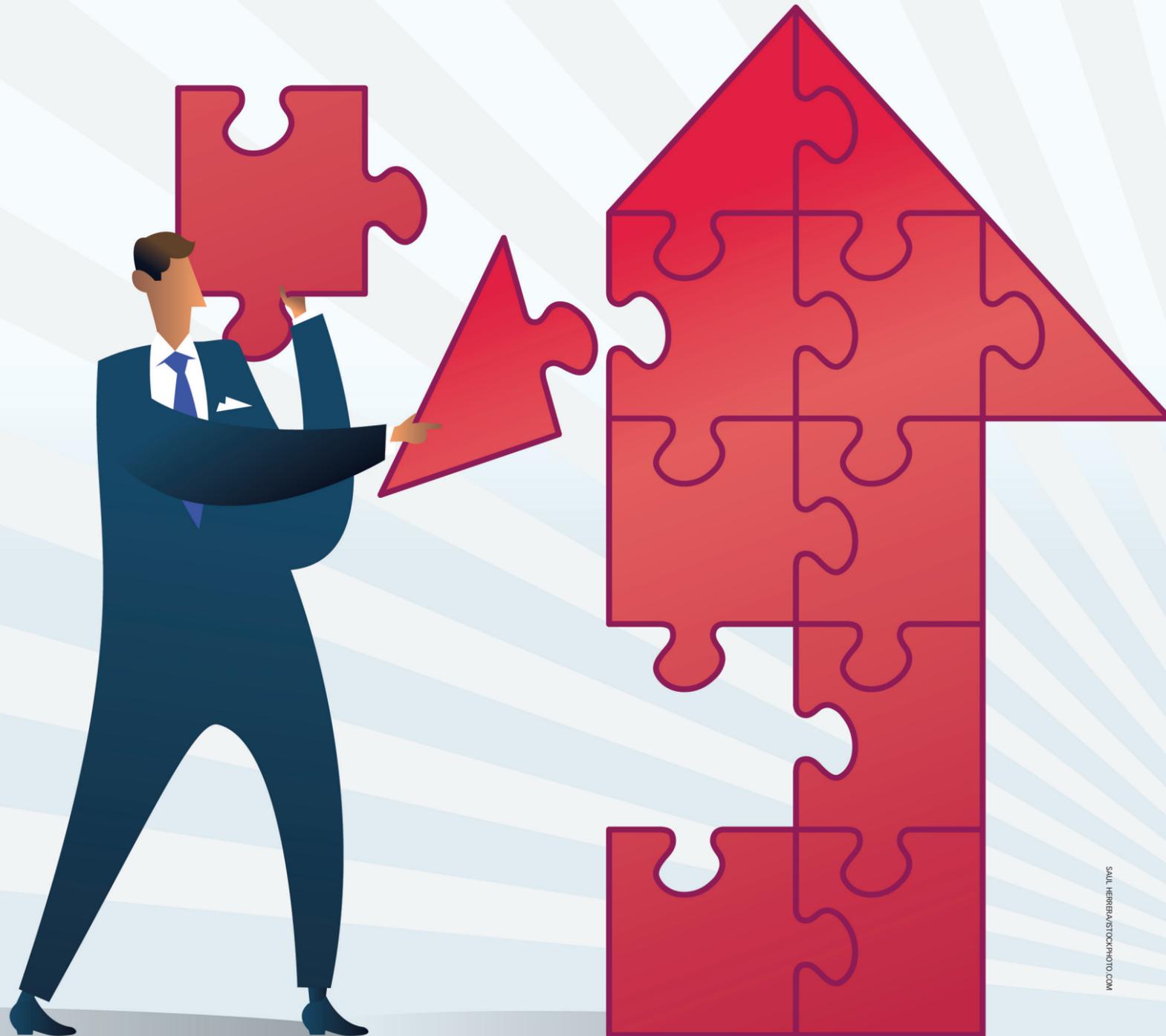


# Does supply chain “fit” matter to investors?



Apparently it does. Companies that match their supply chains to the demand aspects of their products enjoy a higher market capitalization than those without a good supply chain fit.

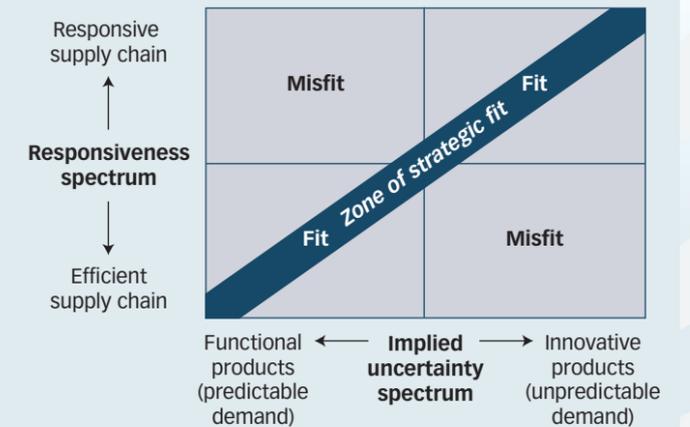
**WHETHER IT'S ON WALL STREET OR FLEET STREET**, investors take notice of companies that have effective supply chains. Manufacturers with well-run supply chains command a higher valuation because they have mastered the match between demand and supply for their product. Companies that have not achieved this alignment, on the other hand, experience delivery delays, quality issues, and excessively high inbound logistics costs, all of which have a negative effect on their financial performance. In short, successful supply chain management equates to the ability to create shareholder value.

One of the key factors for achieving effective supply chain management (and therefore financial success) is having the right “fit” between the demand aspects of a product and the design of its underlying supply chain. For example, innovative products with unpredictable demand are best served by a responsive supply chain that is able to meet quick turnaround times and make the most of short product lifecycles. Functional products with predictable levels of demand, by contrast, are best served by an efficient supply chain that focuses on minimizing costs.

And yet, many companies still fail to adjust their supply chain strategies to match the underlying product.<sup>1</sup> Granted, it's not easy. Most companies deliver a number of products in parallel, which complicates the alignment of supply chains with product portfolios. Additionally, companies must continually reformulate their supply chain fit as they adopt new product lines, enter new markets, build new warehouses and production plants, and lose the protection of traditional industry barriers.

It makes sense, then, that achieving supply chain fit would have a positive impact on a company's financial position. To test this hypothesis and determine to what degree supply chain fit affects financial success, we surveyed the largest manufacturing companies in the United States and Europe. Our financial analysis of 259 U.S.

**[FIGURE 1] ACHIEVING A FIT IN THE SUPPLY CHAIN**



[FRAMEWORK ADAPTED FROM CHOPRA AND MEINDL'S *SUPPLY CHAIN MANAGEMENT: STRATEGY, PLANNING, AND OPERATION* (2010) AND MARSHALL FISHER'S "WHAT IS THE RIGHT SUPPLY CHAIN FOR YOUR PRODUCT?" *HARVARD BUSINESS REVIEW*, 1997.]

[BY PAN THEO GROSSE-RUYKEN AND STEPHAN M. WAGNER]

and European manufacturers shows that those companies demonstrating a good supply chain fit have a market capitalization (or the total market value of all of a company's outstanding shares) that is approximately 19 percent higher than that of counterparts that do not have a good supply chain fit. This article explores that critical link between supply chain fit and corporate performance in terms of market capitalization. Specifically, we demonstrate how companies that have achieved a supply chain fit outperform Standard & Poor's S&P 500 index, an index of stock performance of 500 leading U.S. companies in a number of industries.

**Do you have a good fit?**

Our concept of supply chain fit is based on a framework developed by Marshall Fisher in his seminal 1997 *Harvard Business Review* article, "What is the right supply chain for your product?" and further developed by Sunil Chopra and Peter Meindl in their book *Supply Chain Management: Strategy, Planning, and Operation*.

Top companies achieve supply chain fit by understanding the demand aspects of their products, building a supply chain with the capabilities needed to satisfy its targeted customer segments, and align-

[FIGURE 2] RESPONDENT WORK EXPERIENCE

Work Experience	Seniority		Position		Function	
	N	%	N	%	N	%
0 years-4 years	90	34.75	191	73.75	44	16.99
5 years-9 years	72	27.80	43	16.60	55	21.24
10 years-14 years	32	12.36	14	5.41	44	16.99
15 years-19 years	25	9.65	6	2.32	47	18.15
> 20 years	40	15.44	5	1.93	69	26.64

ing the supply chain strategy to the overall competitive strategy of the company. To achieve supply chain fit, then, supply chain managers must take the following steps:

1. **Understand the product's demand and supply uncertainty levels.** To devise the right supply chain strategy for a product, you must first understand where it lies on the "uncertainty spectrum"—in other words, how unpredictable demand and supply for that product is. Is it a functional product with a predictable level of demand, an innovative product with unpredictable demand, or something in between?

It is important to understand customers' needs for each targeted segment and the uncertainty that the supply chain faces in satisfying those needs. Next, combine demand and supply uncertainty for the

[FIGURE 3] BREAKDOWN OF RESPONDENT SAMPLE

Industry Sector	N	%	Number of Employees	N	%
Aerospace and defense	24	9.27	< 100	3	1.16
Automotive and parts	29	11.20	100-499	20	7.72
Chemicals	16	6.18	500-999	17	6.56
Construction and materials	14	5.41	1,000-4,999	52	20.08
Electricity	4	1.54	5,000-9,999	40	15.44
Electronic and electrical equipment	28	10.81	> 10,000	127	49.04
Food and beverages	19	7.34	<b>Respondent Job Title</b>	<b>N</b>	<b>%</b>
Forestry and paper	5	1.93	C-level executive/vice president	37	14.29
Household and personal goods	26	10.04	Director/department head	122	47.10
Industrial metals	10	3.86	Manager	64	24.71
Machinery and plant engineering	24	9.27	Team leader	18	6.95
Medical equipment	10	3.86	Other	18	6.95
Mining	4	1.54	<b>Respondent Function</b>	<b>N</b>	<b>%</b>
Oil and gas	6	2.32	Supply chain management	106	40.93
Pharmaceuticals and biotechnology	12	4.63	General management	27	10.42
Technology hardware and equipment	17	6.56	Logistics	48	18.53
Textiles	11	4.25	Purchasing	24	9.27
<b>TOTAL</b>	<b>259</b>		Production and manufacturing	20	7.72
			Other	34	13.13

[FIGURE 4] MEASURES OF RESEARCH CONSTRUCTS

Constructs and Items (scale: 1-5)	
<b>Product Innovativeness (PI)</b>	
<i>Please evaluate the following characteristics for your company's main product line:</i>	
PI1*	How long is the average lifecycle of the products in the main product line? ___ < 6 months ___ 6 - 12 months ___ 1 - 2 years ___ 2 - 5 years ___ > 5 years
PI2	How many different variants are available for the main product line? ___ < 20 ___ 20 - 49 ___ 50 - 99 ___ 100 - 999 ___ > 1,000 or more
PI3	What is the average margin of error in the forecast based on units at the time production is committed? ___ 0% - 9% ___ 10% - 19% ___ 20% - 39% ___ 40% - 59% ___ 60% - 100%
PI4	What is the number of sales locations for the main product line? ___ < 100 ___ 100 - 499 ___ 500 - 999 ___ 1,000 - 1,499 ___ 1,500 or more
PI5	What is the frequency of change in order content for the main product line? ___ extremely low ___ low ___ medium ___ high ___ extremely high
<b>Supply Chain Responsiveness (SCR)</b>	
<i>Please indicate the strategic supply chain priorities for the main product line (1= not important at all and 5 = extremely important):</i>	
SCR1	Improve delivery reliability
SCR2	Maintain buffer inventory of parts or finished goods
SCR3	Retain buffer capacity in manufacturing
SCR4	Respond quickly to unpredictable demand
SCR5	Increase frequency of new product introductions

Note: All items were measured on five-point scales. Construct mean is calculated as (arithmetic) mean of all scale scores. Unit of analysis is the main product (line) defined as the current sales (revenue) driver of the company.  
\* Item scale was reverse-scored.

[FIGURE 5] SELECTED COMPANIES WITH A HIGH DEGREE OF SUPPLY CHAIN FIT

Company	Product	Country	Supply Chain Fit [%]
Bayer	Chemicals	Germany	100.00
Hugo Boss AG	Apparel	Germany	100.00
Cisco	Hubs and routers	USA	99.95
Hewlett-Packard	Computer servers	USA	99.95
Adidas	Clothes and athletic wear	Germany	99.95
Sanofi-Aventis	Generic medical products	France	99.95
Renault Trucks	Premium trucks	France	99.95
Dell	Computers	USA	99.90
Dow Chemical	Chemicals and plastics	USA	99.90
Procter & Gamble	Consumer products goods	USA	99.85

underlying product and map the results on the implied uncertainty spectrum. This helps to identify the level of demand unpredictability, disruption, and delay that the supply chain must be prepared to handle. (The implied uncertainty spectrum is shown along the x-axis in Figure 1.)

2. **Assess your supply chain capabilities.** Assess

what type of supply chain you have: Is it a responsive supply chain or an efficient supply chain? A highly responsive supply chain is able to create innovative products, handle large varieties of products, fill a wide range of product quantities, and meet requests for very tight lead times and high service levels.

Unfortunately, responsiveness is not free. For every

strategic choice to increase responsiveness, additional costs are incurred and efficiency declines. A more efficient supply chain, on the other hand, would focus on ways to cut costs in the supply chain at the expense of some responsiveness. (The responsiveness spectrum is shown along the y-axis in Figure 1.)

**3. Match the level of responsiveness to the level of uncertainty.** Next, you need to ensure that the degree of supply chain responsiveness is consistent with the implied uncertainty level. The goal is high responsiveness for a supply chain facing high implied uncertainty and efficiency for a supply chain facing low implied uncertainty,<sup>2</sup> as shown in Figure 1.

By achieving supply chain fit, a company ensures that its supply chain strategy is sufficiently linked to its overall competitive strategy and that its supply chain capabilities help it satisfy the company's target customers. Any misalignment between strategic vision (or the strategy for a product) and execution (or the strategy for the product's supply chain) presents a significant improvement opportunity for a company.

To succeed, however, companies will need to develop a new set of strategic managerial competencies. Managers must be able to view the company holistically with a thorough understanding of the

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linkages among functions. This will not be easy; in many companies, different departments devise different competitive and functional strategies. Without proper information sharing between departments and coordination by executives, companies are not likely to achieve supply chain fit.

**Calculating supply chain fit**

To find out whether achieving supply chain fit affected a company's financial position, we contacted 1,834 supply chain, logistics, and purchasing executives at

the 1,000 largest manufacturing companies in the United States, the United Kingdom, Germany, Austria, Switzerland, and France. We received 259 responses. The respondents have a very good knowledge of their companies' main product lines, supply chain structure, and supplier base. On average, they have worked in the fields of procurement, logistics, supply chain, production, or related fields for 13.2 years. They have held their current positions

for 3.9 years and have worked for their current employers for 9.9 years. Figure 2 summarizes the respondents' characteristics. (For a more detailed breakdown of respondents by title, function, company size, and industry sector, see Figure 3.)

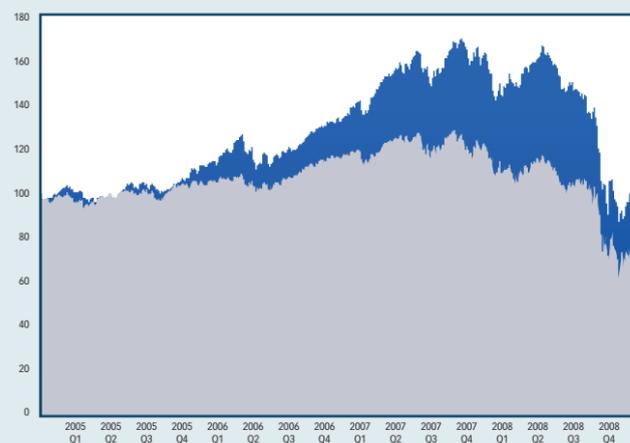
We asked respondents a series of questions that helped them assign their companies a score for product innovativeness (demand uncertainty) and a score for supply chain responsiveness. Product innovativeness was measured in terms of product lifecycle; number of available variants; average forecast error; number of sales locations; and frequency of order changes in terms of content, size, delivery time, or other patterns. As outlined in Figure 4, supply chain responsiveness was measured in terms of delivery reliability, buffer inventory of parts or finished goods, buffer capacity in manufacturing, quick response to unpredictable demand, and frequency of new product introductions.<sup>3</sup>

Companies achieve a high degree of fit when the degree of supply chain responsiveness matches the degree of product innovativeness. Supply chain fit can therefore be calculated by measuring the difference between those two factors. Accordingly, we computed a supply chain fit (SCF) index for each company as follows:

$$SCF = |PI - SCR|$$

where *PI* is the standardized score for product inno-

**[FIGURE 6] MARKET CAPITALIZATION: SUPPLY CHAIN FIT VERSUS S&P 500**



■ Market capitalization index of supply chain fit companies  
 ■ Market capitalization index of S&P 500 companies  
 Note: Supply chain fit companies (N = 163)

**A SAMPLE FIT ASSESSMENT**

To demonstrate how we assess supply chain fit, let's look at a simplified example involving two electronics manufacturers. Both manufacture a DVD player, which is a standardized product. However, manufacturer A achieves a supply chain fit, and manufacturer B does not. Why? After gathering empirical data from both electronics manufacturers about their supply chain responsiveness and product innovativeness, we assessed those factors on five-point scales (see chart).

In this example, electronics manufacturer A has a deviation from the ideal profile (0, or perfect alignment of product and supply chain) of only 0.2. This represents a supply chain fit degree of 95 percent [(100% - (0.2/(5 - 1))]. In other words, electronics manufacturer A has achieved a supply chain fit.

It is evident that the product and supply chain of electronics manufacturer B are not adapted to each other, nor are they sufficiently aligned. For its DVD player, manufacturer B has a low level of product innovativeness but a high level of supply chain responsiveness. Thus, manufacturer B achieves a fit degree of only 45 percent [(100% - (2.2/(5 - 1))].

	Electronics manufacturer	
Product Innovativeness (PI)	A	B
Product lifecycle (long—short)	2	1
Product variants (low—high)	2	1
Forecast error (low—high)	1	1
Number of sales locations (low—high)	3	3
Frequency of order changes (low—high)	1	1
Mean	1.8	1.4
Supply Chain Responsiveness (SCR)		
Delivery reliability (low—high)	3	4
Demand reaction capability (low—high)	2	3
Buffer inventory (low—high)	1	4
Buffer capacity (low—high)	1	4
Product launch frequency (low—high)	1	3
Mean	1.6	3.6
Deviation  PI - SCR	0.2	2.2
<b>Degree of supply chain fit</b>	<b>95%</b>	<b>45%</b>

Note: All items were measured on five-point scales. Construct mean is calculated as (arithmetic) mean as indicated by all scale scores.

vativeness (the degree of demand uncertainty for the product) and SCR is the standardized score for supply chain responsiveness. The ideal supply chain fit score would be 0, indicating that the supply chain responsiveness exactly fit the level of product innovativeness (demand uncertainty). Any deviation from zero indicates the degree of misfit.<sup>4</sup> (For a simplified example of the computation for two similar companies, see the above sidebar "A sample fit assessment.")

**Impact of supply chain fit**

To differentiate between companies with and without a supply chain fit, the data sample was split into two groups: "supply chain fit companies," whose supply chains meet their products' requirements, and "supply chain misfit companies," whose supply chains do not meet their products' requirements. Supply chain fit companies comprised all cases with +/- one standard deviation (0.61) around the arithmetic mean (N = 163). Supply chain misfit companies constituted the remaining cases (N = 96). Figure 5 includes a list of the 10 companies from our survey with the best supply chain fit.

In order to investigate the financial impact of sup-

ply chain fit, we analyzed whether the 163 companies with a supply chain fit outperformed the S&P 500 Index. We developed a market-capitalization index consisting of daily share prices of supply chain fit companies, and then measured it against the S&P 500 Index between Quarter 1 of 2005 and Quarter 4 of 2008. Our results indicate that market capitalization of supply chain fit companies outperforms the S&P 500 Index on average by 18.9 percent—and by as much as 44.5 percent (see Figure 6).

This finding fits very well with previous research,<sup>5</sup> which indicated that companies that adapt their supply chains to the demand aspects of their products achieve superior profitability—up to 100-percent higher profits in terms of sales growth, earnings before interest and tax (EBIT) margins, return on assets (ROA), and return on capital employed (ROCE).

**A call to action**

This research shows that the impact of supply chain management on a company's financial success is much greater than classic logistics key performance indicators (KPIs) may suggest. A well-run supply

chain helps companies to not only reduce costs but also to improve profitability. Indeed, the concept of supply chain fit can be used to identify key supply chain metrics that tie directly to the three key components of economic value added (EVA)—revenue, costs, and assets. As a consequence, the concept of supply chain fit can also be used to show how supply chain initiatives can help improve a company's market capitalization.

Despite the clear benefits of achieving supply chain fit, 37 percent of companies have not yet achieved that goal. Many companies, therefore, have a significant opportunity to boost their financial performance by improving their supply chain fit.

There are several important steps companies can take to move in that direction. First, supply chain management should be represented in the highest echelons of management. This will help to ensure that corporate management understands how supply chain performance impacts market capitalization. Second, everyone who is responsible for managing supply chain activities must be aware of the company's financial performance metrics, so that decisions made at the operational level are tied to expected outcomes. Third, executives have to understand how supply chain fit is achieved, maintained, and continuously adapted. And finally, a process must be established to educate those in operational roles on the impact of their daily actions on the company's overall performance.

It's important to bear in mind, however, that supply chain fit is a dynamic concept. Because customer preferences—and thus the demand aspects of products—are always in flux, any supply chain fit can only be temporary. Therefore, a manufacturing company must always be adapting and aligning its competitive strategy (and resulting implied uncertainty) and supply chain strategy (and resulting responsiveness) as closely as possible. △

#### Endnotes:

1. See, for example, D. Li and C. O'Brien, "A quantitative analysis of relationships between product types and supply chain strategies," *International Journal of Production Economics*, vol. 73, no. 1 (2001):

pp. 29–39; G.N. Stock, N.P. Greis, and J.D. Kasarda, "Enterprise logistics and supply chain structure: The role of fit," *Journal of Operations Management*, vol. 18, no. 5 (2000): pp. 531–547; and D.H. Doty, W.H. Glick, and G.P. Huber, "Fit, equifinality, and organizational effectiveness: A test of two configurational theories," *Academy of Management Journal*, vol. 36, no. 6 (1993): pp. 1196–1250.

2. S. Chopra and P. Meindl, *Supply Chain Management—Strategy, Planning, and Operation*, 4th edition, (Upper Saddle River, New Jersey: Pearson Education, 2010).

3. The criteria that we used to assess innovativeness and supply chain responsiveness are suggested by Marshall Fisher in his *Harvard Business Review* article, "What is the right supply chain for your product?" Vol. 75, no. 2 (1997): pp. 105–116.

4. Similar "fit" procedures have been applied in the literature. For example, see C. Gresov, "Exploring fit and misfit with multiple contingencies," *Administrative Science Quarterly*, vol. 34, no. 3 (1989): pp. 431–453; N. Venkatraman and J.E. Prescott, "Environment-strategy coalignment: An empirical test of its performance implications," *Strategic Management Journal*, vol. 11, no. 1 (1990): pp. 1–23; J.A. Siguaw, G. Brown, and R.E. Widing II, "The influence of market orientation of the firm on sales force behavior and attitudes," *Journal of Marketing Research*, vol. 31, no. 1 (1994): pp. 106–116; and D. Miller, "Stale in the saddle: CEO tenure and the match between organization and environment," *Management Science*, vol. 37, no. 1 (1991): pp. 34–52.

5. P.T. Grosse-Ruyken, S.M. Wagner, and F. Erhun, "The bottom line impact of supply chain management: The impact of a fit in the supply chain on a firm's financial success," working paper, Zurich: Swiss Federal Institute of Technology Zurich, 2009.

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