

The Effects of Exports on Employment in Korean Manufacturing: An Industry-level Analysis

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I. Introduction

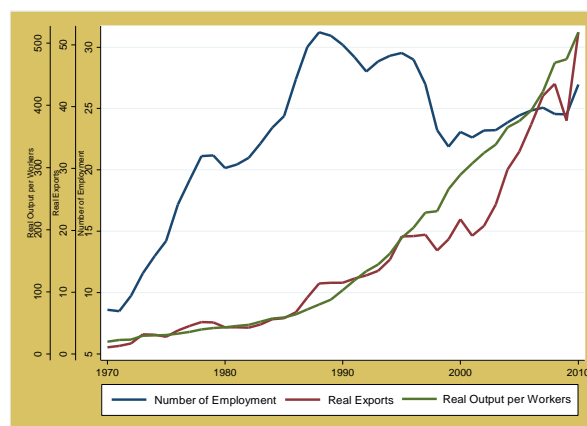
Korea's past export strategy, which mainly focused on labor-intensive industries to drive successful industrialization and economic growth during the 1970s-90s, seems to have lost its effect in the current situation where export expansion is not leading to job creation sufficiently. For the past 20 years since 1990, exports have grown at an annual average rate of 7.8 percent, while employment has declined at an average rate of 0.2 percent.¹

The fact that exports do not create sufficient jobs is a grave issue for a manufacturing-based export-driven economy like Korea. Therefore, it is an important policy question to identify main reasons why the virtuous circle between exports and employment has weakened considerably. With the struggling Korean labor market, the employment effect of exports is one of the major concerns for many economists and policy makers to tackle.

¹ In the 20 years since 1970, manufacturing exports and employment have grown at an annual average rate of 12.4 and 7.4 percent, respectively.

In light of the importance of exports in the Korean labor market, this study looks into the effect of exports on employment using industry-level data for Korean manufacturing sector. We begin with exploring the main reason behind why export growth does not lead to sufficient job creation, and then examine the relationship between exports and employment from various perspectives. Based on empirical results, we derive some policy implications which could possibly strengthen the virtuous cycle between exports and employment.

<Figure 1> Exports, Outputs and Employment



Sources: Statistics Korea and KITA

II. Growth Accounting Methods.

First, the growth accounting method (GAM) has been adopted to decompose the changes in employment induced by exports into the scale and composition effects on employment, so that it emphasizes the important role that changes in the composition of export products have in explaining the causes of weakening the employment effect of exports. Although GAM is not appropriate to account for the causal relationship between exports and employment, it is useful for understanding how the relationship between the two variables differs by industry and time period.

GAM indicates that the reduction in the employment effect of exports is highly correlated with the changes in the composition of export products. In other words, the employment effect of exports has weakened as the composition of export products has shifted to less labor-intensive industries. As shown in Table 1, employment induced by exports has sharply decreased since 1990 and this is mainly caused by the composition effect that is closely related to the changes in composition of exports towards less labor-intensive products.

<Table 1> Decomposition of Employment Effect

Year	ΔEmployment	Scale Effect	Composition Effects
1980-'85	3.32	301,185	64,184
1985-'90	1.87	451,611	128,789
1990-'95	0.80	368,657	-4,554
1995-'00	0.39	397,874	-43,937
2000-'05	0.24	292,598	-60,081
2005-'10	0.19	486,525	-26,944

Notes: 1) ΔEmployment is the number of employment induced by exports worth 100 million Korean won.

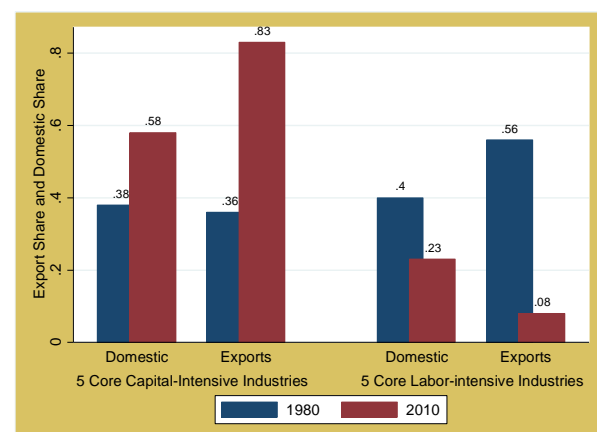
2) Composition Effect means the number of employment induced by the composition of export products.

Sources: Statistics Korea and KITA

A closer look into the changes in the composition of export products shows that the share of the five core labor-saving industries (petroleum, primary metals, transportation equipment, chemicals, electricity and electronics) in total exports has increased significantly from 36 percent in 1980 to nearly 84 percent in 2010. At the same time, the share of the five core labor-intensive industries in total exports has decreased by nearly 48 percent for the last 30 years, as shown in Figure 2.

Figure 2 also captures an important fact that employment induced by exports may be less effective than that by domestic demand. In 2010, the share of the five top labor-saving industries in the total domestic demand is 58 percent, which is very low compared to their 84 percent share of total exports. It should be noted that, in 1980, the share of these industries in the total domestic demand is similar to that in total exports. In addition, the results of examining the employment effect of exports across major industries indicates that the more labor-saving the industries are, the lower the employment effect of exports is.

<Figure 2>



Sources: Statistics Korea and KITA

III. Empirical Analysis and Results

Based on the long-run labor demand equation, the effect of exports on employment is estimated using the difference GMM estimator proposed by Arellano-Bond. The main results of the empirical analysis using the industry-level data are summarized as follows.

First, the increase in exports leads to an increase in manufacturing jobs, and the export elasticity of employment decreases as the capital-intensity of industry increases. This implies that the reason exports do not create sufficient jobs is closely related to the capital intensity of export industry. As a result of calculating the employment effect of exports by applying the maximum value of capital intensity to the interaction term, the export elasticity is statistically significant as -0.03, which indicates that an increase in exports can reduce the employment in the most capital-intensive industry like petroleum.

<Table 2> Main Estimation Results

		ln(Employment)		
		(1)	(2)	(3)
<i>ln(Employment)_L1</i>		0.363† (0.070)	0.361† (0.071)	0.350† (0.065)
<i>ln(Employment)_L2</i>		0.089** (0.043)	0.093** (0.043)	0.095** (0.043)
<i>ln(Domestic Demand)</i>		0.196† (0.046)	0.196† (0.046)	0.193† (0.046)
<i>ln(Wage)</i>		-0.269† (0.072)	-0.279† (0.068)	-0.288† (0.066)
<i>ln(Exports)</i>		0.066† (0.019)	0.076† (0.020)	0.114† (0.038)
<i>ln(Capital Intensity)</i>		-0.197* (0.109)		0.755 (0.577)
<i>ln(Exports)* ln(Capital Intensity)</i>			-0.009** (0.004)	-0.039* (0.021)
AR	AR(1)	0.000	0.000	0.000
	AR(2)	0.247	0.231	0.166
Hansen		0.191	0.195	0.169
Group(KSIC)		122	122	122
Observations		1,388	1,388	1,388

Notes: 1) Numbers in parentheses represent robust standard errors, and †, **, * denote statistical significance at 1%, 5%, 10%, respectively.

2) Year dummies are included in all equations, and the Arellano-Bond two-step difference GMM estimates are reported.

Second, the export elasticity of employment tends to be higher when the export proportion of Small and Medium Enterprises (SMEs) is larger. This means that the employment effect of exports is relatively high in an industry heavily related to SMEs. The export elasticity of employment also depends on a product's main end-use (i.e., intermediates, capital, final consumption), which differs across industries. To be more specific, the greater the proportion of intermediate inputs in an industry, the lower the export elasticity of employment. In contrast, the employment effect of exports is positively associated with the export share of final consumption goods.

These empirical findings imply that, other things being equal, the exports of final consumption goods produced by SMEs are relatively effective in creating jobs. This is the result of emphasizing the role of government policies to encourage the participation and promotion of exports led by SMEs.

<Table 3> Estimation Results Containing the Share of SMEs and Intermediates

		ln(Employment)		
		(1)	(2)	(3)
<i>ln(Employment)_L1</i>		0.350† (0.065)	0.358† (0.073)	0.356† (0.067)
<i>ln(Employment)_L2</i>		0.095** (0.043)	0.079* (0.045)	0.073* (0.043)
<i>ln(Domestic Demand)</i>		0.193† (0.046)	0.198† (0.044)	0.194† (0.046)
<i>ln(Wage)</i>		-0.288† (0.066)	-0.270† (0.070)	-0.297† (0.066)
<i>ln(Exports)</i>		0.114† (0.038)	0.025 (0.022)	0.096† (0.031)
<i>ln(Capital Intensity)</i>		0.755	-0.189*	-0.194*

		(0.577)	(0.102)	(0.107)
<i>ln(Exports)*</i>		-0.039*		
<i>ln(Capital Intensity)</i>		(0.021)		
<i>ln(Exports)*</i>			0.139*	
<i>ln(SMEs share)</i>			(0.079)	
<i>ln(Exports)*</i>				-0.101*
<i>ln(Intermediates Share)</i>				(0.053)
AR	AR(1)	0.000	0.000	0.000
	AR(2)	0.166	0.220	0.312
Hansen		0.169	0.177	0.177
Group(KSIC)		122	122	122
Observations		1,388	1,388	1,388

Notes: 1) Numbers in parentheses represent robust standard errors, and †, **, * denote statistical significance at 1%, 5%, 10%, respectively.

2) Year dummies are included in all equations, and the Arellano-Bond two-step difference GMM estimates are reported.

IV. Policy Implications

In this paper, the overall effect of employment has been analyzed using Korean manufacturing industry-level panel data. Focusing on the efficiency of the resource allocation among industries, the empirical results have emphasized the importance of industries' capital intensity in determining the relationship between exports and employment.

Above all, it is important to understand that the main reason for the weakening of the employment effect of exports is the natural consequence of efficient resource allocation in industries. As the decline in manufacturing jobs that happens in the process of efficient allocation of resources is considered as a positive aspect of economics growth, we should be cautious when it comes to implementing policies for employment promotion through changes in the industrial structure.

This paper emphasizes the importance of government policies to foster SMEs as new growth engines because it is difficult to expect further employment expansion through an increase in exports concentrated in labor-saving

large-sized firms.²

To this end, it is important to implement some policies for SMEs, such as business cooperation between large- and small-sized firms, regulatory reform. Second, it is necessary to actively support startups and SMEs that can adapt quickly to the constant changes of the fourth industrial revolution. Third, it is important to provide government support for securing overseas distribution channels in order to expand the export penetration of SMEs. For example, it can be possible to promote participation and expansion of SMEs utilizing the local distribution of large-sized firms (e.g., E-Mart, Lottemart, etc.) or global open markets (e.g., Amazon, eBay, Taobao, etc.). Finally, it is recommended to increase the participation of SMEs in GVCs through government policies that enable foreign multinational companies to utilize domestic production facilities more actively. [KIEP](#)

² In fact, SMEs account for a large portion of the total workforce, while the share of SMEs in exports is steadily decreasing. In 2014, the export share of Korean firms with 250 or more employees is about 80 percent, which is the highest level among OECD countries, whereas the share of SMEs in total employment is nearly 80% in 2014 and the recent increase in manufacturing employment can be explained by SMEs.