERAGE RCA INDICES FOR KOREAN MANUFACTURING INDUSTRIES FROM 1999 TO 2015

Note: For industry code numbers, refer to Table A1.

Figure 4 represents the annual average RCA indices for the Korean manufacturing industries for the same period. The industry of other transport equipment (code 31, RCA index of 2.387), the industry of electronic components, computer, radio, television and communication equipment and apparatuses (code 26, RCA index of 2.076), the industry of textiles, except apparel (code 13, RCA index of 1.611), the industry of printing and reproduction of recorded media (code 18, RCA index of 1.376), the industry of coke, hard-coal and lignite fuel briquettes and refined petroleum products (code 19, RCA index of 1.172), the industry of motor vehicles, trailers and semi-trailers (code 30, RCA index of 1.134), and the industry of chemicals and chemical products, except pharmaceuticals and medicinal chemicals (code 20, RCA index of 1.084) have higher values than one, suggesting that Korea has comparative advantages in these industries over competing countries.

IV. Empirical Results

Panel A of Table 2 reports the results of the regression analysis of specification (1) from Section III. In model 1, we include Herfindahl indices in terms of product and country. We find that both Herfindahl indices are negative and statistically significant at the level of one percent. Thus, we can conclude that if exports in a manufacturing industry are more diversified in terms of product and country, they tend to be larger in the Korean case. In addition, we find that the variable of distance between Korea and a foreign country is negative and statistically significant at the level of one percent. This finding implies that Korea exports more to a foreign country when the country is closer to Korea. Differences in the rate of change in the foreign exchange rate do not have any effect on exports for Korean manufacturing industries. In model 2, we add the RCA index as an independent variable in the regression and find that the RCA index is positive and statistically

TABLE 2—EFFECTS OF HERFINDAHL INDICES FOR PRODUCT AND COUNTRY AND THE RCA INDEX ON EXPORTS FOR KOREAN MANUFACTURING INDUSTRIES FROM 2000 TO 2016

[Panel A]

Independent variables	Dependent variable	
	ln(Annual exports from Korea to country $i / GDP_i \times GDP_{Korea}$)	
	Model 1	Model 2
ln(Distance between Korea and country i)	-1.245*** (-57.42)	-1.245*** (-57.66)
Difference in FX rate changes between country i and Korea	-0.095 (-1.07)	-0.100 (-1.11)
Herfindahl index for product	-0.735*** (-2.91)	-1.038*** (-4.13)
Herfindahl index for country	-1.700*** (-5.35)	-1.925*** (-6.13)
RCA index		0.716*** (10.18)
Industry effect	Yes	Yes
Year effect	Yes	Yes
N	28,151	28,151
Adjusted R ²	0.542	0.545

[Panel B]

Independent variables	Dependent variable	
	ln(Annual exports from Korea to country $i / GDP_i \times GDP_{Korea}$)	
	Model 3	Model 4
ln(Distance between Korea and country i)	-1.245*** (-57.43)	-1.245*** (-57.66)
Difference in FX rate changes between country i and Korea	-0.095 (-1.06)	-0.100 (-1.10)
Herfindahl index for product	-0.737*** (-2.90)	-1.029*** (-4.07)
Herfindahl index for country	-1.671*** (-5.26)	-1.901*** (-6.05)
RCA index		0.713*** (10.16)
Herfindahl index for product × Crisis	0.207 (0.66)	0.071 (0.22)
Herfindahl index for country × Crisis	-2.710*** (-2.64)	-2.318** (-2.39)
RCA index × Crisis		-0.019 (-0.16)
Industry effect	Yes	Yes
Year effect	Yes	Yes
N	28,151	28,151
Adjusted R ²	0.542	0.545

Note: 1) Numbers in parentheses are heteroscedasticity-robust t-statistics. 2) ***, ** and * denote statistical significance at the level of 1%, 5% and 10%, respectively.

significant at the level of one percent. This finding shows that a Korean manufacturing industry exports more when the industry is more competitive in the world market. For all of the other independent variables, we obtain results identical to those in model 1.

In Panel B of Table 2, we report the results of the regression analysis in specification (2) from Section III. In particular, we introduce a dummy variable for the global financial crisis and interact the dummy variable with the two Herfindahl indices and the RCA index in order to observe the effect of export diversification by country as well as by product and competitiveness on exports during the global financial crisis. In model 3, the variable of interaction between the Herfindahl index in terms of product and the crisis dummy variable is not significant at any conventional level of significance. On the other hand, the variable of interaction between the Herfindahl index in terms of country and the crisis dummy variable is negative and statistically significant at the level of one percent. In model 4, we add the variable of interaction between the RCA index and the crisis dummy variable and find that it is not significant. Thus, we can conclude that country diversification weakened the negative impact of the global financial crisis on Korea's manufacturing exports, but neither product diversification nor export competitiveness did so. For all of the other independent variables, we obtain results matching those in specification (1).

As indicated by the empirical results, the diversification of export destinations played a role in reducing the negative impact on Korean exports during the global financial crisis, while the diversification of export products and competitiveness did not. This may be due to increases in the composition of Korea's export destinations in Asia and Europe, such as China, the ASEAN countries, the European Union, and Eastern European countries, which suffered less of a negative impact due to the crisis than the US, the epicenter of the crisis. In addition, it appears that the expansion of FTAs between Korea and the rest of the world rather than the US contributed to the country's diversification of its exports.⁶ According to related studies (Kim, 2008; Kim and Kim, 2012; Cho *et al.*, 2013), it was found that Korea's FTAs with these economies were beneficial in that they led to increases in exports to the partner economies.

V. Conclusion

In this paper, we examined whether export diversification mitigated the negative effect of the global financial crisis on exports using annual data for 24 Korean manufacturing industries from 2000 to 2016. Specifically, we examined whether the negative effect of the crisis on exports was less prevalent in more diversified industries in terms of country and product. We also examine whether export competitiveness, as measured by the RCA index by industry, had a mitigating effect on exports during the crisis.

⁶Korea signed FTAs with Chile (April 2004), Singapore (March 2006), EFTA (Iceland, Liechtenstein, Norway and Switzerland; September 2006), and with the ASEAN countries (June 2007) before the global financial crisis of 2008-2009.

From our analysis, we find that if exports in a manufacturing industry are more diversified in terms of product and country, the amounts tend to be larger in the Korean case. In addition, a Korean manufacturing industry exports more when the industry is more competitive in the world market. However, during the global financial crisis, only country diversification weakened the negative impact of the global financial crisis on Korea's exports. Neither product diversification nor export competitiveness did so.

The empirical results imply with regard to policy that Korea could mitigate the negative impact of global economic shocks on its exports through export market diversification rather than product diversification. This suggests that it is critical to expand export markets to countries with high growth potential while maintaining export competitiveness in each industry. To this end, policymakers need to continue to make efforts to reduce the cost of new-market development for Korean firms by providing information on new markets and establishing co-marketing strategies.

APPENDIX

TABLE A1—KOREAN STANDARD INDUSTRIAL CLASSIFICATION (REVISION 9) FOR MANUFACTURING

Division Code	Name of Division
10	Food products
11	Beverages
12	Tobacco products
13	Textiles, except apparel
14	Wearing apparel, clothing accessories and fur articles
15	Tanning and dressing of leather, manufacture of luggage and footwear
16	Wood and products of wood and cork, except furniture
17	Pulp, paper and paper products
18	Printing and reproduction of recorded media
19	Coke, hard-coal and lignite fuel briquettes and refined petroleum products
20	Chemicals and chemical products, except pharmaceuticals and medicinal chemicals
21	Pharmaceuticals, medical chemicals and botanical products
22	Rubber and plastic products
23	Other non-metallic mineral products
24	Basic metal products
25	Fabricated metal products, except machinery and equipment
26	Electronic components, computer, radio, television and communication equipment and apparatuses
27	Medical, precision and optical instruments, watches and clocks
28	Electrical equipment
29	Other machinery and equipment
30	Motor vehicles, trailers and semi-trailers
31	Other transport equipment
32	Furniture
33	Other manufacturing

Note: This table is from Lee and Yu (2018).

Source: Korea National Statistical Office (Korean Standard Industrial Classification, 2008).

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