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DOMESTIC MARKET STRUCTURE AND INTERNATIONAL TRADE: AN EMPIRICAL ANALYSIS

Emilio Pagoulatos and Robert Sorensen
Domestic Market Structure and International Trade: An Empirical Analysis

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I. Introduction

It is the objective of this study to integrate research in the areas of industrial organization and international trade theory in order to examine the way industrial market power influences the export and import competing performance of industries and to provide an empirical test of its importance in affecting the international trade performance of U. S. manufacturing industries. \footnote{The existing theory of international trade has been developed under the simplifying assumption of perfect competition and, as such, has ignored much of the progress made in the applied field of industrial organization. In contrast, the study of industrial organization has emphasized the importance of market power in affecting the decisions, behavior and performance of firms in real world industrial markets, but has concerned itself primarily with applications to domestic markets. The reasons for this apparent lack of integration of alternative market structures and international trade theory, as H. G. Johnson [13] has pointed out, include first, the difficulty of reconciling the essentially general equilibrium nature of international trade theory with the partial equilibrium approach of industrial organization and second, the fascination with formal theoretical problems (like the existence, uniqueness and stability of equilibrium solutions) in the pure theory of trade to the exclusion of empirically relevant problems.}

Recently, however, an interest has arisen concerning the relationship between domestic industry market structure and international trade activity.
For example, Lawrence J. White [26] has presented a theoretical analysis comparing the international trade performance of competitive vs. monopoly industries. Moreover, some policymakers in the U.S. have suggested a relaxation in anti-trust enforcement, particularly with regard to merger activity, with the expectation of not only improving the performance of U.S. firms in export markets, but also increasing their ability to confront import-competition from abroad. Unfortunately, with the exception of White's theoretical analysis, the evidence in the literature especially of an empirical nature, offers little help in determining the efficacy of such policies.

The rest of this paper is concerned with analyzing the affects of market power on industry exports and imports and providing empirical evidence on the magnitude of the relationship involved. Section II presents the analytical framework. Section III describes the statistical model and variables. Section IV presents the empirical results and, finally, Section V discusses our conclusions.

II. The Role of Market Power in International Trade

White's theoretical analysis provides a useful starting point for analyzing the impact of market power on international trade. One conclusion emerging from White's paper is that domestic industry market structure affects an industry's international trade performance only when barriers to trade exist. If the world economy is frictionless; i.e. no tariffs, transportation costs or other trade barriers, a domestic monopolist, in effect, becomes a world competitor constrained by the world price and his export or import performance is identical to what would have been obtained if the industry were competitive. However, when impediments to trade do exist, the world price
need not prevail in the domestic market and the performance of monopoly and competitive industries is likely to differ substantially. In import-competing situations, White concludes that a monopolized industry is likely to allow greater levels of imports than would a competitive industry. In exporting situations, however, the results are uncertain. A monopolist capable of international price discrimination (dumping) may export more than a competitive industry. But, if dumping is impossible, the monopolist may set high enough prices in the domestic market to return economic profits and, as a result, export less than a competitive industry.

Interesting as White's analysis is, it only involves the polar cases of monopoly and perfect competition. While real world industries certainly do exist in which firms possess market power, these industries are more likely to be characterized by oligopoly. Furthermore, the existence of market power alters the constraints and opportunities of firms in ways which could not be incorporated in the geometric-mathematical approach of White, but nonetheless may be important in affecting the international trade performance of real world industries. Whether or not the conclusions of the White study are applicable to the more general cases found in actual world markets is a question which ultimately must be resolved with empirical evidence. In what follows, however, we first examine some of these additional constraints and opportunities facing firms with market power and analyze how they might affect export or import-competing performance.

Let us look first at the issue of dumping. It is well known that this is a profit maximizing strategy as long as the foreign elasticity of demand is greater than the home elasticity. While the traditional models of dumping, such as White's, have been applied only to pure monopoly markets, Caves and Jones [5] have recently argued that dumping may be a more common practice in
the context of oligopoly. Their reasoning is that domestic oligopolists are more likely to recognize their mutual interdependence in the home market, than in world markets and, thus, a reduction in price at home is perceived more likely to be matched by rivals than a reduction in price abroad. This implies that the foreign demand would be viewed as more elastic than the home demand and the conditions necessary for dumping arise. While legal restrictions do exist against dumping, there is evidence [3, 7, 17] that indicates this is a common practice in international transactions.

Moreover, the securing of foreign sales involves difficulties not present in the case of domestic sales. Fluctuations in foreign demand and exchange rates as well as the possibility of political developments affecting the existence of export markets, make these operations risky, particularly in situations where new capacity might be needed to serve foreign demand. In addition, the cost associated with entering foreign markets can be substantial, especially if large scale marketing operations are necessary to effectively compete with established foreign producers. Firms possessing market power in their domestic market are the ones most likely to have the secure source of profits and access to credit needed to overcome these difficulties. Thus, market power may afford firms the ability to be more aggressive in pursuing exporting opportunities.

In addition, the achieving of foreign sales often depends upon many non-price factors. Kravis and Lipsey [17, p. 59] for example, report that among the most important of these in manufacturing industries are the ability of firms to supply credit to foreign buyers and the speed and certainty of delivery; and that often these factors take precedence over price in determining sales. But, it is precisely these kinds of factors which determine the distribution of orders for domestic sales in oligopolistic industries in which price competition has been eschewed. Indeed, one explanation for the tendency toward excess capacity
in these industries has been that firms desire to maintain reserve capacity to enable them to serve customers during peak demand periods in order to retain buyer loyalty [20]. Given that firms in these industries are more experienced and familiar with competing on dimensions other than price and may possess reserve capacity which allows them faster and more certain delivery schedules, they accrue advantages in exporting situations over more competitive firms.

Finally, consideration must be given to the goals and motivations of the firm. Indeed, in recent years it has been suggested [1, 18] that the motivation of firms with market control (especially those management controlled) is maximization of sales or growth rather than profits. The sales maximizing firm, however, is constrained in the domestic market by the conditions and growth of demand, unless it is willing to incur the risk associated with price competition for rivals' market shares. Foreign markets can provide a further source of sales which avoids this problem and, thus, export markets may be more vigorously pursued to achieve these goals.

The preceding analysis indicates that firms in real world industries, in which some form of protection from imports results in domestic market control, may be more successful than competitive firms in exporting situations not only because, as White suggests, they can engage in dumping, but also because control over the domestic market may afford them greater opportunities in competing internationally in terms of non-price factors, in overcoming the inherent difficulties of exporting operations and in pursuing sales maximization objectives.

Considering now the import side, a number of cases arise. First, if the price of imports, inclusive of tariffs, is above the domestic monopoly price then regardless of domestic market structure no imports will enter. If, on the
other hand, the price of imports is below the domestic competitive price then the same level of imports will enter regardless of domestic market organization. Domestic market structure will affect the level of imports only in the case where the price of imports falls between the competitive and monopoly price. In this instance, a non-competitive market structure is likely to allow higher import levels than would a perfectly competitive industry because, to the extent that firms collude (tacitly or overtly) and obtain higher prices than would have prevailed under competitive conditions, a greater incentive arises for imports to enter the market. Even if domestic firms were to believe that profits could be maximized by some form of import-forestalling limit pricing, determining the true limit price would be exceedingly difficult. Domestic producers are not likely to have accurate information concerning either the cost factors or motivations of foreign producers. In addition, uncertainties exist with respect to exchange rates, transportation cost, etc. The results of this strategy, therefore, may be an incorrect estimation of the limit price and consequently a failure to discourage imports.

Moreover, it has been suggested [4] that in face of import competition oligopolistic industries may simply yield up a share of the domestic market rather than cut prices to forestall foreign entry. The reason for this phenomenon is that firms, at least in the short run, would rather sacrifice some portion of the domestic market to foreign competitors than engage in price cutting, which, if misinterpreted by rivals, could destroy their agreed upon price structure. Evidence reported by Krause [16] for example, suggests that this was typical of U.S. steel manufactures in the 1950's as producers were willing to give up a share of the domestic market to foreign producers rather than risk deterioration of complex tacit understandings.
Finally, collusion among firms may result in domestic prices high enough to make profitable the introduction of imperfect substitutes into the market. Established producers may not introduce the substitute for fear of spoiling the market for their original product. Barriers to entry may block potential domestic entrants from introducing the substitute. Foreign producers with no fear of spoiling the market for the superior product and in many cases facing fewer barriers to entry, may find it profitable to introduce the substitute. As White [26] has pointed out, this appears to have been the case in the U.S. automobile industry in the late 1950's and again in the late 1960's regarding the "big" vs. "small" car production strategy.

III. The Statistical Model and Variables

In this section the empirical content of the market power-international trade relationship is evaluated by employing multi-variate regression analysis on data for United States manufacturing industries. Manufacturing industries were utilized in order to eliminate from consideration raw agricultural commodities and resource intensive items such as petroleum, etc. The sample consists of 88 Standard International Trade Classification (SITC) three-digit industry groups. The basis for selection of these industries was simple. If it were possible to locate comparable figures in the U.S. Standard Industrial Classification (SIC) system to those in the SITC system, the industry was included in the sample. In this regard, a concordance between the two systems developed by Hufbauer [12] was most helpful. Multiple regression equations are estimated for all 88 industries and for two separate sub-samples, consisting of 50 exporting industries and 38 import-competing industries.
The estimated equations include combinations of seven independent variables. These consist of variables representing domestic market power and additional industry characteristics, such as economies of scale, product differentiation, research and development effort and the geographic extent of the market. In what follows the theoretical rationale and a brief explanation of the construction and data source of each variable is provided.

Foreign Trade

Two dependent variables were utilized to represent exporting and importing activities in each industry. These included total U.S. exports (to the rest of the world) as a percentage of domestic value of shipments (X/VS) and total U.S. imports as a percentage of domestic value of shipments (M/VS) for 1965. Exports and imports were deflated by domestic shipments in each of the industries in order to eliminate possible scale effects and to render them comparable from one industry to another. The industry export and import data were obtained from available O.E.C.D. statistics [19].

Market Power

While no unique measure of market power exists, it is generally agreed among students of industrial organization that the existence of market power rests crucially upon the number and size distribution of sellers in an industry. When the number of sellers is small, each seller recognizes his interdependence with others and that his actions will have an impact on industry prices and output. In addition, collusion (tacit or covert) to obtain monopoly prices is easier when the number of sellers is limited. Market power is, thus, considered to be closely associated with measures of industry concentration. In this analysis market power was expressed alternatively as a weighted concentration
ratio (CR) or an employment entropy measure (E). The weighted concentration ratio (weights being industry value of shipments) was calculated from data in the Census of Manufactures [22]. Since weighted concentration ratios have been criticized as not being accurate measures of actual industry concentration [2], an employment entropy measure which could be constructed more directly from the data was also utilized.\(^7\) The entropy measure of concentration is defined as
\[
(E) = -\sum_{i=1}^{N} q_i \log_2 q_i,
\]
where \(q_i\) equals the share of employment of the \(i^{th}\) firm. If an industry were monopolized then \(q_i = 1\) and \(E\) would have a value of 0. The numerical value of entropy will increase as (a) the number of firms in an industry increases, or (b) employment shares become more evenly distributed among firms within an industry. Entropy is thus, inversely related to concentration with high levels of entropy indicative of low degrees of concentration and vice versa. This measure was calculated from Census data [22] along the lines suggested by Horowitz [10].\(^8\)

While the degree of industrial concentration (however measured) is considered to be the critical determinant of industrial market power, the conduct and performance of an industry is determined by the interaction of concentration with other elements of industrial structure. If the effects of market power, as evidenced by seller concentration, on international trade performance are to be properly identified, it is necessary to account for the impact of other structural characteristics as well.

Economies of Scale

A first industry characteristic which must be considered is the degree to which economies of scale exist in an industry. The presence of economies of scale, for instance, may not only result in an industry becoming highly concentrated, but could also increase the international competitiveness of domestic
firms. While one might infer that concentration is nothing more than a reflection of economies of scale, such a conclusion would be misleading. Economies of scale certainly do explain the degree of concentration in some industries, but by no means all. Concentration is affected by a variety of factors such as merger activity, industry growth, government policies and even stochastic or random events. But, since economies of scale may affect international trade performance by providing domestic producers cost advantages in world markets and also generate feedback effects upon the level of industry concentration, they must be accounted for if the effects of market power are to be isolated.

As a proxy for economies of scale (ES) a measure developed by Hufbauer [12, pp. 178-181] was utilized. This variable reflects cross industry differentials in the achievement of increases in value-added per worker as the size of plant increases. Industries capable of achieving increases in productivity as size of plant increases are considered to possess scale advantages and evidence higher estimated scale coefficients.

Product Differentiation

The behavior of firms will also be influenced by the degree of product differentiation within an industry. When products are differentiated the market share of individual producers becomes less sensitive to variations in prices offered by rivals resulting in a variety of forms of non-price competition. In addition, differentiation may create barriers not only to potential domestic entrants, but to foreign producers as well. However, differentiation, if created by advertising and marketing methods, cannot be expected to transcend national boundaries. What may be of more importance is the ability of the firm to produce customized orders to the differing specifications demanded by foreign buyers or produce goods which are specifically designed to meet the taste of consumers in the countries to which they are sold.
The coefficient of variation in unit values of 1965 United States exports destined to different countries as presented by Hufbauer [12, pp. 190-193] was utilized in the analysis as a proxy for product differentiation (PD). The smaller the variation the more standardized the product is likely to be, whereas the larger the variation presumably the greater is the degree of differentiation. Although this is not the standard method of estimating differentiation, no figures for the more typical advertising to sales ratio could be obtained at our level of aggregation. Nonetheless, variations in unit values may more accurately capture the type of differentiation in international markets described above. Care should be exercised in interpreting this variable since differences in unit values could be attributable to things other than perceived quality differences such as discriminatory pricing practices.

Research and Development Effort

Consideration must also be given to the impact of differing research and development efforts across industries. Technological leadership which manifests itself in new or improved products enables firms to maintain or increase their market shares. In addition, the international trade theory of the "product cycle" [23] suggests that research and development activity, which leads to successful innovations, is an important advantage for firms in international markets. In effect, the successful innovators find themselves with temporary monopoly positions in world markets as well as the domestic market.

A proxy for research and development effort (R & D) was constructed with data provided by Keesing [15] and was calculated as the percentage of scientists and engineers in an industry's labor force. While quantification of the R & D effort has been directed toward analyzing either the output side of the process
(patent production) or the input side (R & D expenditures or employment of R & D personnel), the input measure was relied upon since this was the only one available for the industry sample.

Mean Distance Shipped

Finally, since goods are not equally transportable, the impact of cross industry differentials in transportation cost must be taken into account. A measure developed by Weiss [24] was utilized as a proxy to account for transportation cost differentials. The variable is calculated as the mean distance (in miles) the products of an industry were shipped in U.S. markets (MDS). The implicit assumption in the use of this proxy is that the further a product can be profitably shipped (i.e., the greater the mean distance shipped) the less important are transportation costs relative to other costs.

IV. The Empirical Results

The multiple regression equations relating exports and imports to market power and other industry characteristics are presented in Table 1. Results are provided for the total industry sample and sub-samples consisting of exporting industries and import-competing industries. The coefficient of determination ($R^2$) and F value are given for each estimated equation and "t" values for the estimated coefficients are provided in the parentheses below them. Given that these are cross-section estimates and that the model does not represent a complete explanation of U.S. international trade performance, the $R^2$ values seem quite satisfactory. In addition, an examination of the correlation matrix of independent variables failed to provide evidence that multicollinearity was a problem.
With regard to the export equations \(X/VS\) presented in Table 1, the signs of the coefficients for the weighted concentration ratio and entropy variables support the hypothesis that market power, as measured by fewness of sellers, exerts a positive influence upon industry exports. This positive relation is observed not only for the total industry sample, but for the sub-sample of exporting industries as well. Only the entropy coefficients, however, are significant at a 5% level or better. Other industry characteristics such as product differentiation, economies of scale and distance shipped, were also important in explaining industry exports. Each of the coefficients for these variables display the expected positive sign and all are significant at a 10% level or better.

The results obtained for research and development effort, however, were not impressive. The coefficients for the R & D variable are not significant in any of the export equations and in one case display an unexpected negative sign. This result is perplexing since R & D has been strongly supported in the literature [14, 15] as a source of U.S. comparative advantage. This finding could be explained perhaps by aggregation problems in the data, or the inability of the proxy to properly capture the dynamics of the R & D. In addition, evidence exists [11] which suggests that direct foreign investment by U.S. companies (especially in developed countries) is concentrated primarily in research intensive industries. Thus, in these industries foreign sales by subsidiaries may have been substituted for what otherwise would have been export sales. Finally, the trade indicator used (exports as a percentage of value of shipments) does not necessarily measure comparative advantage for an industry, nor is it the measure most commonly used in studies of the impact of R & D on international trade. Rather, comparative advantage has been couched in terms of the relative
Table 1: Regression Equations Relating Selected Domestic Market Characteristics to U.S. Exports (X/VS) and Imports (M/VS) as a Percent of Domestic Value of Shipments, 1965\(^a\) (t-values in parentheses)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Intercept</th>
<th>Concentration Ratio (CR)</th>
<th>Employment Entropy (E)</th>
<th>Scale Economies (ES)</th>
<th>Product Differentiation (PD)</th>
<th>R &amp; D Effort (R&amp;D)</th>
<th>Mean Distance-Shipped (MDS)</th>
<th>R(^2)</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>X/VS</td>
<td>-6.09</td>
<td>0.071</td>
<td></td>
<td>0.022</td>
<td>0.041</td>
<td>0.40</td>
<td>0.012</td>
<td>0.14</td>
<td>2.67</td>
</tr>
<tr>
<td></td>
<td>(1.34)*</td>
<td>(1.15)</td>
<td></td>
<td>(1.85)**</td>
<td>(1.38)*</td>
<td>(.099)</td>
<td>(2.03)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X/VS</td>
<td>8.86</td>
<td>-1.92</td>
<td>-3.54</td>
<td>-0.030</td>
<td>-0.008</td>
<td>-1.21</td>
<td>-0.017</td>
<td>0.23</td>
<td>4.98</td>
</tr>
<tr>
<td></td>
<td>(1.69)**</td>
<td>(3.38)**</td>
<td>(.648)</td>
<td>(2.10)**</td>
<td>(.222)</td>
<td>(2.48)**</td>
<td>(2.39)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M/VS</td>
<td>-3.54</td>
<td>0.161</td>
<td>-3.20</td>
<td>-0.032</td>
<td>0.004</td>
<td>1.43</td>
<td>0.014</td>
<td>0.32</td>
<td>7.74</td>
</tr>
<tr>
<td></td>
<td>(.648)</td>
<td>(2.18)**</td>
<td>(4.89)**</td>
<td>(2.45)**</td>
<td>(.134)</td>
<td>(3.31)**</td>
<td>(2.22)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M/VS</td>
<td>23.00</td>
<td>0.161</td>
<td></td>
<td>0.022</td>
<td>0.041</td>
<td>0.40</td>
<td>0.012</td>
<td>0.14</td>
<td>2.67</td>
</tr>
<tr>
<td></td>
<td>(3.82)**</td>
<td>(2.18)**</td>
<td></td>
<td>(1.85)**</td>
<td>(1.38)*</td>
<td>(.099)</td>
<td>(2.03)**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All Industries (88)

Exporting Industries (50)\(^b/\)

| X/VS               | -5.45     | 0.021                    |                        | 0.053                | -0.004                      | 0.092            | 0.012                       | 0.20  | 2.20|
|                    | (.080)    | (.250)                   |                        | (2.59)**             | (.094)                      | (.155)           | (1.12)                      |       |     |
| X/VS               | 14.50     | -2.12                    | -2.12                  | 0.045                | 0.014                       | -1.142           | 0.007                       | 0.29  | 3.58|
|                    | (1.78)**  | (2.37)**                 | (2.29)**               | (.324)               | (.253)                      | (.668)           |                             |       |     |

Import-Competing Industries (38)\(^c/\)

| M/VS               | -17.89    | 0.448                    |                        | -0.050               | 0.095                       | -2.13            | 0.021                       | 0.33  | 3.18|
|                    | (1.72)**  | (2.69)**                 |                        | (1.89)**             | (1.36)*                     | (1.56)*          | (1.64)*                      |       |     |
| M/VS               | 32.67     | -5.30                    | -5.30                  | 0.051                | 0.026                       | -2.45            | 0.022                       | 0.45  | 5.21|
|                    | (2.50)**  | (3.95)**                 | (2.14)**               | (2.14)**             | (.414)                      | (2.03)**         | (1.93)**                     |       |     |

\(^a/\) The significance of the coefficients was tested by a one-tailed t test. * Significant at the .90 level.
\(^b/\) Exporting industries were defined as those with a positive net export balance.
\(^c/\) Import-competing industries were those with a negative net export balance.
competitiveness of industries across countries in measures such as net industry exports or industry exports as a percentage of world exports. Since the results obtained did differ from those obtained in the literature [8, 12, 14, 15], the following regression was estimated in which U.S. industry exports as a percentage of O.E.C.D. exports was introduced as the dependent variable.

\[
\frac{X^{i}_{us}}{X^{i}_{oecd}} = -0.843 + 0.080 \text{CR} + 0.027 \text{ES} + 0.091 \text{PD} + 0.939 \text{R&D} + 0.005 \text{MDS}
\]

\[
(0.197) (1.38) *** (2.43) *** (3.22) *** (2.45) *** (0.885)
\]

\[R^2 = 0.32\]

\[F = 7.54\]

As may be observed, the coefficient of R&D was positive and significant at the 1% level, which confirms the importance of R&D effort as a determinant of U.S. comparative advantage. Moreover, the coefficient of the concentration ratio was positive and significant at the 10% level, which corroborates the findings of this study.

Analysis of the import equations (M/VS) in Table 1 provides considerable support for the hypothesis that in import-competing situations the existence of market power is likely to result in industries allowing higher levels of imports. In both the total industry sample and the import-competing industry sub-sample the coefficients for the weighted concentration ratio and entropy variables display signs which indicate a positive relationship between market power and import levels. Furthermore, in all cases these coefficients are significant at a 5% level or better. Additionally, these equations emphasize the importance of economies of scale and research and development effort in improving import-competing performance. The coefficients for each of these variables show the expected negative sign and are significant at a 5% level or better. Finally, as expected, a positive and significant coefficient was obtained for the mean distance shipped variable.
Taken as a whole, the above results suggest that the existence of market power effects an industry's export or import-competing performance in the ways suggested earlier. It should be remembered, however, that a theoretical prerequisite for this conclusion is that some impediment to trade exists which isolates domestic industries from foreign competition. Indeed, in the absence of some impediment to trade, market power should have no or little effect upon an industry's international trade performance. Therefore, the effects of market power on international trade should be most pronounced in industries which are afforded some form of protection. In order to test this hypothesis, one final set of relationships was investigated. The original sample of industries was broken into two sub-samples based upon the degree of nominal tariff protection provided an industry. The first sample contained industries considered to have high tariff protection, while the second contained industries with low tariff protection. The regression results for these two sub-samples are presented in Table 2 which follows the format of Table 1.

Inspection of Table 2 confirms the expected relationship between market power, protection and export and import-competing performance. In the low tariff industry sample no relationship between market power and either exports or imports can be observed. The coefficients for the weighted concentration ratio and entropy are not significant in any of the estimated equations. Within the high tariff industry sample, however, these coefficients are significant in both the export and import equations and their signs parallel those presented in Table 1. Thus, as expected, domestic market power is observed to be a more important factor in influencing exports or imports in industries which enjoy tariffs or other barriers to trade.
Table 2: Regression Results of U.S. Exports and Imports as a Percent of Domestic Value of Shipments on Domestic Market Characteristics: High and Low-Tariff Industries\(^a\) (t-values in parentheses)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Intercept</th>
<th>Market Power</th>
<th>Other Industry Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Concentration Ratio (CR)</td>
<td>Employment Entropy (E)</td>
</tr>
<tr>
<td>High-Tariff Industries (41)(^b)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X/VS</td>
<td>-11.56</td>
<td>0.93</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(2.67)**</td>
<td>(1.66)*</td>
<td>(.075)</td>
</tr>
<tr>
<td>X/VS</td>
<td>1.23</td>
<td>-1.31</td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td>(0.239)</td>
<td>(2.66)**</td>
<td>(.299)</td>
</tr>
<tr>
<td>M/VS</td>
<td>-12.51</td>
<td>0.255</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>(1.41)*</td>
<td>(2.23)**</td>
<td>(.308)</td>
</tr>
<tr>
<td>M/VS</td>
<td>19.93</td>
<td>-3.22</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(1.91)**</td>
<td>(3.23)**</td>
<td>(.119)</td>
</tr>
<tr>
<td>Low-Tariff Industries (34)(^c)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X/VS</td>
<td>-1.38</td>
<td>0.012</td>
<td>-0.013</td>
</tr>
<tr>
<td></td>
<td>(0.257)</td>
<td>(0.156)</td>
<td>(.876)</td>
</tr>
<tr>
<td>X/VS</td>
<td>0.455</td>
<td>-0.258</td>
<td>-0.012</td>
</tr>
<tr>
<td></td>
<td>(0.073)</td>
<td>(0.290)</td>
<td>(.700)</td>
</tr>
<tr>
<td>M/VS</td>
<td>7.67</td>
<td>-0.018</td>
<td>-0.100</td>
</tr>
<tr>
<td></td>
<td>(1.24)</td>
<td>(.199)</td>
<td>(5.69)**</td>
</tr>
<tr>
<td>M/VS</td>
<td>8.24</td>
<td>-0.259</td>
<td>-0.099</td>
</tr>
<tr>
<td></td>
<td>(1.14)</td>
<td>(0.251)</td>
<td>(5.17)**</td>
</tr>
</tbody>
</table>

\(^a\) * Significant at the .90 level.
\(^b\) ** Significant at the .95 level.
\(^c\) *** Significant at the .99 level.

\(^d\) "High-Tariff Industries" are defined as those industries protected by at least a 13.54% nominal import tariff. The mean tariff rate for this group is 20.82%.

\(^e\) Defined as industries protected by at most a 10.00% nominal import tariff. The mean import tariff within this group is 5.56%.
V. Conclusions

The purpose of this paper has been to explore the role of domestic market power in international trade. The results of our statistical analysis on United States manufacturing industries provide considerable support for the hypothesis that domestic market structure is an important factor in influencing an industry's export and import competing performance, particularly in industries afforded protection from foreign competition. Both exports and imports were found positively related to domestic market power (as measured by seller concentration or entropy) and the relationship was statistically significant.

From a policy point of view, these results suggest that changes in anti-trust laws and enforcement aimed at improving the balance of trade may well be counterproductive. While greater industry concentration does appear to improve the performance of industries in exporting situations, it impairs industry performance in import competing situations. Thus, even disregarding the domestic allocative effects of greater monopoly power, serious doubts should be cast upon the desirability of such policies.
Footnotes

*We are indebted to Elizabeth Clayton, Ira Horowitz, Gary Hufbauer, William Merrill, Hugh Nourse and an anonymous referee for helpful comments and suggestions and Mike Mergler for computational assistance. The financial support given by the Center for International Studies and the Office of Research Administration (Summer Research Fellowship) at the University of Missouri - St. Louis is gratefully acknowledged. The authors are responsible for any remaining errors.

1. As generally defined, market power refers to the ability of a firm to control the price, quantity or characteristics of the product it sells. Market power usually exists when: (1) a few large sellers dominate the market, (2) there are few substitutes for the firm's product and (3) entry by new producers is difficult.


3. While a number of definitions of the concept of dumping have appeared in the literature, in this article dumping is defined as selling a product abroad at a lower price than at home after allowance is made for differentials in transportation costs, packaging costs, and quantity discounts.

4. This point has been argued by L. Esposito and F. F. Esposito [8].

5. We are grateful to Gary Hufbauer for providing us a corrected version of his concordance originally presented in [12].
6. Exporting industries were defined as industries with a positive net export balance, while import-competiting industries were those with a negative net export balance.

7. While the entropy measure is preferred because it avoids the aggregation problems associated with the weighted concentration ratio, the data indicate that the two measures are highly correlated. For our sample of industries the simple correlation between the two is -.63.

8. The entropy measure of concentration was originally proposed by Theil [21]. For a more complete discussion of the merits of entropy vs. other measures of concentration see: [9].

9. For a more complete analysis of the determinants of concentration see [20, pp. 72-130] and [25].


11. High-tariff industries were defined as those protected by at least a 13.54% import tariff. Low-tariff industries were those protected by at most a 10% import tariff. Industries falling between these two limits were dropped from the equations in order to more clearly distinguish between the two groups.
References


