

**FIRM SIZE AND EXPORT INTENSITY: A TRANSACTION COSTS AND  
RESOURCE-BASED PERSPECTIVE**  
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Abstract	This paper presents a unifying theory, explaining the different relationships between firm size and export intensity that have been found in previous studies. We propose that transaction costs economies and different types of resources induce a moderating effect on the firm size and export intensity relationship. Data on international businesses in the Netherlands are used to test the theoretical framework empirically, and support is found for different industries.	
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# **Firm Size and Export Intensity: A Transaction Costs and Resource-based Perspective**

**Ernst Verwaal\* en Bas Donkers<sup>S</sup>**

## **Abstract**

This paper presents a unifying theory, explaining the different relationships between firm size and export intensity that have been found in previous studies. We propose that transaction costs economies and different types of resources induce a moderating effect on the firm size and export intensity relationship. Data on international businesses in the Netherlands are used to test the theoretical framework empirically, and support is found for different industries.

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## Introduction

The relationship between firm size and export intensity has been studied frequently in the international marketing literature. The empirical findings have been mixed. Some studies report a positive relationship between firm size and export intensity (e.g. O'Rourke, 1985; Reid, 1982; Tookey, 1964). Other studies report that firm size has little or no influence (e.g. Bnaccorsi, 1992; Moen, 1999; Wolf and Pett, 2000). Wagner (1995) finds a positive relationship that decreases as firm size increases. Finally, a few studies report a negative relationship between firm size and export intensity (e.g. Patibandla, 1995). After more than thirty years of research, scholars of international marketing have still not provided a satisfactory explanation of this empirical puzzle. In this paper, we review the current state of the literature and use transaction costs economies and resource-based theory to explain the empirical puzzle.

There are good reasons to use transaction costs economies and resource-based theory to explain the firm size and export intensity relationship. Transaction costs theory states that transaction costs are particularly important in situations where economic actors make relation-specific investments (Williamson, 1985, p. 30). Export relations require considerable specific investments, e.g. the costs of establishing a distant relationship in an unfamiliar environment and the costs of adjusting products and company procedures to the requirements of foreign buyers. From a resource-based view, differences in resources are frequently used to analyse the capability of firms to overcome barriers and exploit opportunities (e.g. Dean et al., 1998). In the process of internationalisation, this capability is particularly important, since firms have to operate in a diverse and unfamiliar environment.

The paper proceeds as follows. First, we review alternative perspectives on the firm size and export intensity relationship and discuss in some detail the implications of transaction

costs economies and resource-based theory. We submit that transaction costs economies and resource-based theory can explain different outcomes of the firm size and export intensity relationship. Next, we present the data and empirically examine the proposed theoretical framework. The paper concludes with a discussion of the implications of the results.

## **Theory and Hypotheses**

Empirical findings on the relationship between firm size and export intensity have been mixed. The conclusions from these findings vary accordingly. The central themes of the debate are the impact of limited resources, risk perception and economies of scale.

*Limited resources.* The stage theory of the firm (Johanson and Vahlne, 1977) suggests that internationalisation is accomplished by establishing an export capability through a developmental and sequential process. The development of resources and capabilities through time implies that firms are more likely to pursue an export strategy from a developed domestic market. Hence larger firms are more likely to have the resource base necessary to develop an export strategy successfully. Wolf and Pett (2000), however, found that small firms are able to pursue an export strategy by employing a specific skill base, while larger firms, with more broad-based skill sets and capabilities, are more likely to approach an export strategy that is commensurate with their breadth of skills. Thus, given the appropriate type of resources, a small firm can execute an export strategy as effectively as larger firms. Furthermore, Bonaccorsi (1992) argues that small firms can obtain the necessary resources either by the vertical integration of export functions or by access to external resources. Holmlund and Kock (1997) strengthen this argument by finding that social networks of small and medium-sized firms significantly affect the internationalisation process of smaller firms. However, they also re-

port that, although the differences between small and medium-sized firms are generally small, knowledge of foreign markets and competence in exporting can be explained by differences in firm size. Philp (1997) reports similar findings with respect to the export skills of very small firms as compared with larger firms.

*Risk perception.* The relationship between firm size and export intensity can also be influenced by the risk perception of management. Smaller firms may behave more risk-averse, due to a lack of information and the relatively greater impact of failure, than larger firms. Nooteboom (1989, p. 118) argues that larger firms can be expected to be less risk-averse, due to a larger size of operations combined with a greater spread of risk. However, Philp (1997) reports that the perceived risk in exporting is not an explanatory variable in distinguishing very small exporting firms and their larger counterparts. Furthermore, Bonaccorsi (1992) argues that smaller firms may find alternative ways to gather information and that small firms ensure that they can exit with little cost.

*Economies of scale.* The economies-of-scale argument suggests that if economies of scale are significant in the domestic market, large and therefore efficient companies will have a higher export intensity than small and inefficient ones. On the other hand, economies of scale may also stimulate an export strategy for small firms, since they have more to gain from increasing their sales through exports (Ursic and Czinkota, 1984). Larger firms would not have so much to gain, as they have already obtained relatively large outputs in the domestic market. Besides economies of scale in manufacturing, there are economies of scale in export operations. Larger firms can use the benefits of specialisation to reduce the costs of export operations. However, Bonaccorsi (1992) reports that, for Italian manufacturing firms, economies of scale do not play an important role in export operations.

The debate on the firm size and export intensity relationship has provided a number of arguments and counter-arguments. However, the existing theory fails to explain the different

outcomes found in empirical studies. One explanation suggested in the literature is that the different outcomes are due to differences in methodology. For example, Cavusgil (1976; 1984) found that when firm size was measured by number of employees, no relationship was found with export behaviour, but a significant relationship was found when firm size was measured by annual sales. However, the findings in the literature remain contradictory when the same measure of size is used (Calof, 1994, p. 370). Next, we examine how transaction costs and resource-based theory contribute to the explanation of the different outcomes of the firm size and export intensity relationship.

#### *A Transaction Costs and Resource-based Perspective*

Transaction costs economies have particular importance in situations where economic actors make relation-specific investments, i.e. investments that are to some extent specific to a particular set of individuals or assets (Williamson, 1985, p. 30). In the context of export management, specificity relates to the investments that support an export relation and that cannot be used for alternative purposes without additional costs (switching costs). When export relations require specific investments that cannot be used for domestic activities, a certain volume of export trade will be needed to recover the costs. Therefore export-related economies of scale may play an important role in export management. Larger firms may realise more export-related economies than small firms, since they are able to hire specialists to devote their time entirely to export activities. Small firms may also be able to acquire specialist knowledge by hiring external advisers, using export intermediaries or co-operating with other firms. However, these solutions also have a large number of drawbacks (see Rosson (1987)) and make the firm vulnerable to the intermediaries' opportunism. Yet firm size is

not always the appropriate indicator of the benefits of specialisation. The advantages of specialisation should be related to the size of the specialised activities and not to the size of the company in general. Thus export-related economies of scale are not necessarily an obstacle for small firms, provided that they have export relations of significant size. So we expect that the size of the export relation will be a main predictor of export intensity, regardless of the size of the firm.

**Hypothesis 1:** Export relation size is positively related to export intensity.

Differences in resources are frequently used to analyse the capability of firms to overcome barriers and exploit opportunities (e.g. Dean et al., 1998). Two types of resources are particularly important in the context of internationalisation: slack resources and organisational structure.

*Slack resources.* Slack resources offer substantive support for the first phases of developing export relations (Gomes and Ramaswamy, 1999). Small firms typically have fewer slack resources available than larger companies (Singh, 1990). Furthermore, smaller firms may behave more risk-averse, due to a lack of information and the relatively greater impact of failure, than larger firms. Therefore small companies are less likely to engage in an export relation, particularly if the size of the export relation is small. Thus we may expect a positive relationship between firm size and export intensity where the size of export relations is small. However, if small firms succeed in developing export relations with sufficient size, the costs of the relation-specific investment will be recovered and the risks involved will be reduced.

*Organisational structure.* When export relation size becomes larger, foreign buyers may require more attention to their regional and cultural specific requirements. This may significantly increase the complexity of the export relationship. The exporter will need more



complex inter- and intra-organisational co-ordination in order to meet these requirements (Gomes and Ramaswamy, 1999). Smaller firms are seen as being quicker and more nimble than their larger counterparts due to structural simplicity (Chen and Hambrick, 1995), and therefore may be more efficient in responding to the specific requirements of foreign buyers. Such efficient adaptation could provide a competitive advantage for small and medium-sized exporting firms as compared with larger ones. The shoe and textile manufacturing firms in Italy studied by Bonaccorsi (1992) are typical examples of small and medium-sized firms effectively using this competitive advantage.

Thus, if export relation size increases, small firms reduce their competitive disadvantage of limited resources and increase their competitive advantage of quick and efficient intra-organisational co-ordination. Based on this reasoning, we conclude that the different type of resources for small and large firms induces a moderating effect of export relation size on the firm size and export intensity relationship.

**Hypothesis 2:** The relationship between firm size and export intensity will be moderated by the size of export relations.

### **Data and Model Specification**

A randomly selected sample from a database held by the Dutch tax authorities is used for estimation. All firms with international trade activities are registered in this database if they perform legal import and export activities. A large number of exporting firms of various sizes and operating in different economic sectors use the Netherlands as a European trading base.

Table 1: Means, standard deviations and correlations

Variable	Mean	Standard deviation	<i>Log Firms Size</i>	<i>Log Exportrel</i>
<i>Expint</i>	0.329	0.323		
<i>Log Firm size</i>	2.195	1.581	0.308**	
<i>Log Exportrel</i>	9.894	2.651	0.358**	0.454**

Note: \*\* indicates  $p < 0.001$

This provides the opportunity to select a sample from a large variety of firms in similar institutional environments. Another important advantage of this database is that all exporting firms are included, even firms with a very small size of export trade. It would be difficult to identify such firms without this database. Exclusion of these firms may result in a bias towards firms with a larger export relation size. According to the proposed theory, this would affect the outcome of the relationship between firm size and export intensity.

The database was constructed from a survey of 2,988 firms active in international trade activities (imports, exports and logistical services), of which 642 (21.5%) responded after one reminder. The response was tested for representativeness with respect to the size and industry type of respondents. A comparison did not indicate significant differences except that firms with more than 100 employees had a higher response rate than smaller firms. To control for possibly different patterns for different industry types, separate samples were constructed for manufacturing and trading firms. Summary statistics for the variables of interest are given in Table 1.

Our analysis concerns the effect of firm size and export relation size on export intensity. We analyse this relationship using linear regression techniques. To make sure that our results are not driven by a restrictive specification of the functional form, higher-order terms and dummies for the types of goods have been included. Insignificant variables have been

dropped from the model, but these proved to be insignificant. This resulted in a model with the following mathematical specification:

$$\begin{aligned} Expint_i = & a_0 + a_1(\text{Log Firm size})_i + a_2(\text{Log Firm size})_i^2 + a_3(\text{Log Exportrel})_i \\ & + a_4(\text{Log Exportrel})_i^2 + a_5(\text{Log Firm size})_i \times (\text{Log Exportrel})_i + e_i \end{aligned}$$

where for firm  $i$

$Expint$  = the percentage of the value of exports in total sales of the firm;

$\text{Log Firm size}$  = log of the total sales of the firm;

$\text{Log Exportrel}$  = log of the value of exports divided by the number of export relations.

### **Empirical Results and Conclusions**

The estimation results of the resulting model are presented in Table 2. The three estimated models are significant at a 0.1% significance level. Thus we can conclude that the estimated models are highly significant.

Significance levels for tests of the two hypotheses can be derived from tests on parameter restrictions in the model. For hypothesis 1, this test is based on the joint significance of all variables relating to the export relation size. The p-values for this test equal 0.006 for manufacturing, 0.000 for trade and 0.000 for the total sample. The estimation results therefore indicate a highly significant relationship between export intensity and the average size of the firm's export relations.

Table 2: Parameter estimates and p-values

	Manufacturing		Trade		Total sample	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Constant ( $a_0$ )	-0.848	0.007	0.338	0.088	0.086	0.528
Log Firm size ( $a_1$ )	0.158	0.116	0.222	0.002	0.086	0.066
(Log Firm size) <sup>2</sup> ( $a_2$ )	0.023	0.072	0.001	0.935	0.011	0.147
Log Exportrel ( $a_3$ )	0.118	0.010	-0.108	0.008	-0.031	0.232
(Log Exportrel) <sup>2</sup> ( $a_4$ )	-0.001	0.504	0.010	0.000	0.005	0.001
Log Firm size $\times$ Log Exportrel ( $a_5$ ) (mean-centred)	-0.019	0.029	-0.021	0.003	-0.011	0.026
F-value	11.280		8.613		14.056	
Model significance	0.0001		0.0001		0.0001	
N	57		183		288	
Adjusted R <sup>2</sup>	0.520		0.195		0.200	

Hypothesis 2 can be tested with a test on the significance of the interaction effect. The corresponding p-values in Table 2 are 0.029 for manufacturing, 0.003 for trade and 0.026 for the total sample. These suggest that the strength of the relationship between firm size and export intensity is significantly moderated by the size of export relations. To examine the nature of this moderating influence, we present in Figures 1 and 2 the predicted levels of export intensity according to the estimated model for, respectively, manufacturing and trading firms. The curves in these figures represent combinations of firm size and export relation size that result in a certain level of export intensity.

## Industry type: Manufacturing

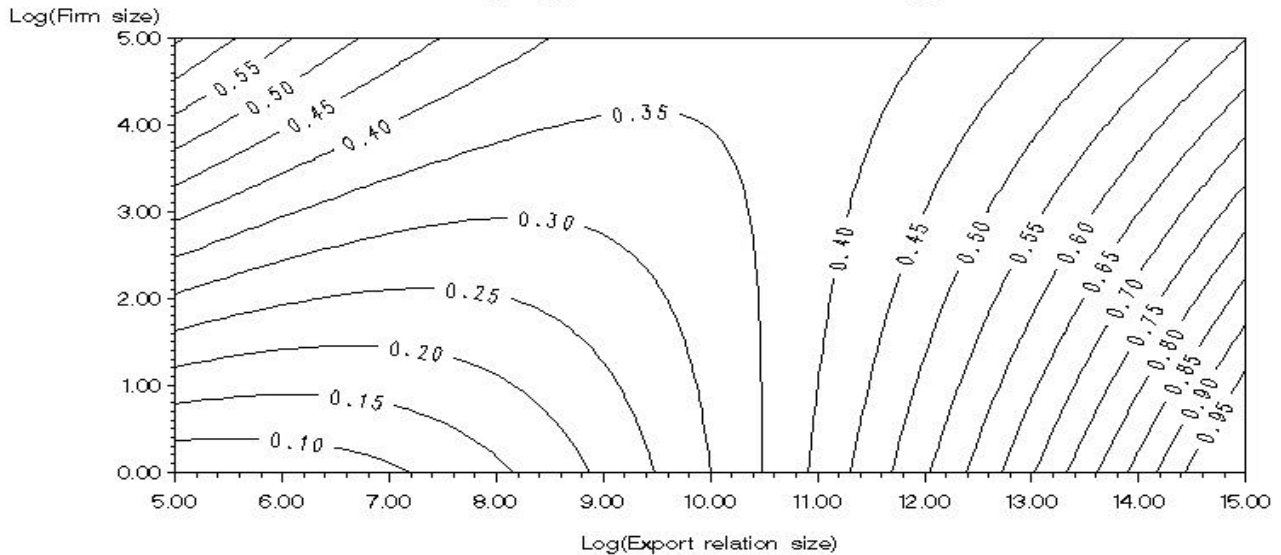


Figure 1: Export relation size and the firm size and export intensity relationship for manufacturing firms

To examine the effect of export relation size, consider the curve with an export intensity of 0.20 in Figure 1. If we increase export relation size, given a certain firm size, we will have to shift to a higher export intensity curve. This holds for most curves in Figures 1 and 2, indicating that export relation size has a positive effect on export intensity. Notable exceptions are the curves in the top left corners of Figures 1 and 2. However, there are only few observations in this area, so the curves in this region are mainly based on extrapolation of the functional form.

When we increase firm size on the curve with an export intensity of 0.20 in Figure 1, given a certain export relation size, a shift to a curve with a higher export intensity will be necessary. All curves that are bent to the left have this property. In the regions where the curves are almost straight vertical lines, a change in firm size has negligible impact on export intensity, while curves bending to the right imply a negative relationship between firm size and export intensity, given the value of export relation size. This illustrates the moderating effect of export relation size on the firm size and export intensity relationship, as proposed by

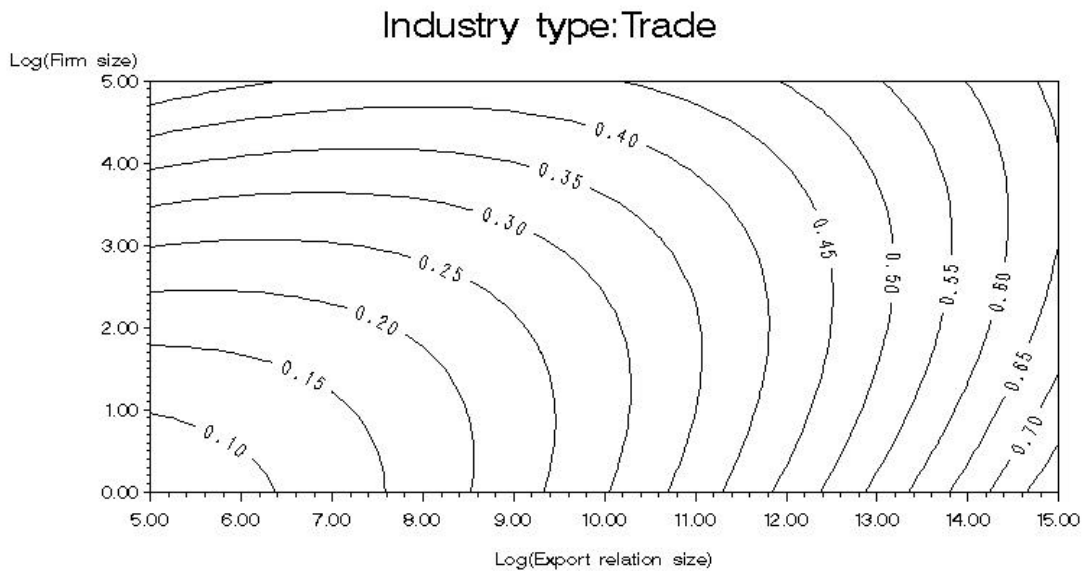


Figure 2: Export relation size and the firm size and export intensity relationship for trading firms

hypothesis 2. Thus, if we select a sample from an industry where export relation size is large, we are likely to find an insignificant or negative relationship between firm size and export intensity, whereas in an industry where export relation size is small, we are likely to find a positive relationship between firm size and export intensity.

For manufacturing firms, the firm size and export intensity relationship is positive if export relation size is smaller than about euro 10,000, then it is approximately flat, and beyond about euro 25,000 it even becomes negative. Comparison of Figures 1 and 2 suggests that the moderating effect of export relation size is stronger for manufacturing firms than for trading firms. For manufacturing firms, the limited division of production capacity may increase the impact of slack resources, and they also have to co-ordinate more complex business functions such as production and product development in addition to other business functions. Thus slack resources and organisational structure may have more impact for manufacturing firms than for trading firms.

Table 3: Correlations between firm size and export intensity by quartiles of export relation size

	Total sample	Quartile 1	Quartile 2	Quartile 3	Quartile 4
R	0.040	0.341	0.177	0.039	-0.213
p-value	0.469	0.001	0.056	0.360	0.030
N	288	72	72	72	72

The specification of the mathematical form of the regression equation assumes a certain pattern that may not completely reflect the actual data. Therefore we apply a more robust test of the hypothesised pattern. For this, we calculate in Table 3 the Pearson correlation coefficients between firm size and export intensity for the total sample and for quartiles of the sample. These quartiles are based on the size of export relations, where the first quartile contains the 25% of firms with the smallest export relation size and the fourth quartile the 25% with the largest. Based on our theoretical framework, we expect a positive relationship in the first quartile and a negative relationship in the fourth quartile. Furthermore, the correlations should decrease between the first and fourth quartiles. Finally, we would expect a rather low value for the correlation of the total sample, since it is the average of opposite values. The results in Table 3 corroborate these expectations, and identical patterns were found for the subsamples of manufacturing and trading firms.

We hypothesised that export relation size has a positive influence on export intensity and a moderating effect on the firm size and export intensity relationship. This hypothesised pattern is clearly supported by the empirical findings presented in this paper. Export relation-specific investments apparently play an important role in export management, particularly for small firms because the knife cuts two ways. When export relation size increases, small firms reduce their competitive disadvantage of limited resources and increase their competitive advantage of quick and efficient adaptation to the specific requirements of foreign buyers. International firms of very different sizes employ different strategies and structures and there-

fore rely on different mixes of resources. However, the size of the export relations should be an important element in developing export policy for both small and large firms.

The results of this study are limited by the single institutional and cross-sectional setting. Future research could validate and extend the proposed theoretical framework by studying the impact of export relation size on the firm size and export intensity relationship in different institutional settings and by examining the dynamics of the relationship.



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