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PRODUCT AND INTERNATIONAL DIVERSIFICATION AMONG JAPANESE MULTINATIONAL FIRMS

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This paper examines the relationship of performance with product and international diversification on Japanese multinational firms from 1977 to 1993. We show the relationships between diversification and performance change over time through the use of multiple time periods and accounting for keiretsu membership. Results show that while diversity strategies vary between keiretsu and non-keiretsu firms, performance is not much different. Across time periods, performance varies considerably, but strategies are less variable. Product diversity has weak effects on firm performance only in one time period, while international diversification has negative profitability and positive growth consequences in in some periods. These results suggest first that diversification strategies and their effects on performance vary across time periods and generally produce some unexpected findings. We do not find strong interactive diversity effects.

INTRODUCTION

A large body of business strategy literature examines the relationships between product diversification and/ or international diversification and firm performance. From a conceptual point of view, increasing levels of diversification should have positive effects on performance due to economies of scope and scale, market power effects, risk reduction effects, and learning effects. Related product diversification is argued (Rumelt, 1974) to provide performance advantage because the different product areas can leverage knowledge gained in each other, while unrelated diversification adds administrative burdens without economies of scope in developing competencies. Similarly, international diversification is argued to provide new markets in which to sell similar products or to apply knowledge developed in old markets, while simultaneously reducing diversifiable risks (Kim, Hwang, and Burgers, 1993). The results of extensive empirical analysis of both product and international diversification effects on performance are somewhat contradictory but tend to support these expectations, as discussed by Hitt, Hoskisson, and Kim (1997), Tallman and Li (1996), Datta, Rajagopalan, and Rasheed (1991), Geringer, Beamish, and daCosta (1989), Grant, Jammine, and Thomas (1988), and Grant (1987). These studies and others have used American and European firms almost exclusively as their data sources, and therefore may have limited generalizability outside the European and North American industrial context. Culturally influenced differences in strategic goal-setting, organizational relationships, control systems, and other strategy-related concerns support this possibility. However, Itami *et al*. (1982) examined Japanese firms in the period 1963–1973 for performance effects of diversification and produced findings in line with Western studies. They did not consider international diversification and their test of degree of product diversity was limited to linear effects.

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This study examines the relationship of different degrees of product diversity and international geographical diversity with performance on the part of large Japanese multinational manufacturing firms. It uses existing theoretical models to predict performance effects of diversification in this less-studied national context. It also introduces variables relating to possible changes in the Japanese business context to address the research question of whether diversification strategies and their performance consequences are constant or vary with changes in context. In consonance with the literature, it first tests whether the relationship of performance to degree of product diversity is positive and linear or curvilinear. Next, it examines the relationship between different measures of international diversity and performance, again a relationship which has been tested with generally positive results among U.S. and European firms. Finally, it examines the relationship of the interaction of product and international diversity and firm performance to determine if the performance impact of product diversity is moderated by the degree of international diversity. All these tests are performed in the presence of several control variables which are based also on the previous literature. In a methodological contribution to this literature, and unlike most previous studies, these tests are conducted on a pooled time-series cross-sectional data base using Least Squares with Dummy Variables (LSDV) regressions with dummy variables for years. In addition to tests on the entire sample, tests also are run on time-wise sub-samples representing firms segmented into what have been called "stable strategic time periods" (Cool and Schendel, 1987). These provide for more sample variance than the typical averaging of data over time, while avoiding the danger of treating dissimilar data as homogeneous.

Key findings suggest that product diversity is a limited determinant of growth performance for Japanese manufacturing firms and that international diversity of sales has a negatively significant impact on accounting performance but a positive relationship to sales growth. These findings are somewhat different from the results in previous studies of Euro-American firms, although no direct test can be conducted given our single nation sample. We also see considerable differences for the Japanese sample across our Strategic Time Periods (STPs). Therefore, the discussion of the results is followed by an effort to differentiate between the universal aspects of relevant theory and the context-dependent behaviors that might alter outcomes. A major outcome of this study is its emphasis on changes over time in strategy and performance and their relationship. Without stating so, diversification studies since Rumelt (1984) have treated diversification as an internal issue of matching resources, strategy, and structure to industry conditions in a consistent manner independent of the larger environmental context. Our findings suggest instead that environmental variations affect strategic relationships deeply.

THEORETICAL ANTECEDENTS OF THE FRAMEWORK

The arguments in this article are based heavily on the resource-based theory of the firm. In this theory, scope economies (Teece, 1982) and economic quasi-rents from shared strategic capabilities (Mahoney and Pandian, 1992; Peteraf, 1993; Teece, Pisano, and Shuen, 1997) are asserted to generate sustained competitive advantage and higher performance (Barney, 1991). Unique, path-dependent strategic resources (Chi, 1994) which are in long-term short supply in the marketplace generate economic quasi-rents that can become higher profits, fund growth, or otherwise support superior performance (Peteraf, 1993). Resource-based theory is particularly focused on those organizational capabilities (Teece *et al*., 1997) or tacit knowledge-based routines (Nelson and Winter, 1982) that can be extended from one element of the firm to another — what Prahalad and Hamel (1990) call core competencies of the corporation. As the firm diversifies, if it moves into product or market areas that permit it to leverage organizational routines or strategic rent-yielding resources from existing operations, it should increase the flow of rents without an equivalent increase in costs. Diversification that moves into businesses or markets in which existing capabilities cannot be exploited will not necessarily raise rents. However, such diversification should raise governance costs. Conner (1991) shows that resource-based theory is related to transaction cost economics theory, which suggests that increasing levels of diversification will, in general, raise the cost of governing the firm

(Jones and Hill, 1988). The use of M-form or multi-divisional structures with internal market governance reduces bureaucratic costs in highly diversified firms, but the size of the firm is eventually limited by accumulated inefficiencies (Williamson, 1975). Jones and Hill (1988) also show that related diversification, which requires intensive interaction among units, will increase management costs faster than unrelated diversification, which requires fewer interactions. Thus, the benefits and costs of diversification, from a perspective including both rent-yielding benefits and transactional costs, tend to rise in concert making predictions of the performance effects of specific levels or types of diversification challenging.

The resource-based theory of the firm (Conner, 1991) generally focuses on product diversification strategies. Leveraging strategic resources and firm-specific capabilities across product lines should provide economies of scope to business-related competencies in addition to appropriating rents from more customers. So long as product diversification into new businesses stays within the scope of the firm's strategic resources and capabilities, it should provide increasing rents. Unrelated or conglomerate diversification which by definition goes beyond this scope will not generate additional rents to these resources. The combination of transaction cost theory and the resource-based viewpoint described above suggests that performance will vary with product diversity in a non-linear relationship, increasing as strategic resources and capabilities are given greater scope, but falling off as product scope exceeds the range of rent-yielding resources and governance scope surpasses management capabilities, raising costs (Tallman and Li, 1996). Adoption of new organizational forms, such as the multi-divisional form, or systems of control and communication, such as profit-sharing and informational technology, should extend the point of diminishing returns to diversification over time.

Resource-based theory suggests that the same benefits of shared capabilities should occur across national markets as across product markets (Fladmoe-Lindquist and Tallman, 1994) and transaction cost theory provides a strong argument for competitive advantage based on internal expansion by multinational firms (Teece, 1986). Firms with profit-making internal competencies (ownership factors) will seek additional profits in international market locations, whether through exports or direct investment (Dunning, 1993). If these capabilities are such that they are embedded in the firm's structure, these international markets will be internalized by foreign direct investment, ensuring the best application of these capabilities while protecting them from compromise (Buckley, 1988). So long as the ownership factors can be applied profitably, greater international market presence should generate higher performance levels. The ability to manage extensive networks of international subsidiaries at low transactional cost seems to be a key capability and source of sustainable competitive advantage for successful multinational firms (Fladmoe-Lindquist and Tallman, 1994). Multinational firms that stay in their same product lines as they spread into new markets would seem able to leverage at least some of their unique capabilities in any national market, despite the need to adjust to local environmental factors (Bartlett and Ghoshal, 1989). Hitt *et al*. (1997) argue that multinational expansion is difficult and complex, which is undoubtedly the case, and that greater international dispersion should lead to the increased bureaucratic costs described above, limiting the scope of benefits to strategic resources internationally. On the other hand, they point to organizational learning effects from complex domestic organizations that might be applicable to international organization. How much greater would the learning be from direct experiences in international markets? The existence of such learning is the basic assumption of Bartlett and Ghoshal's (1989) Transnational Firm and related models. In addition, wider international spread generates benefits from market arbitrage, bargaining power, and superior use of comparative advantage (Kogut, 1985). Organizational learning and development of organizational competencies among multinationals suggest that the negative effects of bureaucratic costs should overcome the benefits of multinational strategies and organization only in the extreme.

This study examines the effects of product diversity and international diversity on performance levels for a sample of Japanese multinational manufacturing firms. Resource-based theory (economies of scope, leverage of capabilities) and transaction cost theory (firm boundaries, transactional efficiency) appear to have universal applicability, suggesting that performance effect differences of diversification across national

contexts at most should be matters of degree or of measurement rather than direction. However, these predictions of performance effects make the implicit assumption that firms diversify for similar reasons, or that contextual differences, strategic intent, and differentiation process differences do not matter to long-term outcomes. Yet, resource-based theory also predicts path dependency for strategic effects, leaving open the possibility that institutional differences in strategic process could lead to different final results. Transaction costs models suggest that the performance outcome of a given amount of diversification will change over time as organizational development and change (to a multi-divisional form, for instance) reduces governance costs. While the theories may supersede context, observable outcomes of particular strategies may vary considerably with changing internal and external conditions.

While differences across nations and over time are characteristic of macro-economic studies, they generally have been ignored in strategy studies. Outside the historic perspective of Chandler (1962), most empirical studies of diversification have not allowed for temporal context, as they have either used cross-sectional or averaged data, seeing strategy as having evolved over time through an internal logic, but not assessing whether strategies and their consequences change with time and contextual change. Geringer, Beamish and da Costa (1989) do find that their geographic diversification effects appear only when their data are separated by region, suggesting that spatial context matters to the performance effects of internationalization. Grant (1987) speculates that his strong results for multinational effects on performance might reflect the poor state of the British economy at the time which perhaps gave multinational firms inordinate advantages over domestic British firms. Product diversification studies do not address such concerns, tacitly assuming isolation from external effects. In this study, we will examine differences in both product and international diversification strategies and performance levels as the Japanese context changes over time.

THE CONCEPTUAL FRAMEWORK AND HYPOTHESES

The existing literature on the diversification, whether product or geographical, is certainly one of the largest bodies of work in business strategy. As several articles provide extensive reviews of this literature, we will address only specific articles particularly relevant to our study (see Tallman and Li, 1996; Datta *et al.*, 1991; Grant *et al.*, 1988; Grant, 1987). Datta *et al.* (1991) distinguish among mode, type, and degree of diversification, a system which we will follow. We begin by addressing the product mode of diversification, followed by the international mode, and then examine the possibility of interaction between these two diversification modes.

Product diversity

As described above, resource-based and related models (Peteraf, 1993; Conner, 1991; Prahalad and Hamel, 1990; Teece *et al.*, 1997) attribute superior performance to competitive advantage based on idiosyncratic factors internal to the firm, suggesting that diversification which extends the market for these factors should generate superior performance. Diversification into areas that do not capitalize on strategic resources should not add to rents, but may be costly, possibly reducing performance. The relationship of performance and the product *mode* of diversity is well established by studies in two related directions — type of diversification and degree of diversity. Rumelt's (1974) seminal study of qualitative *types* of diversification found differences across his "relatedness" categories. Subsequent studies using his methodology (e.g., Geringer *et al.*, 1989; Dubofsky and Vandarajan, 1987; Christensen and Montgomery, 1981; Bettis, 1981) have generally found that related diversification produced higher performance levels than unrelated diversification, although industry effects and other firm-level variables tend to absorb much of the effect of diversification type. Itami *et al.* (1982) found that dominant-constrained diversification also was associated with superior accounting performance in a sample of 112 Japanese firms. While yet other studies find either no effects or benefits to unrelatedness (Michel and Shaked, 1984), the general interpretation of the evidence finds a profitability advantage associated with related diversification. Discrepancies across studies may well result from unlike measures or methods or from underlying non-linearities in the diversification – performance relationship.

Type and degree of diversification appear to be related. Hoskisson *et al*. (1993) showed that a typology variable and a SIC code-based entropy variable both have high loadings on a single latent variable which, in turn, is negatively and significantly related to accounting performance. Tallman and Li (1996) report significant differences, in expected directions, in the mean values of a degree-of-diversity measure across four categories of diversification types. SIC code-based continuous measures of *degree* of diversity which predict a curvilinear relationship of performance with diversity have found that moderate degrees of diversity often predict higher performance (Tallman and Li, 1996; Grant *et al*., 1988; Palepu, 1985). Robins and Wiersema (1995) do not test curvilinear measures of concentric or entropy measures of diversity, but do find that a continuous measure of resource-based related diversity has a positive and significant impact on return on assets (ROA), while more common measures of diversity show negative or non-significant relationships with performance. Itami *et al*. (1982) also tested a continuous diversity index on their Japanese sample, showing it to be positively related to growth, and negatively but non-significantly to accounting measures. However, they did not test for, although they predicted, a curvilinear effect. These various findings suggest that better measures and tests for curvilinear relationships indicate that type and degree of product diversification are related and that related types or intermediate degrees of diversification seem to predict superior performance (Tallman and Li, 1996; Datta *et al*., 1991). The empirical results of Itami *et al*. (1982) support the initial assumption that these hypotheses about product diversity derived from Euro-American theory and experience are applicable to Japanese firms. The performance of an intermediate degree of product diversity should surpass that of lower or higher diversity, suggesting an inverted U-shaped curvilinear relationship of performance to degree of product diversity.[1] This relationship is expressed by the following separate but related hypotheses:

Hypothesis 1a. Performance levels of Japanese multinational manufacturing firms should vary positively with degree of product diversity, but…

Hypothesis 1b. Performance levels of Japanese multinational manufacturing firms should vary negatively with the square of degree of product diversity.

International diversity

Geographical diversification *mode* also has been tested a number of times with various results. The international business literature applies a logic similar to resource-based models to the multinational firm (Fladmoe-Lindquist and Tallman, 1994). Kim *et al*. (1993) argue that the more "multinational" a firm is, that is, the greater its international operations, the greater its opportunities to leverage strategic resources and gain economies of scope across markets while simultaneously diversifying market risks, thus raising its performance levels. Grant (1987) suggests that multinationalism itself *should* confer advantage over non-multinational firms. Multinational firms have opportunities to gain greater returns to intangible resources, to use market power, to spread their market risks, and to seek less expensive inputs and less price sensitive markets (Kim, Hwang, and Burgers, 1993). They can arbitrage across factor markets and leverage their market power to both reduce input costs and control output markets (Kogut, 1985). Indeed, international diversification (defined in different ways) has been found to improve operating performance. Grant (1987) and Grant *et al*. (1988) report that, for a group of British manufacturing firms, multinational diversification, measured by a ratio of sales from operations outside the home country to total sales, shows a linear positive effect on performance level. Hitt *et al*. (1997) used an international entropy index to find a positive but curvilinear declining relationship between international diversity and performance for a sample of U.S. firms. Geringer *et al*. (1989) find that degree of internationalization explains accounting performance, but only when standardized for continent of origin.

As with product diversification, results are not always positive (Siddharthan and Lall, 1982; Michel and Shaked, 1986), but the different mea-

[1] Diversification and diversity are distinguished by Grant and colleagues (1988) and Tallman and Li (1996). Degree of diversity measures reflect current positions rather than the strategic objectives inherent in diversification typologies. We will use the diversity terminology from here in our empirical study.

sures used to describe geographical diversification also are not necessarily related to each other (Cosset and Nguyen, 1991), effects may vary across different dependent variables, and direction of investment flow may represent very different strategic purposes with emphasis on different performance measures. Large sample studies observe only levels of diversity of activities and related performance, but cannot easily address issues of strategic intent or management control structure, conceptually important factors in multinational performance. Johansson and Yip (1994) do use interview data to compare small samples of Japanese and American firms in a study of industry drivers and globalization strategies, finding that global strategy (more multinationalization) and structure affect performance of U.S. firms more than that of Japanese firms, but have positive impacts in both cases. Japanese multinational firms have competed successfully through exports and through foreign direct investment, suggesting that the economic logic of resource-based or capability-based models also applies in the Japanese context (Porter, 1990).

A non-linear, positive then decreasing relationship between multinationality and performance has been suggested in some studies (Hitt *et al*., 1997; Geringer *et al*., 1989), but not in others (Tallman and Li, 1996; Johansson and Yip, 1994; Grant *et al*., 1988). While governance costs presumably could overwhelm the scope economies of multiple markets, the common use of national or regional profit centers in multinational organizations and the typically gradual or step-wise expansion of multinational firms (Chang, 1995; Bartlett and Ghoshal, 1989; Johansson and Vahlne, 1977) suggests that as firms learn about managing in the international marketplace, performance need not drop due to increasing internal governance costs. Internalization theory (Buckley, 1988), an international interpretation of transaction cost economics, suggests that inefficiencies in organizing for international markets will result in increased use of alternative governance schemes to minimize such costs. In addition, Japanese firms traditionally have focused their value-added efforts at home, using exports and then subsidiaries focused on sales and marketing to support intra-firm exports until fairly recently, when rising yen values and political pressure from trading partners have encouraged gradual and limited foreign direct investment backed by substantial intra-firm trade (Chang, 1995; Kojima, 1978; Bartlett and Ghoshal, 1989), suggesting that the bureaucratic costs of international expansion may be limited in this case. Our logic as stated above, and as developed from resource-based theory, suggests that:

> *Hypothesis 2. Performance levels of Japanese multinational manufacturing firms should vary positively and linearly with the degree of multinationality.*

Most studies of the performance effects of international diversification address multinationalism, or the strategic importance of foreign operations, although Ramaswamy (1993) and Tallman and Li (1996) also address questions of international configuration or country scope of operations. Few recent management studies of multinational firms examine the effects of exports on firm performance, although the economics literature suggests that economies of scale in production and access to more diverse markets will result in positive performance effects from increasing exports from the home market. In addition, resource-based theory suggests that capabilities in product development and manufacturing should be subject to economies of scale and scope through exports, possibly in association with direct investment (Dunning, 1993; Hamel and Prahalad, 1985). Internalization models propose that market opportunism eventually will limit the use of exports as international firms sell products incorporating their particular competencies across borders (Buckley, 1988), but the use of sales and marketing organizations should extend the potential for home-based manufacturing through intra-firm export, and locational benefits of home production may offset transactional disadvantages of not operating in the local market (Dunning, 1993). Also, as this study addresses Japanese firms specifically, and as these firms are represented as having replaced exports with foreign direct investment later in their life cycles, less extensively, and in more limited value-added chain positions than Euro-American multinational firms (Bartlett and Ghoshal, 1989), we suggest that exporting should be tested also as a means of international market diversification, and is most likely to have a significant effect in earlier time periods. Additionally, studies indicate that direct investment and exports may both increase si-

multaneously, a condition characterized particularly for Japanese firms as "export-enhancing investment" by Kojima (1978). Thus, whether exports are alternative to or complementary to operations by foreign subsidiaries, we suggest:

Hypothesis 3. Performance levels of Japanese multinational manufacturing firms should vary positively with the level of export sales by the firm from the home country compared with total sales.

Most studies of international diversity have addressed only strategies of internationalization, whether through exports or through foreign direct investment and sales by foreign subsidiaries. However, the transactional literature of the multinational firm (Buckley, 1988; Dunning, 1993) suggests that **how international sales are governed** is as important as the decision to pursue such sales. The literature of the multinational firm contrasts market controls with hierarchical controls to explain performance success via transaction-specific concerns for governance efficiency. These studies typically address industry level characteristics and conclude that as opportunism risks increase across industries, reflecting greater differentiation in firm-specific resources, greater use of internal governance (measured by foreign direct investment) rather than market governance (exports) will generate superior performance. Transaction cost models suggest that exports (market governance) are efficient for cross-border movement of simple products, but that complex technology-based products provide greater chances for gain through opportunism and are more efficiently and safely handled by internal means of control (Teece, 1986). Firm-level resource-based models predict that the exploitation of strategic capabilities will be better accomplished through the greater control of direct investment in subsidiaries. We suggest that the effects of superior firm-specific capabilities will be enhanced by a reduced use of exports and an increase in foreign direct investment as a result of superior management of these capabilities and lower expenditures for protective mechanisms. As these two primary means of entering international markets may be expected to increase simultaneously as firms become more international, especially if Kojima (1978) is correct that Japanese firms use export-enhancing direct investment, we expect that their effects could become confused. In order to address the specific impact of the relative use of one form of governance control versus the other, we suggest the following:

Hypothesis 4. Performance levels of Japanese multinational manufacturing firms should vary positively with proportion of sales by international operations to total international sales increases.

Interaction effects of international diversity and product diversity

If related or moderate degrees of product diversity are expected to improve performance compared to single-business or unrelated diversified firms, and international diversity is expected also to improve performance, just how might these diversity variables act together? Both product diversification theory and the theory of the multinational firm address issues of economies of scope in application of strategic resources and of efficient transaction governance, either across business or national boundaries. The similarities in theoretical basis and performance effects of the two directions of diversification suggest that the potential for significant interaction should be high (Tallman and Li, 1996). Thus, increasing international diversity should improve the performance of single-business firms by extending the reach of their competencies. For the unrelated diversified firm, the same benefits may accrue to each product division independently (presuming that the separate profit centers are actually managed separately). More interesting interactions occur as related product diversification mixes with increasing international diversity. Jones and Hill (1988) suggest that related diversification, because it requires more intensive interaction and thus more management intensity, will have its benefits offset by the negative effects of excessive governance costs at a lower level of diversity than will unrelated diversification. If the governance and communication complexities of managing a multinational firm are added to these existing complexities, we may well expect a depressive effect on performance. A firm which tries to apply a broad, but related, product portfolio on an integrated global basis may well stretch its management resources excessively. On

the other hand, Hitt *et al*. (1997), working from a learning perspective, maintain that prior product diversification gives experience with managing multiple product-markets which can be exploited in international markets to give positive interaction effects.

In empirical studies, Geringer *et al*. (1989) test for the effects of the interaction of product and international diversification on performance, but find no significant effects. Tallman and Li (1996) suggest, but do not show empirically, that multinationality should improve the performance of low product-diversity firms by providing risk diversification and a broader customer base over which to gain economies of scope to fixed resources. Kim *et al*. (1989) show that the impact of product diversification categories on performance is contingent on degree of multinationalism. They show no effect of global diversification on related-diversified firm performance. However, they show that more product-diversified firms do perform better when they are more geographically diversified, contrary to Franko (1989), and that high geographical diversification seems to eliminate performance differences between levels of product diversity. Hitt *et al*. (1997) do find a positive interaction effect, showing that greater product diversification reduces the negative effects of high levels of international diversity. However, the correct test for the significance of the increase of variance explained by the addition of their interaction term, as described below (Jaccard, Turrisi, and Wan, 1990), indicates that they fail to demonstrate true joint effects in their regression model. When they graph the simple regression of performance on international diversification, they demonstrate that increasing international diversity demonstrates an inverted-U shaped regression line only for moderate levels of product diversity.

Hitt *et al*. (1997) treat linear product diversity effects as moderating curvilinear international effects, while we are treating linear international effects as moderating curvilinear product effects, based on other literature (Tallman and Li, 1996; Grant *et al*., 1988). Indeed, both effects are conceptually primary independent variables, so the choice of moderator seems somewhat artificial and arbitrary. Their predictions are based on rents and internal learning effects, while ours are based on rents and bureaucratic cost effects. In this case, resource-based increases in performance increase when a *narrow* set of product capabilities are spread over new markets. In the highly diversified, but non-related firm, individual business units gain the same benefits in international markets and their very non-relatedness keeps bureaucratic governance costs down. Moderately product-diversified firms, however, are hypothesized to be able to gain the major benefits to economies of scope through the product mode of diversification by integration of activities across the various product divisions of the firm. The very large increase in necessary interactions required to maintain the reciprocal interdependencies typical of product relatedness and concurrently to support integrated operations over a wide geographical area is hypothesized to drive the governance costs of internal transactions to a level surpassing marginal benefits, thus reducing performance for intermediate levels of product diversification when combined with greater geographical diversification (Hill and Kim, 1988; Jones and Hill, 1988). In a mirrored approach to that of Hitt *et al*. (1997), we propose that the combination of resource-based theory and transaction cost theory, backed by some empirical evidence, suggests that increasing levels of international diversity should improve the performance levels of firms with low product diversity, have little effect or negative effect on firms with intermediate degrees of product diversity, and reduce the negative second-order effects of high levels of product diversity. We therefore suggest the following associated hypothesis, following our formulation of the first hypothesis:

> *Hypothesis 5a. The interaction of multinational diversity and product diversity should be negatively related to performance for Japanese multinational manufacturing firms, and…*
>
> *Hypothesis 5b. The interaction of multinational diversity and product diversity squared should be positively related to performance for Japanese multinational manufacturing firms.*

We note, though, that these last hypotheses assume that the firms with intermediate levels of product diversification are approaching a level of diversification at which management resources are

consumed by integrating a large number of related products and cannot efficiently manage large increases in international market scope. If the strategic resources of these firms are not fully leveraged by product diversity and their management capabilities are not stretched by the mix of increasing products and extending geographical markets, then the hypothesized "linearizing" of the regression of performance on product diversity may not occur. Instead, analysis of both diversity modes should show primarily main effects and few true joint effects (Jaccard *et al*., 1990).

The Effects of Context

We have made mention of the fact that relatively few studies of diversification effects among Japanese firms have been conducted. We have suggested that the unique aspects of the Japanese business environment might lead to different strategies, objectives, and outcomes than those of a similar group of firms in the intensively studied Euro-American context. Japanese companies, for instance, are often said to focus on employment, sales growth, or market share rather than profits, Japanese capital markets appear to accept lower returns, and relationships among firms and banks reduce financial performance pressures. As this is a single-country study, no direct comparisons are possible, and the apparently universal aspects of our underlying theory do not provide inherent expectations or disprovable hypotheses about national differences.

One aspect of large Japanese multinationals is that many of them are members of keiretsu, families of firms in related and unrelated industries with interlocking ownership and unique inter-firm relationships. Various authors suggest that keiretsu membership may affect product diversification strategy, as keiretsu tend to rely on group relationships to gain economies of scope and scale rather than on internal diversification or true markets. Various studies also address the issue of whether keiretsu membership affects export performance (Hundley and Jacobson, 1998). Internal sales, the existence of group trading companies, and possible negative competitive effects are discussed by Hundley and Jacobson (1998) as being related to lower export sales on the part of horizontal or financial keiretsu. We will include membership in these same six major financial or horizontal keiretsu groups in our analysis.[2] Should this dummy variable significantly impact our findings, we will have evidence that at least one unique aspect of the Japanese business environment does affect diversification strategies.

Hypothesis 6a: Firms that belong to financial keiretsu should demonstrate lower levels of diversification.

Hypothesis 6b: Firms that belong to financial keiretsu should demonstrate lower levels of accounting performance.

We also suggested in our introduction that strategies and their consequences should vary across time. As will be seen, we do incorporate dummy variables for years to control for a variety of non-specified time-dependent effects in a pooled cross-sectional time-wise data base. However, in the regression models that we use, dummy variables require uniform slopes while permitting intercepts to vary. This assumes homogeneity of relationships between the various independent variables and the dependent variable over time, suggesting a consistency of relationships that reflect the data. Changes on an annual basis with yearly data could reflect simple instability in the data and suggest that averaging over the entire period might be necessary to reduce noise in the data, so that using the calendar year as a division point would be entirely arbitrary. A better approach would be to find periods of years during which strategies are stable. To test for the existence of meaningful time periods, a procedure is adopted that has been used by researchers in strategic group studies to identify "stable strategic time periods" (e.g., Cool and Schendel, 1987). This procedure involves the comparison of covariance matrices from year to year to determine if significant changes are present between groups of years. If no changes appear within a block of years, that block is taken to be a single group for analytical purposes. If significant changes in

[2] Johnston and McAlevy (1998) refer to these same six companies as *kigyoshudan*, or horizontally connected companies. We will use the "horizontal keiretsu" or "keiretsu" terminology interchangeably as being more familiar to most readers. Johnston and McAlevy (1998) provide a detailed discussion of the role of cross-shareholdings in these companies and of changes over time in this key variable.

the covariance matrices are determined to exist between groups of years (particularly if backed up with evidence of exogenous changes in the system), this is taken to be an indication of the existence of stable strategic time periods, and analyses are conducted separately for each of the stable blocks of time. Cool and Schendel (1987) also suggest that when these statistical tests coincide with observable events in the environment, evidence for stable strategic time periods is strengthened. We look for evidence of relevant strategic time periods and examine their effects on strategic interaction and performance to consider whether implicit assumptions of long-term strategy-performance stability are justified.

Hypothesis 7: Identifiable periods of strategic stability bounded by changes in the strategy-performance relationship can be identified in a time-wise study.

DATA, VARIABLES, AND METHODOLOGY

In our empirical model, independent variables measuring levels of product and international diversity are predicted to explain one or more dependent variables which measure performance. The measures of international diversity are expected to interact with and moderate the relationship of the product diversity measures and the performance variables. The explanatory relationship is further affected by control variables measuring exogenous conditions of either the industries or the organizations tested.

The sample

Using criteria for multinational firms consistent with those adopted by Stopford (1983), the 108 largest Japanese manufacturing multinationals were identified for the year 1981. These firms were chosen, and ranked, according to their consolidated worldwide sales as identified from Nikkei's "NEEDS" data base. The sample was checked against a similar listing drawn from the 1981 edition of the *Kaigai Shinshutu Kigyo Soran*, using identical criteria. The latter set included essentially the same companies, with some minor variations in rankings, as those obtained from the "NEEDS" data base. The consistency of companies included in the separate lists exceeded 95 percent, confirming the reliability of the sample as representing the 108 largest Japanese industrial multinationals. The only similar study of product diversity and performance in Japanese firms that we identified is that of Itami *et al.* (1982), which examined data on 112 manufacturing firms from 1963–1973. The majority of our data were extracted from the Daiwa Securities Co., Ltd. *Analyst's Guide*, an annual produced by Daiwa Institute of Research, Ltd., Tokyo, Japan, and covered the years 1976–1993. Additional data were collected from the *Japan Company Handbook* and annual reports of the identified companies and from the Worldscope data base on Nexis/Lexis. Further information to fill in missing values was obtained from Stopford and Dunning (1983) and Stafford and Purkis (1989). Numerous missing values for 1976 resulted in analysis of the years 1977–1993.

The variables

Performance measures. We use multiple indices, as any single measure may generate criticism (Weiner and Mahoney, 1981). A variety of measures has been used in the past, and the use of multiple alternative concepts of performance strengthens the measure (Tallman and Li, 1996). To facilitate comparison with prior research, the initial measures were after-tax figures for return on assets (ROA), return on total sales (ROS) and sales growth (Grant, 1987; Grant *et al.*, 1988; Geringer *et al.*, 1989). Use of the growth measure tests the common perception that Japanese firms emphasize increasing market share over short-term profitability (Johansson and Yip, 1994) and provides a measure of operating performance to complement measures of accounting performance. Accounting-based measures of a firm's profitability have received criticism from some authors (e.g., Aaker and Jacobson, 1987), but there is justification for their use (Hoskisson *et al.*, 1993). Managers and external analysts frequently use data such as ROA and ROS as a measure of management effectiveness and the various measures of profitability are typically related (Robins and Wiersema, 1995). In addition, changes in stock prices tend to follow the announcement of such figures as ROA or ROS,

indicating that these reports have important signaling effects (Fama and Miller, 1984). Grant (1987) uses both of these measures, while many studies which focus on domestic firms use ROA (Robins and Wiersema, 1995), as do Hitt *et al*. (1997). Geringer *et al*. (1989) provide a lengthy argument in favor of sales-based measures in international studies to avoid the effects of differential measures of asset valuation. Their rationale suggests that depreciation adjusts asset values differentially, depending on the date of investment and accounting rules. This is particularly relevant to very international companies which face a variety of accounting rules, and is exacerbated by the possible use of historical exchange rates. As sales and profits are both reported at current rates and reflect current operations, ROS will be treated as our primary measure of profitability. Sales growth will provide a means of capturing competitive advantage targeted at market-based expansion rather than profitability. Johansson and Yip (1994) assess the findings of a number of studies to confirm that Japanese firms tend to report lower profitability than U.S. firms but also to be less concerned with profitability objectives and more concerned with market share growth. As we are comparing within a Japanese sample, cross-national differences are not directly relevant, but disinterest in some performance measures might well disassociate these measures from actual performance differentials. Itami *et al*. (1982) used similar measures. Grant *et al*. (1988) used a four year time lag when performing their "dynamic" analysis. Conceptually, we felt that a one-year lag could be considered to reflect a typical planning cycle, but longer lags were problematic. Therefore, we used single year lag from strategic inputs to performance measurement.

Product diversification strategy. The primary measure of Product Diversity is a Herfindahl-type measure of product diversity. Such a measure takes into account both the number of segments in which the firm operates and the relative importance of each segment to the firm's sales. It is similar to measures used by Tallman and Li (1996), Grant *et al*. (1988), and Itami *et al*. (1982). Robins and Wiersema (1995), while developing a new measure of relatedness using SIC-code type information, conclude that while traditional measures have flaws, the Herfindahl-type measures had advantages over entropy measures in representing relatedness of diversification and a resource-based perspective.[3]

International diversity. Measures of multinationalization should reflect the relative size and strategic importance of foreign and domestic operations (Grant, 1987). The degree of multinationality, or the relative intensity of internalized international operations (foreign direct investment) compared to international market activities (exports or licensing), is treated in the transaction cost economics of international markets as a key indicator of the existence of strategic capabilities which require the protection and control of internal hierarchical governance (Teece, 1986). One measure of multinationality, used by Tallman and Li (1996), Geringer *et al*. (1989), and Grant *et al*. (1988), is the ratio of sales from foreign operations to total sales of the firm. Other studies use foreign asset ratio (Ramaswamy, 1993), country count (Tallman and Li, 1996), foreign employee ratio (Kim *et al*., 1989), or an entropy measure based on weighted foreign sales (Hitt *et al*., 1997). We used a measure of international diversity similar to that of Grant *et al*. (1988), called Foreign Sales Ratio (FSR), calculated as the ratio of foreign subsidiary sales to total firm sales (also see Stopford, 1983; Daniels and Bracker, 1989; Geringer *et al*., 1989; and Tallman and Li, 1996).[4] As established by Tallman and Li (1996), this measure does not control for intermediate goods exported from the home country and resold by subsidiaries. Thus, it cannot be considered an absolute measure of international to domestic operations, but seems to be a good relative indicator, and has been widely used. It has been suggested that Japanese firms have focused on global strategies characterized by large levels of export sales from the home company (Abegglen and Stalk, 1985; Bartlett and Ghoshal, 1989). Therefore, a measure of export intensity, rather than sales by overseas subsidi-

[3] In a comparison of means across detailed Rumelt-type categories, our Herfindahl variable showed consistent increases as diversification categories increased from dominant-constrained through unrelated, suggesting, as in Tallman and Li (1996), that the continuous variable was consistent with the qualitative assessment typology.

[4] Hitt, Hokisson, and Kim (1997) use an entropy measure of international diversity and find it to be highly correlated (r=0.69) to the simple foreign sales ratio.

aries, may be more relevant than for Euro-American firms, which move to multinational operations at an earlier stage in their international life-cycles, according to Bartlett and Ghoshal (1989). We test this possibility with the ratio of export sales to total firm sales, called Export Sales Ratio (ESR).

One difficulty admitted by Tallman and Li (1996) was that they could not examine firm-level strategies for management control. In this case, we can use a measure of internalization, or the relative use of internal international operations versus exports to service foreign markets, by calculating the ratio of sales by foreign subsidiaries to total international (subsidiary + export) sales, called Internal Ratio (IR). The firm with greater relative levels of internal control of international operations relative to market control will be higher on this ratio, regardless of total levels of participation in international markets. This measure therefore differentiates a strictly overseas sales strategy from a multinational operating strategy using internal production. Of course, exports of intermediate goods will be double counted in a measure of gross subsidiary sales while intermediate goods produced by developing country subsidiaries and imported into Japan for assembly and re-exported will be double counted in the opposite direction, resulting in the inherent assumption that all firms have similar ratios of internal exports to exports sold outside the firm, and making any statement of the absolute effects impossible. As all firms with international operations should show some use of intra-firm trade, we feel that this measure does provide a reasonable indication of degree of internalization of international markets. However, such measures do not differentiate global firms with international production from multi-local (Yip, 1992) firms with similar levels of international operations but very different strategies.

Contextual effects – keiretsu affiliation. We used a dummy variable to represent membership in one of the six major financial or horizontal keiretsu groups, similar to the formulation in Hundley and Jacobson (1998). The literature has focused on these groups, which have been generally stable for over 30 years and have strong institutional ties (Flath, 1993; Yoshinari, 1992; Lawrence, 1991). The data come from *Kigyo Keiretsu Soran*, an annual publication of Toyo Keiai, Tokyo and were confirmed through "Dodwell's Industrial Groupings in Japan", published by Dodwell Consulting Group, and the *Japan Company Handbook*. This dummy variable proxies for what are actual continuous variables representing different levels of association. Positive keiretsu membership in this study represents only the closest level of affiliation, those companies which are part of the "president's council" or equivalent. Hundley and Jacobson (1998) provide a good discussion of the effects and meaning of such affiliation.

Contextual effects–Strategic time periods. Identification of strategic time periods was accomplished for the present study by means of LISREL multiple groups analysis (Joreskog and Sorbom, 1989).[5] This technique allows for a test of the equality of covariance matrices across groups using a Chi-square statistic. Groups may represent any set of observation that are mutually exclusive and clearly defined. For the present data, groups are defined as mutually exclusive subsets of the years from 1977 through 1993. Testing for a significant inter-group difference was accomplished by comparing the covariance matrices for a reduced form equation (a regression on all the available explanatory variables) for year 1 and for year 2. No significant difference was found, so the data for years 1 and 2 (1977 and 1978) were combined and tested against year 3. This procedure was followed until a difference significant at better than a 0.05 probability (Chi-square of 21.94 with 5 degrees of freedom) was found between the pooled years 1 through 10 and year 11. This significant chi-square difference served as an indi-

[5] LISREL multiple groups analysis proceeds in three steps. First, a LISREL solution is obtained across groups that are hypothesized to be different (in the present case, the groups are the different time periods). No constraints are imposed in the first step, and a chi-square statistic is obtained for the unconstrained solution. Second, a LISREL multiple group solution is obtained for the same groups as in step 1, except that parameters across groups are constrained to be equal. A chi-square statistic is also obtained for this second step. Third, the chi-square value obtained for the constrained solution is subtracted from the chi-square value obtained for the unconstrained solution. This difference is also distributed as a chi-square statistic with degrees of freedom equal to the difference between the degrees of freedom of the constrained and unconstrained solutions. Consequently, the difference in chi-squares can be used to test for equality of covariance matrices of the two solutions.

cation that years 1 through 10 formed one STP and could be treated as a single homogeneous sample for subsequent analyses. This procedure was then continued from year 11 until another statistically significant chi-square was obtained; in this case, the break point came between years 15 and 16 (Chi-square of 11.39 with 5 degrees of freedom). Hence, years 11 through 15 were treated as a second STP, and as no significant difference was found between years 16 and 17, they formed a third strategic time period. The three STPs uncovered via LISREL multiple groups analysis were 1977–1986, 1987–1991, and 1992–1993. These three time periods formed the basis for homogeneous data blocks to be used in subsequent analyses. Cool and Schendel (1987) propose that such time periods be checked against exogenous developments which might have strategic significance to establish face validity. We examine external events in our analysis of results below.

Control variables. Following Grant *et al*. (1988), we also control for other variables that are likely to affect firm performance, including firm size, leverage, and industry. Firm size, a commonly used control variable often related to diversity levels, is measured by employee count. Firm leverage is operationalized as the percentage of long term debt to total capital (debt plus equity). Prior research has shown industry effects to have important impacts on cross-sectional variation of firm performance (Schmalensee, 1985). Some studies use industry dummy variables (Grant *et al*., 1988), others use industry characteristics (Robins and Wiersema, 1995; Tallman and Li, 1996). We use dummy variables for industry sector identity. Industry categories and numbers of incumbent firms are shown in the Appendix.

Methodology

Comparisons of means across contextual variables. As a first check on the effect of the contextually-focused moderating variables on diversity strategy and performance, we performed Analyses of Variance on the independent and dependent continuous variables using first keiretsu membership/non-membership and second Strategic Time Period as the categorical variables. Pairwise comparisons for significant ANOVAs were performed using simple t-tests.

Pooling and the use of least squares with dummy variables Regressions. We used multiple regression models to examine the effects of diversity on performance. Most diversification studies which have multi-year data average the variables over time and use Ordinary Least Squares regression models. While this reduces transient errors, we were concerned with the possibility of smoothing significant, but changing, effects by averaging so many years. An initial solution to this problem was the use of a pooled cross-sectional time-wise data set (see Sayrs, 1989). Pooling results in the use of a data set with N x T observations (N observations times T years). Pooling reduces variance compared to separate regressions for each year, but retains variance lost in smoothing through averaging. However, pooling may violate basic assumptions of Ordinary Least Squares models. The assumption of essentially homogeneous interactions among the variables is less likely to hold as heteroscedasticity may exist within each cross-section and between the cross-sections. Serial autocorrelation also often occurs with time-series data. Durbin-Watson statistics calculated for time series on each firm showed small, but significant, autocorrelation in 37 of 108 cases. We also saw more significant correlations among the independent variables in the case of the pooled data than for the averaged data. Therefore, the use of Ordinary Least Squares on the pooled data appeared inappropriate, and the regressions were calculated using dummy variables for the different years within the STPs. Time-related effects are absorbed by the dummies which effectively permit parallel regression lines for each of the years (Sayrs, 1989). We also estimated our regressions with a General Linear Model which is not sensitive to bias from autocorrelation and heteroskedasticity (Bergh and Holbein, 1997).

Lagging across STPs was handled in the following manner. The regression of the 1987 performance variables on the 1986 explanatory variables (or the 1992 performance variables on the 1991 inputs) were assigned to the first (second) STP. In this way, the regression was associated with the STP of the explanatory variables. Thus, the time-series pools were 1977–1986, 1987–1991, and 1992–1993 for the independent vari-

ables and 1978–1987, 1988–1992, and 1993 for the dependent variables, assuming implicitly that the environmental effects from any one year were reflected in performance for the subsequent year, at which time the environment and relations among the variables had changed, but had not yet been reflected in performance.

RESULTS

Comparisons of Means

The results of the comparisons of means are shown in Table 1. As can be readily seen, the means of the diversity measures are significantly different between the keiretsu and non-keiretsu firms. Non-keiretsu affiliated firms are more diversified on both the international and the product dimensions than are keiretsu members. We confirm Hundley and Jacobson's (1998) finding that non-keiretsu firms show export ratios more than five percentage higher than keiretsu-affiliated firms. However, while these same firms are also consistently higher performers, only ROA, of the performance variables, shows a significant difference between the two groups. This suggests that keiretsu membership indeed does have an impact on strategy, but that keiretsu membership alone does not determine performance levels. Hypothesis 6a is supported, but Hypothesis 6b is generally not supported.

The outcome of the tests for STPs suggests that Hypothesis 7 is supported – the strategy-performance relationship changes over time. This is tested further below. We see a complex pattern of differences across the Strategic Time Periods. We see generally, but not consistently, declining performance of the corporations, with all measures lower in STP3 than in earlier periods. The level of product diversity holds constant across all three time periods. Sales by overseas subsidiaries are higher in the second two STPs than in the first, while export sales are lower in the second two STPs than in the first. While these results may suggest that exports and sales by subsidiaries are in fact substitutes for Japanese multinational companies, we must consider the effects of various exogenous conditions on both strategy and performance variables. These considerations will be discussed at length below, and comparisons of the performance effects of different strategies made.

Regressions of Performance on Diversity

The correlation matrix for the entire pooled sample is given in Table 2. The only noticeably high correlations for independent variables are those between the Herfindahl index of Product Diversity and its own squared value, a positive relation between Foreign Sales Ratio and Internal Ratio, and a negative relationship between Export Sales Ratio and Internal Ratio. As the different international sales ratios are related, but are not used in the same regressions, multicollinearity does not appear to represent a major problem for this study, except when using squared or interaction variables. As these are critical to our hypotheses, we report variance inflation factors for our estimated coefficients. A large variance inflation factor indicates that the explanatory variable is explained by a combination of the other independent variables. Again, these occur only for our squared and interaction terms, where they would be expected.

Full Sample. Although we have described already our logic for developing separate time periods for analysis, we wished to compare directly the effect of using strategic time periods as opposed to the full sample in our analysis of performance effects. Therefore, we first ran a series of regressions, shown in Table 3, on the entire pooled data set, using dummy variables for years but not separating the time periods.[6] The results for ROA were very similar to those for ROS, and as described above we preferred to use ROS as our measure of profitability.

The results are somewhat unexpected in comparison to our theory and Euro-American empiricism-based hypotheses. Product diversity signs are as expected, but they are either marginally significant (profitability) or are not significant (growth), compared to high levels of significance in Grant *et al*. (1988) and Tallman and Li (1996) using similar measures on British and American samples, respectively. Hypotheses 1a and 1b receive mild support on a profitability measure. Perhaps our greatest surprise, however, is that

[6] For ease of presentation, as the year dummies were included to correct for possible analytical problems and the industry dummies were used to control for otherwise unspecified industry effects, but neither are the focus of our efforts, the values of their coefficients are not shown, but are available from the authors.

Table 1. Comparisons of means

Categorical Variable:	ROA	ROS	Sales Growth	Asset Growth	Herfindahl Ratio	FSR	ESR	IR
Keiretsu:								
Member (N=53)	0.020	0.020a	0.058b	0.085c	0.383	0.082	0.186	0.345
Non-Member (N=55)	0.026	0.023a	0.067b	0.097c	0.418	0.146	0.240	0.402
Time Period:								
STP 1 (1977–86)	0.025d	0.021	0.086	0.076e	0.600f	0.107	0.228	0.340
STP 2 (1987–91)	0.023d	0.025	0.047	0.159	0.598f	0.125g	0.196h	0.416k
STP 3 (1992–93)	0.014	0.015	–0.015	0.002e	0.600f	0.131g	0.187h	0.437k

a-a; b-b; and so forth indicate that the means so labelled are not significantly different within their columns for each categorical variable.

Foreign Sales Ratio shows a significant negative relationship to profitability, contrary to Hypothesis 2, and to all theory and to expectations from previous tests.[7] We do note that Sales Growth is positively related to FSR, so that Hypothesis 2 receives partial support. Hypothesis 3 is supported for profitability, but not for Sales Growth. Note that the significant effect of ESR occurs only when the keiretsu/non-keiretsu dummy is included. Otherwise, the sign remains the same, but the coefficient is not significant. Results for Internal Ratio are similar to those for FSR, although Sales Growth is not related significantly to IR, the reverse of those predicted in Hypothesis 4. The regressions testing Hypotheses 5a and 5b were run using centered variables to reduce any effects of multicollinearity. These were compared to regressions of the centered Product Diversity, Product Diversity Squared, and FSR main effects only (not shown, as the coefficients and significances are virtually identical). Comparisons of R^2 values show that adding the interactive terms changes significances of main effects, but does NOT increase explanatory power significantly, suggesting that the apparently significant joint effects are collinearities of the main effects, not true interactions (Jaccard *et al*., 1990).[8] With no true interaction or moderating effect of the two diversity modes, we have demonstrated a consistent product diversity effect across all levels of geographical effects. While interesting and significant, this result does not support Hypotheses 5a and 5b, but shows the two types of diversity to exacerbate curvilinear performance effects. We included a dummy variable to account for membership in one of the six major financial keiretsu. This variable showed a significant positive effect of membership on the intercept of the ROS regression line, but the slope coefficients were essentially unchanged from regressions without the keiretsu dummy, except in the case of ESR, which was only significant when the keiretsu dummy was present.

Separate time-wise samples. Having tested for the effects of diversity on performance for the full sample, we performed the same regressions separately on pooled data from each of our strategic time periods in order to observe possible significant changes in coefficient values across time periods. Table 4 displays the results of

[7] The regression was run with the FSR^2 term, as in Hitt *et al*. (1997). This term was insignificant for ROA and ROS, and was significant and positive for Sales Growth, with significant negative first-order effect, implying an *upward* curving regression line. As this was not hypothesized and added little explanatory power to the significant positive linear term shown, we chose to use the linear regression. In any case, our findings are counter to those of Hitt *et al*.

[8] Jaccard *et al*. (1990) recommend that the null hypothesis of no significant increase in explained variance be tested with the following statistic: $F(k_2\text{-}k_1, N\text{-}k_2\text{-}1) = ((R_2^2\text{-}R_1^2)/(k_2\text{-}k_1))/((1\text{-}R_2^2)/(N\text{-}k_2\text{-}1))$. A non-significant F indicates that the interactive term does not add explanatory power and does not represent a true joint effect. The product term represents variances due to both main and interaction effects. Significant t values and a non-significant R^2 increase suggest that only the main effects components are significant, and are adequately represented in the main effects only model.

Table 2. Simple statistics and correlations

	Mean	SD	ROS	SaleGr	Emply	Lever	Herf	Herf**2	FSR	ESR	IR	AssetGr
ROA	0.023	0.025	0.898*	0.217*	0.050*	–0.556*	–0.026	–0.036	–0.041	0.073*	–0.034	0.023
ROS	0.022	0.026		0.204*	0.024	–0.463*	0.006	–0.004	0.022	0.084*	–0.041	0.101*
Sales Growth	0.055	0.112			0.031	–0.152*	0.018	0.014	–0.006	0.109*	–0.070*	0.114*
Employees (10s)	1355	1526				–0.037	–0.034	0.016	–0.182*	0.235*	–0.344*	–0.000
Leverage	0.425	0.217					0.082*	0.094*	–0.191*	–0.180*	–0.043	–0.044
Herfindahl	0.600	0.166						0.983*	0.020	0.026	0.097*	0.013
Herf-Square	0.388	0.176							−0.037	–0.038	–0.067*	0.012
ForSalRatio	0.116	0.138								0.094*	0.509*	–0.009
ExpSalRatio	0.213	0.185									–0.534*	0.011
Internal Ratio	0.377	0.289										–0.021
Asset Growth	0.091	0.541										

*$p<0.05$

Table 3. Least square regressions with dummy variables for year and industry (not shown) and 1-year lagged dependent variables

Variables (VIFs)	Hypothesis 1 & 1a		Hypothesis 2		Hypothesis 3		Hypothesis 4		Hypothesis 5 & 5a (Centered Variables)	
	ROS	SALESGR	ROS	SALESGR	ROS	SALESGR	ROS	SALESGR	ROS	SALESGR
Keiretsu firm	0.005***	0.003	0.004***	0.005	0.005***	0.003	0.005***	0.004	0.004***	0.004
K=1 v. K=0	(3.61)	(0.58)	(3.06)	(1.00)	(4.00)	(0.54)	(3.77)	(0.69)	(2.82)	(0.72)
[1.00]										
Employee Count	0.000	–0.000	–0.000	–0.000	0.000	–0.000	–0.000	–0.000	–0.000	–0.000
(10s)	(0.51)	(–1.45)	(–0.29)	(–1.30)	(0.22)	(–1.59)	(–0.62)	(–1.31)	(–0.46)	(–1.46)
[1.270]										
Leverage Ratio	–0.053***	–0.064***	–0.055***	–0.060***	–0.054***	–0.63***	–0.056***	–0.059***	–0.055***	–0.060***
[1.492]	(–17.20)	(–5.02)	(–17.77)	(–4.74)	(–17.47)	(–4.97)	(–17.93)	(–4.73)	(–17.58)	(–4.66)
Product Diversity	0.036*	0.111							0.032*	0.154**
[1.103]	(1.91)	(1.47)							(1.66)	(1.97)
Product Diversity^2	–0.032*	–0.088							–0.026	–0.124*
[31.546]	(–1.80)	(–1.21)							(–1.44)	(–1.67)
Foreign Sales Ratio			–0.016***	0.034*					–0.154***	0.037**
[1.206]			(–3.71)	(1.90)					(–3.50)	(2.03)
Export Sales Ratio					0.008**	–0.014				
[1.757]					(2.06)	(–0.84)				
Internal Ratio							–0.011***	0.013		
[1.651]							(–4.26)	(1.30)		
FSR*PD									0.334**	1.382**
[1.100]									(2.23)	(2.24)
FSR*PD^2									–0.295**	–1.172**
[41.152]									(–2.18)	(–2.11)
F statistic	19.30***	26.53***	20.60***	27.61***	20.11***	27.45***	20.83***	27.50***	18.06***	24.21***
R^2	0.23	0.29	0.24	0.29	0.23	0.29	0.24	0.29	0.24#	0.30#

*p<0.10, **p<0.05, ***p<0.01; # Not significantly different (p>0.05) from regressions without product terms
Numbers in parentheses are t-values, numbers in brackets are variance inflation factors

Table 4. Least square regression with dummy variables for year and industry (not shown) and 1-year lagged dependent variables

	Hypotheses 1 & 1a						Hypothesis 2					
	ROS			Sales Growth			ROS			Sales Growth		
STP:	1	2	3	1	2	3	1	2	3	1	2	3
Keiretsu firm K=1 v. K=0	0.004*** (2.72) [1.00]	0.004* (1.70) [1.00]	0.008 (1.14) [1.00]	0.005 (0.71) [1.00]	–0.006 (–0.73) [1.00]	0.016 (1.53) [1.00]	0.004** (2.47) [1.00]	0.003 (1.16) [1.00]	0.007 (1.00) [1.00]	0.008 (1.18) [1.00]	–0.005 (–0.65) [1.00]	0.015 (1.40) [1.00]
Employee Count	0.000 (0.045) [1.27]	0.000 (1.06) [1.29]	0.000 (0.18) [1.30]	–0.000 (–1.33) [1.26]	0.000 (0.28) [1.29]	–0.000 (–0.45) [1.30]	–0.000 (–0.23) [1.27]	0.000 (0.44) [1.29]	0.000 (0.04) [1.30]	–0.000 (–1.28) [1.26]	0.000 (0.21) [1.29]	–0.000 (–0.51) [1.30]
Leverage Ratio	–0.055*** (–15.46) [1.63]	–0.043*** (–6.68) [1.35]	–0.024 (–1.27) [1.17]	–0.077*** (–4.73) [1.61]	–0.007 (–0.27) [1.35]	–0.030 (–1.03) [1.17]	–0.056*** (–15.86) [1.63]	–0.046*** (–7.26) [1.35]	–0.023 (–1.29) [1.17]	–0.072*** (–4.40) [1.63]	–0.005 (–0.19) [1.35]	–0.033 (–1.14) [1.17]
Product Diversity	0.043** (1.97) [1.11]	0.049 (1.44) [1.10]	–0.012 (–0.10) [1.12]	0.189* (1.89) [1.11]	–0.012 (–0.09) [1.10]	0.109 (0.61) [1.12]						
Product Diversity^2	–0.042** (–2.00) [30.58]	–0.036 (–1.13) [32.57]	0.004 (0.03) [35.09]	–0.168* (–1.74) [30.58]	0.046 (0.37) [32.57]	–0.107 (–0.64) [35.09]						
Foreign Sales Ratio							–0.012** (–2.29) [1.20]	–0.030*** (–3.64) [1.20]	–0.018 (–0.60) [1.21]	0.053** (2.31) [1.20]	–0.013 (–0.42) [1.20]	–0.013 (–0.28) [1.21]
Export Sales Ratio												
Internal Ratio												
FSR*PD												
FSR*PD^2												
F statistic	22.39***	7.72***	0.45	24.05***	3.90***	1.54	23.69***	9.05***	0.52	25.45***	4.02***	1.67*
R^2	0.30	0.18	0.05	0.32	0.10	0.15	0.30	0.20	0.05	0.32	0.10	0.15

*p<0.10; **p<0.05; ***p<0.01

Number in parentheses are t-statistics, number in brackets are variance inflation factors

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Table 4. *Continued*

STP:	Hypotheses 3						Hypothesis 4					
	ROS			Sales Growth			ROS			Sales Growth		
	1	2	3	1	2	3	1	2	3	1	2	3
Keiretsu firm K=1	0.005*** (3.28) [1.00]	0.004* (1.93) [1.00]	0.006 (0.95) [1.00]	0.006 (0.85) [1.00]	0.007 (0.85) [1.00]	0.014 (1.31) [1.00]	0.004*** (2.94) [1.00]	0.004* (1.85) [1.00]	0.008 (1.13) [1.00]	0.006 (0.81) [1.00]	0.005 (0.58) [1.00]	0.016 (1.59) [1.00]
Employee Count	–0.000 (–0.05) [1.27]	0.000 (1.02) [1.29]	0.000 (0.03) [1.30]	–0.000 (–1.66) [1.27]	0.000 (0.27) [1.29]	–0.000 (–0.58) [1.30]	–0.000 (–0.69) [1.27]	0.000 (0.43) [1.29]	0.000 (0.15) [1.30]	–0.000 (–1.34) [1.27]	0.000 (0.31) [1.29]	–0.000 (–0.15) [1.30]
Leverage Ratio	–0.056*** (–15.85) [1.63]	–0.043*** (–6.84) [1.35]	–0.024 (–1.32) [1.17]	–0.074*** (–4.74) [1.63]	–0.003 (–0.12) [1.35]	–0.034 (–1.19) [1.17]	–0.057*** (–16.11) [1.63]	–0.046*** (–7.28) [1.35]	–0.023 (–1.22) [1.17]	–0.074*** (–4.48) [1.63]	–0.003 (–0.13) [1.34]	–0.021 (–0.78) [1.17]
Product Diversity												
Product Diversity^2												
Foreign Sales Ratio												
Export Sales Ratio	0.012*** (2.71) [1.75]	0.006 (0.74) [1.85]	–0.025 (–0.97) [1.73]	0.002 (0.11) [1.75]	–0.041 (–1.35) [1.85]	–0.036 (–0.91) [1.73]						
Internal Ratio							–0.011*** (–3.49) [1.61]	–0.013*** (–3.12) [1.68]	0.001 (0.08) [1.63]	0.016 (1.16) [1.61]	0.001 (0.09) [1.68]	0.050** (2.37) [1.63]
FSR*PD												
FSR*PD^2												
F statistic	23.65***	7.94***	0.58	25.04***	4.15***	1.76*	24.21***	8.74***	0.48	25.14***	4.01***	2.32*
R^2	0.30	0.18	0.06	0.31	0.10	0.16	0.31	0.19	0.05	0.32	0.10	0.20

*p<0.10; **p<0.05; ***p<0.01

Numbers in parentheses are t-statistics, number in brackets are variance inflation factors

Continued overleaf

Table 4. *Continued*

	Combined Diversity Effects Without Interaction Term (Centered Diversity Variables)						Hypotheses 5 & 5a (Centered Diversity Variables)					
	ROS			Sales Growth			ROS			Sales Growth		
STP:	1	2	3	1	2	3	1	2	3	1	2	3
Keiretsu firm K=1 v. K=0	0.004** (2.42) [1.00]	0.002 (1.04) [1.00]	0.007 (1.00) [1.00]	0.008 (1.08) [1.00]	0.007 (0.80) [1.00]	0.016 (1.46) [1.00]	0.004** (2.40) [1.00]	0.002 (0.91) [1.00]	0.008 (1.18) [1.00]	0.006 (0.86) [1.00]	−0.007 (−0.76) [1.00]	0.017 (1.52) [1.00]
Employee Count	0.000 (0.08) [2.28]	0.000 (0.48) [2.29]	0.000 (0.07) [2.31]	−0.000 (−0.088) [2.28]	0.000 (0.19) [2.29]	−0.000 (−0.47) [2.31]	0.000 (0.00) [1.27]	−0.000 (−0.15) [1.29]	0.000 (0.19) [1.30]	−0.000 (−1.39) [1.27]	0.000 (0.33) [1.29]	−0.000 (−0.37) [1.30]
Leverage Ratio	−0.056*** (−15.62) [6.73]	−0.046*** (−7.15) [8.47]	−0.025 (−1.32) [6.87]	−0.071*** (−4.31) [6.73]	−0.008 (−0.33) [8.47]	−0.030 (−1.04) [6.87]	−0.056*** (−15.77) [1.63]	−0.045*** (−7.13) [1.35]	−0.030 (−1.56) [1.17]	−0.067*** (−4.29) [1.63]	−0.009 (−0.36) [1.35]	−0.040 (−1.33) [1.17]
Product Diversity	0.038* (1.74) [1.11]	0.030 (0.88) [1.10]	−0.020 (−0.17) [1.12]	0.217** (2.16) [1.11]	−0.022 (−0.17) [1.10]	0.105 (0.58) [1.12]	0.033 (1.50) [1.11]	0.065* (1.86) [1.10]	−0.040 (−0.33) [1.12]	0.025** (2.49) [1.11]	−0.050 (−0.36) [1.10]	0.026 (0.14) [1.12]
Product Diversity^2	−0.036* (−1.73) [31.06]	−0.018 (−0.56) [33.56]	0.011 (0.10) [35.59]	−0.197** (−2.05) [31.06]	0.056 (0.44) [33.56]	−0.103 (−0.61) [35.59]	−0.030 (−1.41) [31.06]	−0.051 (−1.55) [33.56]	0.020 (0.18) [35.59]	−0.223** (−2.30) [31.06]	0.082 (0.62) [33.56]	−0.028 (−0.16) [35.59]
Foreign Sales Ratio	−0.011** (−2.07) [1.21]	−0.029*** (−3.50) [1.21]	−0.018 (−0.60) [1.23]	0.055** (2.50) [1.21]	−0.015 (−0.47) [1.21]	−0.010 (−0.21) [1.23]	−0.009* (−1.86) [1.21]	−0.022*** (−2.62) [1.21]	−0.019 (0.62) [1.23]	0.054** (2.30) [1.21]	−0.022 (−0.65) [1.21]	−0.005 (−0.11) [1.23]
Export Sales Ratio												
Internal Ratio												
FSR*PD							0.218 (1.31) [1.10]	0.971*** (3.19) [1.16]	−2.090 (−1.62) [1.22]	2.001*** (2.63) [1.10]	−0.875 (−0.72) [1.16]	−1.657 (−0.82) [1.22]
FSR*PD^2							−0.261* (−1.74) [35.46]	−0.743*** (−2.71) [61.35]	1.847* (1.65) [60.24]	−1.661** (−2.42) [35.46]	0.686 (0.62) [61.35]	1.131 (0.65) [60.24]
F statistic	63.85***	47.23***	1.55	41.71***	16.23***	6.43***	20.19***	8.69***	0.57	38.78***	14.54***	5.71***
R^2	0.30	0.20	0.05	0.32	0.10	0.15	0.31	0.23	0.08#	0.33	0.10#	0.17#

*p 0.10; **p<0.05; ***p<0.01; #not significantly different (p>0.05) from regressions without interaction terms
Numbers in parentheses are t-statistics, number in brackets are variance inflation factors

statistical tests of our five models run on each year group independently to permit comparisons of slope coefficients over time, again using centered variables to test for interaction effects in Hypotheses 5a and 5b.

Hypotheses 1a and 1b predict that the coefficient of Product Diversity is positive and that the coefficient of the square of Product Diversity is negative. We find that Hypotheses 1a and 1b hold for ROS and Sales Growth in the first stable time period, then become non-significant in the second and third STPs. These findings suggest that the results for the complete pooled data set (Table 3) apparently were driven by results for the first stable time period, which covers the largest number of years and has a fairly strong predicted relationship. Although Product Diversity itself varied little over time (Table 1), it seems to lose its impact on performance after 1987, suggesting that while Itami *et al*. (1982) may have reflected their studied time period accurately, the Japanese context has changed since that time in a way that influences corporate strategy-performance relationships.

Hypothesis 2, which predicts that Foreign Sales Ratio will positively affect performance, is tested for the same three STPs. The coefficient of FSR is negative and significant for the first two STPs in the regressions of return on sales. The hypothesis is supported for the first year group when performance is measured by Sales Growth, but we see non-significant results in STPs 2 and 3. Again, we see that the initial regressions on the complete data set were dominated by the significant results for the first and longest STP, but these initial aggregate analyses hid the changing patterns shown in Table 4.

Hypothesis 3 predicts that performance is positively related to Export Sales Ratio. Hypothesis 3 is supported in the first STP for return on sales, an effect also hidden in the aggregate analyses reported in Table 2. The coefficients for Export Sales Ratio are non-significant and Hypothesis 3 is not supported for STPs 2 and 3. Note that our informal prediction prior to Hypothesis 3 that effects of ESR would be greatest in earlier times is shown to be accurate for ROS.

Hypothesis 4 suggests that performance is positively related to the ratio of international subsidiary sales to total foreign sales. The coefficient of Internal Ratio is significant but negative for the first two time periods for ROS and non-significant for the third. IR is significantly and positively related to Sales Growth in the third STP only. Overall, Hypothesis 4 is not supported. The results for IR mirror those for FSR when performance is measured by profitability, suggesting that relatively more international sales by internalized overseas operations are associated with lower profitability. Greater IR is associated with increased sales growth, at least at certain times, but interestingly, not in the same STP as FSR. Again, changes in coefficients in the dis-aggregated analyses in Table 4 provide a basis for very different interpretations than do the full-sample results in Table 3.

Hypotheses 5a and 5b hold that the multiplicative interaction of multinational diversity and product diversity is negatively related to performance while the interaction with the quadratic term is positively related to performance, essentially "flattening the curve" of the Product Diversity main effects. In the full sample test, we found that the non-significant explanatory power of the interaction term suggested that no true interaction took place. In the dis-aggregated sample case, we find that in some STPs a small but significant interaction effect does occur. Using centered variables to reduce multi-collinearity effects, we find significant (but small) increased explanatory power for ROS in STPs 1 and 2, and for Sales Growth in STP 1. In these equations, we see changes in levels of significance for main effects, but the signs on the interactive terms are the same as those on the Product Diversity and Product Diversity^2 main effects. Hypotheses 5a and 5b are not supported, as the signs are contrary to those predicted, and we could interpret the interactions, such as they are, as leading to increased negative effects at high levels of combined diversity, where the negative product and negative multinational diversity effects are reinforcing.

In summary, results for model testing under the assumption of stable time periods show most hypotheses to be only partially supported, or find opposite but significant results. The finding that the significance levels and signs of the coefficients change over the different STPs supports the finding of significant differences in covariance matrices, supporting Hypothesis 7. It suggests that information in the original data set is being covered up by pooling of the data over the entire period. That strategic relationships change over

time is not difficult to grasp intuitively, but calls into question the (unstated) assumptions of long-term equilibrium in previous studies. For the keiretsu membership dummy variable we note that the intercepts for the two dummy variable values are significantly different in STP1. Again, though, the slope coefficients generally are not different from those in regressions without the keiretsu dummy variable and the R^2s of the equations change very little. While we see that both the independent and dependent variable means are at times significantly different between the two groups, the addition of a keiretsu-context variable does not greatly change the diversity strategy – performance relationship. We also note that keiretsu effects are consistent only in STP1. H6 predicts effects on both strategy and performance, but not the effect on their relationship, so it is not tested directly by the regressions.

DISCUSSION

Contextual effects. We see that our results for Japanese firms are not always as we hypothesized from previous studies. We may be seeing effects which relate to institutional effects in Japan as opposed to the Euro-American context, or to levels of development or comparative economic conditions, which change over time in all markets. An institutional effect which we do measure is keiretsu membership. This input indicates that keiretsu membership does affect levels of diversity, but has little consistent relationship to performance. In addition, the strategy – performance relationship does not appear to be much affected by keiretsu membership. This implies that the diversity – performance effects that we identify are systemic to the large manufacturing multinational firms that we test rather than specific to keiretsu or non-keiretsu affiliates. However, the significant difference in ESR and the significance of the effect of ESR on profitability when the keiretsu dummy is added, suggest that Hundley and Jacobson's (1998) analysis of export effects is accurate, and partially supports their performance findings. They mention, but do not test for, differences in the use of overseas operations, suggesting no significant difference. We do see higher use of overseas production as well as of exports by non-keiretsu firms. However, the negative performance effects that persist when the keiretsu dummy is added require additional consideration. Further analysis of the role of keiretsu membership by testing for true moderating or interactive effects in the regressions is a pressing concern for future testing.

The findings in Table 4 suggest that diversity strategy, performance, and the diversification relationship with performance for the Japanese firms in this study change over time. The findings of Itami *et al.* (1982) for an earlier period, combined with our results, suggest strong contextual effects on the relationship of diversity with performance in Japan. We find that our statistical definition of STPs is supported and is quite comparable with qualitative distinctions of separate time periods based on observable changes in the environment of the sample, a key concern in establishing the real effects of such time periods (Cool and Schendel, 1987). The first STP roughly corresponds to a period of currency weakness during which Japan made major advances in overseas sales, often with exports from the home country. The second STP was a period of a strengthening yen, a strong Japanese stock market and real growth rate, and much overseas investment in industrialized markets. The third STP was also a time of a strong yen, but it was the beginning of a period of stagnation in the Japanese domestic economy, political uncertainty and serious drops in the property and equity markets in Japan. This period has seen reduced overseas investment and a refocusing on the domestic Japanese economy. The characteristics of these periods are described below and summarized in Table 5. These changes in the economy suggest that indeed the changes across STP do reflect real changes in context.

Japanese real growth in GNP fluctuated through the early 1980s, bottomed out in 1987, then grew steadily until 1991, after which it dropped precipitously. The Japanese discount rate also bottomed out in 1987, then rose until 1990, after which it dropped steadily through 1996. Concurrently, the Plaza Accord of 1985 helped to alleviate the yen's previous weakness by establishing the downward revision of the dollar and led to a continuous strengthening of the yen until 1988 when the appreciation first stopped and then reversed until 1990, at which point the yen once more began a strong rise against the dollar. The three time periods identified for this study and

Table 5. The stable time periods

	Discount rate	Yen Value	Japan Real Growth Rate	Overseas Activity	Nikkei Index
STP 1: 1977–1986	Falling	Low	Fluctuating, but falling	Steady rise in exports with direct investment primarily in Asia	Steady increase
STP 2: 1987–1991	Rising	Rising through 1988, then strong but declining	Rising through 1990, then falling	Drop in exports through 1989, then increasing, with a sharp increase in direct investment in the US	"Bubble" growth and collapse
STP 3: 1992–1993	Sudden drop	Strong and rising	Low and falling	Increasing exports, sudden slowdown in direct investment	Much lower and fluctuating

the changing trends in yen value also correspond roughly to the overall rise in Japanese exports from the mid-1970s to 1985, their drop between 1986 and 1988, and their rise between 1989 and 1993. The strong yen after 1986 also corresponded to increased Japanese foreign direct investment until the "bubble economy" burst in 1990 and yen-denominated asset values collapsed, forcing repatriation of capital. Finally, the Nikkei stock average exhibited almost steady upward growth throughout the 1980s until reaching a peak at the end of 1989. Stock prices then began falling as fast as they had risen, until plateauing in 1992. Johnston and McAlevy (1998) provide a detailed analysis of the effect of the equity market bubble on cross-shareholdings in the six horizontal keiretsu or kigyoshudan which we have studied.

Defining a clear cause and effect relation between exchange rate movements, GDP growth, equity market growth, changing levels of cross-shareholdings, and a large number of other macro-economic variables and the variables of this study is beyond our scope. However, we consider it likely that such relationships are the basis for the stable time periods found here. The existence of periods of consistent trends and major inflection points between periods in the general economy reinforces the idea that stable time periods and corresponding inflection points would be present in MNE variables as well. Thus we see increasing or stable profitability in the first two STPs, and a sharp drop in STP3. Sales Growth declines steadily from period to period, and the added variable of Asset Growth reflects the "bubble years" with a peak in STP2.[9] We see little change in product diversity over the entire time frame, but a steady rise in sales by overseas subsidiaries and corresponding drop in exports, possibly reflecting the revaluation of the yen over the latter part of the study. Of particular note, we see in Table 1 that ESR drops in the latter two STPs, at a period of strong yen and expensive exports, while FSR rises, as might be expected. Future studies of the direct effects of various measures of national economic and political activity on the strategies and performance of firms and as moderators of the strategy – performance relationship are essential. These variables may well interact with firm-level strategic variables to generate differences in performance to the same strategy. For instance, pursuing rents via exports may work well with a stable or declining currency, but may be overwhelmed by the effects of a strong currency.

[9] During the second STP, a strong yen and over-valued property and equity markets in Japan led to very high asset valuations for many Japanese firms across all industries.

Product diversity and performance. For the full sample, we find that the impact of Product Diversity is significant, if less so than has been found in some previous studies (Grant *et al*., 1988; Tallman and Li, 1996). This result is similar across the dependent variables, although significant only for profitability, and for the lagged and non-lagged independent variables. A first interpretation of these results is that, due to institutionalized organizational forms, internal product diversification strategies may not be seen as closely tied to performance for this sample as is commonly assumed. The keiretsu membership variable shows that product diversity is higher for non-keiretsu firms (as might be expected), while performance, is generally, but not significantly, higher for non-keiretsu firms as well. The effects of financial group membership are neither strong nor consistent over time. Again, though, explicit tests for a moderating role in the strategy – performance regressions should be made.

Our results also vary across time periods. In this case, the levels of product diversity are virtually constant, but the diversity – performance relationship changes dramatically. The end of a long period of fairly consistent GNP growth, weak currency, and high exports for Japan is covered by STP1. Under such stable conditions, intermediate levels of product diversity appear to be related to higher profitability and to some growth in sales, while high levels of diversity result in lower performance, similar to the findings of Itami *et al*. (1982). The sudden changes in 1986–87 which separate STP1 and STP 2 may reflect the boom in the Japanese domestic economy during a period of "bubble growth" in financial and real estate assets and domestic purchasing power. This was followed by sudden domestic pressures as a variety of social, political, and economic factors caused the beginning of a slowdown in the Japanese economy and the collapse of Japanese equity markets, coinciding with STP3. The non-significant performance effects of Product DIversity suggest that perhaps the magnitude of these fluctuations on all firms overrode a relatively minor impact of diversification choices on performance. The typically low explanatory power of product diversification (single digit R^2s in most studies) may simply be masked under such conditions.

International diversity. The negative relationships of FSR and IR with ROS for the whole sample are unexpected, given the usual findings (see Grant, 1987). However, the overall data represent a period of growth in overseas investment in other industrial countries by Japanese companies. If increasing FSR is the result of this increased foreign direct investment, its positive effect on Sales Growth and negative effect on ROS might reflect the effects of investment in market expansion, even of "buying market share." This suggests that profits are sacrificed, at least in the short term, in overseas markets in order to reduce prices and increase sales rapidly, and is supported further by the positive profitability effect of Export Sales Ratio. These combined results might be interpreted as meaning that international sales can improve income, but that the added costs of reliance on sales by overseas subsidiaries, compared to exports, result in reduced profitability. The general lack of impact or negatively significant relationship of international diversification with ROS also may support assertions that for at least some of this period, firms that were less dominant in Japan set up foreign operations to try to build an overseas presence (Mascarenhas, 1986), a reversal of the usual "diversity-drives-performance" argument which is only partially alleviated by a one-year lag. That non-keiretsu firms showed higher overseas sales (Table 1) tends to support this view.

We see the overall pattern reflected strongly in the first STP. Higher exports are tied to higher profitability but not overall sales growth, while increased sales by subsidiaries are tied to growth but to lower profitability. The transition from STP 1 to STP 2 represents a change in Japanese global activities from export to investment in association with a strengthened yen and international political pressures to reduce Japanese trade surpluses, and particularly coincides with the failure of exports to support profits, possibly due to price cutting to offset yen values. Limited use of final assembly plants to exploit a weak yen was replaced by massive investment in many value-added stages as the yen strengthened and Japan became a major outward investor. This might be seen as a transition from export-enhancing direct investment to export-replacement as the strong yen made Japanese manufactures prohibitively expensive in world markets, and we do see the size, if not the performance effects, of FSR and Export Sales Ratio moving in opposite

directions from STP1 to STP2. At the same time, the strong domestic economy in Japan in STP2 may explain why sales in overseas markets are not associated with sales growth — growth in domestic sales may well have dominated overseas performance, and overseas sales required profit sacrifices just to maintain position with a strong yen, whether using exports or foreign operations (which typically used major inputs from Japan in any case). In STP 3, the beginning of a period of domestic slowdown and a continued strong yen, Japanese growth slowed dramatically, exports suffered, international portfolio investment was recalled, and direct investment continued (at a slower rate) to increase non-yen value-added in manufacturing. This difficult condition may explain why, although neither higher FSR nor higher ESR had significant effects, relatively higher internalization led to growth in sales.

Interactive effects. The effects of the interactive terms in our last model are not in accordance with the proposed hypothesis. For the full sample, we see that the two modes of diversification act simultaneously, but without interaction. More or less of one type of diversity does not significantly change the relationship with performance of the other mode, although both together seem to reduce profitability at higher levels of diversity. As the multiplicative effects of product and geographical diversity get higher, we see improved performance, which then begins to drop at higher levels of combined diversity. In combination with the negative main effect of foreign sales ratio on profitability, it would seem that limited product diversity in the domestic Japanese economy could improve short-term profitability, while movement of operations overseas, combined with limited product diversity, could increase sales growth.

The disaggregated model shows weak interactive effects in STPs 1 and 2, indicating that moderate combined diversity benefits performance. We see moderate changes in significance of product diversity main effects on profitability when the interaction terms are present, but no real change in the negative effects of FSR. The main effects change little in the Sales Growth regressions when product terms are incorporated. Again, the benefit of not accepting time-wise homogeneity is indicated. The effects of interaction are weak, even when significant, and therefore hard to interpret. What does seem to be the case is that the eventual negative effect of product diversity and the negative effect of FSR on profitability work simultaneously. As FSR increases, the steepness of the rising and falling quadratic curve of Product Diversity is enhanced, but the overall pattern of effects does not change.

This situation leads to two possible interpretations of the small curvilinear interactive effects in the first two periods. One is that the positive effects of product diversity at low levels can counter the negative "market buying" effects of greater foreign operations, while the negative effects of higher levels of product diversity combine with and are enhanced by the continuing high costs of greater multinational diversity. A second, but not necessarily competing, interpretation is that levels of overall diversity which strain management capabilities beyond efficient levels are found only when diversity is particularly high in both modes, and neither alone is typically excessive for Japanese multinational firms. The STP 2 effects are most noticeable, as the main effects of product diversity alone are non-significant, but the interactive terms are highly significant for profitability. Recall that this was a period of rapid international investment as a strong yen made foreign assets seem a bargain even to Japanese firms which had not previously had major operations overseas, and a period of rapid investment in the domestic economy, possibly with more diversity in domestic investment (Johnston and McAlevy, 1998). Sudden diversifying expansion with little organizational preparation could be expected to result in lowered profitability. The general lack of significance for diversity in STP 3 may result from the collapse of Japanese equity and property markets in the early 1990s, leading to generally poor domestic performance which masked the effects of Product Diversity combined with some benefits (or at least the disappearance of negative effects) from previous investment in overseas markets. The lack of major interactive effects suggests that for these firms, the two types of diversity can safely be evaluated in isolation, although both have significant effects which tend to move in the same direction.

ANALYSIS AND CONCLUSIONS

We propose that we have made several contributions to the literature of diversification studies. First, we have shown that diversification strategy

effects on performance for a sample of Japanese manufacturing multinational firms can be significant, but vary over time. Second, we have shown that the performance effects of product and international diversification strategies are at times unexpected for our Japanese sample. We see also that while keiretsu-related firms have a different strategic profile from non-keiretsu firms, their diversity – performance relationship is not dramatically different, except in the case of export sales. Fourth, we used a methodology not previously applied to diversification studies that enabled us to compare directly changes in strategy and performance.

Our evidence shows that the relationship of product diversification strategies and results for Japanese manufacturing multinational firms vary over time, rather than being fixed relationships. We also see that product diversification strategies hardly vary over time, despite great changes in Japan which have significant performance effects. This, and the significant, if small, differences in means between keiretsu and non-keisetu firms, tend to confirm much of the anecdotal evidence about Japanese inter-firm relations and suggest that diversification studies need to address diversification pursued through network relationships and perhaps other less-than-totally-hierarchical means through finer grained distinctions of organization forms. Also, we find that multinational diversification is apparently less valuable in practice than in theory, at least over the short to medium term during periods of rapid economic change, and particularly for generating profits through economies of scope. This may be evidence that managing globally is more difficult than commonly thought. It may also suggest that developing foreign markets and then maintaining them for long-term policy reasons in the face of currency fluctuations and changing economic and political conditions, both home and abroad, requires strategic sacrifice — including, in this case, profitability. We have interpreted these results to suggest that product diversity is not a flexible strategy in Japan, which seems compatible with the literature on Japanese industrial organization (Johnston and McAlevy, 1998; Abegglen and Stalk, 1985), and that international diversity is used to accomplish alternative objectives – sometimes seeking growth at the expense of profits. Despite changes over time, the meaning and objectives of diversity strategies may vary across national groups and assumptions of generality made from studies of single nations appear to require careful interpretation. This result supports the findings of Geringer *et al*. (1989) for differential effects across continental groups. Direct comparisons across countries should be attempted with as much control for difference in external conditions as possible.

We find through our interpretation of Strategic Time Periods that developments in the home country can be associated with dramatic changes in the effects of both product and multinational diversity strategies. This suggests that, at least for Japan and perhaps for other countries which are highly dependent on international markets, studies of business and corporate strategy must incorporate longitudinal analysis to detect the effects of changing environmental conditions on strategy. Single year data, averaging data over time, or improper pooling of data can lead to results which are less generalizable than is often assumed. As environmental conditions fluctuate, strategies also seem both to vary and to have varying effects on performance. STP analysis of longitudinal effects on U.S. or European firms appears to be essential as an extension of the many previous static studies in those regions. However, we also see that further analysis is needed on these issues. Specific analysis of changes over time can reveal the dynamics of strategic change. Also, more detailed analysis of exogenous inputs could reveal much. If statistical changes can be associated with specific policy changes (e.g., exchange rate reversals, export incentives, voluntary restraint agreements), an industry perspective on diversification strategy gains renewed strength. Even more appropriate to further analysis of our findings would be identification of stable time periods from detailed macro-economic, political, cultural, etc. models and the association of firm-level strategic change with these exogenously and quantitatively determined (as opposed to our endogenously and inferentially determined) periods. Within these periods, we can test for moderating effects of specific variables, but we expect these, too, to change across different stable time periods. We can also look for industry- or firm-related trends which may be confounding relationships in the larger data set. Finally, as stated by Tallman and Li (1996), the need to look at more complex variable relationships, perhaps through the use of endogen-

ous explanatory variables in a set of structural equations, is becoming more apparent in diversification studies. Simple assumptions of independence of input effects are hard to support as more and more "strategy variables" are brought together.

We developed our hypotheses on a theoretical foundation of resource-based and transaction cost economics, theory developed from observation of Euro-American populations of firms, and on the basis of empirical findings for these same populations. The hypotheses were only partially supported in our study of large Japanese manufacturing multinational firms. This is most noticeable for the regression of profitability on foreign sales ratio. Do these results imply that the two theories either are not correct or are applicable only within the Euro-American context in which they were developed? This seems unjustifiably extreme. More likely our results, combined with various other studies of foreign direct investment and international alliances, suggest that the specific applications of these theories vary. Product diversification can be managed in different ways. The objectives of international expansion may vary as well. For instance, it seems improbable that Japanese multinationals feel that they truly experience consistent negative outcomes from foreign direct investment, given the extent and continuing nature of such investment. Our assessment of the relative balance of profitability and growth suggests that a more likely explanation is that the strategic objectives of such investment are different for Japanese firms, both at different times and as compared to the Euro-American focus on profitability measures. Likewise, unexpected impacts from product diversity do not mean necessarily that economies of scope do not exist or that transactions are not costly in Japan, but that the means of diversification and perhaps the management of the process may differ. The interactions of the two modes of diversity, while not strong, suggest a more integrated approach to diversification, not a lack of attention to core competencies or transactional efficiency. However, while the theories themselves may apply in Japan – even universally – their application would seem to be very dependent on macroeconomic, cultural, political, and other contextual factors. These issues require direct testing.

Finally, we look at possible managerial implications from this research. For companies competing in global industries, an understanding of the differences in diversification strategies and their performance effects could have a major influence on competitor analysis. If Japanese, and possibly European and other Asian, companies collectively use different approaches to leveraging their capabilities across product markets, they should be analyzed on their own terms, not compared against the very different strategies of American industry. In addition, multinationals contemplating multinational expansion through acquisition or start-up might consider the strategies in their target countries before assigning particular values to individual firms and in developing strategies in foreign subsidiaries. Simplistic generalization of strategic techniques should be treated with appropriate skepticism, and strategic change in response to changing environments over both space and time must be emphasized. This aspect of the study should raise questions concerning the "one size fits all" models of strategy which are widely touted to businesses.

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REFERENCES

Aaker, D. A. and R. Jacobson (1987). 'The role of risk in explaining differences in profitability', *Academy of Management Journal*, **30**, pp. 277–296.

Abegglen, J. and G. Stalk (1985). *Kaisha: The Japanese Corporation*. Basic Books, New York.

Barney, J. B. (1991). 'Firm resources and sustained competitive advantage', *Journal of Management*, **17**, pp. 99–120.

Bartlett, C. A. and S. Ghoshal (1989). *Managing across Borders: The Transnational Solution*. Harvard Business School Press, Boston, MA.

Bergh, D. D. and G. F. Holbein (1997). 'Assessment and redirection of longitudinal analysis: Demonstration with a study of the diversification and divestiture relationship', *Strategic Management Journal*, **18**(7), pp. 557–572.

Bettis, R. A. (1981). 'Performance differences in related and unrelated diversified firms', *Strategic Management Journal*, **2**(9), pp. 379–383.

Buckley, P. J. (1988). 'The limits of explanation: Testing the internalization theory of the multinational

enterprise', *Journal of International Business Studies*, **19**(2), pp. 181–194.
Chandler, A. (1962). *Strategy and Structure*. MIT Press, Cambridge, MA.
Chang, S. J. (1995). 'International expansion strategy of Japanese firms: Capability building through sequential entry', *Academy of Management Journal*, **38**(2), pp. 383–407.
Chi, T. (1994). 'Trading in strategic resources: Necessary conditions, transaction cost problems, and choice of exchange structure, *Strategic Management Journal*, **15**(4), pp. 271–290.
Christensen, H. K. and C. A. Montgomery (1981). 'Corporate economic performance: Diversification strategy versus market structure', *Strategic Management Journal*, **2**(4), pp. 327–343.
Conner, K. R. (1991). 'A historical comparison of resource-based theory and five schools of thought within industrial organization economics: Do we have a new theory of the firm?', *Journal of Management*, **17**, pp. 121–154.
Cool, K. and D. E. Schendel (1987). 'Strategic group formation and performance: The U.S. pharmaceutical industry, 1963–82', *Management Science*, **33**, pp. 1102–1124.
Cosset, J. C. and T. H. Nguyen (1991). 'The measurement of the degree of foreign involvement', University of South Carolina CIBER Working Paper Series, D-91–01.
Daniels, J. D. and J. Bracker (1989). 'Profit performance: Do foreign operations make a difference?', *Management International Review*, **29** (1), pp. 46–56.
Datta, D. K., N. Rajagopalan and A. M. A. Rasheed (1991). 'Diversification and performance: Critical review and future directions', *Journal of Management Studies*, **28**(5), pp. 529–558.
Dubofsky, P. and P. Vandarajan (1987). 'Diversification and measures of performance: Additional empirical evidence', *Academy of Management Journal*, **30**, pp. 597–608.
Dunning, J. H. (1993). *The Globalization of Business*. Routledge, London.
Fama, E. F. and M. Miller (1984). *The Theory of Finance*. Dryden, Hinsdale, IL.
Fladmoe-Lindquist, K. and S. B. Tallman (1994). 'Resource-based strategy and competitive advantage among multinationals'. In P. Shrivastava, A. Huff, and J. Dutton (eds.), *Advances in Strategic Management*, Vol. **10a**, JAI Press, Greenwich, CT, pp. 45–72.
Flath, D. (1993). 'Shareholding in the keiretsu, Japan's biggest groups,' *Review of Economics and Statistics*, **75**, pp. 249–257.
Franko, L. G. (1989). 'Unrelated product diversification and global corporate performance'. In A. R. Negandi and A. Savara (eds.), *International Strategic Management*. Lexington Books, Lexington, MA, pp. 221–241.
Geringer, J. M., P. W. Beamish and R. C. daCosta (1989). 'Diversification strategy and internationalization: Implications for MNE performance', *Strategic Management Journal*, **10**(2), pp. 109–119.
Grant, R. M. (1987). 'Multinationality and performance among British manufacturing companies', *Journal of International Business Studies*, **Fall**, pp.79–89.
Grant, R. M., A. P. Jammine and H. Thomas (1988). 'Diversity, diversification, and profitability among British manufacturing companies, 1972–84', *Academy of Management Journal*, **31**(4), pp. 771–801.
Hamel, G. and C. K. Prahalad (1985). 'Do you really have a global strategy?', *Harvard Business Review*, **63**(4), pp. 139–140.
Hill, C. W. L. and W. C. Kim (1988). 'Searching for a dynamic theory of the multinational enterprise: A transaction cost model', *Strategic Management Journal*, Summer Special Issue, **9**, pp. 93–104.
Hitt, M. A., R. E. Hoskisson and H. Kim (1997). 'International diversification: Effects on innovation and firm performance in product-diversified firms', *Academy of Management Journal*, **40**, pp. 767–798.
Hoskisson, R. E., M. A. Hitt, R. A. Johnson and D. D. Moesel (1993). 'Construct validity of an objective (entropy) categorical measure of diversification strategy', *Strategic Management Journal*, **14**(3), pp. 215–235.
Hundley, G. and C. K. Jacobson (1998). 'The effects of the keiretsu on the export performance of Japanese companies: Help or hindrance?, *Strategic Management Journal*, **19**(10), pp. 927–937
Itami, H., T. Kagono, H. Yoshihara and A. Sakuma (1982). 'Diversification strategies and economic performance', *Japanese Economic Studies*, **11**(1), pp. 78–110.
Jaccard, J., R. Turrisi, and C. K. Wan (1990). *Interaction Effects in Multiple Regression*. Sage, Newbury Park, CA.
Johansson, J. K. and J. E. Vahlne (1977). 'The internationalization process of the firm: A model of knowledge development and increasing foreign market commitments,' *Journal of International Business Studies*, **8**(Spring/Summer), pp. 23–32.
Johansson, J. K. and G. S. Yip (1994). 'Exploiting globalization potential: U.S. and Japanese strategies', *Strategic Management Journal*, **15**(8), pp. 579–601.
Johnston, S. and L. McAlevy (1998). 'Stable shareholdings and Japan's bubble economy: An historical overview', *Strategic Management Journal*, **19**(11), pp. 1101–1107.
Jones, G. R. and C. W. L. Hill (1988). 'Transaction cost analysis of strategy-structure choice', *Strategic Management Journal*, **9**(2), pp. 159–172.
Joreskog, K. G. and D. Sorbom (1989). *LISREL 7 A Guide to the Program and Applications*. SPSS, Inc., Chicago, IL.
Kim, W. C., P. Hwang and W. P. Burgers (1989). 'Global diversification strategy and corporate profit performance', *Strategic Management Journal*, **10**(1), pp. 45–57.
Kim, W. C., P. Hwang and W. P. Burgers, (1993). 'Multinationals' diversification and the risk-return trade-off', *Strategic Management Journal*, **14**(4), pp. 275–286.
Kogut, B. (1985). 'Designing global strategies: Profiting

from operation flexibility', *Sloan Management Review*, **27**(1), pp. 27–38.
Kojima, K. (1978). *Direct Foreign Investment.* Groom Helm, London.
Lawrence, R. Z. (1991). 'Efficient or exclusionist: The import behavior of Japanese corporate groups,' *Brookings Papers on Economic Activity*, pp. 311–341.
Mahoney, J. T. and J. R. Pandian (1992). 'The resource-based view within the conversation of strategic management', *Strategic Management Journal*, **13**(5), pp. 363–380.
Mascarenhas, B. (1986). 'International strategies of non-dominant firms', *Journal of International Business Studies*, **17**(1), pp. 1–26.
Michel, A. and I. Shaked (1984). 'Does business diversification affect performance?' *Financial Management*, **13**(4), pp. 18–25.
Michel, A. and I. Shaked (1986). 'Multinational corporations vs. domestic corporations: Financial performance and characteristics,' *Journal of International Business Studies*, **16**, pp. 89–106.
Nelson, R. R. and S. G. Winter (1982). *An Evolutionary Theory of Economic Change.* Belknap Press, Cambridge, MA.
Palepu, K. (1985). 'Diversification strategy, profit performance and the entropy measure', *Strategic Management Journal*, **6**(3), pp. 239–255.
Peteraf, M. (1993). 'The cornerstones of competitive advantage: A resource-based view', *Strategic Management Journal*, **14**(3), pp. 179–191.
Porter, M. E. (1990). *The Competitive Advantage of Nations.* Free Press, New York.
Prahalad, C. K. and G. Hamel (1990). 'The core competence of the corporation', *Harvard Business Review*, **68**(3), pp. 79–91.
Ramaswamy, R. (1993). 'Multinationality and performance: An empirical examination of the moderating effect of configuration'. In D. P. Moore (ed.), *Academy of Management Best Papers Proceedings*, pp. 142–146.
Robins, J. A. and M. F. Wiersema (1995). 'A resource-based approach to the multibusiness firm: Empirical analysis of portfolio interrelationships and corporate financial performance', *Strategic Management Journal*, **16**(4), pp. 277–299.
Rumelt, R. P. (1974). *Strategy, Structure, and Economic Performance*. Harvard University Press, Cambridge, MA.
Rumelt, R. P. (1984). 'Towards a strategic theory of the firm'. In R. B. Lamb (ed.), *Competitive Strategic Management*. Prentice-Hall, Englewood Cliffs, NJ, pp. 566–570.
Sayrs, L. W. (1989). *Pooled Time Series Analysis*. Sage, Newbury Park.
Schmalensee, T. (1985). 'Do markets differ much?', *American Economic Review*, **75,** pp. 341–351.
Siddharthan, N. S. and S. Lall (1982). 'Recent growth of the largest U.S. multinationals', *Oxford Bulletin of Economics and Statistics*, **44**(1), pp. 1–13.
Stafford, D. C. and R. H. A. Purkis (1989). In J. Stopford (ed.), *Directory of Multinationals*. Macmillan, London.
Stopford, J. M. (1983). *The World Directory of Multinational Enterprises, 1982–1983.* Macmillan, London.
Stopford, J. M. and J. H. Dunning (1983). *The World Directory of Multinational Enterprises, 1982–1983: Company Performance and Global Trends*. Gale Research Company, Detroit, MI.
Tallman, S. and J. T. Li (1996). 'The effects of international diversity and product diversity on the performance of multinational firms', *Academy of Management Journal*, **39**(1), pp. 179–196.
Teece, D. J. (1982). 'Towards an economic theory of the multiproduct firm', *Journal of Economic Behavior and Organization*, **3**, pp. 39–63.
Teece, D. J. (1986). 'Transactions cost economics and the multinational enterprise: An assessment', *Journal of Economic Behavior and Organization*, **7**, pp. 21–45.
Teece, D. J., G. Pisano and A. Shuen (1997). 'Dynamic capabilities and strategic management', *Strategic Management Journal*, **18**(7), pp. 509–534.
Weiner, N. and T. Mahoney (1981). 'A model of corporate performance as a function of environmental, organizational, and leadership influences', *Academy of Management Journal*, **24**, pp. 453–470.
Williamson, O. E. (1975). *Markets and Hierarchies: Analysis and Antitrust Implications.* Free Press, New York.
Yip, G. S. (1992). *Total Global Strategy.* Prentice-Hall, Englewood Cliffs, NJ.
Yoshinari, M. (1992). 'The big 6 horizontal keiretsu,' *Japan Quarterly*, **34**(2), pp. 186–199.

APPENDIX: INDUSTRY GROUPS

Group#	Group Name	N Firms	Constituent Industries
1	Consumer Products	12	Apparel Beverages Food Publishing and Printing Soaps and Cosmetics Toys
2	Transport	21	Industrial and Farm Equipment Motor Vehicles and Parts Transport Equipment
3	High Tech and Electronics	26	Computers and Office Equipment Electronics Scientific Equipment
4	Metals and Industrial Materials	16	Building Materials Metal Products Metals
5	Chemicals and Related	16	Chemicals Pharmaceuticals Rubber and Plastics
6	Primary Industries	7	Forest Products Mining and Crude Oil Petroleum Refining
7	Textiles	9	Textiles