Evaluation of subsidiary marketing performance: combining process and outcome performance metrics

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Abstract Issues in evaluating marketing performance and devising appropriate metrics for measurement have taken center stage in marketing thought and practice in recent years. We propose an empirical model that enables a multinational enterprise (MNE) to assess the marketing performance of its subsidiaries, taking into explicit consideration the fact that tactical actions by subsidiaries contribute to the creation of assets that can be harnessed for marketing outcomes. Thus, our model captures the asset creation abilities of marketing expenditures and also takes in to account the environmental differences of the context in which each MNE subsidiary operates. We evaluate comparative, overall, and process-level (creation of market assets and market yield) marketing performance in the context of multi-country operations. This simultaneous examination of marketing process and marketing outcome performance enables a global corporation to gain strategic, operational, and diagnostic insights into the performance of its subsidiaries. Our approach is empirically illustrated with an evaluation of the marketing performance of subsidiaries of a large global corporation.

There is now more pressure on marketing scholars and practitioners to demonstrate that the marketing function contributes to shareholder value for the firm (Doyle 2000; Rust et al. 2004). The importance of justifying marketing investments and the metrics necessary to measure marketing performance thus have taken center stage. However, though extant conceptual models link marketing expenditures and tactical actions to the creation of marketing assets—which can be harnessed over the long-term (Rust et al. 2004; Srivastava et al. 1998, 1999)—few empirical studies relate marketing expenditures to marketing performance through the creation of market-based assets.

At the same time, the justification of marketing expenditures and the assessment of marketing performance is particularly complex for multinational enterprises (MNE). Although MNE performance assessment is clouded by various economic and accounting exposure risks, such as translation and transaction risks (Shapiro 2006), such firms must separate the unique contributions of the marketing functions conducted by their subsidiaries. Country-level operations augment the complexities of both the measurement process and the evaluation of global performance and therefore require unique adaptations to the design of marketing performance evaluation systems (Hewett and Bearden 2001). Further complicating these assessments, little consensus exists about how to measure

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the long-term effects of marketing activities (Dekimpe and Hanssens 1995). Measuring and reporting marketing performance to external stakeholders certainly is important (e.g., Doyle 2000), but global MNEs must also consider measures of marketing performance within and across their various subsidiaries.

Financial performance assessments of the overall corporation provided to shareholders are facilitated by legal and tax guidelines, but effective evaluations of marketing performance across the global organization, even for internal purposes, encounter several challenges. For example, the marketing performance of a subsidiary at any given time consists of the cumulative impact of various marketing processes and activities. Marketing measures that reflect only simple output–input ratios do not capture this complexity. Moreover, environmental factors such as competitiveness and regulatory constraints affect country-level operations, so these factors must be taken into account when comparing subsidiaries that operate in different national environments (Carpano et al. 1994; Porter 1986).

We examine country-level marketing performance within a framework of marketing processes and outcomes in the context of a global firm's country-level operations. Our framework explicitly considers the creation of market assets as an intermediate outcome between marketing expenditures and marketing performance and thus captures the impact of such long-term assets on marketing performance. As noted by Rust et al. (2004, p. 77), "marketing actions both create and leverage market-based assets." Thus, we posit that marketing performance of global subsidiaries relies on dual marketing processes within unique environments: market asset creation and market yield processes. Market asset creation refers to all activities undertaken by an organization to attract and retain customers, develop markets through advertising and distribution programs, and create and sustain brands. Market yield processes refer to the deployment of market-based assets. Considering these two processes, we propose a strategic classification matrix that provides a better understanding of the performance and operations of subsidiaries, given the environmental variations in which their marketing strategies get executed. We illustrate the model using data from the country-level marketing operations of a large MNE.

Marketing performance assessment in the global context

Empirical assessments of subsidiary performance within the international business and marketing literatures are relatively sparse. The neglect of the individual firm, as noted by Craig and Douglas (2000), may occur because researchers simply assume that leveraging a domestic positioning will help the firm succeed in international markets as well. Or it could be the lack of access to data on subsidiary operations.

Prior literature addresses the strategy–performance link in international business according to four perspectives: dynamic capability, standardization, configuration–coordination, and integration–responsive (Luo 2002; Zou and Cavusgil 2002). Each perspective yields insights into assessments of global marketing performance and contributes to the development of market creation and market yield processes as bases for evaluating subsidiary performance. The dynamic capability perspective calls for building and leveraging capabilities across the MNE network of subsidiaries (Luo 2002), so performance assessment involves creation-oriented and yield/exploitation processes. The standardization perspective entreats MNEs to seek scale economies by standardizing their marketing activities across subsidiaries and adapting marketing strategy to relevant environmental differences (Syzmanski et al. 1993). Integration–responsive (Zou and Cavusgil 2002) and configuration–coordination (Bartlett and Ghoshal 1989; Craig and Douglas 2000) perspectives instead suggest the need to leverage location-specific advantages and take explicit account of firm- and country-specific advantages enjoyed by each subsidiary while coordinating activities across subsidiaries to gain relevant synergies and control location-specific advantages and disadvantages.

Literature describing these four perspectives indicates several key conclusions. First, broadened measures of marketing performance should include both tangible and intangible factors (e.g., Bharadwaj et al. 1993; Srivastava et al. 1998). Second, marketing performance assessment must not only compare the relative performance of each subsidiary but also focus on processes that lead to superior performance (Birkinshaw and Morrison 1995; Tallman 1991; Zhao and Luo 2002), because marketing performance is not simply a direct relationship between inputs and outputs but involves developing enduring tangible (e.g., branded product lines) and intangible (e.g., brand awareness) market-based assets that can contribute to superior performance (Srivastava et al. 1998).

Third, traditional measures of performance should be reexamined to create better measurement models. The dynamic capability perspective, which addresses temporally and contextually contingent market-based assets, recommends developing marketing metrics within the context of the creation and deployment of existing market-based assets. Thus, marketing performance assessments must deal with how these assets prompt financial outcomes such as sales, profits, and cash flows (Srivastava et al. 1998). Marketing expenditures create market-based assets that can maximize the revenue and other outputs of long-term marketing investments. Keh et al. (2006) show in the

context of services that raw marketing inputs may relate to final revenue outcomes through intermediate processes.

Fourth, in addition to a focus on assuring shareholders of marketing performance, measurement approaches should provide a diagnostic tool for the company. Performance assessment is a critical component of the marketing control process, so assessments should identify areas that need improvement, expenses to curb, and investments to make as well as provide a fair mechanism for evaluating divisional, segment, or, in the case of a MNE, subsidiary (Kim and Mauborgne 1993; Taggart 1997) performance.

Subsidiary marketing performance assessment: a model

As Zou and Cavusgil (2002) note, each perspective in international business literature offers a partial explanation of how to enhance marketing performance. An integrative approach should include not only direct impacts on performance but also processes that contribute to intermediate and final outcomes. Borrowing insights from the dynamic capability perspective, we take into account the processes of marketing asset creation and deployment and thus emphasize explicit contributions to marketing performance. With the standardization perspective, we can examine the same or similar variables across various

subsidiaries; the integration–responsiveness and configuration–coordination perspectives reiterate the need for appropriate environmental controls that may affect subsidiary operations and contribute to differential performance by subsidiaries of the same MNE.

To understand overall marketing performance, marketing operations could be considered as two natural sub-processes processes (market creation and market yield) for measuring the individual performance of each subsidiary (Fig. 1). Because a country's operations are contextually and temporally contingent, the MNE must examine its overall performance in the context of the process-level activities of creating and deploying market-based assets and seek to coordinate these activities globally to achieve synergy with subsidiaries (Zou and Cavusgil 2002). We elaborate on these processes with specific reference to global marketing operations.

Market asset creation process

Although market assets are created through a variety of strategic and tactical marketing actions, the focus is on marketing expenditures and their impact on market asset creation (Rust et al. 2004). Strategic and tactical marketing activities may include personal selling, advertising, and distribution (Anderson 1995), designed to create market-

Figure 1 Two-stage process for subsidiary marketing performance assessment.
Note: Market asset creation efficiency relies on two inputs (marketing personnel and marketing expenditures) and three outputs (number of brand-aware customers, number of retail outlets, and number of industrial customers). Market yield efficiency uses three inputs (number of brand-aware customers, number of retail outlets, and number of industrial customers) and three outputs (sales, market share, and profits).

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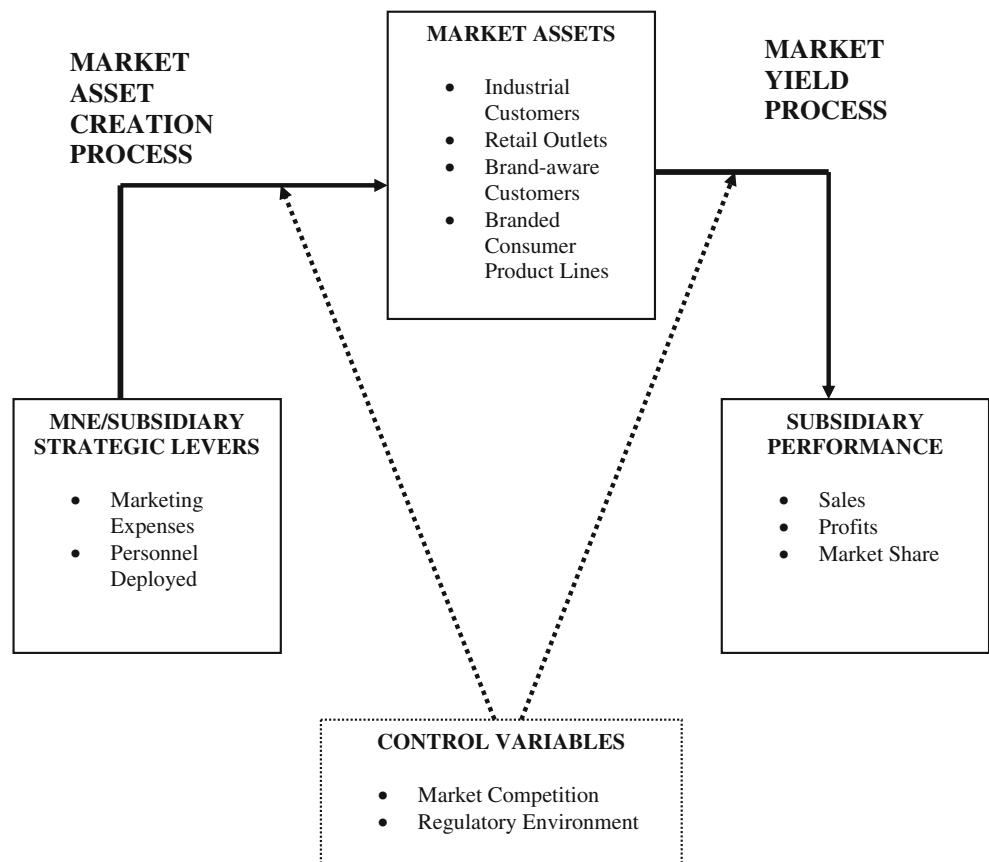
based assets such as distribution networks, brand awareness, brand preference, and a customer base. Marketing expenditures on strategic and tactical marketing activities not only affect immediate sales, such as those from a short-term promotion campaign, but also develop market assets that are more long term in their nature and impacts (Kamakura et al. 1991; Reinartz and Kumar 2003).

These marketing expenditure effects on the creation of market-based assets can be observed within each national context of the MNE's operations. Within each country, the subsidiary expends financial and personnel resources to create a marketing network and other relational market-based assets. Successful market creation efforts enable an extensive marketing network, the fruits of which can be measured by, among other things, the brand presence in country markets and the development of key relational accounts (Yip and Madsen 1996).

Market yield processes

Market yield activities aim predominantly to convert market assets into increased sales and profits. Firms differ in terms of how effectively they can harness the assets at their disposal. In the case of an MNE, different subsidiaries may have different assets, perhaps due to the environment in which they operate or their efforts to translate marketing expenses into long-term, market-based investments.

A MNE's global operations consist of subsidiaries operating in different environments with possibly different priorities to capture sales and revenue from existing market assets. Newer subsidiaries or those in markets with tremendous untapped potential may focus on creating market assets; those with a well-developed marketing network or that operate in mature markets might focus on capturing value from assets already developed. When a sufficient market-based asset network exists, the subsidiary's attention shifts to asset deployment or utilization, which involves optimizing all sources of rent, including additional shares of customers' wallet, improved profit margins from marketing activities, and a growing share of the overall market. As the market approaches saturation, the marginal cost of acquiring new customers increases, so the subsidiary's attention shifts to market yield activities, because market asset creation activities require tremendous efforts and expenditures (e.g., extending the brand to new markets).

Market yield processes also involve translating the subsidiary's asset-building efforts into asset-deployment efforts. Yet the success of a firm's marketing strategy and its resultant development of a marketing network and loyal customer base do not automatically confer enhanced sales, profits, or market share. Instead, the firm operates in a dynamically changing environment, and the market knowledge and lessons learned aid its market yield.

Strategic classification

Traditionally, marketing research examines either the overall performance of the firm's marketing function or an individual element. For example, research on portfolio models (Wind et al. 1983) and market orientation (Kohli and Jaworski 1990) discusses the role of marketing within the functions of the firm. Similarly, research that models the pattern of responses to direct marketing campaigns (Basu et al. 1995) examines processes within the marketing function.

Recent research suggests that the links among marketing expenditures, the creation of market assets, and market yield may be quite complex (Rust et al. 2004). Marketing expenditures may not lead to the strategic development of market assets, or market assets may not be adequately harnessed to yield the desired marketing performance objectives, such as sales and profitability (Sheth and Sisodia 2002). Both the effectiveness and the efficiency of marketing activities may be called into question when evaluating these links (Keh et al. 2006; Sheth and Sisodia 2002). For example, Dowling and Uncles (1997) challenge the effectiveness of marketing expenditures, especially on customer reward programs, for developing a loyal customer base. Market creation efforts may not produce the desired results if the strategies are unsuccessful or inefficient because of, say, poor implementation or environmental factors. Reinartz and Kumar (2000) show that loyal customers are not always the most profitable, especially if the costs to serve them are not less than those for new customers. That is, market yield efforts might not contribute to the desired performance objectives, such as profitability, because of misdirected marketing efforts or environmental factors (Dowling and Uncles 1997).

In global operations, the effectiveness and efficiency of market asset creation and market yield processes result from not only strategic directions or tactical implementation but also the specific national environmental context of each subsidiary. A firm may expend considerable resources on marketing activities but not be able to create a strong brand in a specific country, especially if customers have low switching costs and/or regulations curtail the marketing mix activities in which the firm can engage. In emerging markets, for example, the absence of long-term contracts facilitates customer switching among mobile telephone service firms. In Scandinavia, restrictions on advertising affect the range of options for marketers and curtail market asset creation.

Any assessment of the marketing performance of subsidiaries, especially market assets and market yield efforts, must partial out the effects of environmental differences, including competition, regulation, and the country infrastructure necessary for marketing. Thus, instead of a simple relation between inputs and outputs, performance evaluation must consider the specific objec-

tives of the subsidiary as well as the unique environment in which it operates. For example, MNE subsidiaries in all countries may not focus on the same marketing objectives. Some may be sales subsidiaries and perform an outpost function in which they coordinate independent distributors and service contractors. Others may be engaged in domestic account building activities.

Our examination of performance in terms of market assets and market yield enables the classification of country operations into four cells (Fig. 2). Starting from the upper right-hand quadrant, the first cell is "world-class operations"; country operations manage both the creation of market assets and market yield very effectively. They represent the best asset creation and deployment practices, and learning organizations should use them as standards to be emulated.

Moving counterclockwise, the second cell, "miners," represents country operations that manage market yield (deploy assets) very effectively but are unable to create market-based assets efficiently. Firms engaged in the short-term maximization of sales, especially through strategies such as price promotions, may fall into this cell. Their activities and expenditures produce results, but in the long term, their lack of attention to enduring market-based assets compromises their strategic position. Such subsidiaries are especially vulnerable to environmental threats, including changes in the competitive structure, and a well-positioned competitor with a clear focus on market-based assets can hinder their ability to optimize sales even in the short term.

The third cell is labeled "prospectors," whose country-level operations display high asset creation performance but low market yield (asset deployment). Prospectors focus on customer acquisition indiscriminately but obtain low yields from each customer for several reasons. First, the economic

conditions in the target market may be so unfavorable that customers buy smaller quantities of the product. Second, an emphasis on customer acquisition may lead to marginal customers who are light users of the product and less likely to convert into loyal customers. Third, trade decisions, such as retailers' display decisions, could influence or negate high brand equity in that country (Buchanan et al. 1999).

Subsidiaries falling into the fourth cell, "poor operations," require extensive attention to bring about improvements in both their asset creation and market yield (asset deployment) processes. Poor operations may result from improper marketing processes or unfavorable environmental conditions (e.g., economic or political stress).

The paths A through E in Fig. 2 identify the ways in which subsidiaries falling short of world-class operations could improve their performance. Poor operations result from poor performance in both market creation and market yield activities, so subsidiaries should focus on either the creation of market assets through suitable expenditures to generate new accounts (path A) or improving market yield from existing accounts (path B)—or both (path E). Prospectors need to focus on improving their market yield processes (path C), and miners must supplement existing accounts with new ones (path D) to become world-class.

We do not classify the entire MNE into performance assessment cells; it may have world-class operations compared with its competitors, but its subsidiaries still may fall into another cell. Coca-Cola's subsidiaries demonstrate world-class performance in Mexico (highest per capita consumption) but prospector status in Peru (Inka Cola is the top-selling brand). Dell demonstrates world-class performance in the USA but is a miner in India.

The classification provides a static view of subsidiary performance. If all subsidiaries were established at the same time, faced the same market and environmental conditions, and provided similar inputs, it would be a snapshot of the absolute performance of each. However, subsidiaries inevitably face different market and environmental conditions, and the MNE evolves by establishing new subsidiaries. If in the MNE evolution, all subsidiaries may be considered "mature" because they have been in operation for several years, the classification provides a good summary of relative performance. Market and environmental differences also can be controlled for in the analytical model.

Finally, the classification is merely a diagnostic tool. Subsidiaries could move from being prospectors to world-class operations or, with sufficient impetus, to miners. The snapshot of performance at one point of time thus offers subsidiaries recommendations for improving their performance so that they may move to a different performance quadrant.
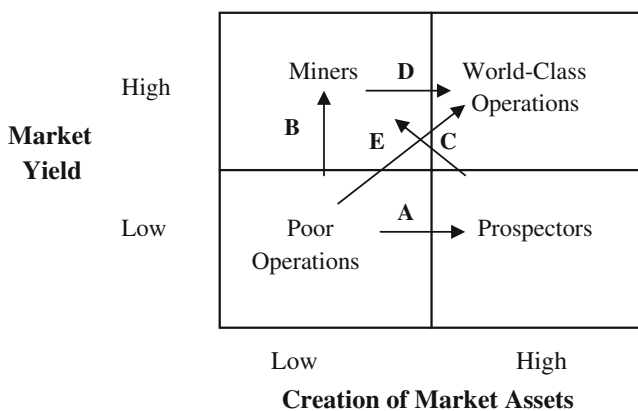
Figure 2 Country-level operations matrix. Classification of country operations.
Note: Paths to superior performance: **A**: primary focus on creation of market assets. **B**: Primary focus on market yield processes. **C**: Focus on market yield from existing accounts. **D**: Focus on creation of market assets to supplement market yield processes. **E**: Simultaneous focus on market creation and market yield processes.

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Combining overall marketing performance and marketing process performance

If the overall performance variable adequately captures the processes that underlie the relationships between overall inputs and outputs, country-level operations could be classified into two cells: high market asset creation with high market yield and low market creation with low market yield. However, marketing operations across countries are much more complex. Subsidiaries that perform better than their counterparts but enhance their performance by improving market assets or market yield can be classified as either low market creation with high market yield or high market creation with low market yield.

Measuring overall and process-level performance

Many traditional methods examine the performance of subsidiaries; we concentrate on comparative efficiency, which acknowledges both inputs and outputs and takes into account the operating unit's productivity in transforming inputs into outputs relative to other units that operate in similar conditions. The simplest way to measure efficiency is through productivity ratios. However, these simple output/input ratios are not directly applicable to most marketing operations that involve multiple inputs and outputs, unless we apply arbitrary weights to combine them into a single productivity index (Kamakura et al. 1996).

To accommodate multiple inputs and outputs, we evaluate subsidiaries using data envelopment analysis (DEA), a linear programming approach that identifies a piecewise-linear Pareto frontier that defines the most efficient transformation of multiple inputs into multiple outputs and then measures the efficiency of the subsidiaries relative to this efficiency frontier. Subsidiaries located at the frontier are designated the "best practices" against which we compare all other units. We thus can evaluate the efficiency of the other units in relation to the best practices located in the closest facet of the Pareto frontier.

Marketing literature uses DEA widely to assess the efficiency of sales branches (Mahajan 1991), banks (Kamakura et al. 1996), managerial performance (Murthi et al. 1996), and retail outlets (Grewal et al. 1999). Donthu et al. (2005) use DEA to benchmark marketing productivity. Because this technique is not new, we provide only a basic discussion as it applies to our case. Suppose we are interested in measuring the efficiency of subsidiary o relative to all subsidiaries $k = 1$, 2, …, K. Each subsidiary k uses inputs x_{ik} ($i = 1, 2, …, I$) and allocative inputs z_{lk} ($l = 1, 2, …, L$) to produce outputs y_{jk} ($j = 1, 2, …, J$). The only distinction between inputs x_{ik} and allocative inputs z_{lk} is that the former are under the direct control of the subsidiary, whereas the latter are not, because

they either are managed at corporate HQ or represent uncontrollable environmental factors. Charnes et al. (1978) demonstrate that the technical efficiency T_o for the subsidiary in question can be measured by solving the following linear programming problem:

min T_o subject to

$$y_{jo} \leq \sum_k \lambda_k y_{jk} \text{ for all outputs } j; \qquad (1)$$

$$T_o x_{io} \geq \sum_k \lambda_k x_{ik} \text{ for all inputs } i; \qquad (2)$$

$$z_{lo} \geq \sum_k \lambda_k z_{lk} \text{ for all allocative inputs } l; \qquad (3)$$

$$\lambda_k \geq 0 \text{ for all subsidiaries } k; \text{ and } \sum_k \lambda_k = 1. \qquad (4)$$

The convex combination of all subsidiaries defined by $\sum_k \lambda_k = 1$ represents the best practice with which the focal subsidiary o is compared. If $\lambda_o = 1$, the focal subsidiary o is at the Pareto frontier and therefore efficient ($T_o = 1$). Otherwise, all subsidiaries k for which $\lambda_k > 0$ define a facet of the Pareto frontier against which the focal subsidiary is compared, and T_o measures the degree of relative inefficiency of the focal subsidiary. In other words, $T_o < 1$ indicates that a combination of subsidiaries (defined by $\lambda_k > 0$, $k = 1, 2, …, K$) can produce the same level of outputs as the focal subsidiary using only a fraction (T_o) of its inputs. The solution of the linear programming not only measures the efficiency of the focal subsidiary but also identifies the other subsidiaries that form the benchmark.

This interpretation holds only when constraints 1–3 are binding (i.e., $y_{jo} = \sum_k \lambda_k y_{jk}$, $T_o x_{io} = \sum_k \lambda_k x_{ik}$, and $z_{lo} = \sum_k \lambda_k z_{lk}$) or, in other words, when the outputs produced and allocative inputs consumed by the focal subsidiary are equal to those from the benchmark and the inputs from the focal subsidiary, after the efficiency adjustment, are equal to those from the benchmark. If output constraint 1 is not binding (i.e., $y_{jo} < \sum_k \lambda_k y_{jk}$), the focal subsidiary not only would need to use a fraction (T_o) of its current inputs but also would have to produce more of the jth output until it equaled the level produced by the benchmark. An equivalent conclusion exists when an input constraint is not binding.

The DEA approach yields managerially useful byproducts. In addition to developing relative efficiency ratings for subsidiaries, the efficiency models provide information about the extent to which each input consumed by an inefficient subsidiary should be reduced to maintain the same level of output and keep the input mix ratios (i.e., the basic technological recipe) approximately unchanged. However, the DEA methodology has limitations. First, as

a deterministic linear programming approach, the model does not take into account any measurement error in the inputs or outputs and is susceptible to outliers. This limitation can be overcome by superimposing a measurement model on the frontier estimation model, with a stochastic DEA extension (Cooper et al. 1998) or frontier estimation model (Greene 2000). However, for our application, this superimposition would require either longitudinal data to estimate a stochastic frontier or a strong set of assumptions about the nature of the measurement error. Second, the dimensionality of the Pareto frontier increases with the number of inputs and outputs, making it easier for a subsidiary to be placed at the frontier. However, this problem is not unique to the DEA methodology but common to most measures of relative efficiency.

Empirical test

We illustrate our proposed framework for subsidiary assessment on data collected from 18 subsidiaries of a global *Fortune* 50 firm that sells automotive products to industrial and retail customers, has annual worldwide sales that exceed $100 billion, and employs more than 85,000 people. The subsidiaries are located in a geographical domain with relatively common cultural characteristics. The names of the company and its subsidiaries are not reported to ensure confidentiality. Also, all subsidiaries are engaged in retail operations to industrial and retail customers. By comparing the performance efficiency of a set of subsidiaries that are homogenous in their mandates from the MNC headquarters, we can compare them along the same dimensions. If different subsidiaries have different mandates or roles and these assignments are known a priori, the designated roles can be incorporated easily as allocative inputs in Eq. 3. Alternatively, we could compare the efficiency measures to the assigned roles a posteriori, in which case we would expect that the centrally assigned roles for each subsidiary directly explain inefficiencies in market creation or development.

To determine overall efficiency, we use the total number of marketing personnel and marketing expenses as inputs and sales volume, market share, and profits as outputs (Kamakura et al. 1996). We measure marketing expenses in dollars spent on marketing activities. Marketing personnel deployment is obtained from a comprehensive human resources study of the firm, in which each employee filled out a form to detail the number of hours he or she spent on all activities. The number of marketing personnel equals the sum of the proportion of employees' time (in human years) used for marketing activities. Measures of sales volume, market share, and profits come from company records.

To determine the efficiency of market asset creation and market yield, we obtain data on the intermediate process outputs. Market asset creation—attracting new customers, retaining existing customers, and laying the foundation for developing future customers—entails three variables: number of industrial customers, number of retail outlets, and number of brand-aware customers (these tap both customer and brand assets). The company provided information for these variables, as well as the population of each country. Market asset creation efficiency relies on two inputs (marketing personnel and marketing expenditures) and three outputs (number of brand-aware customers, number of retail outlets, and number of industrial customers). We obtain the number of brand-aware customers by multiplying unaided brand recall by the population. Market yield efficiency uses three inputs (number of brand-aware customers, number of retail outlets, and number of industrial customers) and three outputs (sales, market share, and profits).

To assess the creation of market assets and overall efficiencies, we may need to control for certain country- or market-specific variables outside the scope of the firm (Pilling et al. 1999). As suggested by the firm's managers, we control for market competitiveness and level of market regulation and thereby control for market-level factors that cause subsidiaries to operate in unequally attractive markets. Those with less competition should be more attractive.

Market condition variables (e.g., market competitiveness) should affect both overall and market creation efficiency ratings. Market pressures (i.e., competition, government control) also should diminish overall and in terms of market creation activities compared with when there are no market pressures. Using a modified Delphi technique, we asked marketing managers at the regional HQ to provide independent ratings of market competitiveness and the level of market regulation on 100-point rating scales. The ratings were circulated, and the group met to arrive at a consensus. An evaluation of 0 on each variable denotes high levels of market competitiveness and market regulation, which reflects allocative inputs (i.e., low values represent less productive environments). The data appear in Table 1, disguised through hidden conversion factors.

Results

In Table 2, we summarize the efficiency measures obtained with DEA. Using the overall and process-level efficiency measures, we classify each subsidiary into the strategic matrices by (overall) performance, creation of market assets, and market yield. As Fig. 3 shows, subsidiaries at the efficiency frontier (efficiency = 1.0) are classified as high; all others are low.

One of the advantages of using control variables is that factors outside the control of country-level operations appear in the DEA analysis. We control for market

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Table 1 Inputs and outputs for 18 subsidiaries

Country	Personnel (in human years)	Expenses	Competitiveness (100 points)	Regulation (100 points)	Sales volume	Market share	Profits	Retail outlets (number)	Industrial customers (number)	Brand-aware customers (number)
1	10.8	9	75	15	7	53	1.8	33	90	89.1
2	4.5	4	75	15	1.3	15	.6	12	38	47
3	7.4	2.9	75	15	.6	20	.4	18	47	94.7
4	7.1	6.3	75	15	3.3	80	2.5	14	190	23.2
5	2.8	2.3	75	15	.6	26	2	9	19	15
6	151.6	48.3	15	75	29.9	16	14.1	243	1322	2524.7
7	145.7	45.1	15	15	51	20	2.5	364	929	4007
8	34.3	11.5	50	15	15.3	22	5.3	103	109	1864.8
9	46.9	11.1	50	75	10.5	38	17.4	61	572	3432.6
10	21.4	12.4	50	50	3.8	13	2.3	45	3	270
11	55.6	16.1	50	50	7.7	19	4.5	111	310	2436.2
12	7.6	3.7	50	75	3.2	36	1.3	11	49	340.2
13	23.4	6.2	50	15	3.7	20	.6	68	88	1139.7
14	25.2	9	50	75	7.8	16	.2	68	288	617.3
15	42.3	8.4	50	50	8.9	62	5.1	50	151	535.7
16	18.1	9.8	50	75	4.6	7	2.1	52	101	634
17	74.3	42.3	15	75	23.3	11	4.3	279	271	121.3
18	10.5	1.1	75	15	1.7	15	0	31	41	121.3

competitiveness and market regulation when assessing both overall and market asset creation efficiency. In Table 2, efficiency scores without control variables (in parentheses) differ from those obtained when we account for these environmental factors. Several interesting observations result. According to the overall efficiency ratings, subsidiaries 1, 4, 5, 6, 7, 8, 9, 12, 13, 15, 17, and 18 are at the frontier. According to the decision matrix in Fig. 3,

Table 2 Efficiency and super-efficiency measures

	Efficiency			Super-efficiency		
	Overall	Creation	Yield	Overall	Creation	Yield
1	1.00	1.00 (0.95)	1.00	1.43	0.95	1.79
2	0.82	0.89	0.90	0.82	0.89	0.90
3	0.68	0.87 (0.85)	0.50	0.68	0.85	0.50
4	1.00	1.00	1.00	–	2.32	–
5	1.00	1.00	1.00	2.39	1.69	5.69
6	1.00	1.00	1.00	–	–	–
7	1.00	1.00	1.00	–	–	–
8	1.00	1.00	1.00	1.30	1.22	2.03
9	1.00	1.00	1.00	–	3.11	–
10	0.80 (0.39)	0.76 (0.62)	1.00	0.39	0.62	12.86
11	0.45 (0.40)	0.86	0.43 (0.40)	0.40	0.86	0.40
12	1.00	1.00 (0.92)	1.00	1.14	0.92	1.60
13	1.00 (0.51)	1.00	1.00 (0.38)	0.51	1.08	0.38
14	0.74 (0.73)	1.00	0.70 (0.57)	0.73	1.18	0.57
15	1.00	0.74 (0.52)	1.00	1.20	0.52	1.85
16	0.62 (0.54)	1.00 (0.95)	0.56 (0.52)	0.54	0.95	0.52
17	1.00 (0.80)	1.00	1.00	0.80	1.47	13.31
18	1.00	1.00	0.70 (0.55)	2.63	3.41	0.55

Values within parentheses are efficiency scores without control variables. For illustrative purposes, the super efficiencies were calculated for the models without control variables. We used the DeaFrontier software to calculate the super efficiencies (see Zhu 2003). – indicates that it was not feasible to calculate super efficiency (see Seiford and Zhu 1999).

Figure 3 Classification of country marketing operations. Note: Inefficient subsidiaries are those not on the efficiency frontier and efficient subsidiaries are those on the efficiency frontier.

	Inefficient Subsidiaries		Efficient Subsidiaries (Overall Performance)	
Efficient (Market Yield)	10		15	1, 4, 5, 6, 7, 8, 9, 12, 13, 17
Inefficient	2, 3, 11	14, 16		18
	Inefficient	Efficient	Inefficient	Efficient

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subsidiaries 1, 4, 5, 6, 7, 8, 9, 12, 13 and 17 are world-class operators because they are at the Pareto frontier in both processes. Subsidiary 18 is efficient in the creation of market assets but inefficient in market yield and therefore is a prospector. Subsidiary 15 is a miner because it is efficient in market yield but inefficient in creation of market assets. For obvious reasons, none of the efficient subsidiaries are classified into the poor operations cell.

Subsidiaries 2, 3, 10, 11, 14, and 16 are inefficient with regard to overall marketing operations. Among them, units 2, 3, and 11 are inefficient in both market yield and market asset creation (poor operations). Subsidiaries 14 and 16 efficiently create market assets but deal with market yield inefficiently (prospectors). Subsidiary 10 has inefficient market asset creation but efficient market yield processes (miner). No subsidiary in this group is a world-class operation.

The classification matrix is diagnostic in terms of the process-level strategies that subsidiaries should follow. We discuss some of these strategies in the context of efficient subsidiaries, but the recommendations for inefficient subsidiaries are similar. Subsidiaries in the world-class operations cell should be studied and emulated by other firms. Subsidiary 18 is efficient in its overall marketing and creation of market assets but inefficient in its market yield, a mix that suggests it seeks marginal customers and instead should increase its customer selectivity. In contrast, subsidiary 15 is efficient overall and in market yield but not in creating market assets, which indicates that it should improve its ability to acquire new customers.

Recent research uses a super-efficiency DEA model to discriminate among efficient decision making units (DMUs) such as subsidiaries (Andersen and Petersen 1993; Banker et al. 1989). The super-efficiency results in Table 2 demonstrate that even among efficient subsidiaries, some are more efficient than others. However, several researchers question the use of super-efficiency model for ranking DMUs and instead advocate its use for other purposes, such as identifying influential observations (Banker and Chang 2006; Seiford and Zhu 1998).

Nevertheless, using only the efficiency measures, the DEA analysis provides data on a smaller subset of comparable units that a subsidiary should emulate. This diagnostic information appears in Tables 3 and 4 for subsidiaries that are inefficient in the creation of market assets and market yield, respectively. For example, subsidiary 15, classified as a miner, has an efficiency rate of 0.74 for market creation (Table 3). That is, a "virtual" subsidiary formed by a convex combination of units 9, 12, and 13, with weights of 15.4%, 29.7%, and 54.9%, respectively, produces at least the same level of outputs as subsidiary 15 but uses only 74% of its input levels. The results from Table 3 also indicate that a virtual subsidiary that defines the best practice could reduce its marketing personnel by 8.96 units (beyond the 74% of the current level of inputs of subsidiary 15) and simultaneously increase its number of brand-aware customers by 720 units. In other words, to operate at the same performance level as the virtual benchmark, subsidiary 15 must maintain the same market creation outputs with 74% of its current marketing effort, reduce marketing personnel by an additional 8.96 units, and increase brand-aware customers by 720 units. Comparing an inefficient unit with the relevant facet of the efficiency frontier thus provides clear directions for improving its performance in terms of the inputs to reduce and outputs to be produced at a higher rate. The analysis also indicates the efficient units that can engage in best practices for emulation. However, the DEA analysis cannot tell a manager how to achieve the necessary input reductions and output increases; this effort must be learned from an in-depth study of the best practices that form the virtual subsidiary for the focal unit.

Table 3 Inefficiencies in market creation

		Inefficient Subsidiaries in Market Creation								
		2	3	10	11	13	14	15	16	18
Efficiency		0.89	0.87	0.76	0.86	1.00	1.00	0.74	1.00	1.00
Inputs	Personnel				1.25			8.96		
	Expenses	0.48		2.86						
Outputs	Retail outlets		0.66							
	Industrial customers			69.18						
	Brand awareness			304.20				720.00		
Allocative	Market competitiveness	0.37	1.03		3.06					
	Regulatory environment				18.00			7.94		
Frontier	Subsidiary 1	0.05								
	Subsidiary 4	0.08	0.11							
	Subsidiary 5	0.85	0.55	0.08						
	Subsidiary 7				0.09					
	Subsidiary 8	0.02			0.55					
	Subsidiary 9				0.28			0.15		
	Subsidiary 12			0.53				0.30		
	Subsidiary 13		0.04	0.34	0.08			0.55		
	Subsidiary 17			0.06						
	Subsidiary 18		0.30							

Conclusion and future research directions

Managerial implications

This study presents a conceptual framework that can aid MNEs in evaluating subsidiary marketing performance in a multi-country context. The approach we present represents a marked departure from extant literature in international business and marketing. Whereas prior studies make comparisons across a broad spectrum of MNEs, our approach applies to the subsidiary level of an individual firm. It has more practical insights, because any MNE can use it to assess the marketing performance of its subsidiaries. It yields better comparative performance assessments, because the perfor-

Table 4 Inefficiencies in market yield

		Inefficient subsidiaries in market yield								
		2	3	10	11	13	14	15	16	18
Efficiency		0.94	0.5	1	0.43	1	0.7	1	0.56	0.7
Inputs	Retail outlets									7.26
	Industrial customers		4.5				79.31			
	Brand awareness	22.62	32.35		515.5					
Outputs	Sales				0.33					
	Market Share	16.68	6		36.93		35.87		27.01	13.39
	Profit	1.42	1.6				3.89			2.09
Allocative	Market competitiveness									0.85
	Regulatory environment						18.98		10.68	
Frontier	Subsidiary 1	0.08					0.06		0.02	0.1
	Subsidiary 4	0.06								
	Subsidiary 5	0.85	1							0.87
	Subsidiary 7									
	Subsidiary 8								0.01	0.03
	Subsidiary 10				0.05				0.22	
	Subsidiary 12				0.07		0.28		0.61	
	Subsidiary 13				0.05					
	Subsidiary 15				0.84		0.61		0.13	
	Subsidiary 17						0.04		0.02	

mance evaluation benchmarks refer to the unique context and operations of the MNE firm rather than other firms that operate in different industries, countries, or environmental contexts and with different constraints. Furthermore, our explicit consideration of process and environmental factors considers differences in the market environments across subsidiaries. The implications thus apply across a gamut of marketing decisions, including planning, analysis, implementation, and control of marketing activities.

Whereas overall performance measures actual, not potential, performance, the four-way classification we use can help identify subsidiaries with latent performance potential. By focusing on marketing performance processes, this approach supersedes conventional measures (e.g., overall marketing efficiency measurements, portfolio approaches) because it helps identify the process that needs improvement at each subsidiary level. In addition to providing assistance in resource allocation decisions, our approach identifies the exact process that needs specific resources. For example, rather than simply recommend increased budgets or resources, it helps MNE headquarters (HQ) identify specific activities to which to deploy resources to enhance performance. It also helps HQ identify extraneous sources of performance differences, such as distinct environmental variables. Performance assessments in overall marketing efficiency studies and portfolio models mistakenly assume similarity across units and attribute performance differences solely to factors beyond the control of the units themselves. Finally, our classification and performance assessment model is more actionable because it can identify specific strategies for performance improvements, whereas marketing efficiency studies only identify performance differences, and portfolio models help only with broad resource allocation decisions, such as decreasing investments, or irreversible decisions, such as exit.

To tackle the crucial problems of resource allocation and performance rewards, we recommend comparing subsidiary operations along the process priorities of creating market assets and obtaining market yield. In addition to its strategic implications, the framework reduces the adverse effects of relying on a single measure of performance and provides a greater degree of strategic control for the subsidiary, which leads to greater consensus in decision making and evaluation and, possibly, greater subsidiary compliance (Kim and Mauborgne 1993). Although we present our framework with cross-sectional data, managers also can use it to track relative changes in year-to-year performance and thus gain a better understanding of relative changes in market creation, market yield, and performance.

Therefore, MNEs that use the proposed framework and method will not only allocate resources across their various subsidiaries better but also leverage their deployed resources more effectively by providing specific strategic guidelines to subsidiaries. The HQ can mandate that subsidiaries focus on market creation or market yield activities to improve their marketing performance. Budgeting and resource allocation decisions become less ambiguous, following from a rational framework. Moreover, the use of a transparent analytical technique by HQ removes any potential political or other influence charges from budgeting decisions. Such transparency also has advantages in terms of the compensation of foreign managers, in that pay-for-performance compensation schemes can be executed and accepted across the MNE.

The results of our analysis could reveal the various marketing processes of the most efficient subsidiaries. With closer inspection, the MNE can identify specific strategic and operational processes that might be learned across the global corporation. These results and implications are similar to the standardization–adaptation decision and suggest that firms standardize in some countries to enhance efficiency and adapt in others to respond effectively to environmental variations (Syzmanski et al. 1993). The results also enable a ready identification of subsidiaries, unique to the context of the firm, that could be designated "centers of excellence" on the basis of their strategic choices, implementation, and performance (e.g., Frost et al. 2002).

Limitations and avenues for further research

Because our model can accommodate a variety of input and output variables, one of its limitations involves the constraints on variable selection and data collection. Whereas the model's flexibility in incorporating several variables is an asset, that asset can become a limitation because managerial discretion and even consensual decision making between HQ and various subsidiaries may be needed to identify the relevant variables.

At another level, there are inherent difficulties in identifying various contextual or control variables. For example, the level of competitive activity within a national environment may affect subsidiary performance, but measuring such competitive activity may be problematic. Objective data, such as the number of competitors or competitor sizes, market shares, and expenditures, may only be a start and need to be refined by qualitative judgments about the levels and extent of competitive activity. In our study, we overcome this limitation only through a separate survey that sought a consensual measure of competition in each national environment.

Further research might examine the extent to which country market experience and the stage of the product lifecycle in a specific country affect a subsidiary's strategy choice. Although all the subsidiaries in our study were established several decades ago, other MNE contexts might

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provide cases in which some subsidiaries are new and others quite mature. The age of the subsidiary and the product lifecycle stage should be modeled more explicitly in further research.

Additional research should take into account the relative differences in competitive positioning across various subsidiary operations. For example, subsidiaries interested in pursuing a niche strategy should collect data sensitive to such differences. The evaluation of market creation performance would acknowledge the number of segment-level customers created, given segment size estimates. Our initial framework can expand to include additional input, output, and intermediate variables, as well as control variables, such as those that reflect the diversity of national environments (e.g., subsidiary lifecycle stage, infrastructure availability, literacy rates, cultural factors). Whereas we examine the effects of various strategic marketing levels on market penetration and subsidiary performance within the context of one MNE, further research might examine specific relationships among these variables across a group of MNEs.

Finally, additional research might extend our suggested approach both vertically and laterally. The units being evaluated could be various divisions within a large firm or subsidiary or the entire MNE network. Lateral comparisons between two or more MNEs might focus on the country-level operations of each. Such an investigation could identify why some apparently strong global brands underperform in some markets or how country differences affect MNE performance differences. For example, a MNE that focuses primarily on emerging markets may perform poorly overall compared with another that focuses on developed markets, especially because the former may be focused more on market creation, whereas the latter is attempting to harness its marketing assets. Longitudinal data could clarify the effects of lagged variables.

References

Anderson, J. C. (1995). Relationships in business markets: Exchange episodes, value creation, and their empirical assessment. *Journal of the Academy of Marketing Science*, 23, 346–350 (Fall).

Andersen, P., & Petersen, N. C. (1993). A procedure for ranking efficient units in data envelopment analysis. *Management Science*, 39, 1261–1264 (October).

Banker, R. D., & Chang, H. (2006). The super-efficiency procedure for outlier identification, not ranking efficient units. *European Journal of Operational Research*, 175(2), 1311–1320.

Banker, R. D., Das, S., & Datar, S. M. (1989). Analysis of cost variances for management control in hospitals. *Research in Governmental and Nonprofit Accounting*, 5, 268–291.

Bartlett, C. A., & Ghoshal, S. (1989). *Managing across borders*. Boston, MA: Harvard University Press.

Basu, A., Basu, A., & Batra, R. (1995). Modeling the response to direct marketing campaigns. *Journal of Marketing Research*, 32, 204–212 (May).

Bharadwaj, S. G., Varadajaran, P. R., & Fahey, J. (1993). Sustainable competitive advantage in service industries: A conceptual model and research propositions. *Journal of Marketing*, 57, 83–99 (October).

Birkinshaw, J. M., & Morrison, A. J. (1995). Configurations of strategy and structure in subsidiaries of multinational corporations. *Journal of International Business Studies*, 26(4), 729–754.

Buchanan, L., Simmons, C. J., & Bickart, B. A. (1999). Brand equity dilution: Retailer display and context brand effects. *Journal of Marketing Research*, 36, 345–355 (August).

Carpano, C., Chrisman, J. J., & Roth, K. (1994). International strategy and environment: An assessment of the performance relationship. *Journal of International Business Studies*, 25(3), 639–656.

Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring efficiency of decision making units. *European Journal of Operations Research*, 2(6), 429–444.

Cooper, W. W., Huang, Z. M., Lelas, V., Xi, S., & Olesen, O. B. (1998). Chance constrained programming formulations for stochastic formulations of efficiency and dominance in DEA. *Journal of Productivity Analysis*, 9, 53–79.

Craig, C. S., & Douglas, S. P. (2000). Configural advantage in global markets. *Journal of International Marketing*, 8(1), 6–26.

Dekimpe, M. G., & Hanssens, D. M. (1995). The persistence of marketing effects on sales. *Marketing Science*, 14(1), 1–21.

Donthu, N., Hershberger, E. K., & Osmonbekov, T. (2005). Benchmarking marketing productivity using data envelopment analysis. *Journal of Business Research*, 58, 1474–1482 (November).

Dowling, G. R., & Uncles, M. (1997). Do customer loyalty programs really work? *Sloan Management Review*, 38, 71–82 (Summer).

Doyle, P. (2000). *Value-based marketing: Marketing strategies for corporate growth and shareholder value*. New York: Wiley.

Frost, T. S., Birkinshaw, J. M., & Ensign, P. C. (2002). Centers of excellence in multinational corporations. *Strategic Management Journal*, 23, 997–1018 (November).

Greene, W. (2000). *Econometric analysis* (4th ed.). Englewood Cliffs, NJ: Prentice Hall.

Grewal, D., Levy, M., Mehrotra, A., & Sharma, A. (1999). Planning merchandising decisions to account for regional and product assortment differences. *Journal of Retailing*, 75(3), 405–424.

Hewett, K., & Bearden, W. O. (2001). Dependence, trust, and relational behavior on the part of foreign subsidiary marketing operations: Implications for managing global marketing operations. *Journal of Marketing*, 65, 51–66 (October).

Kamakura, W. A., Lenartowicz, T., & Ratchford, B. T. (1996). Productivity assessment of multiple retail outlets. *Journal of Retailing*, 72(4), 333–356.

Kamakura, W. A., Ramaswami, S., & Srivastava, R. K. (1991). Applying latent trait analysis in the evaluation of prospects for cross-selling of financial services. *International Journal of Research in Marketing*, 8(4), 329–349.

Keh, H. T., Chu, S., & Xu, J. (2006). Efficiency, effectiveness and productivity of marketing services. *European Journal of Operational Research*, 170, 265–276.

Kim, W. C., & Mauborgne, R. A. (1993). Effectively conceiving and executing multinationals' worldwide strategies'. *Journal of International Business Studies*, 24(3), 419–448.

Kohli, A. K., & Jaworski, B. J. (1990). Market orientation: The construct, research propositions. *Journal of Marketing*, 54, 1–18 (April).

Luo, Y. (2002). Capability exploitation and building in a foreign market: Implications for multinational enterprises. *Organization Science*, 13, 48–63 (January-February).

Mahajan, J. (1991). A data envelopment analytic model for assessing the relative efficiency of the selling function. *European Journal of Operational Research*, 53(2), 189–205.

Murthi, B. P. S., Srinivasan, K., & Kalyanaram, G. (1996). Controlling for observed and unobserved managerial skills in determining first-mover market share advantage. *Journal of Marketing Research*, *33*, 329–336 (August).

Pilling, B. K., Donthu, N., & Henson, S. (1999). Accounting for the impact of territory characteristics on sales performance: Relative efficiency as a measure of salesperson performance. *Journal of Personal Selling & Sales Management*, *19*(2), 35–45.

Porter, M. E. (1986). Changing patterns of international competition. *California Management Review*, *28*, 9–31 (Winter).

Reinartz, W., & Kumar, V. (2000). On the profitability of long lifetime customers: An empirical investigation and implications for marketing. *Journal of Marketing*, *64*, 17–35 (October).

Reinartz, W., & Kumar, V. (2003). On the profitability of long-life customers in a noncontractual setting: An empirical investigation and implications for marketing. *Journal of Marketing*, *64*, 17–35 (October).

Rust, R. T., Ambler, T., Carpenter, G. S., Kumar, V., & Srivastava, R. K. (2004). Measuring marketing productivity: Current knowledge and future directions. *Journal of Marketing*, *68*, 76–89 (October).

Seiford, L. M., & Zhu, J. (1998). An acceptance system decision rule with data envelopment analysis. *Computers & Operations Research*, *25*, 329–332 (April).

Seiford, L. M., & Zhu, J. (1999). Infeasibility of super efficiency data envelopment analysis models. *Information Systems & Operational Research*, *37*, 174–187 (May).

Shapiro, A. C. (2006). *Multinational Financial Management* (8th ed.). Hoboken, NJ: Wiley.

Sheth, J. N., & Sisodia, R. S. (2002). Marketing productivity issues and analysis. *Journal of Business Research*, *55*(5), 349–362.

Srivastava, R. K., Shervani, T. A., & Fahey, L. (1998). Market-based assets and shareholder value: A framework for analysis. *Journal of Marketing*, *62*, 2–18 (January).

Srivastava, R. K., Shervani, T. A., & Fahey, L. (1999). Marketing, business processes, and shareholder value: An organizationally embedded view of marketing activities and the discipline of marketing. *Journal of Marketing*, *63*, 168–179 (Special Issue).

Syzmanski, D. M., Bharadwaj, S. G., & Varadarajan, P. R. (1993). Standardization versus adaptation of international marketing strategy: An empirical investigation. *Journal of Marketing*, *57*, 1–17 (October).

Taggart, J. H. (1997). Autonomy and procedural justice: A framework for evaluating subsidiary strategy. *Journal of International Business Studies*, *28*, 51–76 (First Quarter).

Tallman, S. B. (1991). Strategic management models and resource-based strategies among MNEs in a host market. *Strategic Management Journal*, *12*, 69–82 (Summer).

Wind, Y., Mahajan, V., & Swire, D. J. (1983). An empirical comparison of standardized portfolio models. *Journal of Marketing*, *47*, 89–99 (Spring).

Yip, G. S., & Madsen, T. L. (1996). Global account management: The new frontier in relationship marketing. *International Marketing Review*, *13*(3), 24–42.

Zhao, H., & Luo, Y. (2002). Product diversification, ownership structure, and subsidiary performance in China's dynamic market. *Management International Review*, *42*, 27–48 (First Quarter).

Zhu, J. (2003). *Quantitative model for performance evaluation and benchmarking: Data envelopment analysis with spreadsheets*. Boston, MA: Kluwer.

Zou, S., & Cavusgil, S. T. (2002). The GMS: A broad conceptualization of global marketing strategy and its effect on firm performance. *Journal of Marketing*, *66*, 40–56 (October).