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Ownership Structure and Export Performance: Firm-Level Evidence from the Republic of Korea

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Contents

Abstract

The central objective of our paper is to empirically examine the relationship between the ownership structure of firms and their export performance. To do so, we use data from the Republic of Korea, a classic example of successful export-oriented industrialization. While a large and growing empirical literature investigates the relationship between the ownership structure and overall performance of firms, there are almost no studies that delve into the issue of whether the concentration of ownership has a positive or negative effect on export performance. The primary contribution of our study is to help remedy this serious gap in the empirical literature on ownership and performance. Our empirical results indicate that Korean firms with more concentrated ownership are more likely to be exporters, and to export more.

I. Introduction

According to the corporate governance literature, a firm's ownership structure affects its performance. In a seminal paper, Berle and Means (1932) proposed a simple intuitive explanation for the relationship between a firm's ownership structure and its performance. A manager tends to pursue his/her own interest rather than owners' profits in the absence of adequate monitoring. When ownership is widely dispersed, owners do not face strong incentives to engage in monitoring the management since they incur high monitoring costs but capture only a small share of the benefits. All owners thus face an incentive to free ride on others. This implies that firms with a more concentrated ownership will be more closely monitored and will perform better. At the same time, there are theoretical reasons for why concentrated ownership may harm corporate performance. For example, a dominant shareholder can expropriate firm resources to his benefit at the expense of minority shareholders (Joh 2003).

In theory, ownership concentration can thus have either a positive or negative impact on a firm's performance. Therefore, whether ownership concentration is beneficial or harmful for corporate performance is ultimately an empirical question that needs to be resolved through empirical analysis. A large and growing empirical literature has sprung up to examine precisely the issue. The literature, which includes Demsetz and Lehn (1985); Morck, Shleifer, and Vishny (1988); McConnell and Servaes (1990); and Hermalin and Weisbach (1991), fails to uncover any definitive pattern. A number of additional studies have elaborated upon the empirical methodology. For example, in order to account for firm heterogeneity, Himmelberg, Hubbard, and Palia (1999) included firm-specific control variables and Griliches and Hausman (1986) applied the fixed-effects model to panel data. However, the overall evidence on the relationship between ownership structure and corporate performance remains mixed and inconclusive.

The central objective of our paper is to empirically examine the relationship between the ownership structure of firms and their export performance. Due to globalization and integration of markets, export performance is an increasingly influential determinant of overall corporate performance. At the same time, there are some conceptual grounds for a relationship between a firm's ownership structure and its performance, as explained in Section III. In particular, firms with more concentrated ownership may be more likely to export due to the higher risk of exporting vis-à-vis selling in the domestic market. While a large and growing empirical literature investigates the relationship between ownership structure overall corporate performance, there are almost no studies that delve into the relationship between ownership structure and export performance. The main contribution

of our study is to help remedy this serious gap in the empirical literature by investigating this relationship on the basis of firm-level data from the Republic of Korea.

At a broader level, the Republic of Korea is a well-known example of highly successful export-led industrialization and growth. Underlying its export prowess is the success of Korean companies such as Samsung, LG, and Hyundai, which have become global brands with operations all over the world. More generally, Korean firms that vary widely in terms of structural characteristics, including size and ownership concentration, export a broad range of manufactured products. Given the export success of Korean companies and their structural diversity, it would be interesting to examine whether ownership concentration has a significant effect on their export performance. In addition to informing us about the role of ownership structure in Korean firms' export performance, the study marks a first step toward filling a major gap in the broader empirical literature on ownership structure and corporate performance.

The rest of the paper is organized as follows. Section II outlines a conceptual basis for a relationship between the ownership structure of firms and their export performance, and reviews the empirical literature on this relationship. Section III describes the data and variables used in the empirical analysis, and Section IV reports and discusses the main findings of the analysis. Section V brings the paper to a close with some concluding observations.

II. Ownership Structure and Export Performance: Conceptual Basis and Empirical Literature

In this section, we first outline the conceptual basis for a relationship between the ownership structure of a firm and its export performance, and then briefly review the empirical literature.

A. Conceptual Overview

For firms, entering the export market is a high-risk activity that involves sunk costs, revenue volatility due to exchange rate fluctuations, limited knowledge of market conditions, and tougher competition. The agency problem influences a firm's export decision-making through attitude toward risk. If two firms are identical except in ownership structure, the manager of a firm owned by small number of shareholders will try to increase the firm's value by venturing into export markets that have high growth potential. At the same time, fast-growing foreign markets expose the firm to greater risk than the domestic market due to asymmetric information. The manager of a firm with less concentrated ownership will try to minimize risk and thus concentrate on the domestic

market. This manager wants to achieve concrete results in a short period by focusing on the less risky domestic market rather than the more risky foreign market. The implication is that firms with more concentrated ownership are more likely to export.

This study will hypothesize that manager's preferences toward risk are related to its ownership structure. In a firm with a diffuse ownership structure, the manager maximizes his own interests rather than shareholders' profits by venturing into the foreign market. The manager will maximize his expected utility from the firm's profits by avoiding risk. However, in a firm with concentrated ownership, the manager represents the dominant shareholder's interest and thus maximizes the firm's expected profits rather than his own expected utility. Therefore, the manager of such firms bears the risks associated with foreign markets. Risk preference has crucial implications for a firm's export decision since exporting is a fundamentally risky activity. Breaking into the export market requires a large sum of upfront sunk costs, including adapting products to foreign consumer preferences, complying with foreign government regulations, and building distribution networks. Expected profits are subject to high risks due to limited information about foreign demand and exchange rate fluctuations. In these circumstances, the decision to export depends mostly on costs and expected profits for firms with concentrated ownership structure but risk attitudes for firms with dispersed ownership.

B. Empirical Literature

As noted earlier, there is a large and growing empirical literature that delves into the relationship between the ownership structure of firms and their overall performance. This literature looks at the relationship between ownership concentration and measures of overall corporate performance such as profit rate. In marked contrast to this rich literature, there are only a few empirical studies investigating the nexus between ownership and exports. Most of the few studies look at the impact of foreign ownership rather than ownership concentration on export performance.

Cole, Elliot, and Virakul (2010) investigate the relationship between foreign ownership and a firm's decision to export, using the annual survey of Thai manufacturing firms from 2001 to 2004. They find that foreign-owned firms are more likely to export than domestic firms. They further find that the propensity to export differs according to the country of ownership. Ngoc and Ramsetter (2009) analyze data on multinational firms in Viet Nam to examine the relationship between foreign ownership and exports in the Vietnamese manufacturing sector. They find that companies with a very high share of foreign ownership, i.e., 90% or more foreign-owned, make a disproportionate contribution to Viet Nam's manufacturing exports. A number of additional empirical studies examine the relationship between foreign ownership and export performance in other countries. These include Filatotchev, Stephan, and Jindra (2008); Wignaraja (2008); Rojec, Damijan, and Majcen (2004); and Rasiah (2007, 2005, and 2003).

To summarize our literature review, it should be clear that the empirical literature on the relationship between the ownership structure of firms and their export performance is quite limited. More importantly, this limited literature deals primarily with the effect of foreign ownership on export performance. Some studies compare the export performance of foreign-owned firms versus domestic firms whereas others compare the export performance of firms with different shares of foreign ownership. None of the studies delve into dimensions of ownership structure other than foreign ownership. In particular, the studies do not look at the effect of ownership concentration on export performance. However, there are conceptual grounds for believing that whether a firm's ownership structure is relatively concentrated or diffuse will influence its success as an exporter. The underlying intuition is that exporting is fundamentally risky activity, as explained above.

III. Data and Variables

In this section, we describe the data and variables used in our empirical analysis of the relationship between the ownership structure of firms and their export performance. The data set used in this paper is an unbalanced panel consisting of annual time-series for 463 Korean manufacturing firms during 1994–2005, with a total of 5,557 observations. The sample covers all manufacturing firms whose stocks are listed on the Korean Stock Exchange. The enlisted firms are required to report their financial status. All firms' data are taken from their financial reports.

Exports are observed in 1,640 observations, which is about 29.5% of total observations. Given that a large portion of observations are domestic firms, a binary variable of exporters/nonexporters is first constructed to investigate the impact of ownership concentration on a firm's export decision. We use the logit model, which is widely used in the literature on firm-specific effects on export activity. This model regresses the binary variable on the set of explanatory variables that include concentration rate and other relevant variables. In the logit model, coefficient estimates represent the impact of explanatory variables on the probability of firms being exporters. In addition, we estimate a Tobit model to study firm's export propensity, i.e., ratio of exports to total sales. The propensity to export is defined on [0, 1], which suggests that a Tobit model designed for censored data will be useful.[1]

Our key variable of interest is the ownership concentration rate (CR) since the central objective of our empirical analysis is to investigate the effect of ownership structure on export performance. CR is defined as the ratio of the dominant shareholder's share to total shares, and reflects the extent to which the dominant shareholder controls the management. CR is a good proxy for ownership structure since dominant shareholders tend to exercise a great deal of influence on the management of Korean firms.

[1] Applying ordinary lease square regression method will produce biased estimates.

To accurately estimate the impact of ownership concentration on exports, we have to control for other firm-specific factors that influence exports. Our control variables include standard variables such as wage rate, capital intensity, research and development (R&D) stock, firm size, productivity, and firm age. Among these variables, wage rate and capital intensity represent the traditional factor endowment theory. R&D stock reflects the technology gap theory of trade (see Posner 1961, Krugman 1979) or the product cycle theory (see Vernon 1966) in which technological innovation plays a central role in shaping international trade structure. Many empirical studies have analyzed the impact of R&D on firms' export activity (see Kumar and Siddharthan 1994, Hirsch and Bijaoui 1985, Wakelin 1998).

There are fixed costs associated with entering export markets. These include collecting information, establishing a distribution network, and adapting products to foreign tastes and regulations. Since these costs are sunk costs, uncertainty may cause persistence in export participation. Firms may continue to export even though it is temporarily unprofitable to do so, or hesitate to export due to the option value of waiting for more information (see Roberts and Tybout 1997). For this reason, a number of studies point out that exporters are large and productive enough to absorb the costs of waiting (see Richardson and Rindal 1995, Bernard and Jensen 1997a and 1997b, Bleaney and Wakelin 1999, Roberts and Tybout 1997). Firm size affects export performance through economies of scale in production and export marketing, higher capacity for taking risks, better access to financing, and sufficient managerial, R&D, and marketing resources.

Both productivity and age are additional firm-specific variables that may influence a firm's decision to export. The effect of productivity on exports is intuitively straightforward since global markets are typically much more competitive than the domestic market. Therefore, more productive and efficient firms are more likely to be internationally competitive and more likely to export. The impact of firm age on exports is ambiguous. On one hand, older firms might have higher export propensities because they are more experienced in international trade. On the other hand, many newer firms are more successful with new technology, which can be an important tool for exports. The positive impact of age might diminish beyond a certain threshold as a firm's learning curve rises at a decreasing rate. In light of this possibility, we include both age and age squared in our estimation.

We compute the wage rate by dividing total labor costs by the number of employees (L). Total labor costs consist of wages, bonuses, retirement compensation, and all other costs associated with employee remuneration. The capital stock (*K*) is the real amount of tangible fixed assets. Dividing K by L gives us the capital–labor ratio (K/L). Labor productivity (VA/L) is per capita value added (VA), and comprises net profits, labor costs, net interest payments, rents, taxes other than corporate tax, and depreciation costs. R&D stock is estimated by perpetual inventory methods based on firm's R&D investment. Following much of the literature, we apply a depreciation rate of 10%. Firm age is calculated from the founding year. All variables are converted into constant 2000 prices.

Table 1 presents sample means and standard deviations. We perform the t-test on the null hypothesis that mean values are equal between exporters and nonexporters. The null was rejected at the 1% significance level for every variable except age. Most significantly, this implies that exporters have higher ownership concentration than nonexporters. In addition, relative to nonexporters, exporters pay higher wages and have greater capital intensity ratio, R&D stock, labor productivity, and sales.

Table 1: Variables for Ownership Concentration and Exports of Korean Manufacturing Firms: Means (standard deviations)

Variable (Abbreviation)	Definition	Exporters	Nonexporters
Exporters	Exporters if exports>0	1640+	3916
Export propensity	Exports/sales	0.410(0.291)	
Ownership concentration rate (OC)	Largest shareholder's share rate	29.74(19.16)	25.76(19.51)
Wage rate (Wage)	Labor costs/employment	14.69(19.94)	11.83(17.78)
Capital intensity (K/L)	Fixed capital (K)/employment (L)	1.875(2.410)	1.581(1.845)
Research and Development Stock (R&D)	R&D stock	264.76(2008.7)	77.67(933.0)
Labor Productivity (Prod.)	Value added (VA)/employment (L)	17.42(30.44)	13.28(29.94)
Firm age (Age)	Years elapsed from foundation	28.65(11.91)	28.74(16.73)
Sales	Total sales	10927(54940)	2621(12434)

Note: + denotes the number of exporting firms. All the other variables are in 10 million Korean won in 2000 constant prices, except largest shareholder's share rate and firm age. To convert into approximate US dollars, divide by 1,000.

IV. Main Empirical Findings

In this section, we report and discuss the main results from our empirical analysis, which consists of two parts (i) logit estimation of the decision to export or not and (ii) tobit estimation of export propensity. Before estimating the logit and tobit models, we examine the correlation between explanatory variables. Table 2 reports the Pearson correlation coefficients. There exists a strong correlation between wage rate and labor productivity, R&D stock and both sales and employment, and sales and employment. We do not use these pairs of variables together in regressions to avoid multicollinearity.[2]

[2] Putting these correlated variables together changed the significance and sign of coefficient estimates, which is apparent symptom of multicollinearity.

Table 2: Correlation between the Variables for Ownership Concentration and Exports of Korean Manufacturing Firms: Pierson Correlation Coefficient

Variable	OC	Wage	K/L	R&D	Prod.	Age	Sales
Wage	0.0615						
K/L	0.0930	0.2273					
R&D	−0.0617	0.1099	0.0223				
Prod.	0.0355	0.855	0.1803	0.1496			
Age	0.0817	−0.0427	0.1526	0.0135	−0.0328		
Sales	−0.0531	0.176	0.1113	0.7279	0.2372	0.0162	
L	−0.0771	0.0777	0.0313	0.6499	0.1087	0.0566	0.7775

Age = firm age, K/L = capital intensity, OC = ownership concentration rate, Prod. = labor productivity (=VA/L), R&D = research and development, Sales = total sales, Wage = wage rate.
Source: Authors' estimates.

A. Logit Estimation of Exporters versus Nonexporters

Table 3 reports the results of our logit estimation of the export decision, i.e., whether or not to export, of our sample of Korean manufacturing firms. The regression uses a binary variable of exporter or nonexporters as the dependent variable. For our purposes, the key explanatory variables is the ownership concentration rate. Additional explanatory variables include variables widely used in the trade literature, such as wage rate, capital intensity, and R&D stock. We experiment with various permutations of explanatory variables to estimate four different models.

Table 3: Logit Regression for Ownership Concentration and Exports of Korean Manufacturing Firms: Dependent Variable (exporters/nonexporters)

Variable	Model			
	(i)	(ii)	(iii)	(iv)
OC	0.005***	0.005***	0.005***	0.006***
	(0.001)	(0.001)	(0.001)	(0.001)
Wage	0.005***		0.004***	0.004***
	(0.001)		(0.001)	(0.001)
K/L	0.055***	0.057***	0.034**	0.073***
	(0.014)	(0.014)	(0.014)	(0.015)
R&D	0.0001***	0.0001***		0.0001***
	(0.00004)	(0.0000)		(0.0000)
Prod.		0.003***		
		(0.001)		
Age				0.005
				(0.008)
Age^2				−0.0003***
				(0.0001)
Sales			0.00001***	
			(0.00000)	
Constant	−1.181***	−1.167***	−1.131***	−1.007***
	(0.064)	(0.063)	(0.060)	(0.139)
LLR	−2937.85	−2938.46	−3212.95	−2906.21
$x^2(4)$	65.47***	64.25***	101.16***	128.75***
No. of Obs.	4837	4837	5261	4837

***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.
Age = firm age, K/L = capital intensity, OC = ownership concentration rate, Prod. = labor productivity (=VA/L), R&D = research and development, Sales = total sales, Wage = wage rate.
Note: Standard errors are in parentheses.
Source: Authors' estimates.

The coefficient estimates of ownership concentration rate, wage rate, capital intensity, and R&D stock are all positive and significant in Model (i). Estimation results show that a firm's probability of entering the foreign market increases with ownership concentration rate, wages rate, capital intensity, and R&D stock. This implies that exporting firms pay higher wages and have greater capital intensity and R&D stock. Model (ii) substitutes wage rate with labor productivity as explanatory variable. These two variables are closely correlated.[3] The coefficient estimates of all the explanatory variables remain positive and significant. This is still the case when R&D stock is replaced with sales in Model (iii).[4] Model (iv) added both firm age and firm age squared as additional explanatory variables to Model (i). The coefficient estimates of the basic explanatory variables remain the same. However, the coefficient of age is positively insignificant and its squared term is negatively significant.[5] This suggests that the impact of business experience on entering export market diminishes as firms grow older, even though it might initially have a positive influence.

Most significantly, our estimation results show that higher ownership concentration rate increases the probability of firms entering foreign markets. The results thus support our central hypothesis that firms with concentrated ownership venture into risky export markets to maximize expected profits whereas firms with dispersed ownership tend to stay home to avoid the risk of incurring the large sunk costs associated with exporting. Managers in firms with dispersed ownership prefer to avoid risk and achieve concrete business outcomes in a short period. This discourages them from entering risky foreign markets, which require large sunk costs that can only be recovered in the long run. Our empirical results confirm the existence of an agency problem—risk-averse managers of firms with diffuse ownership do not export even though exporting is profitable and thus beneficial for shareholders.

With respect to our control variables, our results show that firms are more likely to be exporters as wage rate, capital intensity, R&D stock, productivity, and sales increase. Our results confirm that within the Korean manufacturing sector, exporters are larger, more productive, more capital- and R&D-intensive, and pay higher wages than nonexporters. Our evidence is consistent with a large body of empirical literature that find similar differences between exporters and nonexporters (see Bernard and Jensen 1997a and 1997b; Aitken, Hanson, and Harrison 1997; Aw and Hwang 1995; Clerides, Lach, and Tybout 1998; and Roberts and Tybout 1997). Such evidence is intuitively plausible since more efficient and larger firms with adequate resources are better able the large sunk costs required to enter foreign markets.

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[3] Coefficient estimates of these two variables become insignificant due to multicollinearity when they are both included.

[4] Multicollinearity causes coefficient estimates of R&D to be insignificant when these two variables are both included.

[5] Coefficient estimates of wage rate, labor productivity, and R&D stock become insignificant due to multicollinearity when labor productivity and sales are added to Model (iv).

Since the probability of a firm's being an exporter might differ across industries, we also rerun Model (iv) in Table 3 for firms in different industries. Table 4 reports the results. The coefficient estimates of concentration rate are positively significant in the textiles, paper, basic metal and fabrication industries, but negatively significant in the chemical industry, and insignificant in the other industries. An increase in concentration rate increases the probability of entering the export market in more industries (four industries out of seven) than not. However, the correlation is negative in the chemical industry, which consists of large firms producing standardized raw materials and products for the People's Republic of China market. The ownership of these firms is dispersed since this industry is mature enough to attract a large number of investors.[6] Moreover, entering the Chinese market might not pose much risk to the firms in this industry due to both product standardization and robust structural demand.

Table 4: Logit Regression for Ownership Concentration and Exports of Korean Manufacturing Firms by Industry: Dependent Variable (exporters/nonexporters)

Variable	Industry						
	Food	Textiles	Paper	Chemical	Nonmetal	Basic Metal	Fabrication
OC	0.005	0.013**	0.020**	−0.008**	−0.012	0.023*	0.018*
	(0.009)	(0.006)	(0.008)	(0.003)	(0.010)	(0.005)	(0.002)
Wage	0.033*	0.040***	0.014	0.005	0.013	0.012	−0.002
	(0.008)	(0.022)	(0.015)	(0.003)	(0.013)	(0.008)	(0.002)
K/L	−0.347**	−0.317**	0.282*	0.218*	0.102*	-0.031	−0.167*
	(0.162)	(0.127)	(0.077)	(0.033)	(0.039)	(0.041)	(0.060)
R&D	0.0009	-0.008	0.017**	0.001*	0.001	0.0002	0.0001*
	(0.0006)	(0.013)	(0.008)	(0.0003)	(0.001)	(0.0002)	(0.0000)
Age	0.088*	0.262*	0.058	−0.011	−0.084	0.052	0.035**
	(0.033)	(0.049)	(0.074)	(0.016)	(0.140)	(0.039)	(0.016)
Age^2	−0.0006**	−0.002*	-0.001	−0.0002	0.001	−0.0006	−0.001*
	(0.0003)	(0.0005)	(0.001)	(0.0002)	(0.001)	(0.0006)	(0.0002)
Constant	−4.157*	−7.265*	−3.285*	−0.542***	−0.862	−2.131*	−1.001*
	(0.908)	(1.064)	(1.209)	(0.284)	(2.466)	(0.624)	(0.240)
LLR	−153.64	−202.41	−117.53	−699.52	−112.80	−286.07	−1051.73
$x^2(8)$	27.07*	69.20*	38.25*	137.37*	15.85**	32.43*	105.49*
Obs.	399	412	224	1281	274	446	1706

***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.
Age = firm age, K/L = capital intensity, OC = ownership concentration rate, R&D = research and development, Wage = wage rate.
Note: Standard errors are in parentheses. For others, see notes to Table 3.
Source: Authors' estimates.

The coefficient estimate of the wage rate is positive and significant in the food and textiles industries. Capital intensity is positive and significant in the paper, chemical, and nonmetal industries, but negative and significant in the food, textiles, and fabrication industries. R&D stock is positive and significant in the paper, chemical, and fabrication metal industries. Age is positive and significant in the food, textiles, and fabrication industries, and age squared is negative and significant in the same industries. Our results

6 The foundation of Korean chemical industry was built up in the early 1970s.

confirm that the influence of the explanatory variables differs across industry. Relatively labor-intensive firms are more likely to be exporters in the food, textiles, and fabrication industries, while relatively capital-intensive firms are more likely in the paper, chemical, and nonmetal industries. The results show that exporting firms pay significantly higher wages only in the food and textiles industries. Our results suggest a nonlinear (initially positive but subsequently negative) impact of firm age in the food, textiles, and fabrication industries. The signs and significance of the coefficient estimates remain the same in every industry when we substitute labor productivity for wage rate.[7]

B. Tobit Estimation of Export Propensity

The previous section treated exporting as a zero-one binary variable by dividing the sample firms into exporters and nonexporters. If there are many different export markets that require separate fixed costs to enter, risk-averse firms are likely to export to a smaller number of markets since entering more markets entails a larger total fixed cost. As discussed earlier, a lot of the fixed costs are sunk costs. We now treat a firm's exports as a continuous variable rather than a binary variable. More precisely, we measure a firm's export performance as export propensity, or the ratio of export revenues to total sales.

Table 5 represents the coefficient estimates of the tobit estimation of export propensity for Korean manufacturing firms. Export propensity defined on [0, 1] is the dependent variable, where 0 stands for nonexporters and 1 stands for firms exporting their entire output. Applying ordinary least squares estimation method to this censored data will cause coefficient estimates to be biased since this method can generate predicted values of the dependent variable that lie outside the feasible range. To deal with the problem, we use a tobit model censored at both right and left ends. As for the logit estimation, our key explanatory variable of interest is the ownership concentration rate. In addition, we include explanatory variables widely used in the trade literature such as wage rate, capital intensity, and R&D stock. In estimation, a semi-log model is utilized, which transforms all explanatory variables into logarithms to control for heteroscedasticity arising from firm scale. However, we use the dependent variable in its original form to keep its censored characteristics.[8] We estimate four models, which represent various permutations of the explanatory variables.

[7] The results we obtain when we substitute labor productivity for wage are available upon request. Labor productivity has a positive and significant effect on a firm's decision to export.

[8] However, age and its square term is used in their original form because the logs of these variables are perfectly correlated.

Table 5: Tobit Regression for Ownership Concentration and Exports of Korean Manufacturing Firms: Dependent Variable (exports/sales)

Variable	Model			
	(i)	(ii)	(iii)	(iv)
log(OC)	0.083***	0.086***	0.076***	0.079***
	(0.018)	(0.018)	(0.018)	(0.018)
log(Wage)	−0.078***		−0.096***	−0.147
	(0.011)		(0.011)	(0.097)
log(K/L)	0.021*	0.011	0.048***	0.005
	(0.012)	(0.013)	(0.012)	(0.013)
log(R&D)	0.009**	0.021***	0.006*	−0.002
	(0.003)	(0.003)	(0.003)	(0.003)
log(Prod)		0.071***		0.097***
		(0.010)		(0.012)
Age			−0.001	0.0008
			(0.003)	(0.003)
Age^2			−0.0001***	−0.0001***
			(0.0000)	(0.0000)
log(L)				−0.022
				(0.097)
Constant	−1.455***	−1.964***	−1.620***	−2.574***
	(0.174)	(0.200)	(0.180)	(0.217)
LLR	−2471.92	−2473.02	−2418.36	−2377.50
$x^2(4)$	117.90***	115.72***	225.02***	306.75***
No. of total Obs.				3947
(left, right censored)				(2731, 32)

. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.
Age = firm age, K/L = capital intensity, OC = ownership concentration rate, Prod. = labor productivity (=VA/L), R&D = research and development, Wage = wage rate.
Notes: Standard errors are in parentheses. For others, see notes to Table 3.
Source: Authors' estimates.

The coefficient estimates of ownership concentration rate, capital intensity, and R&D stock are all positively significant, but that of wage rate is negatively significant in Model (i). Estimation results show that firm's export propensity rises with the ownership concentration rate, capital intensity, and R&D stock, but falls with the wage rate. Model (ii) substitutes wage rate with labor productivity as explanatory variable. These two variables are closely correlated.[9] The coefficient estimates of concentration rate, R&D stock, and labor productivity are positive and significant, but that of capital intensity become insignificant. When both age and squared term of age are added as explanatory variables in Model (iii), the coefficient estimates of original explanatory variables are positively significant, but that of age is positively insignificant and its square term negatively significant. When labor productivity and employment are added in Model (iv), the coefficient estimates of wage rate, capital intensity, and R&D stock become insignificant due to multicollinearity.

[9] Coefficient estimates of these two variables become both insignificant due to multicollinearity when both are included.

Most significantly, our estimation results show that an increase in the ownership concentration rate boosts a firm's export performance. The results suggest that firms with concentrated ownership are willing to bear the high level of risk required to enter a large number of foreign markets in order to maximize expected profits. In contrast, our evidence implies that the managers of firms with dispersed ownership tend to avoid the risk of incurring large sunk costs required to enter a large number of foreign markets. They may prefer instead to concentrate on fast-growing export markets that they are more familiar with due to geographical proximity. This type of export strategy is less risky and involves lower sunk costs than exporting to many different countries. For example, the People's Republic of China is a highly promising market for a large number of Korean firms, regardless of their ownership structure. On the other hand, our results indicate that firms with more concentrated ownership are more likely to bear the higher risk associated with exporting to slower growing and less familiar markets. Our evidence supports the existence of agency problem in a firm's decision making about the number of export markets. Risk aversion deters the managers of firms with dispersed ownership from exporting to more markets even though doing so may raise profits and thus benefit shareholders.

With respect to our control variables, much of our evidence mirrors the results of our logit analysis. More specifically, our tobit results indicate that firms with higher capital intensity, R&D stock, and productivity export to more markets. One departure from the logit results is that firms paying lower wages are likely to enter more export markets than firms paying higher wages. Our tobit results are based on comparing the wage rates of exporters with those of other exporters while our logit results are based on comparing the wage rates of exporters and nonexporters. Our tobit results suggest that exporters paying lower wages export to more countries than exporters paying higher wages, whereas our logit results suggests that exporters pay higher wages than nonexporters.

Since firms' export propensity might differ across industries, we also rerun Model (iii) in Table 5 for firms in different industries. Table 6 reports the results. Coefficient estimates of concentration rate are positively significant in the textiles, basic metal, and fabrication industries, but negatively significant in the chemical industry, and insignificant in the other industries. Empirical results show that increase in concentration rate increases the probability of entering more export markets in three industries out of seven, but decreases the probability in the chemical industry. The results are very similar with industry-level estimation results from logit analysis, except in the paper industry, where the relationship turns insignificant. Our results are thus fairly robust across dependent variable and estimation models.

The coefficient estimates of wage rate are positive and significant in the textiles and nonmetal industries, but negative and significant in the paper, basic metal, and fabrication industries. Capital intensity is positive and significant in the paper, chemical and nonmetal industries, but negative and significant in the textiles, basic metal, and fabrication

industries. R&D stock is positive and significant in the food and nonmetal industries, but negative and significant in the textiles industry.

Table 6: Tobit Regression for Ownership Concentration and Exports of Korean Manufacturing Firms by Industry: Dependent Variable (exports/sales)

Variable	Industry						
	Food	Textiles	Paper	Chemical	Nonmetal	Basic Metal	Fabrication
log(OC)	−0.017	0.253*	0.094	−0.086*	−0.025	0.330*	0.182*
	(0.031)	(0.096)	(0.059)	(0.030)	(0.065)	(0.047)	(0.032)
log(Wage)	−0.006	0.245*	−0.302*	−0.025	0.157**	−0.126*	−0.155*
	(0.016)	(0.078)	(0.082)	(0.025)	(0.069)	(0.026)	(0.019)
log(K/L)	0.018	−0.284*	0.152**	0.209*	0.090***	−0.093*	−0.054**
	(0.024)	(0.086)	(0.059)	(0.023)	(0.053)	(0.030)	(0.028)
log(R&D)	0.021**	0.022***	−0.002	0.009	0.073**	0.007	0.004
	(0.009)	(0.013)	(0.009)	(0.008)	(0.032)	(0.005)	(0.008)
Age	0.005***	0.111*	−0.042	0.0002	−0.071**	0.002	0.014**
	(0.003)	(0.022)	(0.026)	(0.006)	(0.032)	(0.010)	(0.006)
Age^2	0.00005***	−0.0009*	0.0004	−0.0001**	0.0009**	−0.0000	−0.0004*
	(0.00003)	(0.0002)	(0.0003)	(0.0000)	(0.0004)	(0.0001)	(0.0001)
Constant	−0.842**	1.122	−3.429*	−2.533*	−0.186	−0.994**	−1.279*
	(0.333)	(1.197)	(0.883)	(0.336)	(0.756)	(0.400)	(0.349)
LLR	−80.14	−102.94	−60.31	−608.66	−83.95	−168.37	−961.14
$x^2(8)$	18.09*	70.84*	29.11*	157.11*	12.79**	63.77*	187.83*
No. of Obs. (left, right censored)	364 (307, 0)	228 (166, 0)	166 (124, 0)	1125 (807, 1)	239 (199, 2)	332 (181. 0)	1415 (904, 28)

***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.
Age = firm age, K/L = capital intensity, OC = ownership concentration rate, R&D = research and development, Wage = wage rate.
Note: Standard errors are in parentheses. For others, see notes to Table 3.
Source: Authors' estimates.

Estimation results show firm-specific factors have a different influence on export activity across different industries. Relatively less capital-intensive firms paying lower wages have higher export propensity in the basic metal and fabrication industries, while the reverse holds in the nonmetal industry. Labor-intensive firms have higher export propensity in the basic metal and fabrication industries, but capital-intensive firms do so in the nonmetal industry. As wage rate rises and capital intensity falls, export propensity rises in the textiles industry but falls in the paper industry. These results imply that firms producing human capital-intensive clothes and materials perform better in the textiles industry. The competitive advantage of Korean firms in this mature industry might thus lie in designer clothing, high-end functional clothes, and differentiated textile materials. These products are custom-made and produced in small quantities. However, firms mass producing standardized products in large factories tend to export more in the paper industry, where competitive advantage is based mainly on production costs. Furthermore, the scope for product differentiation is limited in the paper industry.

Coefficient estimates of firm age are positive and significant in the food, textiles, and fabrication industries, but negative and significant in the nonmetal industry. Age squared is negative and significant in the food, textiles, chemical, and fabrication industries. These results imply that the positive impact of experience on export performance generally declines as firms get older. Sign and significance of coefficient estimates remains mostly unchanged when we substitute labor productivity for wage rate.[10]

V. Concluding Observations

The central objective of our study was to empirically examine the relationship between the ownership structure of firms and their export performance. More specifically, using data from the Korean manufacturing sector, we investigate the relationship between ownership concentration and export performance. In contrast to the large and growing empirical literature that delves into the relationship between the ownership structure of firms and their overall performance, there are almost no studies that explore the impact of firms' ownership concentration on their export performance. The few empirical studies that touch upon the ownership–exports nexus look at the relative export performance of foreign-owned firms versus domestic-owned firms. Therefore, the primary contribution of our study is to help remedy this serious shortcoming of the literature on the basis of firm-level evidence from the Republic of Korea.

We estimate two types of empirical models—logit models and censored tobit models—to examine the relationship between ownership concentration and export performance. Our most significant finding is that firms with concentrated ownership are likely to enjoy stronger export performance than firms with diffuse ownership. The primary implication of our empirical results for policy makers is that the positive effect of concentrated ownership on exports is an important additional factor that must be factored into policies influencing the ownership concentration of firms and, more generally, corporate governance. Our evidence lends support to the conventional wisdom that originally family-owned firms with highly concentrated ownership, known as *chaebols*, made a big contribution to the Republic of Korea's export success. Given the importance of exports in the Korean economy, our analysis suggests a need to exercise caution in policies that seek to regulate and control the *chaebols*.[11]

While our study empirically investigates an important but previously underexplored relationship between ownership structure and export performance, it is by no means the

[10] The results we obtain when we substitute labor productivity for wage are available from authors upon request. R&D stock has positive significant impact on firm's exports only in the chemical, basic metal, and fabrication industries. Labor productivity has a positive significant effect in every industry except the paper and nonmetal industries.

[11] The *chaebols* have been blamed for contributing to the Republic of Korea's collapse during the Asian financial crisis of 1997–1998 through excessive investment and expansion. More recently, they are widely blamed for the growing concentration of economic power and the consequent lack of a dynamic small and medium enterprises sector.

definitive final word. In fact, our study marks a first step toward better understanding the ownership–export nexus that will, hopefully, encourage other researchers to delve into the issue. There are several promising directions for future research. Perhaps the most promising research area is to examine the relationship between ownership structure and export performance in other successful export-led East Asian economies. It would also be interesting to take a look at the ownership–exports relationship in more mature advanced economies such as the US, which have different corporate governance environments. Finally, another potential extension of our research would be to look at the relationship between ownership structure and foreign direct investment.

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About the Paper

Sangho Kim and Donghyun Park empirically examine the relationship between the ownership structure of firms and their export performance. To do so, they use firm-level data from the Republic of Korea, a classical example of successful export-oriented industrialization. Their empirical results indicate that Korean firms with more concentrated ownership are more likely to be exporters and export more.

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