Supply Chain and the Executive Agenda

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Abstract

In recent years, supply chain pundits and consultants emphasized the importance of strategies such as just-in-time, lean manufacturing, off- shoring or frequent deliveries to retail outlets. However, with significant economic changes, rising labor costs in developing countries, huge volatility in oil and other commodity prices, and new regulations such as carbon emission caps, some of these strategies may imperil the supply chain. At the same time, logistics and supply chain management have been the focus of executive meetings, business columns and research institutes as never before. The importance of integrated, globally optimized supply chains is well understood and it seems that in many companies executives have discovered the impact on business performance that can be achieved by effectively managing their supply chains.

With all these changes and pressure, it will be quite remarkable if supply chain is not an important topic in the agenda of today's CEOs and CFOs. This study tries to answer questions such as - Is Supply Chain Management an important topic on the agenda of today's business leaders, in particular CEOs and CFOs? If it is on the agenda, what specifically is included? - risk management, cost cutting or new channels? If SCM is not directly on the CEOs/CFOs agenda, what is on their agenda? Is there a link between SCM and these topics?

To gain insight into these issues, the research team collected data from about 200 companies across a variety of industries. Our results indicate not only a link between the executive agenda and supply chain strategies but also that business and financial performance go hand in hand with supply chain performance. The research results indicate significant difference between Cost-Efficient and Responsive supply chain strategies and an overall increasing drive towards flexibility. The research identifies the key supply chain strategies that could give the optimal results from operational, business and financial perspectives.

Acknowledgement

I am grateful for the knowledge, wisdom, insight, and support from my thesis advisor Prof. David Simchi-Levi. This thesis will not have been possible without his guidance which provided the direction for our research and encouraged the research team to think beyond traditional boundaries of this topic. Prof. David always inspired us with his creative ideas whenever we were stuck in our research.

I also want to thank TruEconomy and Jaap Willem Bijsterbosch for generously sponsoring the research. I am also grateful to our research patron Dr. Costas Vassiliadis for his continual support throughout the project. Costas and my predecessor in the research team, Mohit Puri designed the surveys. Costas and the TruEconomy team administered the surveys. Without Costas' hands on involvement, guidance and feedback, this research work and thesis wouldn't have been possible. Other people in the background, who made this work happen, include Ferry Mulder, Mike Li and Janet Kerrigan who supported through various stages of the project. I sincerely thank the CEOs, CFOs and Supply Chain Directors who participated in the study by responding to the survey.

I am also thankful to Amrit Saxena, a Research Science Institute student, who helped the research team by obtaining public financial data and doing a pilot analysis of the impact of supply chain strategies on actual financial performance. I would also like to thank Anita van der Kooij, one of the contributors of Categorical Regression Method in SPSS, for helping me understand the technique.

Last but not the least, this work wouldn't have been possible without the love, inspiration and support from my wife and children.

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1 Introduction

Steam created by the cooking process can cause unpleasant wetness to walls and furniture. It makes the kitchen a less enjoyable place to be for both the cook and the family. Strong smells created by the cooking can spread throughout the house. Cooking oils may be vaporized when frying and this oil can be deposited in all areas around the cooker. The décor suffers and redecorating is required sooner than should be necessary. A cooker (kitchen) hood will, if installed with ducting, extract from the kitchen virtually all the steam and strong cooking odors.

Aleezah[1] is a company that pioneered cooking hoods since 1970. They are the world leader with 41% of the market in Europe and 17% world-wide and revenue of 350 Million Euros. Following a growth strategy they expanded into complementary sectors like motors for kitchen-hoods, boilers, refrigerators and ovens for domestic use. Their value proposition to the customers is "*design, experience and technology*".

The products that Aleezah deals with are not inimitable. Hence competitive differentiation through innovation, brand and customer satisfaction are high on the CEO's agenda. Further, Aleezah's CEO focuses on shareholder return through pricing and superior management of operating costs. Staying ahead of the competition through stronger customer relationships is high on the CEO agenda. The Aleezah Group is implementing specific actions aimed not only at effectively responding to changed conditions in the sector but specifically at consolidating levers for growth and future profitability including production outsourcing plans to low cost countries, reduction in cap-ex for non-core activities and continued improvement of Net Working Capital.

Aleezah's supply chain being cost efficient requires management to emphasize on purchasing and collaboration processes. Their focus is on supply chain processes, in particular Sales and Operations Planning to obtain alignment between plans and collaboration with suppliers and customers. Their supply chain innovation focus is on design for supply chain, forecast accuracy and network redesign to support faster time to market. The purchasing focus areas are supplier costs, reduction of supplier lead times and optimal positioning of inventory.

[1] The real name of this company, and other differentiating details, has been disguised for confidentiality.

Let's compare and contrast Aleezah's strategies with those of Arthur Inc[2]. Arthur Inc. makes innovative products for the family ranging from baby products to health and beauty products. Their baby care products include strollers & toys, nursing pillows and a leading retail brand. Their health and beauty care products include self care medical devices, incontinence products toiletries and birth control devices. "Innovation, Quality, and Supply Chain" are the most important components of their value proposition. Market share growth through new products, staying ahead of competition by stronger customer and supplier relationships and competitive differentiation through innovation and brand are high on the CEO's agenda.

Arthur Inc considers their supply-chain to be flexible response. Their supply chain strategy focuses on satisfying customer demand through reduction of stock-outs and improvement of product quality. Their strategies for supply chain innovation focuses on new product launches and network redesign to support faster time to market. Supplier reliability and quality is of prime importance to them.

What makes these companies different? Why do they have different supply chain strategies? How are their business strategies related to supply chain strategies? How does their customer value proposition relate to supply chain strategy? Executives and managers have intuitively understood the need for aligning the strategies of various arms of their organization. What is the best way to optimally align the strategies to obtain the best performance?

These questions have become more relevant in the present environment characterized by uncertainty and volatility in a number of areas. Is the economy going to grow and at which pace? Which markets are going to exhibit the biggest growth? What is the outlook for commodity prices in general and oil prices in particular? Is the cost of labor in emerging markets going to keep increasing? What is the role of frontier markets in achieving supply cost reduction? What is the impact of global fiscal deficits on corporate access to financing with good terms?

In such an environment, companies need to deploy a set of robust and agile business strategies. They need to differentiate from the competition; identify core capabilities that they must possess; determine how to achieve growth and maximize the return to its shareholders; and finally

[2] The real name of this company has been disguised for confidentiality

implement strategies to reduce risk exposure. Business strategies and operations strategies are driven by customer value proposition that the firm delivers to its customers.

In "Operations Rules: Delivering Customer value through flexible operations" (Simchi-Levi, 2010) Professor David Simchi-Levi demonstrates a framework to allow firms to link their operations strategy with customer value proposition. He illustrates this framework with a few examples. For instance, Amazon and Wal-Mart compete in the same space but focus on a different value proposition. Wal-Mart on everyday-low-pricing and hence a focus on a cost efficient supply chain, whereas Amazon's customer value proposition is production selection and availability and hence a supply chain strategy that emphasizes responsiveness and reliable order fulfillment strategy.

By the same token, the business strategy of Dell Computers when selling its product online is customer experience—the ability of consumers to choose whatever product configuration they want—and therefore, Dell strategy is focused on flexibility through an assemble-to-order manufacturing strategy. This is exactly the challenge that Dell faced when the firm recently introduced a new channel to market, the retail channel. Here the customer value proposition is not selection—the number of configurations available at a store is rather limited—but rather the value proposition is low price. Therefore, in the retail channel, the operations strategy must emphasize cost efficiency.

Thus, different customer value propositions require the deployment of different supply chain strategies. Past experience has shown that companies with a mature level of alignment between their supply chain and business strategies are more successful in delivering their customer value propositions.

1.1 Defining the research problem

Firms embarking on supply chain improvements, often face the question of alignment of their operations strategy to business strategy. The goal of this research is to identify the alignment of supply chain strategy and the executive agenda in a systematic way and develop a framework that links the firm's value proposition to its supply chain strategy.

Thus the objectives of this research thesis are:

- To identify the links between the business strategies of the CEO and supply chain strategies
- To identify the impact of operations and business strategies on the business performance and financial performance
- To analyze the business, financial and operating strategies followed by best-in-class companies
- To understand the impact of operations strategies on the market value of companies.

The following hypotheses are tested as part of the research:

- Companies competing in markets with functional products (cost efficient supply chains) and innovative products (flexible response supply chains) have significantly different operations strategies and performance indicators.
- With increasing productivity and information availability, companies will build more flexibility into their operations.
- An appropriate operations strategy results in better financial and business performance
- Operations strategy and executive strategy are linked to each other. Effective alignment results in best performance.
- The operations strategy that a company deploys must be driven by the value proposition that the firm provides to its customers.

The research also tries to address the following general questions:

- What are the top focus areas of CEO/CFO/SCM?
- What are the different supply-chain strategies that support the optimal business performance, financial performance and operations performance?
- What are the best supply chain strategies for supporting a particular executive agenda?

1.2 Thesis Overview

This research originated from Professor David Simchi-Levi's and TruEconomy's prior research study on European Supply Chains and other consulting engagements. This work tries to

empirically investigate many of their findings. The next chapter deals with the methodology employed and is supported by appendices, that goes into details of the survey and statistical tools.

The third chapter reviews some key insights from the popular strategy literature and gives a broader context in which strategies are made and frames the research problem in such context. It also summarizes some findings from other recent research work on the various strategies of organizations and the alignment between them.

The fourth and fifth chapter presents the insights and rules derived from the research based on the survey and the supplementary research based on public data available on a subset of companies.

2 Methodology and Approach

The backbone of the framework consists of three distinct elements – CEO, CFO and SCM agenda items. In the initial phases of the project, an extensive literature review of various business and academic journals was conducted to identify existing references to the link between CEO and CFO agenda items and supply chain strategies. At the same time we also looked at financial and non-financial performance measures.

In the subsequent phase, we conducted pilot interviews with fourteen companies from eight different industry groups to support and compare the findings from the literature review. We asked pilot participants to indicate the top five focus areas in their executive strategy, SCM strategy and business performance measures. The combined findings from the pilot and literature review phases were used to create a properly focused survey that was posted on the web for invited companies to fill out.

The focus areas in each part of the survey are shown below. Company executives are asked, each one in their respective section, to identify which of these focus areas are currently on the top of their agenda.

Figure 1 Focus Areas of the three limbs of the survey

Then, for each of the focus areas they were asked to indicate in a finer level of detail the items on which they place particular emphasis. If a company executive strategy focuses on competitive differentiation is it achieving it by strengthening its brand or by investing in product innovation? If it is focusing on growth, does the growth strategy emphasize profitability or market-share? If it

focuses on building capabilities, what are the capabilities it is trying to build? Is it looking at building strong customer and supplier relationships, for example, or is it looking at optimizing its supply chain asset strategy?

Similarly, when the supply chain strategy is focused on visibility does it emphasize visibility of the production schedule or the inventory plan? When it is focused on supply chain innovation, does it emphasize network redesign for emerging markets or launch of new products? When it is focused on purchasing, does it emphasize reduction of supplier lead-times or supplier performance?

Participants provide their answers to the above questions as well the achievement of their companies in certain Key Performance Indicators. The detailed survey questions are available in Appendix A: Survey Questionnaire

Survey responses are then analyzed for relationships across the items of the CEO, the CFO and SCM agendas. These correlations help form emerging hypotheses linking business strategies with supply chain strategies in both the cost-efficient and flexible response group of companies.

What are the key differentiators between the strategies of cost-efficient and flexible response companies? When a cost-efficient company has growth, for example, at the heart of its business strategy what are the preferred supply chain strategies? What is the CFO strategy in terms of liquidity and costs? Answers to these questions and insights of this type establish the link between the firm's value proposition and its supply chain strategy.

2.1 Survey Demographics

A total of 196 companies have participated in the survey—not all have completed the three sections. In particular, 192 companies completed the SCM sections, 128 completed the CEO sections and 107 completed the CFO sections. A total of 92 companies have completed all three parts of the survey—the analysis and key findings are based only on these companies.

Interestingly, more companies in our survey emphasized flexible responsiveness. Specifically, 57 out of the 92 companies characterize themselves as focusing on responsiveness while 35 characterize their strategy as focused on cost efficiency.

Participating companies come from a wide variety of industries including *Industrial, CPG, Healthcare, High-Tech, Retail and Transportation*. The split of companies across industries is illustrated below.

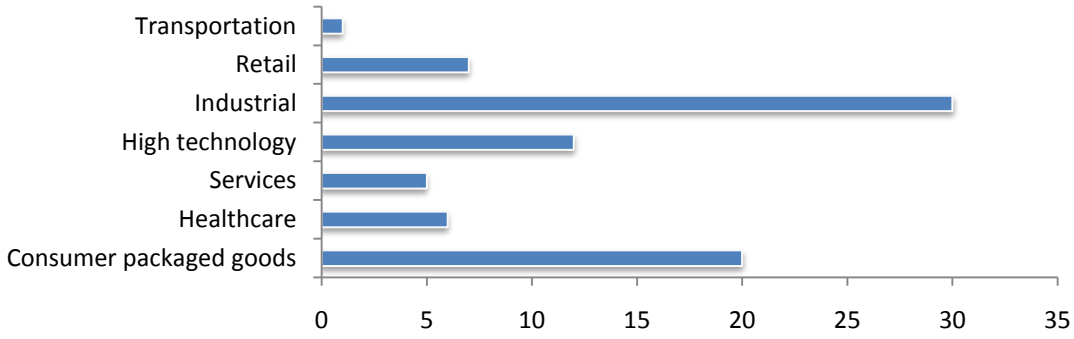

Figure 2 Distribution of participating companies across industries

The majority of participating companies in our study (66%) have a make-to-stock manufacturing function; a smaller number (44%) have *Make-to-Order environment and* only 20% have an Assemble-*to-Order* supply chain. This is illustrated below.

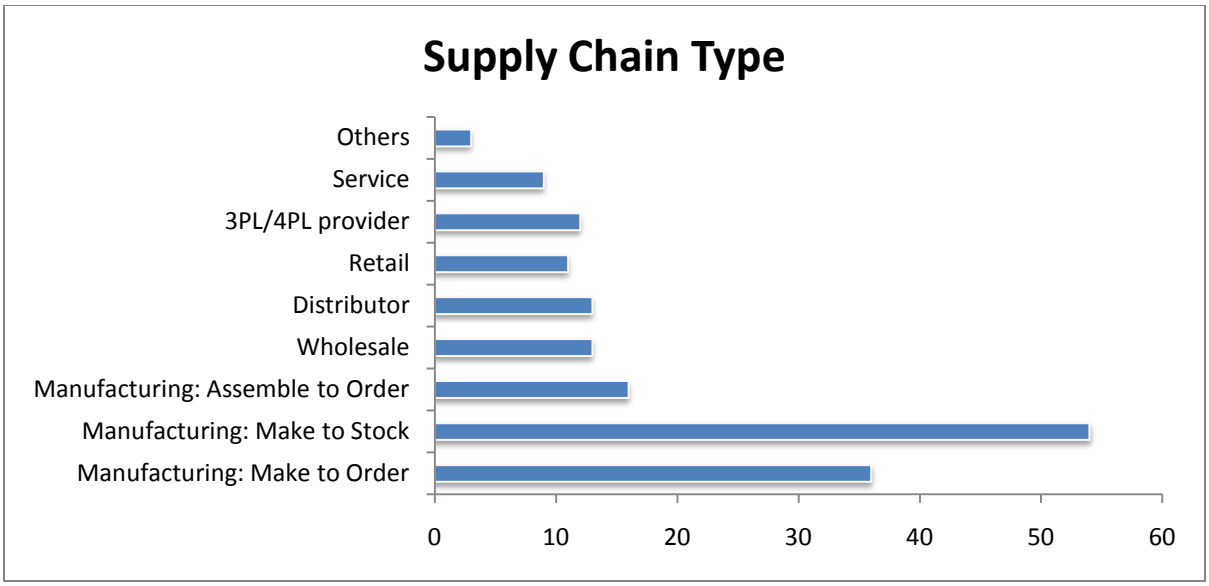

Figure 3 Supply Chain Type of participating companies

Top demand regions by spending are Western Europe and North America which can be explained by the fact that the largest fraction of survey participants represents European companies. Interestingly, out of the participants that have significant sales in North America, the majority (2:1) are flexible response companies. On the other hand, companies that sell significantly in Eastern Europe are mostly (2:1) cost-efficient.

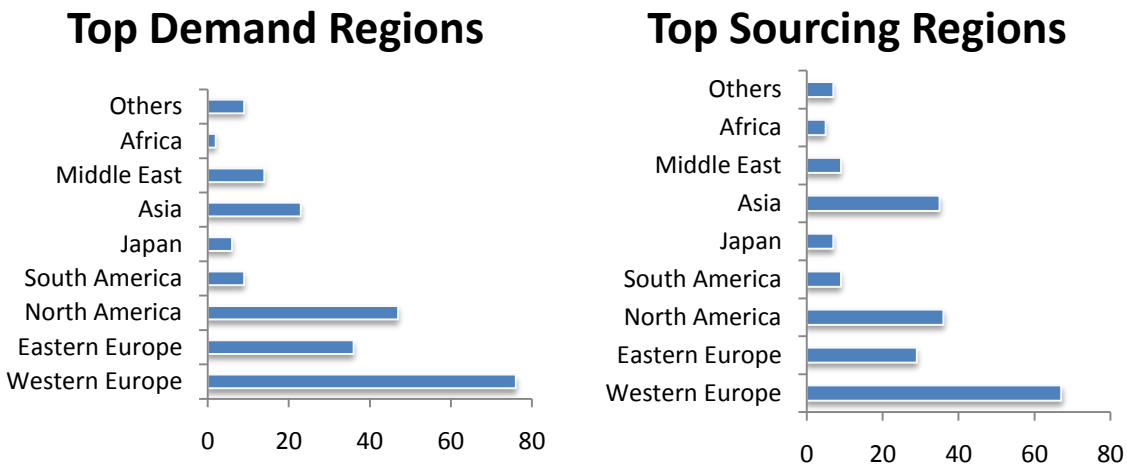

Figure 4 Top Demand and Sourcing Regions

Not surprisingly, top sourcing regions by spending for the survey participants are Western Europe followed by North America and Asia. Top inbound and outbound transportation modes are Road and Water. As expected, the majority of companies that apply air transportation mode are flexible-response companies.

2.2 Supplementary Financial Data

Apart from the survey, we also validated some of the findings by verifying with respect to real financial performance data. To carry out our financial data collection, we accessed an online financial database, Capital IQ, to obtain financial data of the companies that completed the three-part survey and their associated industries. A quarter of the companies were public companies and about a third of the companies were large private companies with publicly available financial data.

While using Capital IQ, we focused on several financial metrics that we believe are of significant relevance to corporate supply chains. The major financial metrics that we assessed for public companies were revenue, return on equity, return on assets, return on capital, debt to equity ratio, total asset turnover, and gross margin. For private companies, we focused on revenues and total asset turnovers as there is limited information available for such corporations. We looked at all of these financial metrics over a four year period between 2006 and 2009.

Once we had properly cataloged the necessary company data, we found the associated industry data for each company to calculate a ratio to assess the companies' performances relative to their industries' averages. To calculate this ratio, we proceeded with the following method:

$$Relative\ Metric = \frac{Company\ Metric - Industry\ Metric}{|Industry\ Metric|}$$

If a company had higher ROE than that of its industry in a particular year, relative ROE would be positive. If it underperforms relative to the industry, relative ROE would be negative.

Additionally, we also wanted to look into a financial metric that accounted for intangible assets of a company. Economists have used Tobin's Q as a measure of performance of a company since the last four decades. Defined as the ratio of market value of a firm to the replacement costs of its assets, Tobin's Q plays an important role in many financial interactions (Chung & Pruitt, 1994). Thus, we used Tobin's Q for each of our public companies as an additional metric of focus.

We calculated Tobin's Q as follows

$$Tobin's\ Q = \frac{Market\ Capitalization}{Average\ Total\ Assets}$$

Where $Average\ Total\ Assets\ for\ Year\ 1 = (\ Total\ Assets_{Year\ 0} + Total\ Assets_{Year\ 1})/2$

2.3 Approach to identify best performers

Clear identification of sustainable strategies and successful alignment requires identification of best performers. As part of the survey, executives were asked to rank their company's performance against their own targets for certain key performance indicators (KPIs). Thus we had collected four executive KPIs, six supply chain KPIs and nine financial KPIs. As expected, companies that did well in some did not do so well in others.

The KPIs collected were reduced to one single metric each for CEO (called Business performance Indicator, BPI), CFO (called Financial Performance Indicator, FPI), SCM (called Supply Chain Performance Indicator, SPI) and an Overall Performance Indicator, OPI) through a statistical technique called principal components analysis (see Appendix Section 8.2) (UCLA: Academic Technology Services, Statistical Consulting Group.,). These new performance indicators were used to find the relationship between performances from the four perspectives.

From an operational perspective, it was clear that companies with cost-efficient and flexible response supply chains require different treatment. The supply chain KPIs included information on inventory turns, supply chain costs, customer order fill rate, customer order lead time, customer order profitability, and forecast accuracy. Of course, one would expect that cost

efficient companies will emphasize inventory turns and supply chain costs while flexible response companies emphasize customer order fill rate and customer order lead time.

Therefore performance against targets on inventory turns and supply chain costs were applied to identify the best-in-class cost efficient companies. Similarly performance against targets on customer order fill rate and customer order lead time were used to identify the best-in-class flexible response companies. The subset of best-in-class companies were used to identify the correlations between strategies.

Additionally, for identifying the companies that are performing well for a given executive strategy, we used a different benchmark. For growth focused companies, the best performers were identified by high performance in revenue growth and market-share growth. For companies focused in competitive differentiation, the best performers where identified by high performance in customer satisfaction and market share. Best performers among those who were focused in shareholder return were identified by high performance in Return on Equity.

2.4 Statistical Tests Overview

At a higher level of abstraction, the three part survey could be summarized as in the diagram below.

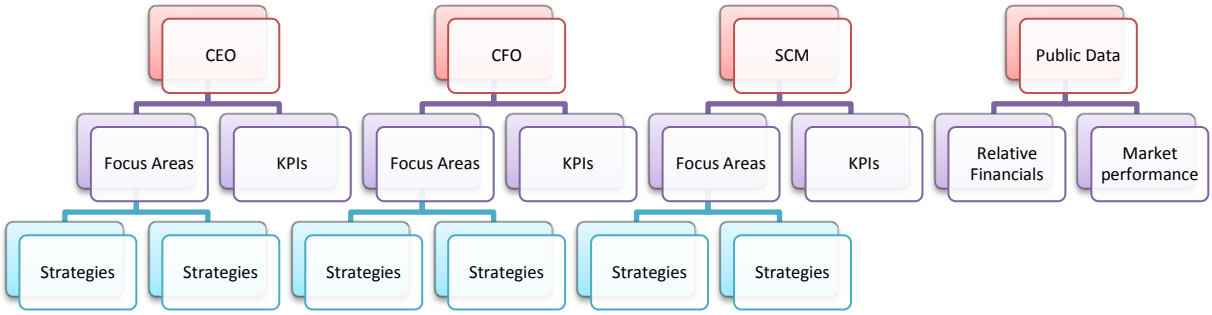

Figure 5 High Level Organization of the Survey

We examined the following relationships through statistical tests:

- Pearson's Chi-square tests to test the independence of focus areas within the CFO/CEO/SCM survey
- Spearman's correlations to test the statistical dependence between strategies both within and across the surveys
- Spearman's correlations to test the statistical dependence between strategies and KPIs both within and across the surveys
- Categorical Regression with Optimal scaling to find the most effective operation strategies for best performance
- Generalized Linear Model Regression to find the most effective operations strategies that help companies out-perform the industry. This was performed for a panel of four years of data from the publicly available financial databases.
- Generalized Linear Model Regression to find the most effective operations strategies that help companies get a higher market value over book value (Tobin's Q). This was performed for a panel of four years of data for public companies only.

A detailed discussion on the tests is available in Appendix B Statistical Tests.

3 Strategies and Measurement

3.1 What is strategy?

Strategic thinking has its origins in the strategy of war and is defined formally as elaborate and systematic plan of action (Beckman & Rosenfield, 2007). Over the years strategy thought leaders adapted these definitions to fit business environments where the battles were fought among competing firms. Two points of view have emerged as the most prominent in strategy making:

1. The field of competitive strategy that grew largely out of the military strategy and focuses on positioning a firm in the right way within the right industry.
2. The resource based view of the firm that focuses on the capabilities of the firm and how they can be leveraged to obtain competitive advantage.

According to Porter's five forces model (M. E. Porter, 1998), industries comprise suppliers, buyers, potential new entrants, incumbent competitors and possible substitutes. Each player has primarily three options to position itself to gain a dominant position

- Cost leadership: A firm could aim to be the low cost provider in an industry
- Differentiation: A firm could stand out by delivering products or services with higher quality or distinctive features
- Focus: A firm could serve a narrow segment of the market, focusing on particular customer groups, product lines or geographies.

Within these three generic positions, firms can further distinguish themselves by choosing an orientation based on customer's needs (For example, IKEA serves most of the needs for young first time home buyers), customer's accessibility (Carmike cinemas, for example, operates theaters in towns with populations under 200,000) or the variety of a company's products or services (For example, Vanguard provides an array of common stock, bond and money market funds that offer predictable performance and rock-bottom expenses) (M. Porter, 1996). Ultimately in the competitive strategy view, the key is to identify a desired position in the industry and structure the activities and develop the capabilities of the firm to match or fit the requirements of that position.

While the competitive strategies view suggest that industry structure plays the central role in creating opportunities for superior profitability, the resource based view argues that competitive advantage is derived from the firm's development of its resources and capabilities. Firms occupy different market positions because they possess unique resources and capabilities that are valuable, rare and inimitable (Beckman & Rosenfield, 2007). A resource is an observable asset that can be valued and traded – such as a brand, patent, land or license (Hoopes, Madsen, & Walker, 2003). Capabilities are the processes, activities or functions performed within a system and reflect the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a certain end result (Beckman & Rosenfield, 2007). They could be

- Process based capabilities (For example, McDonald's ability to deliver low-cost, highly consistent fast food throughout the world)
- Systems or Coordination based capabilities (For example, Southwest airlines co-ordinates the multiple activities associated with low-cost air travel)
- Organization based capabilities (Nucor Corporation's social environment which in turn supports strongly effective knowledge management)
- Network based capabilities that reach outside the bounds of a single organization and encompass the entire value chain or supply network (Dell's logistics system, for example)

Despite the debate between the two views, many authors have argued that strategy comes about through an iterative process that employs both the perspectives (Beckman & Rosenfield, 2007; Hax & Wilde, 2001; Mintzberg, Ahlstrand, & Lampel, 2005). In short, strategy is an iterative process of examining the marketplace for opportunities and leveraging the firm's ever changing capabilities in new and interesting ways such that the business can get where it wants to get to.

3.1.1 Corporate, Business and Functional Strategies

Strategy is defined at multiple levels in the organization as depicted in (Hofer & Schendel, 1978).

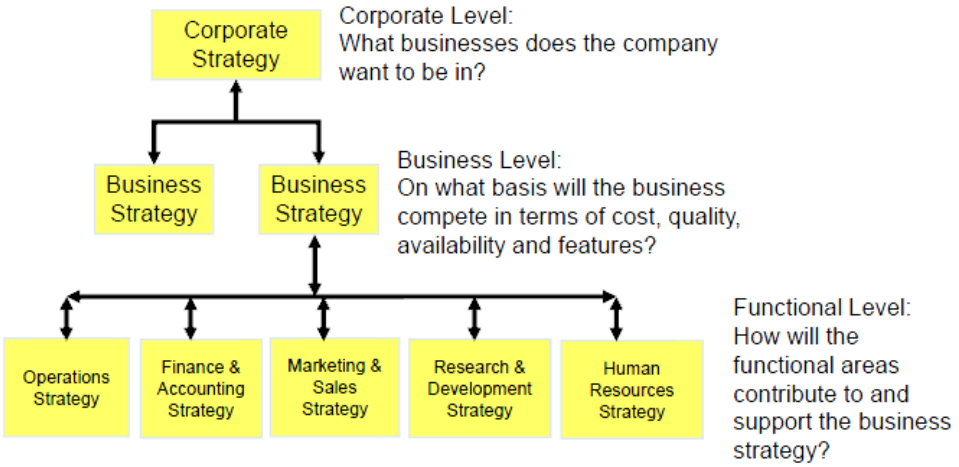

Figure 6 Levels of Strategic Planning

At the corporate level, decisions are made about the scope of firm including the choice of industries and markets in which it will participate. This includes investment in and divestment of businesses as well as allocation of resources among existing businesses. The finance strategy is a critical part of corporate strategy, as investments or divestiture involves financing.

At the business level, decisions entail choosing specific market segments in which the firm will compete, deciding how the firm will position its products and services to compete in those markets, and determining which of the firm's capabilities to leverage and how. To develop business strategy, the firm must think about its positioning not only in terms of its competition, but also in terms of in terms of customers, suppliers and complementors. Studies have shown that those companies that engage in system level thinking about their business strategies significantly outperformed those that focused at the product level. (Sterman, 2000)

At the functional level, decisions are made about how to synergistically structure the activities in operations, finance and accounting, marketing and sales, research and development, human resources and information technology to support or create competitive advantage. The functions also may offer resources, capabilities or competencies from which new sources of competitive advantage may be derived and on which new business strategies may be developed.

3.1.2 Value Proposition and Strategy

There is less agreement among management practitioners about what constitutes a 'Value Proposition' – or what makes it persuasive. A value proposition is an analysis and quantified review of the benefits, costs and value that an organization can deliver to customers and other constituent groups within and outside of the organization. It is also a positioning of value, where Value = Benefits / Cost (Barnes, Blake, & Pinder, 2009).

A customer value proposition is a statement that describes why a customer should buy a product or use a service. It is a clearly defined statement that is designed to convince customers that one particular product or service will add more value or better solve a problem than others in its' competitive set. Properly constructed, they force companies to rigorously focus on what their offerings are really worth to their customers (Anderson, Narus, & Rossum, 2006). In Operations Rules (Simchi-Levi, 2010), Prof. David Simchi-Levi defines customer value as "the way customers perceive the company's offerings, including products, services and other intangibles. Customers' perceptions can have multiple dimensions such as:

- Product Innovation,
- Product selection and availability
- Price and brand
- Value-added services and
- Relationships and experiences.

The first three items in the list of dimensions are essentials, and the last two are more sophisticated and may not be always as important, but can be mined for ideas to create a unique way to add value and differentiation to a company's offering. He lists a few examples of customer value propositions and their respective operations strategies.

Customer Value Proposition	Example	Operations Strategy
High Fashion content at a reasonable Price	Zara	Speed to Market
Customer Experience	Dell Direct	Responsiveness through Configure-to-Order
Product Innovation	Apple	Efficiency through outsourced

		manufacturing and logistics
Everyday Low Pricing	Wal-Mart	Cost Efficiency
Product Selection and Availability	Amazon	Efficient and reliable Order Fulfillment

Table 1 Five ways to compete in the market

Evidently, there is a link between value propositions and strategies. In the rest of the chapter, we'll explore these relationships in detail.

Traditional operations strategies have often focused on either efficiency, responsiveness or a combination of the two. Typically in an efficiency strategy, production and distribution decisions are based on long term forecasts, finished goods inventory is positioned close to market demand and supplier selection is mostly based on component costs.

By contrast, a responsive strategy focuses on speed, order fulfillment, service level and customer satisfaction. Here, the objective is to eliminate stock outs and satisfy demand by competing on response time and speed to market. Typically, in such a strategy, product variety is high and product life cycle is short.

Our research uses this differentiation in operations and investigates further as to how the companies are differing in terms of strategy.

3.2 What's on the Executive Agenda?

The business strategies are the basis on which the business competes in terms of cost, quality, availability and features. It depends on a variety of factors such as competitive environment, industry lifecycle and the dynamics of the value chain. We embarked on finding the focus areas by reading a number of recent CEO survey reports and by interviewing a small number of CEOs across industries. The findings were compiled and re-organized to form the survey questionnaire.

3.2.1 Insights from previous works

The IBM's 2008 Global CEO Study of more than 1000 CEOs across the world (IBM, 2008b) indicate that the CEOs see a huge *gap between expected change and ability to manage it.* CEOs are spending more time on *customer retention* and *collaboration to differentiate*. About two

thirds of the CEOs are implementing extensive *innovations*. Many of them are designing global businesses with *changed capabilities* and new partners engaging in *mergers and acquisitions* and industry model changes. They also note that *Corporate Social Responsibility* rising on agenda.

A 2009 study looked in depth at 16 CEOs of large U.S. corporations who were appointed 4 to 8 years ago and whose companies produced compound annual shareholder returns 20% greater than those from 2003-2008.(Carrott, 2009) According to the article, the main agenda of a new CEO in the first 12 months is to motivate the organization to create *measurable long-term value for shareholders.* The successful CEO's first year agenda includes:

- Establish *value creation as the ultimate measure of success*. CEO should resist pressure to slash R&D, cut brand building budgets or similar actions that *boost earnings per share* without creating value.
- Learn exactly how the company creates value and use it as a measure of success and get the core business on track.
- Set multiyear goals linked to value creation. In companies such as Adobe has 75-90% of top *executive compensation* comes from stock options and bonuses *tied to long term value creation.*
- Manage *Balance Sheet and Cash Flow as aggressively* as P&L and share the benefits with stock holders.
- Convey a need for urgency in achieving measurable progress toward value creation at all levels.

A McKinsey interview of C. John Wilder, CEO of TXU (Strickland, 2006) describes how economic thinking helped him lead TXU out of a regulated mindset and towards competitive success. According to him there has been a momentum of *change management after de-regulation.* 95% of economic rent comes from 5% of activities that can be identified more quickly in project mode vs. conventional organizational mode. He *outsourced and divested* number of areas that were not contributing directly to *improving customer service* and increased investment in core areas. Another factor that contributed to TXU's turnaround was introduction of *pay for performance*.

The 2006 article on Strategy+Business titled CEOs Build Strategy on "Data Democracy" (Booz and Company, 2006), the authors describe how the executives use *data to create competitive advantage* and direct the distributed employee power towards a common strategy. Globalization has increased the flow of data that companies must track- e.g. wage changes in Eastern Europe and Asia, price of steel worldwide, China's policy on currency valuation etc. Getting bad or incomplete intelligence can drain profitability. The CEOs must focus on collecting, assessing, and packaging data for consumption across the organization to mitigate business intelligence weaknesses. The authors also noted that *information security concerns*, financial regulations, and the highly publicized failures of intelligence systems has organizations set up board subcommittees *focused on IT*.

The 2008 Article –"Rethink your strategy - Urgent Memo to the CEO" (Branstad, Jackson, & Banerji, 2008) suggests a number of ways that help corporate leaders seize new opportunities, in the midst of the economic slowdown. The suggestions include reexamining the portfolio of businesses and staying focused on best products/services with competitive advantage with the extra cash and *minimizing working capital* to get through the slowdown. The article exhorts the CEOs to anticipate future industry structure and put an *M&A strategy into place* as acquiring attractive and complementary parts of marginal rivals may provide higher return than internal projects. The authors suggest taking intelligent risks by making *fixed price claims on capacity known to be reliable and recapitalizing debt by securing long term debt* at lower fixed rates.

The McKinsey article "A guide to CEO-elect" (Coyne & Rao, 2005) brings to the light a surprising fact that within three years of appointment one third of all CEOs chosen in US are gone. CEOs typically have about six to nine months to draw up a full agenda. Decisions made during first few months are disproportionately important in outcome, therefore period before CEOs take control is the best time to assess and fill any critical weaknesses. The article emphasizes ways of *making structural changes within the organization* and having the predecessor or the board 'clean the house' through policy changes, retirements etc.

The McKinsey Global article "What worked in cost cutting – and what's next", finds that companies were able cut costs effectively through the economic crisis, primarily by lowering the variable costs in response to lower demand. According to the authors, in order for strategic

sourcing and lean to work, they require big cultural changes and long term organizational commitment. The executive priorities for the future are *organizational effectiveness, talent and capability building, productivity growth and service improvement*.

The above mentioned articles and the interviews with select CEOs across industries, lets us summarize the typical CEO agenda as a combination of various attributes such as **differentiation** *(includes customer value &satisfaction, market segmentation, brand, innovation, R&D),* **growth** *(includes revenue, profit, market share, customer retention, managing recession),* **shareholder return** *(includes cost to meet demand, pricing and margin protection, stock performance, alignment of organization structures and incentives)* , **capabilities** *(includes staying ahead of competition, gap between ability and expected change, industry and global trends, deeper relationships, time to respond, organizational effectiveness, productivity growth),* **compliance** *(includes quality, regulation, sustainability policy, energy use)* and **risk management** *(includes stability & flexibility for volatility, disruption).*

3.2.2 Structuring the survey

One of the challenges of designing a survey to understand the executive strategy is to clearly identify focus areas and strategies that are mutually exclusive and collectively exhaustive. Since there were no other work that we could leverage to identify such categorization, we relied on our judgment to categorize them, backed up the literature survey and discussions with the select CEOs. Thus we proposed Competitive differentiation, Growth, Building capabilities through own resources or alliances, Shareholder return, Corporate social responsibility and Risk management as the high level focus areas. We also left a field to capture any information that was not belonging to these categories. Cost control and optimal pricing were the only two additional focus areas thus captured. This validates our initial hypothesis about the focus areas.

Executives are constantly concerned about competitive differentiation. There are a number of ways to differentiate in the market. Some companies (Pharmaceuticals for example) make huge investments in R&D and regularly come up with ‘innovation’ in products and services. Some companies especially service companies focus on ‘customer satisfaction’ as a way of differentiation. Large conglomerates such as 3M, General Motors, and General Electric use

‘brand’ as the key differentiating factor. Using ‘market segmentation’, product designers can focus more on a particular set of needs and marketers can use a particular media to reach a set of users, thus enabling the company to differentiate. Companies such as Walmart, differentiate by their ‘supply chain’. Thus we propose – Innovation, Customer satisfaction, Brand, Market segmentation and Supply chain as the strategies for competitive differentiation.

Growth is another prime agenda for the CEO. Though not mutually exclusive, ‘Sales revenue’, ‘Profit’, ‘Market share’, ‘customer base’ and ‘new products and services’ are the key measures of growth.

In a largely interconnected world, no company has the resources or capabilities to single handedly compete in the market place. ‘Stronger supplier relationships’, ‘Stronger customer relationships’ and ‘Ownership of assets or resources’ are the obvious subcategories in the focus area of ‘Building capabilities through own resources or alliances’. ‘Staying ahead of competition’ by building own resources and capabilities and improving ‘customer response time’ are the other agenda items that we proposed.

As indicated in many of the above mentioned articles ‘Shareholder returns’ is one of the primary objectives of the CEO. Among the strategies, we proposed ‘Customer pricing’, ‘operating costs’, ‘Resource allocation’ as the key ones. ‘Stock performance’ and ‘Shareholder dividend’ could be their key indicators.

Off late, there is a lot of buzz around ‘Corporate social responsibility’ being the focus of many companies. The sub focus areas under this could be ‘Responsibility for social needs’, ‘Brand image benefits’ or even plain ‘value to the customer or shareholder’. Quite often ‘Compliance to regulatory requirements’ and ‘internal standard operating procedures’ or ‘Environmental policy’ are drivers for corporate social responsibility.

‘Volatility of supply’ and ‘Volatility of demand’ drives the key challenges for ‘Risk management’. Based on our interviews, ‘Detecting disruption’, assessing the ‘Impact of disruption’ or ‘Mitigating disruption’ could be focus areas for CEOs to manage risks.

The following mind-map represents the CEO survey design.

Figure 7 Mind-map of Executive Focus Areas

Based on the discussions with the select CEOs, we decide to track the key business performance metrics as ‘Revenue’, ‘Market share’, ‘Customer satisfaction’ and ‘Return on equity’. The survey respondents were requested to state their achievement of business targets with respect to them (as High, Medium or Low). Post survey, the free text field for other metrics that CEOs track, yielded customer delivery, geographic growth, operating profit, debt freeness, total supply chain costs, service level sustainability, working capital ratios, EBITDA, total trade spend, real internal growth, market contribution from the respondents.

The complete survey questionnaire for the CEO is available in Appendix section 7.3.

3.3 What's on the Supply Chain Agenda?

Supply chain strategies require a total systems view of the linkages in the chain that work together efficiently to create customer satisfaction at the end point of delivery to the consumer. The goal is to lower the costs throughout the chain by driving out unnecessary costs and focusing attention on adding value. The supply chain system must be responsive to customer requirements. We embarked on finding what supply chain executives thought about their focus areas by reading some of the prior survey reports and by interviewing a small number of Supply Chain Directors across industries. The findings were compiled and re-organized to form the survey questionnaire.

3.3.1 Insights from previous works

The IBM Chief Supply Chain Officer Study (IBM, 2009) captured the challenges and aspirations of about 400 Supply Chain officers across the globe. According to the study, Supply Chain leaders continue to struggle to gain more *supply chain visibility*, to meet escalating *customer demands* and to *control costs*. They also noticed that *emerging economies* are developing into real markets, not just places to procure low-cost parts and outsource manufacturing. Rapid, constant change is rocking this traditional area of strength and outstripping supply chain executives' ability to *adapt- flexibility*. Flooded with more information than ever, supply chain executives still struggle to "see" and act on the right information. As per the authors, CFOs are not the only senior executives urgently concerned about risk - *risk management* ranks remarkably high on the supply chain agenda as well. The study also noted that despite demand-driven mantras, companies are better connected to their suppliers than their customers. Contrary to initial rationale, *globalization* has proven to be more about revenue growth than cost savings. According to the study smarter supply chain of the future will be *instrumented* (generated by sensors, RFID tags, meters, actuators, GPS, devices), *interconnected* (with customers, suppliers, IT systems) and *intelligent* (move past sense and respond to predict-and-act).

In one of the early surveys of Supply Chain executives in 2004, Capital Consulting and & Management Inc (CCMI) identified a number of critical supply chain focus areas (Capital Consulting and Management Inc, 2004). They included developing collaboration programs for

major economic advantages- supplier spend data analysis with incentives to *improve and share value, redesign inefficient practices* and jointly plan with key customers, suppliers, and 3PL partners. They identified the need to *optimize cash flows* - supply chain initiatives overlook the flows of funds across trading partners a critical factor in delivering shareholder value. It is interesting to note that supply chain executives considered accelerating supply chain actions and decision making as critical to their success. The wanted to respond faster to *changing customer needs*, more flexibly adjust manufacturing and delivery cycles and *expedite new products to market.* Another focus area was supply chain security - beyond adding inventory to address *risk of supply interruptions*, new regulations and procedures- identify key vulnerabilities, set priorities and innovative, cost-effective and realistic ways to address them. Supply Chain leaders had a strong focus on technology- advanced analytical tools to supply chain planning and execution- for issues such as *forecast accuracy, expediting, production schedule changes,* inventory write-downs, *RFID smart tag capabilities* for data capture and transmission.

A McKinsey study (Pande, Raman, & Srivatsan, 2006) indicate that outsourcing relationships are more complex with difficulty in access to critical data (e.g. details about quality, supplies on hand, manufacturing capacity, warranty analysis, regulatory compliance). Even planning for a demand spike may require data locked up across many partner IT systems. Leading companies, who have outsourced and globalized significantly, consolidate supply chain data and have tailored information flows to supply chain types (For example, fashion, engineered, stable etc). We anticipated that a number of companies would be interested in *developing capabilities to monitor critical supply chain information.*

The article "Debugging the Supply chain" (Appling & Buckley, 2009) argues that companies that consciously make *innovation* a key element in supply chain re-engineering can gain a competitive edge, even in tough economic times. Supply chain innovation can produce significant gains in revenues, profits, and market share. The article illustrates the story of 10 year old Cricket communications that brought about supply chain innovation by creating a cross functional forum of leaders from every part of the company and outside suppliers.

The journal article "An Empirical Analysis of the Effect of *Supply Chain Disruptions* on Long-Run Stock Price Performance and Equity Risk of the Firm" (Hendricks & Singhal, 2005)

investigated 827 disruption announcements made during 1989–2000 and found that the average abnormal stock returns of firms that experienced disruptions is nearly –40%. Much of this underperformance is observed in the year before the announcement, the day of the announcement, and the year after the announcement. Furthermore, the study indicates that firms do not quickly recover from the negative effects of disruptions. Also, the equity risk in the year after the announcement is 13.50% higher when compared to the equity risk in the year before the announcement. The concern for risk is re-iterated by another McKinsey research article (Paulonis & Norton, 2008), which finds that executives find that supply chain risk is rising sharply due to greater complexity of products and services, high energy prices, and increasing financial volatility.

Another McKinsey research on operations executives at more than 60 companies (Constantine, Ruwadi, & Wine, 2009) suggests that companies with high-performing supply chains differentiate themselves from ordinary performers through superior application of six principles – linking supply chain strategy to company strategy, segmenting the supply chain to master the product and service complexity that matters the most, tailoring the supply network to optimize service, cost and risk goals, using lean tools for supply chain optimization, robust sales and operations planning and focusing on talent. The research also finds that the first two are dependent on the last four.

For breakthrough operating strategies, a reframing of the business equation is needed – from higher fixed cost structure to lower variable costs more in tune with user needs (Laseter & Johnson, 2004). To cite some examples, Toyota changed EOQ to batch size of 1 by reducing set up time; Southwest reduced costs and improved customer service by point-to- point instead of hub and spoke; Progressive realized that real leverage came from quick and accurate claims settlement and not from lower operating expenses; Amazon and Google reframed the IT paradigm by embracing ‘cloud computing’. We anticipated that some of the Supply Chain executives would be *re-thinking their business equations*.

According to the IBM article based on the survey of 664 supply chain officers (Butner, 2010), supply chain management isn’t just about aligning supply and demand. In the end, it has to be about developing and executing the strategies to achieve the company’s financial objectives.

According to the article, visionary supply chain leader's top strategic and smarter capabilities include

- *Extensive outsourcing* of non-differentiated functions - to take advantage of global capabilities, skills and cost structures and share risks across the extended network.
- *Optimized pipeline inventory*. Inventory is kept at ideal levels throughout the supply chain.
- Efficient *cost structures*. Visionaries employ variable costs structures that fluctuate in direct synchronization with demand variability. Integrated, balanced, evaluation of constraints helps reduce/contain costs while maintaining customer service levels.
- Cost-efficient *sustainability* practices. They use models, analyzers and optimizers of cost and service levels, while evaluating the trade-offs of the carbon footprint, energy, water usage. Product design includes environmental considerations such as recycling and after-life disposal.
- Hedged risks. Visionaries use inclusive *risk management policies* and programs that are adjusted for the probability of an event occurring. To facilitate immediate response, mitigation strategies are in place and known by all.
- Rapid response to changes in market conditions and demand variability. Networked Sales & Operations Planning linked to actual demand signals (point-of-sale [POS], orders, continuous replenishment). Use of market analytics and *customer collaboration* to predict demand.
- In-process or in-stream *reallocation of inventory* in response to demand variation: resupply, redistribute, reroute. Responsive allocation of all resources: human, assets, supply
- Use of *business intelligence and analyt*ics on key control point indicators (forecasts versus orders, schedules versus production capability, inventory in transit, shipment status). Performance management, dashboards and alert notification for exception management.
- *Collaborative planning and execution* with partners
- Resourceful integration and *visibility* across the supply chain (internal & external)

- Real-time information generated by *"smart" devices and objects* (RFID, sensors, actuators).

Finally, we expected that Supply Chain leaders will be thinking about *sustainability* - about smart use of energy; cap and trade; increased gasoline tax and reduced income tax, energy demand and supply imbalance; petro-politics; energy poverty; climate change and biodiversity loss (Flower, 2009).

The above mentioned articles and the interviews with select Supply Chain Directors/COOs across industries, lets us summarize the typical SCM agenda as a combination of various attributes such as **demand fulfillment** *(inventory, lead time, total costs, service level, quality, product lifecycle integration, visibility, segmentation, flexibility, # of SKUs, programs such as VMI),* **Sales &Operations Planning** *(realistic operating plan aligned with business and financial plans, minimize cross-functional conflict, profitably support growth),* **procurement** *(ensuring long term supply of raw materials, supplier viability, rationalization, near-shoring, collaboration, contracts),* **network design** *(impact of demand & supply volatility, energy prices, sustainability, industry trends),* **supply chain asset strategy** *(owning versus outsourcing and competitive differentiation through manufacturing, distribution, transportation and retailing),* **risk management** *(assess & reduce impact of variability, disruption alerts and response, risk sharing, transfer &residual)* and **Supply Chain Organization & Process** *(includes redesigning inefficient practices, spend analysis, get capacity at better terms , access to data, IT tools, security, people development, alliances)*

3.3.2 Structuring the survey

As in the CEO's strategy survey, there are no prior works that provides a categorization of different types of supply chain strategies. Based on the interviews and secondary research, we propose 'Satisfying Customer Demand', 'Visibility', 'Supply chain innovation', 'Purchasing', 'Supply chain assets', 'Supply chain organization, processes and technology' and 'Risk management' as the highest level of abstraction of the supply chain focus areas.

A number of sub-focus areas could be thought for categorizing 'Satisfying customer demand'. 'Reduction of customer lead times', 'Reduction of stock outs' and 'Reduction of total costs',

‘Improvement of product or service quality’ are some of the obvious ones. ‘Deployment of segmentation strategies’ (they could be at market or product or service level) helps the entire organization focus on a set of requirements and customers to help them meet their demand. Some companies ‘deploy value added services’ (An example is Men’s warehouse offering tailoring to help their customers obtain the ‘perfect fit’) as another way of satisfying customer demand.

In an increasingly complex world with high risks of disruptions, ‘Supply Chain Visibility’ is of prime importance. There are a number of ways in which the supply chain leadership gains visibility. ‘Shipment plan’, ‘Inventory plan’, ‘Production schedule’ are the most important ones. Actions emerging from the visibility are ‘Expediting shipment’, ‘adjusting inventory levels’, and ‘adjusting production schedule’. Some sophisticated supply chains use technologies such as RFID and 2D barcode to track and trace products.

In the last fifty years, companies have seen a number of ‘Supply chain innovations’ – Toyota production system, P&G’s continuous replenishments, the ocean shipping containers, universal product code, Ford’s assembly line etc to name a few (Gilmore, 2010). It is difficult to categorize how companies are innovating their supply chains. As a start, we propose ‘Launch of new products or services’, ‘Introducing new channels of distribution’ and ‘Sustainability and CO2 footprint initiatives’ as some of the key strategies. ‘Product or service design for supply chain’ is often another supply chain innovation usually done to support environmental policy, stock keeping unit rationalization or logistics cost reduction. Many companies use ‘Product or Service lifecycle management’ to support premium pricing at launch or to prevent price erosion due to obsolescence. ‘Network redesign’ to support faster time to market by implementing postponement strategies or proximity to suppliers or adding new value added services is another type of supply chain innovation. The commoditization of software solutions has increased the adoption of analytical techniques to improve ‘Forecast accuracy’ – another supply chain innovation.

‘Purchasing’ is one of the prime focus areas of supply chain. The focus areas could be ‘Reduction of supplier lead-times’, ‘Reduction of supplier costs’ and improvement in the supplier’s ‘timeliness’, ‘reliability’ ‘capability/know how’ and ‘quality’. Some companies have ‘optimal positioning of inventory’ as one of their purchasing focus areas.

‘Supply chain assets’ focus area involves managing the productivity and cost control of the assets under the trust of supply chain leadership. It involves reducing ownership of ‘manufacturing plants’, ‘distribution centers’, ‘transportation assets’ or ‘retail stores’. Quite often, the same strategic assets can be used for competitive differentiation (Redbox DVD rental makes the ubiquitous rental boxes to differentiate from its competitors such as Netflix and Blockbuster)

A number of strategies fall under the umbrella of ‘Supply chain organization, processes and technology’. Number one of course is ‘Sales and Operations planning’ (S&OP) process to that aligns operating plans with business and financial plans. Collaboration processes with ‘customers’ and ‘suppliers’ are other organizational and process measures. The use of information technology to improve data visibility and integrity of the supply chain ‘planning processes’ or ‘execution processes’ form other sub-focus areas. ‘Building internal supply chain competencies’ or ‘minimizing internal cross-functional conflicts’ are two internally focused organizational strategies.

The 9/11 attack, the SARS epidemic, Katrina and scores of other natural and man-made disruptions have increased companies’ awareness of the need for active ‘Risk management’ (Sheffi, 2007).(Sheffi, 2007) We anticipated that the companies will be monitoring several sources of risk – such as ‘Customer demand’, ‘Materials availability’, ‘Workforce availability’, ‘Process or technology failures’, ‘Political or regulatory context’, ‘Competitor response’, ‘Industry wide trends’ and ‘Environmental’ risks. These risks could have impact in terms of ‘Cost fluctuation’, ‘Obsolescence and price erosion’, ‘Inefficient use of existing assets’, ‘Inability to satisfy customer demand’, ‘Inability to meet supplier obligations’. Classic risk management literature talks about four ways of dealing with risks – avoid, reduce, transfer or accept (Deloach & Temple, 2000). The article “On the Value of Mitigation and Contingency Strategies for Managing Supply Chain Disruption Risks” (Tomlin, 2006) mentions two additional approaches – exploit and ignore. ‘Building contingencies in manufacturing’, purchasing, distribution, transportation or retail locations’ are ways of avoiding and reducing the impact of risks. ‘Risk sharing with customers and suppliers’ are ways of reducing or transferring risks. ‘Disruption and response scenario planning’ are ways to exploit the risks. ‘Risk monitoring

processes or technologies', 'quantitative and qualitative approaches' are fundamental to good risk management practices.

The following mind-map represents the thinking about the survey design.

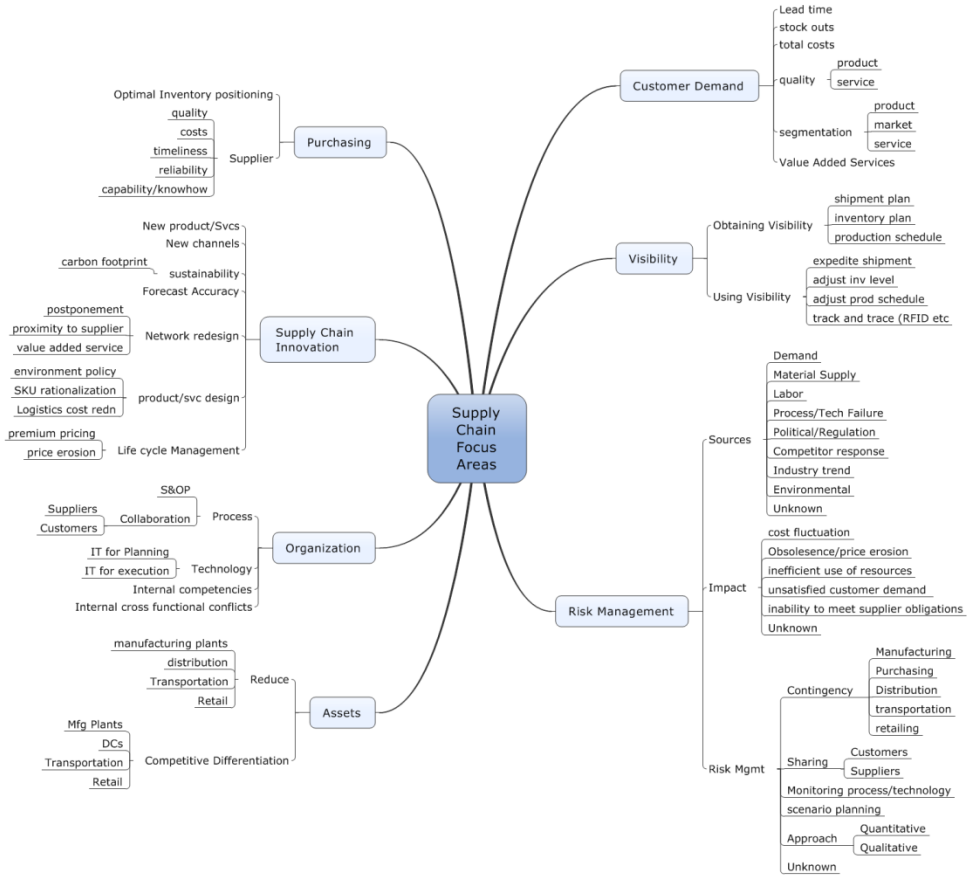

Figure 8 Mind-map of Supply Chain focus areas

Our discussions with the select Supply Chain Directors lead to us to decide on the key performance indicators as 'Inventory turns', 'Customer order fill rate', 'Customer order lead-time', 'Supply chain costs', 'Customer order profitability' and 'Forecast accuracy'.

The complete survey questionnaire for the Supply Chain Director/COO is available in Appendix section 7.2.

3.4 What's on the Financial Agenda?

Today's CFO is more than the bean counter – he/she is driving strategy and leading change. CFOs help the organization reach out and grow the business and then refine it to make sure that there is value created out of that expanded business. The CFO function balances the twin demands of return on investment and meeting growth objectives. We started on exploring the CFO focus areas by reading some of the prior survey reports and by interviewing a small number of CFOs across industries. The findings were compiled and re-organized to form the survey questionnaire.

3.4.1 Insights from previous works

The IBM study of more than 1900 CFOs (IBM, 2010) describes the evolution of the role of the CFO with the pivotal event of global economic downturn. Under a glaring spotlight, CFOs and their Finance organizations had to address *urgent capital acquisition, cash flow and revenue challenges*. But volatility and uncertainty also drew them into more frequent boardroom conversations about *forecasts, profitability, risk management and strategic decisions related to supply chains, pricing and production*. More than 45 percent of CFOs indicate that their Finance organizations are not effective in the areas of strategy, information integration, and risk and opportunity management. With expectations rising faster than effectiveness, Finance faces a *widening execution gap.* However, there is a small group of CFOs with significant advantages in managing enterprise risk, monitoring business performance and driving insight from information. There are two key focus areas that are the critical success factors - *Finance efficiency* and *business insight*. To reduce the complexity of their financial operations, they have implemented *common processes across Finance,* such as source-to-report, and standardized data and metric definitions, such as the components of gross margin. Their business insights help them drive operational efficiency, spot market opportunities, react faster and ultimately predict changes in the business environment. To enable these capabilities, they have far greater levels of information integration across the enterprise, analytical talent that can effectively partner with the business, and more mature analytical capabilities, such as *integrated planning and forecasting, scenario planning and predictive modeling*.

The pre-recession IBM study of CFOs (IBM, 2008a) conducted primary research with over 1200 CFOs to ascertain their choice to use differing financial management governance models, and their role and effectiveness in risk management. *Globalization* and the *prevalence of risk* place an additional burden on the already full Finance agenda. CFOs had a difficult time prioritizing their agenda. Curiously, the study finds that two agenda items ranking lowest in importance, supporting / managing / mitigating *enterprise risk* (66 percent) and driving *integration of information across the enterprise* (62 percent), are the key differentiators for outperformers in revenue and stock price growth. The study also notes that 62 % enterprises (> USD $5B) have encountered material risk events in the last three years and 42% were not well prepared for it. 42% of respondents do historic comparisons to avoid risk. Just 32% set specific risk thresholds, and only 29% create risk-adjusted forecasts and plan. *Integrated Finance Organization* help their enterprises stock perform better with revenue growth rates nearly double that of their industry peers (CAGR).

The McKinsey article "Ten Questions for CFOs" (Cogman, Dobbs, & Giordano, 2009) suggest questions that CFOs should be asking themselves and their executive colleagues as the recovery from the credit crisis approaches. Among the suggested focus areas are *supply chain flexibility to meet the demand, acquisition targets, restructuring, alliances, divestitures, capital acquisitions, risk management and the impact of recovery on cost of talent acquisition and capital spending*.

The article "What's Keeping CFOs Awake at Night?" (Cummins, 2008), reviews Deloitte's new workbook that explores nine critical debates currently shaping finance. *Planned vs actual business performance* (earnings guidance), organization structure (outsourcing, hiring for current skills or future potential) and *sustainability* are the most important of them.

The secondary research and interviews with the CFOs lead us to believe that their focus areas would be a combination of **Profitability** *(ROE, ROC, EBIT etc),* **Liquidity** *(corporate cash, working capital, cash-to-cash cycle time, scenario planning, debt reduction, divestiture)* , **Cost** *(clarity of costs & value, sharpen resource allocation to align with shareholder and customer value, purchasing analysis),* **Restructuring** operations *(growth, cost efficiency, tax& regulatory, M&A, better terms with partners, customer retention, quality)* **Variance** *(budget, earnings guidance planned v. actual, flexibility in recession)*

3.4.2 Structuring the survey

Our discussions with select CFOs and secondary research lead to the hypothesis that 'Profitability', 'Liquidity' and 'costs' are the most important focus areas for the chief financial officers. CFOs are often involved in restructure of operational assets or debt. CFOs are charged with managing the variance in budget and earnings. Survey respondents pointed out 'cash flow', 'risk', 'vendor managed working capital' and 'net working capital' as additional focus areas.

'Return on equity (ROE)', 'Return on invested capital (ROIC)', 'Earnings before interest and taxes (EBIT)' and 'Operating margin' are the industry standard ways of measuring profitability. Survey respondents had a number of ways of measuring profitability including 'economic value added (EVA)', 'net equity/EBITDA', 'marginal contribution by brand/product/channel' as other ways of measuring the same.

'Liquidity' is measured in terms of 'Corporate cash (cash and short term investments in the balance sheet)', 'Working capital' (current assets) , 'Cash-to-cash cycle time' and 'operating cash flow' (cash generated from revenue excluding costs associated with long term investment or capital items or investment in securities(Ross, Westerfield, & Bradford, 2009)). 'Sales scenario planning' and 'Operations scenario planning' are strategies that finance executives deploy to ensure liquidity.

With the global recession, the perception of the CFO's role has changed from helping the business to understand the financial implications of operational decisions to helping business to understand the operational decisions required to improve its financial position. Many CFOs are helping their companies achieve significant and sustainable cost reductions (PricewaterhouseCoopers, 2009). 'Cost of goods sold', 'Purchasing spend', 'Operational efficiency', 'Sales, general and administrative expenses', 'Research and development expenses', 'Capital expenses' are the various heads of expenses that CFOs usually monitor. Some CFOs pointed out 'logistics costs' as an additional head that they monitor.

CFOs are often charged with 'restructuring operational assets or debt'. Our hypothesis of the key drivers for this focus area were 'Lower costs', 'Capacity at better terms', 'Growth', 'Better quality', 'Customer retention', 'Tax efficiency', 'Risk mitigation' and 'Merger, acquisition or

divestiture'. Most CFO responses fell into these categories, but some suggested purchasing spend as another focus area.

Variance analysis measures the differences between expected results and actual results of a production process or other business activity. Measuring and examining variances can help CFOs and the rest of the management contain and control costs and improve operational efficiency (Hilton, Maher, & Selto, 2008)(Hilton, Maher, & Selto, 2008). The variances that CFOs typically monitor are 'Budget variance' and 'Earnings variance'. These in-turn are built on other commonly measured variances such as direct labor rate variance, direct labor efficiency variance, direct material price variance, and direct material quantity variance. We also decided to add 'Customer response', 'Supplier response' and 'Compliance' to verify if CFOs worried about these as part of monitoring variance.

The following mind-map represents the CFO survey design.

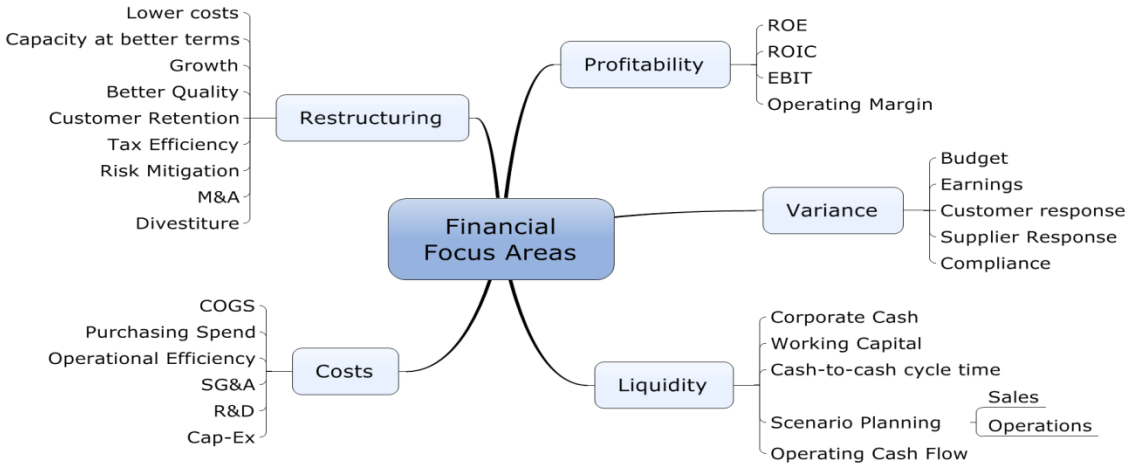

Figure 9 Mind-map of Financial Focus Areas

Financial Metrics used by the CFO fall under various levels such as indicator (windsock) metrics (those give a quick overview of company's financial health), dashboard metrics (those indicate operations that require review) and tuning knob metrics (those provide the ability to tune the other levels) (Sehgal, 2008). Metrics such as ROA, ROE, ROC, margins and various ratios and leverage metrics fall into the top level windsock category. The lower two categories are best used for industry comparisons, operational improvements and day to day monitoring. We decided to focus on the top level for evaluating the company performance and thus selected 'Return on Equity' 'Return on Assets', 'Inventory Turnover', 'Total Asset Turnover', 'Operating Cash Flow', 'Net Working Capital to Assets', 'Operating Margin', 'Debt to Equity ratio', 'Total debt ratio' as the key business performance indicators in the CFO survey.

The complete survey questionnaire for the CFO is available in section 7.4

3.5 Strategy alignment

During the warm days of the year, we often see eight-person shells racing up the Charles River in Massachusetts. Although they contain strong, motivated athletes, the key to their success is that they row in synchronization. Attempting to implement independent tactics for each of them would be disastrous. Many corporations are like uncoordinated shells. They have business units with highly motivated, experienced professionals, but the efforts of individual business units are not coordinated. The shell's coxswain is like a corporate headquarters. A passive coxswain consumes space and detracts from the crew's overall performance. The superior coxswain, like a well-led corporate headquarters, adds to the performance of individual divisions. A study conducted by Kaplan and Norton (Kaplan & Norton, 2006) indicate that companies that are superior in alignment have better business results than those who are not so good in alignment. Alignment was the key differentiator among the management best practices for implementing strategy that made these organizations different. Alignment means changing the organization to ensure the strategies are achieved. Most organizations fail to implement strategies because they under estimate the importance of this process. It is wrong to assume that best practice is always best practice. The processes appropriate for operational excellence are totally different from those for product leadership. (Holland, 2002). Strategic positioning and excellence in execution are, in isolation, insufficient to generate sustainable advantage. Creating and sustaining tight

alignment between the parts of organization is now the key to success. To facilitate alignment, modern strategy-formulation processes are more dynamic and iterative (Gattorna, 1998). IBM's fall and rise constitute a good example for effective realignment.

The IEEE paper "Manufacturing Strategy and Business Strategy in Medium-Sized Enterprises" (Raymond & Croteau, 2009) empirically investigates the extent of alignment and its effect on performance outcomes of productivity and profitability. With data from about 150 Canadian Medium Enterprises, they find that certain types of manufacturing systems are appropriate for certain type of strategic orientation. They observed a positive association of alignment and productivity for prospectors (innovative in introducing new products and testing new markets) and defenders (cost oriented and aims to maintain in its position in a relatively stable market) but not for analyzers (adopt a balanced orientation in the trade-off between risk minimization and opportunity maximization). This implies that even strategic alignment is not prescriptive.

Our contention is that a new framework is required to help organizations align market focus, strategic response and operational capabilities on the premise that better the alignment, the better the bottom-line performance. Our research explores more into how companies can bring alignment between executive, operations and finance arms of the organization. Awareness of the linkages between the strategies and performance indicators of these three elements of a firm helps to align them better.

3.5.1 Insights on the link between executive agenda and supply chain agenda

In the past decade or so, a few management authors have investigated the link between CEO's agenda and supply chain agenda. In one such article by published in Strategy+Business (Heckmann, Shorten, & Engel, 2003), the authors have pointed out that when supply chain management is a CEO level agenda item as part of the overall business strategy, annual savings improvement in the 'cost to serve customers' are nearly double (8.8% versus 4.4%). Supply chain management is most powerful when it is viewed as an embedded cross-functional capability in an organization. The study finds that great cost savings can be achieved when the management is willing to re-organize the supply chain itself, rather than willing only to make

adjustments within the existing supply chain structure. The study also finds that for Supply Chain Management to reach its full potential, *technology alone is not sufficient.*

The article "Operations Experts Make a Comeback to the Executive Suite" (Strategy+Business, 2006) , written in the wake of dot com bust and the crash of the new economy, states that business operations have returned to the forefront of corporate strategy. Supply chain executives of companies such as Nike and United Technologies have boosted performance by *turning business process and integration into a force of strategy and innovation*. This in-turn has catapulted supply chain specialists and operations experts into the ranks of top corporate decision makers. According to Mahender Singh, Director of MIT's Supply Chain 2020 project, superior supply chains share certain characteristics such as, *operating models creating a competitive advantage for the business, emphasis on high performance execution defined by metrics and supporting and enhancing the overall strategy of the business*.

In a 2007 article in Supply Chain Management Review titled "Getting Supply Chain on the CEO's Agenda" (Thompson, Eisenstein, & Stratman, 2007), the authors point out a three part agenda for supply chain executives to get supply chain into the CEO's Agenda – think beyond cost, develop real collaboration skills and grow your personal leadership capabilities. CEOs emphasize growth over cost reduction. 93% of the CEOs view the importance of supply chain management to overall business strategy as critical or very critical. Supply chain executives need to move beyond a mindset focused solely on delivering the 'right product, at the right place, at the right time, at the lowest cost' to one more oriented towards growth. Supply chain leaders are well positioned to leverage their knowledge of the extended supply chain to help build offerings that provide measurable value.

The Harvard Business Review article "Are You the Weakest Link in Your Company's Supply Chain", (Slone, Mentzer, & Dittmann, 2007) cautions CEOs who are disengaged from supply chain management against the risk of sabotaging partner strategy and customer relations – and leaving money on table. Supply chain management can deliver significant, tangible benefits in the form of *reduced working-capital investment, lower fixed costs, faster inventory turns and greater return on assets.* However it has become complex, technology-driven discipline that reaches across functions, business processes, and corporate boundaries.

CEOs can exert influence in the following seven key areas of supply chain management:

- Picking the right leaders: CEOs fail to realize that supply chain has become such a complicated set of activities. CEOs who are up to date on supply chain practices and trends insist that only the best supply chain professionals be hired.
- Initiating benchmarking and devising metrics: Metric's effectiveness should be confirmed directly with several of the company's best customers. True cost to serve, determined on an activity basis, should be part of the CEO's metrics dashboard.
- Setting incentives for supportive behavior: They should drive the focus on total landed costs beyond transportation or procurement costs individually. They should reward employees and suppliers on demonstrated savings.
- Keeping up with supply chain technologies and trends: CEOs should lend their authority to the change-management process, helping buy-in and making certain that resources are in place.
- Eliminating cross-functional crossed wires: CEOs should be personally involved in developing a mature S&OP process. Operations and supply chain should be held equally accountable with sales and marketing for customer service and inventory.
- Adding supply chain insight to business planning: CEOs should demand that relevant business planning and negotiations anticipate and explicitly address important supply chain ramifications.
- Resisting the tyranny of short-term thinking: Near term focus can lead to decisions that conflict with one another, creating unintended consequences in the supply chain. CEOs should lead the company away from supply chain disruptions such as quarter-end surges and misaligned promotions

However, the Supply Chain Management Review article "Trigger Events can get the CEO's attention" (Gibson, Rutner, & Manrodt, 2005) notes that recognition of logistics and SCM among C-Level executives in the private sector is nowhere near as strong as it has been among their counterparts in the military. No one cares about supply chain management until there is a problem. CEO involvement in supply chain is sporadic and situation-specific, trigger events such as occurrence of a compelling event- a global sourcing initiative, new product launch, changing

customer requirements or a sharp increase in operating costs. There are some exceptions – in case of companies such as Walmart, Limited and Caterpillar, the strategic visionary CEO saw the growth opportunity and used SCM as a key building block for growth , satisfy retail requirements and manage a global supply base. Companies such as Amazon, Whirlpool and RadioShack brought in change agents from outside to bring about strategic changes in the supply chain.

3.5.2 Insights on the link between CFO's agenda and Supply Chain agenda

A number of management authors have researched on the link between CFO's agenda and the supply chain agenda. In 2003, CFO research services conducted a survey of US finance executives to learn more about how they view supply chain management and how their role in the supply chain is changing (CFO Research Services, 2003). A majority of CFOs say that their *supply chain is decentralized*, that their supply chain is *poorly aligned with corporate strategy*, and that obtaining a *clear picture of total costs and sources of value is difficult*. The report mentions the rising importance of CFO, with the supply chain reporting to the CFO in many leading companies. CFOs report that reducing operating costs and improving customer service as the most important supply chain goals. CFOs see the supply chain as crucial to business success. While there is gap between supply chain importance and its performance, CFOs admit that major supply chain changes are required but difficult. The report identifies four major areas where CFOs are playing a major role in addressing supply chain issues that affect corporate results:

- *Reducing operating costs* – Successful cost cutting programs reduce the total costs while not compromising customer service or the overall value of a product. Some of the innovative methods include risk sharing with suppliers to reduce operating costs.
- *Improving working capital management* – One of the ultimate goals of better supply chain performance is to decrease the need to tie up assets in working capital. CFOs work with customers to speed their payments and work with suppliers to extend payment terms. Lean initiatives such as vendor managed inventory (VMI) help reduce the third arm of the working capital – inventory costs.
- *Increasing inventory transparency* - For many CFOs, inventory metrics such as days-on-hand inventory or inventory turns are an important window to supply chain performance.

Some CFOs have been able to drive better inventory management by ensuring that the ERP implementation process runs smoothly.

- *Strengthening customer service* – While many CFOs take naturally to cost cutting and inventory management, fewer attempt to influence the end of supply chain that meets the customer. CFOs who understand the direct impact on revenues, evaluate the sales value of supply chain improvements.

Aberdeen Group's benchmark study of 400 companies in 2005 (Enslow, 2006), finds that the interests of supply chain and financial organizations are converging. Savvy supply chain managers are realizing that *by reducing supply chain uncertainty and increasing visibility, they can help the finance organization hold less cash as well as reduce the working capital* tied up in inventory. The study finds four of the top CFO pressures:

- Making the Best Use of Corporate Cash – Finance organization want to actively manage cash the same way supply chain managers want to actively manage inventory. Longer and uncertain lead times often stretch corporate cash-to-cash cycles. Multi-party supply chains make it difficult to gain clear forward visibility of financial commitments. Reducing supply chain uncertainty and increasing visibility, helps the finance organization hold less cash. On the cash collection side, supply chain improvements that result in more perfect orders and using proof of delivery to trigger customer invoicing can help reduce the days sales outstanding. On the payment side, transaction automation and global visibility platforms can improve both financial performance and supply chain performance.
- Corporate Budget Oversight- Global supply chain uncertainties contribute to budget overruns and erosion of expected gross margins. Supply chain managers are using budget concerns to gain CFO support for technology projects that improve transportation sourcing, costing, and analytics to forecast impact.
- Reduce the working capital tied up in inventory – Supply chain managers have a number of opportunities to reduce working capital by decreasing inventory investment and obsolescence. Some of the most effective ones include having suppliers manage inventory between minimum/maximum levels instead of sending them purchase orders and connecting supply chain visibility initiatives to six sigma programs to identify and

reduce bottlenecks and to minimize lead time variability. Inventory optimization technologies can help set better safety stock parameter, identify opportunities for postponement and inventory risk pooling, and improve sourcing decisions.

- Trade compliance – This emerging cross functional best practice is to leverage free-trade-agreement and other customs knowledge to drive lower total landed cost.

By designing supply chain initiatives that also drive value for the financial organization, by greater automation, visibility, and functional coordination, the supply chain organization can gain a new cheerleader: the CFO.

A more recent article by McKinsey written in the wake of the recession, "Freeing up Cash from Operations" (Niemeyer & Simpson, 2008) states that many enterprises have solid opportunities to free up cash and reduce or postpone spending it. Simple steps such as enforcing payment terms and sending bills early, can often add two to four days of sales to cash. This is equivalent to $100 million to $200 million for a typical consumer goods manufacturer with $20 billion in sales. Eliminating the extra inventory buffers that every step in the supply chain tends to add- a reduction of this magnitude could approach $400 million—enough to cover a 2 percent decline in revenue for the year. Exploiting the current willingness of major project suppliers to renegotiate prices- can reduce capital spending.

The Supply Chain Management Review article "The Supply Chain- Finance link" (Presutti Jr. & Mawhinney, 2007) offers a practical way to successfully accomplish the linkages between supply chain execution and financial performance. Their approach incorporates EVA and the SCOR model, in a way similar to the 'balanced score card'. The elements of the SCOR model important supply chain related performance drivers, while the corporate performance metrics represent important outcomes. EVA emphasizes and isolates activities that help to drive value creation, generally categorized as revenue, costs and assets. Using EVA as the measure of overall financial performance, the authors demonstrate the ties that the SCOR model provides for linking the supply chain metrics to corporate financial goals. Besides better performance, external drivers such as the Sarbanes-Oxley act of 2003 mandate that for all public companies, the aggregate financial numbers be clearly supported by the data coming from the operations.

In “Linking the CFO to Supply Chain Execution” (Rajasekharan, 2009), Dr. Mahesh Rajashekharan, an ex-VP of i2 Technologies points out that SOX and other compliance and risk management responsibilities require the public company CFO to have tighter control over supply chain performance and execution. Short-lifecycle product companies serving volatile markets such as high tech and consumer electronics have difficulty meeting revenue projections without the ability to generate forward-looking financials based on product demand-supply fluctuations. Yet, many of these companies have not integrated the supply chain and finance functions. Effective supply chain management benefits the CFO in four ways - *reducing cash-to-cash cycle times, reducing the company’s risk profile, achieving profitable growth and delivering predictable revenues.*

Thus, CFOs can see the relationships among the financial metrics and operational metrics. They are positioned to make the proactive investments and decisions required to make the business plan happen using their greatest strategic tool – the supply chain.

3.5.3 Current approaches and Challenges in aligning strategies

Companies may develop their operations and functional strategies from the top down, driving decisions about operations activities and investments from their business objectives or from bottom up, learning about the capabilities of the company and identifying business opportunities in which to apply them. In reality, many companies integrate the two approaches, establishing executive-level objectives, collecting information from customers and within the organization and integrating the information to create a strategic focus for the company (Beckman & Rosenfield, 2007). A third approach is to benchmark and imitate other companies.

One commonly used tool to align strategy is the balanced score card. It helps integrate multiple perspectives such as corporate perspective, financial perspective, customer perspective, internal business process perspective and learning and growth perspective. A balanced scorecard is cascaded down the organization by translating the corporate-wide scorecard (referred to as Tier 1) down to first business units, support units or departments (Tier 2) and then to teams or individuals (Tier 3). The end result is focus across all levels of the organization that is

consistent. The organization alignment is clearly visible through strategy, using the strategy map, performance measures and targets, and initiatives (Balanced Scorecard Institute,).

However, there are a number of challenges that organizations face in aligning operations and executive strategies. At most companies, responsibility for supply chain management tends to be pushed down the leadership hierarchy. Typically each functional components of supply chain management (procurement, transportation, distribution, and inventory) is managed discreetly and with little co-ordination among them. Furthermore, supply chain management isn't usually included in the strategic planning process.

Our research effort is not to substitute the dialogue within the organization in the strategy evolution process. In fact, it complements the strategy alignment process by unearthing certain patterns observed in the alignment of operations and executive arms of the organization, so as to link these seamlessly.

4 Research Findings

With about 200 companies responding to the questionnaire with about 92 companies responding to all the three surveys, analysis seems to be a daunting task. As mentioned earlier, we sliced and diced the data from multiple perspectives to obtain a number of insights.

4.1 Drive towards flexibility

A quick observation made in the beginning is the increasing drive towards flexibility. Of the 92 companies that responded to all the three surveys, 62% of the respondents characterized their supply chain as 'flexible response' and the rest of them as 'cost efficient'.

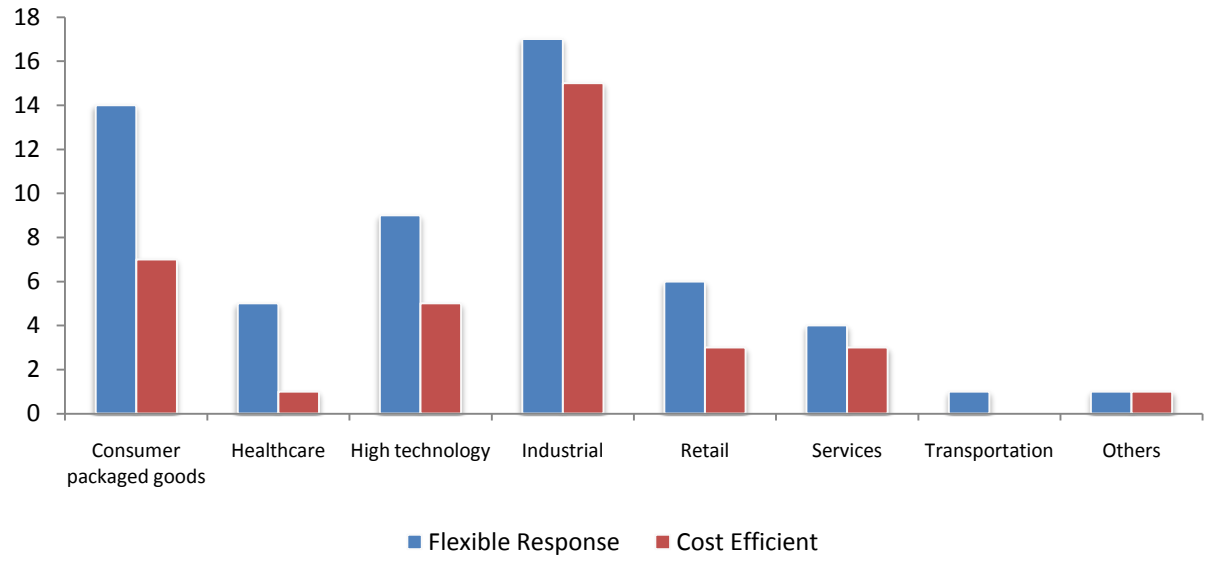

Figure 10 Industry profiles of survey respondents

It is expected that in industries such as hi-tech, healthcare, and transportation, where the product innovation speed is very high, the supply chain would be tending towards flexible response. It is interesting to note that even in industries such as consumer product goods, industrial and retail which are traditionally thought to be cost efficient, more than 50% of the respondents said that their supply chain was 'flexible response'. A possible explanation is that with the advances in technologies that improve productivity and communications, product innovation speed, sometimes known as clock speed (Fine, 1999), is increasing even in traditional industries.

Another possibility is that the level of volatility in supply and demand is increasing, as well as the increase in other types of risks, forcing the companies to be more flexible and responsive.

To illustrate this shift towards flexibility, consider the case of Pepsi Bottling Group (PBG) (Simchi-Levi, 2010). In early 2005, PBG approached MIT with a daunting challenge – consumer preference was shifting from carbonated drinks to non-carbonated drinks and from cans to bottles. At that time, PBG produced these newly preferred products in limited number of plants, resulting in half of the plants operating at capacity and leading to service problems during periods of peak demand. The solution provided was surprisingly simple. It focused on a flexible manufacturing strategy that matched production sourcing decisions with consumer preferences on a quarterly basis. Sourcing decisions were based on total supply chain costs including manufacturing, transportation and warehousing costs as well as customer service requirements. This strategy improved supply chain performance by significantly reducing out-of-stock levels, effectively adding one and half production lines' worth of capacity to PBG's supply chain, without any capital expenditure. This example illustrates how small investments in flexibility can provide a lot of leverage and how cost-efficient companies can adopt flexibility without impacting the cost structure.

4.2 Top Focus Areas from Survey Responses

The top three focus areas for the CEO include **Growth**; **Competitive Differentiation**; and **Shareholder Return**.

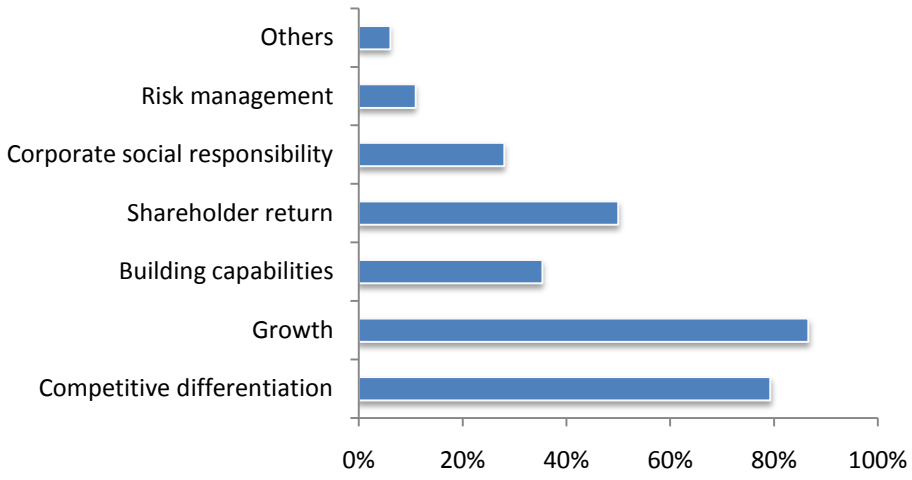

Figure 11 CEO Focus Areas

The most popular ways in which companies pursue Growth is by focusing on Profitability, Sales Revenue and New Products and Services. Competitive Differentiation is pursued by focusing on Innovation, Customer Satisfaction and Brand. Finally, Operating costs stands out as the focus area for pursuing Shareholder Return followed by Customer Pricing and Resource Allocation.

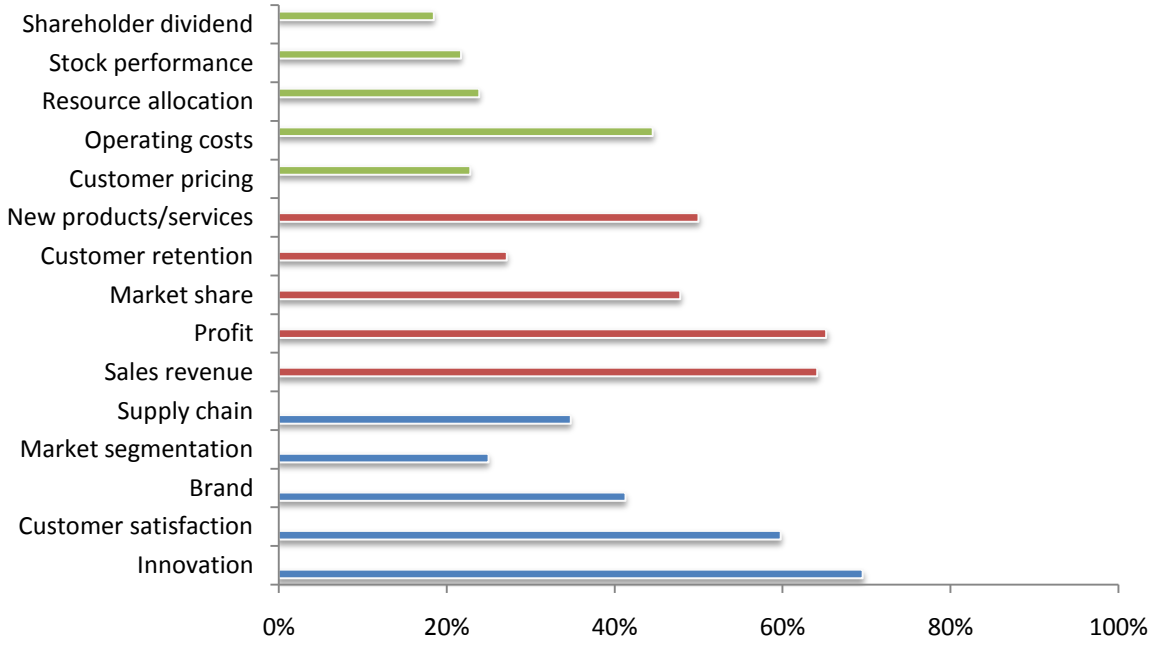

Figure 12 CEO Strategies in their top focus areas

The top three focus areas for supply chain executives include **Satisfying Customer Demand, Supply Chain Organization, Processes and Technology** and **Purchasing**.

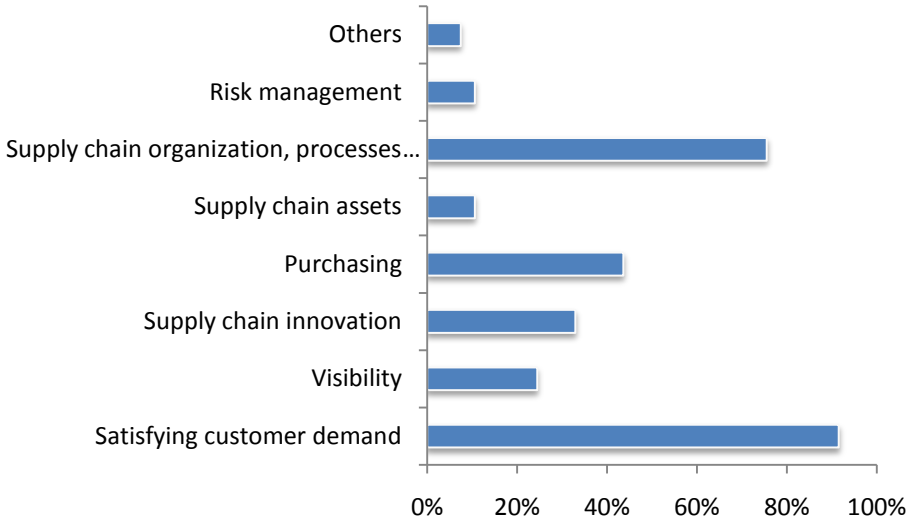

Figure 13 Supply Chain Focus Areas

Satisfaction of Customer Demand is mostly achieved through Reduction of total costs, Reduction of customer Lead Times, and Reduction of Stock Outs. Executives who identify Supply Chain Organization, Processes and Technology emphasized S&OP processes, followed by IT for Planning and Collaboration. Finally, those executives who focus on purchasing, emphasized Reduction of Supplier Costs, Supplier Quality and Supplier Reliability and Reduction of Supplier Lead-Times.

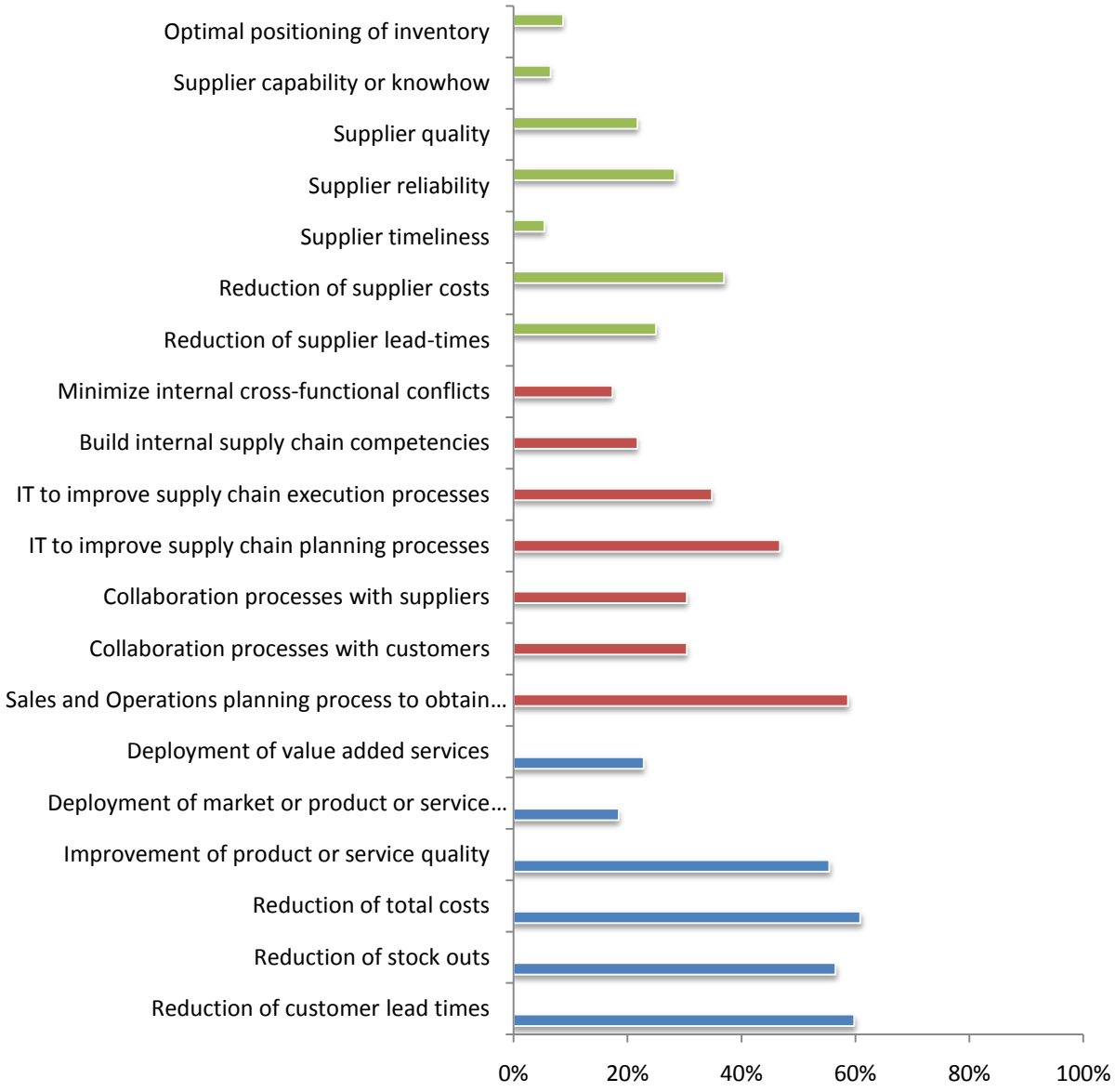

Figure 14 Supply Chain Strategies in their top focus areas

Finally, the top focus areas for the CFO include **Costs, Profitability** and **Liquidity**.

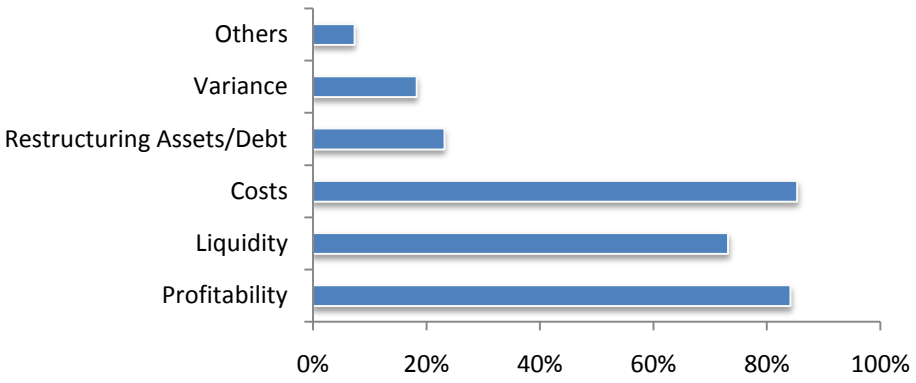

Figure 15 CFO Focus Areas

Focus on Costs is pursued by emphasizing Reduction of COGS, Operational Efficiency and Reduction of Sales, General and Administrative Expenses. According to the survey, CFOs who focus on Profitability emphasized EBIT and Operating Margin whereas those CFOs focusing on Liquidity emphasized Operating Cash Flow, Working Capital and Corporate Cash followed by Cash-to-Cash Cycle Time.

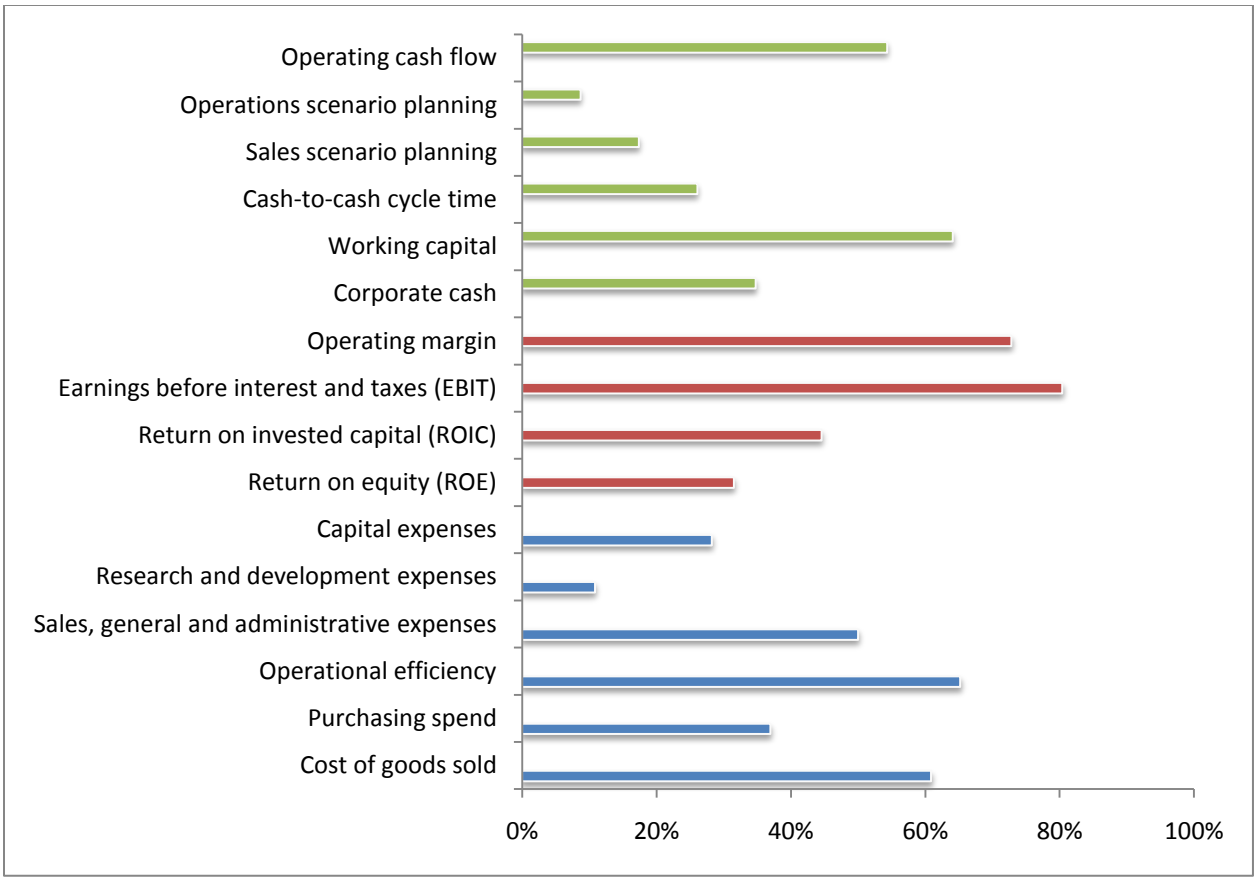

Figure 16 CFO Strategies in their top focus areas

All these observations apply to the complete sample of participating companies. A more refined analysis allows us to distinguish between strategies used by successful cost efficient companies and strategies applied by best-in-class flexible response companies. This is discussed in a subsequent section, followed by emerging correlations across the SCM, CEO and CFO strategies. The correlations are critical in identifying the link between the firm's value proposition and its supply chain strategy.

4.3 Top Focus Areas for Best-in-Class Supply Chains

The best-in-class supply chain companies were identified as described in section 2.3. For the best-in-class supply chains, we identified the top strategies among more than fifty supply chain strategy options. Reduction of total costs, reduction of stock outs, sales and operations planning, improvement of product/service quality, reduction of customer lead times and IT for improving

the supply chain planning turned out to be the most prominent, with more than 50% of the best-in-class companies adopting them.

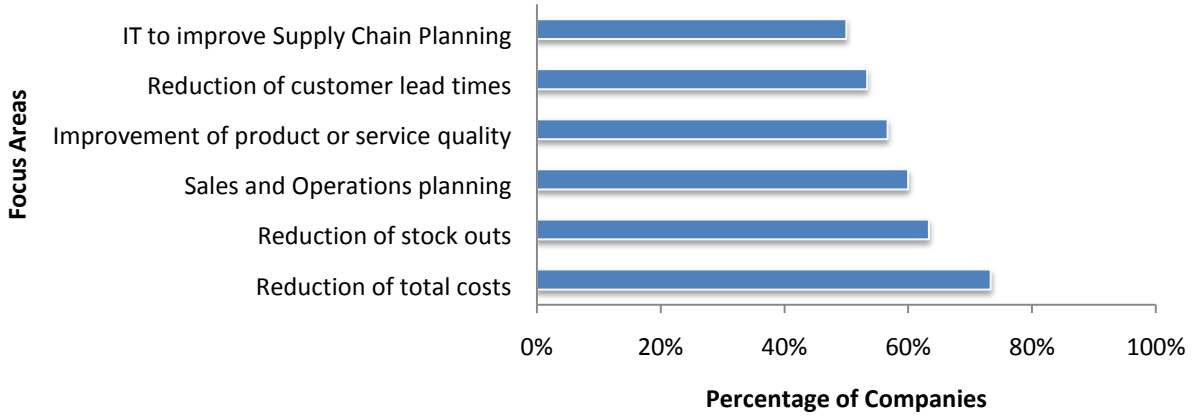

Figure 17 Top Focus Areas for Best-in-Class Supply Chains

Similarly, the CEOs of best-in-class Supply Chain companies had six strategies that were followed by more than 50% of the companies. They were competitive differentiation through innovation, customer satisfaction and brand, growth in sales revenue and profit and shareholder returns through reduced operating costs.

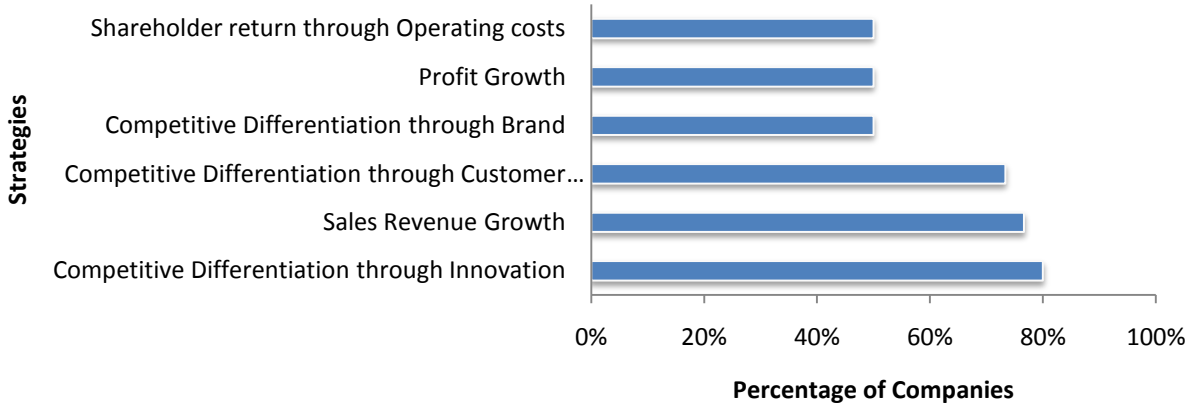

Figure 18 Top Focus Areas of CEOs of Best-In-Class Supply Chain Companies

The CFOs, on the other hand, had eight strategies adopted by more than 50% of respondents. EBIT, Operating margin and operational efficiency topped their priorities, closely followed by

reduction of COGS, working capital, SG&A and improving operating cash-flow and return on invested capital.

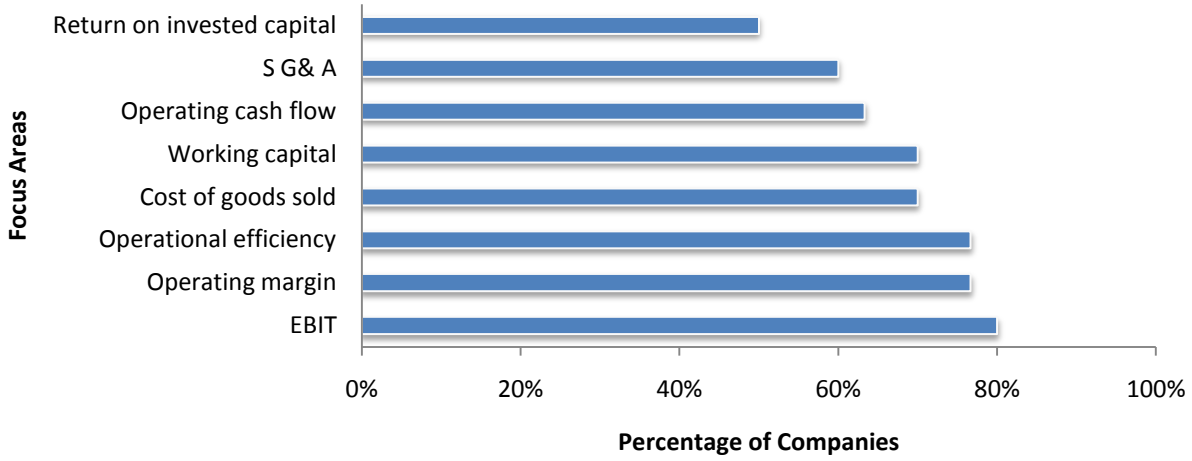

Figure 19 Top Focus Areas of CFOs of Best-in-Class Supply Chain Companies

4.4 Differences between Cost Efficient and Flexible Response Companies

Traditional operations strategies have often focused on either 'efficiency' or 'responsiveness' or a combination of the two. It has been always a puzzle for the supply-chain executive to understand the difference between them and the context to which these strategies can be applied. The factor that determines the most is the product type. Functional products (staples that satisfy basic needs, which do not change over time, have stable, predictable demand and have long life cycles) require an efficient supply chain (Fisher, 1997). Innovative products (unpredictable demand, shorter life cycle, high profit margin) require a responsive supply chain.

The following table summarizes the key difference between cost-efficiency and responsiveness.

	Cost-Efficiency	Responsiveness
Primary goal	Cost	Time
Supply Chain Innovation	Process focus	Product focus
Manufacturing strategy	High utilization	High flexibility
Inventory strategy	Minimize inventory	Buffer inventory
Lead time strategy	Reduce but not at expense of increasing cost	Reduce even if costs are significant
Supplier selection strategy	Total Landed Cost, quality	Speed, quality

Transportation strategy	Low cost transportation modes	Fast modes of transportation

Table 2 Differences between cost efficiency and responsiveness

4.4.1 Differences in Performance of the Companies

The empirical research of strategies and performance indicators of executives and supply chain officers indicate significant differences among companies that characterize themselves as cost efficient or flexible response. As discussed in section 2.3, we identified 30 companies that were best-in-class in their supply chain. Among the best in class companies, the differences between cost efficient companies and flexible response companies with respect to the supply chain key performance indicators are shown in the figure below.

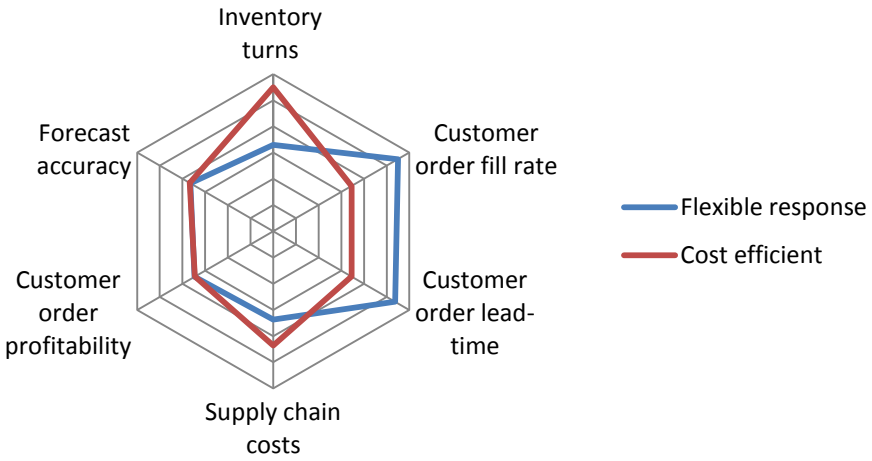

Figure 20 Differences between Cost Efficient and Flexible Response Companies

The figure below illustrates the similarities and differences between best-in-class flexible response and best-in-class cost efficient companies along with the financial metrics. As we can see, best-in-class flexible response supply chain companies dominate on almost all financial measures except three – inventory turns, where supply chain best-in-class cost efficient companies perform better and operating cash flow and total asset turnover, where performance of the two classes of companies is the same.

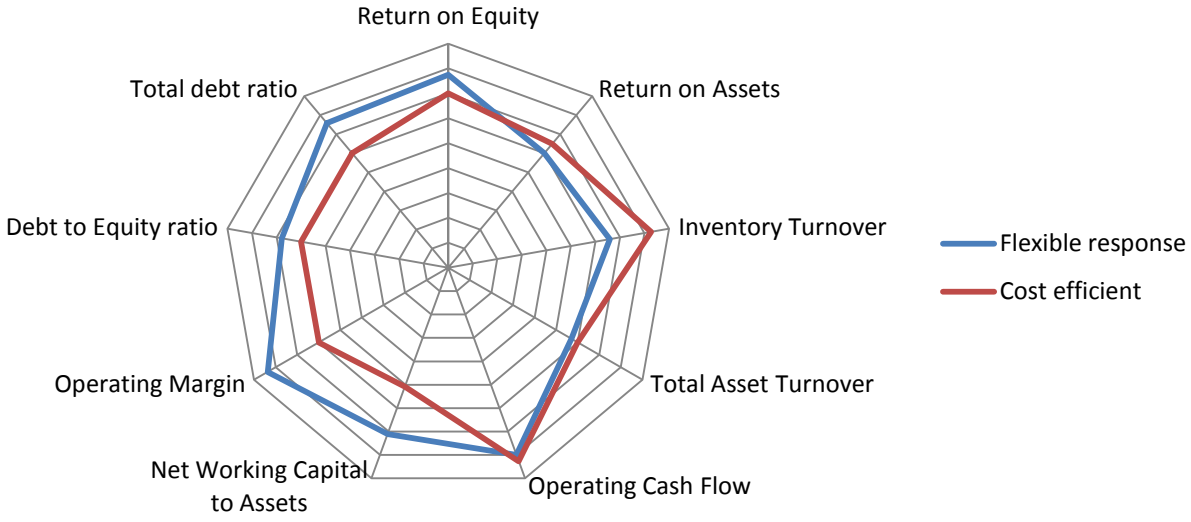

Figure 21 Financial Performance of Supply Chain Best-in-Class against targets

At the same time, in figure below, there is very little difference between best-in-class cost efficient and best-in-class flexible response companies relative to their individual business targets such as revenue or return on equity while some difference exists in favor of flexible response companies when considering customer satisfaction and market-share.

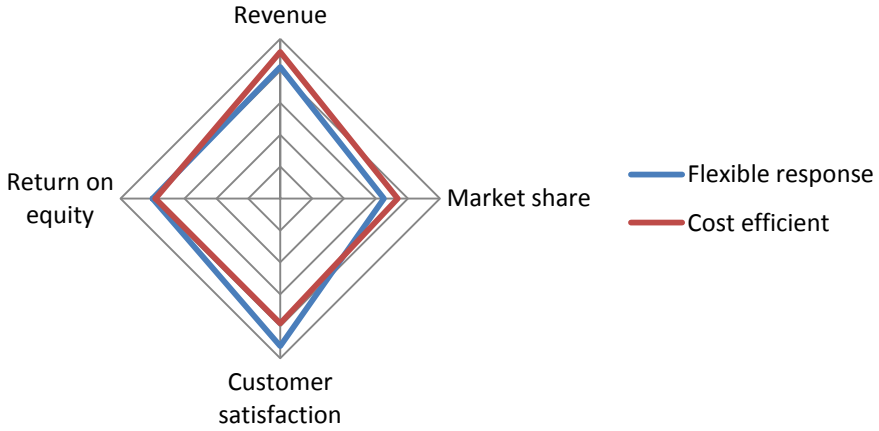

Figure 22 Business Performance of Supply Chain Best-in-Class companies

4.4.2 Differences in Supply Chain Strategies

Figure below illustrates the supply chain focus areas for the 30 best-in-class supply chain companies. Observing the graph and further analyzing the data, there are a number of insights inferred.

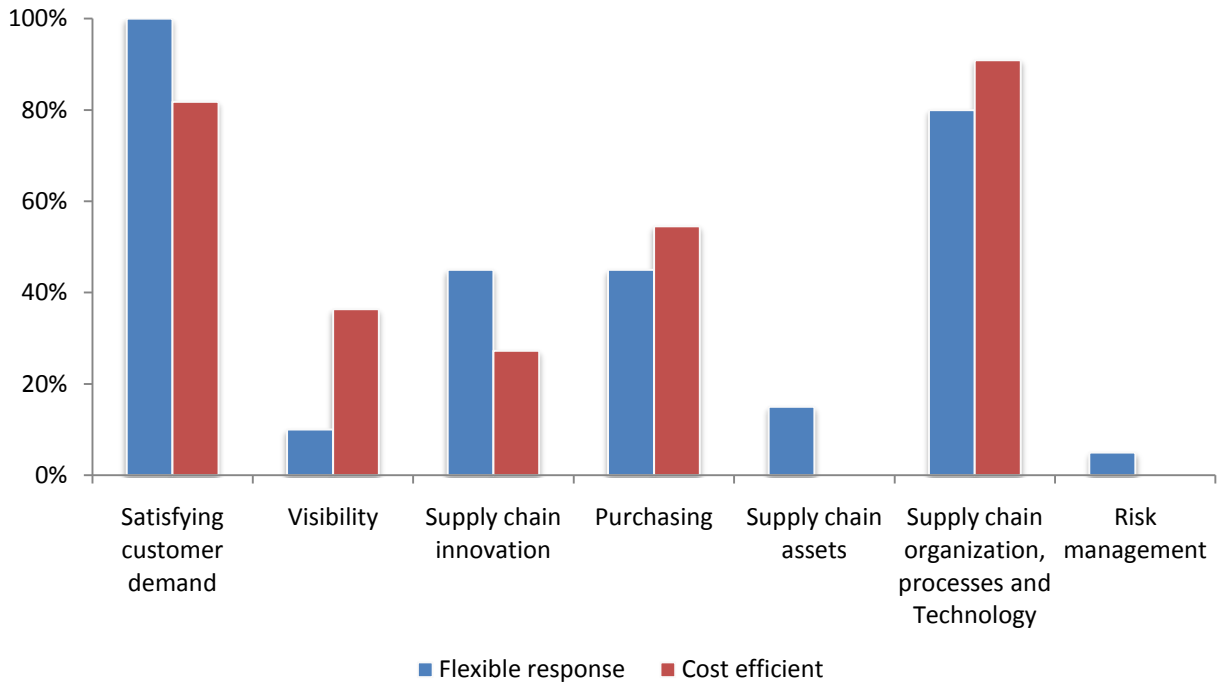

Figure 23 Supply Chain Focus Areas of Best-in-Class Supply Chain Companies

4.4.2.1 Flexible Response companies emphasize the fulfillment function

Survey evidence presents a number of findings that highlight the focus of flexible response supply chains on the fulfillment function. Satisfying customer demand has been selected as the top focus area by 100% participating flexible response companies. The majority of them have answered that reduction of customer lead times as well as reduction of stock outs are top priorities. Further survey evidence suggests that in order to achieve these objectives, companies move along the following directions:

- Competitive differentiation and flexibility through manufacturing and distribution – implementation of postponement strategies.

- IT solutions for planning (forecasting, capable to promise, available to promise, order planning) to reduce information lead times and properly position supply for sales and order promising.
- Collaboration initiatives and visibility in upstream and downstream parts of the supply chain.

By contrast, the minimization of total supply chain costs is (almost) equally important for both cost efficient as well as flexible response companies.

4.4.2.2 Operational Visibility is a key strategy for cost-efficient supply chains

Focus on operational visibility in our survey is three times higher for cost-efficient companies. The emphasis of these companies is lower inventories and lean supply chains, removes a certain degree of system flexibility and exposes the supply chain to all sorts of disruption. To mitigate these risks, best-in-class cost-efficient companies invest in supply chain visibility. As a result, most of the cost-efficient companies emphasize visibility into supply chain inventory.

4.4.2.3 Cost-efficient and flexible response supply chains adopt different supply chain innovation strategies

The data shows that cost efficient best-in-class companies tend to place particular emphasis on design for supply chain. This typically involves the design of products and processes taking into account products and supply chain characteristics. It usually leads to a reduction in the number of components, product and supplier rationalization, and generic products which allows for postponement strategies. Risk pooling concepts can be applied to reduce uncertainty and volatility and lead times can be reduced as a result of postponement. Initiatives involving Design for supply chain in various companies have reduced working capital – by reducing inventories – while maintaining or improving service levels. These improvements are more popular with cost-efficient supply chains.

Innovation in flexible response companies, on the other hand, is focused on a high frequency of new products and service introduction. This is probably associated with the fact that flexible-response supply chains are typically encountered in faster clock speed industries, such as high-

tech. The supply chain organization is critical in this case, since the frequent introduction of new products and services requires seamless supply chain integration and support in various levels.

Finally, cost efficient supply chain companies place particular emphasis on the innovation of the distribution channel which can be explained by the tremendous impact it can have on the transportation and warehousing cost reduction. For that purpose, cost efficient companies invest in distribution and transportation to reduce exposure to cost and risk.

4.4.2.4 Cost-efficient and Flexible-response supply chains adopt different purchasing strategies

Indeed, cost efficient supply chains focus on reducing total landed costs in making purchasing decisions while flexible response companies focus on lead time reduction.

4.4.3 Differences/Similarities in Executive Strategies

Figure below illustrates the CEO's focus areas for the 30 best-in-class supply chain companies.

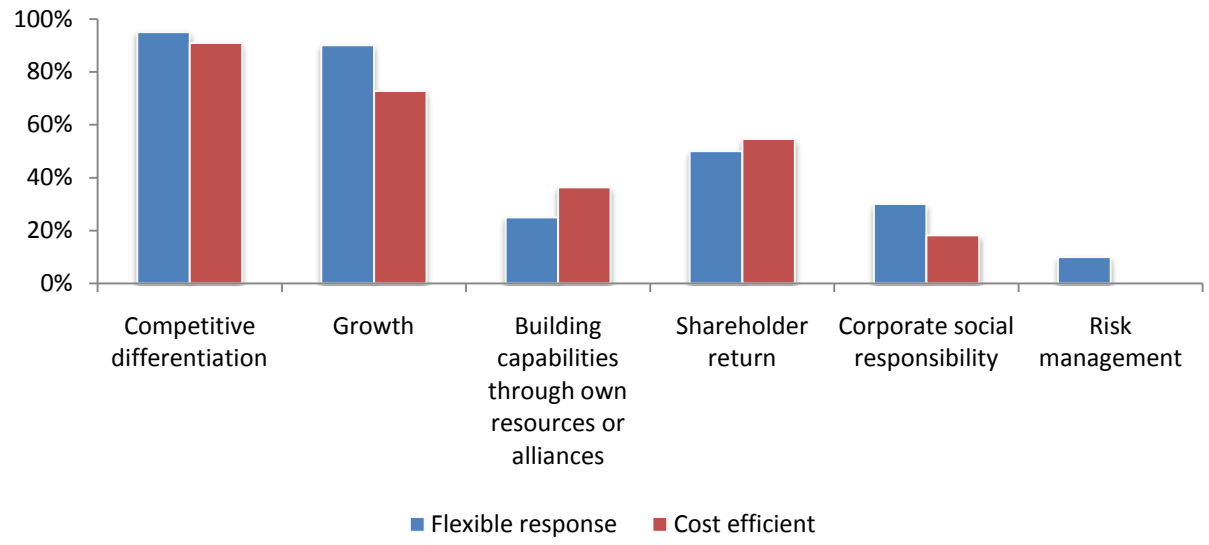

Figure 24 Executive Focus Areas of the best-in-class supply chain companies

Interestingly, CEOs of the best in class companies focused more on Competitive Differentiation than growth. Growth was the most preferred executive strategy for other CEOs. The key difference between flexible response and cost efficient groups was in deploying competitive

differentiation strategy. Flexible response companies focused more on innovation, while cost efficient companies focused more on customer satisfaction.

Best performers of both flexible response companies and cost efficient companies had similar growth strategies. The growth in profit and sales revenue dominated the strategies of both the groups. While flexible response companies gave the secondary emphasis on growth by new products/services, cost efficient companies emphasized growth in profits.

Both the groups focused on operating costs as the most common strategy for increasing shareholder returns. The best performing cost efficient companies had a strong focus on customer pricing, a critical factor for efficiency.

Flexible response companies gave relatively higher importance to corporate social responsibility. Environmental policy and compliance to regulatory requirements, followed by responsibility for social needs were the top focus areas.

4.4.4 Differences/Similarities in Financial Strategies

Figure below illustrates the CEO's focus areas for the 30 best-in-class supply chain companies.

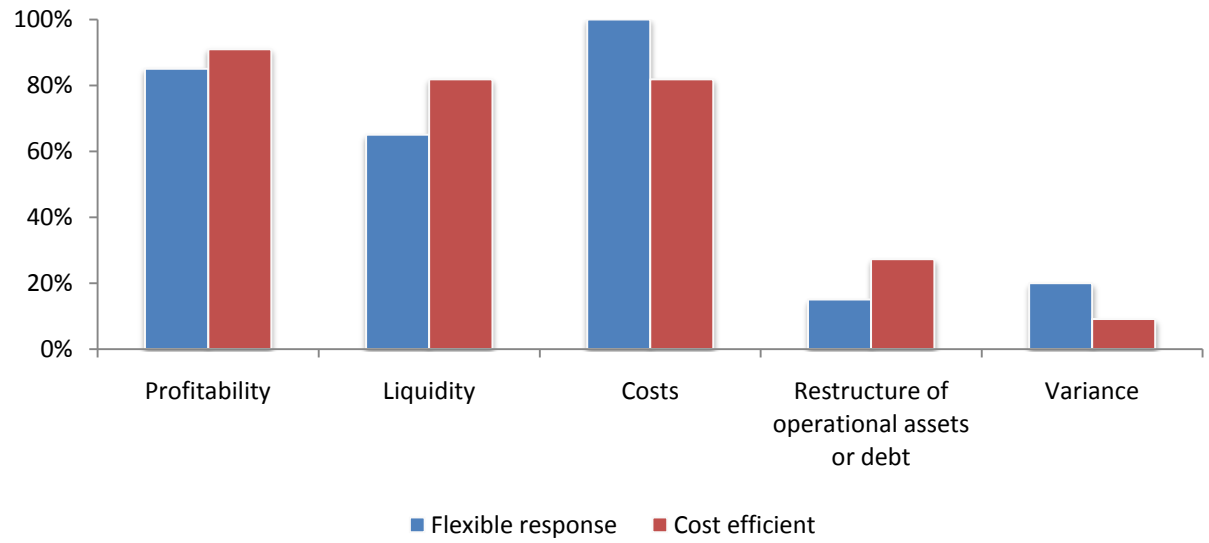

Figure 25 Regardless of the type of operations strategy, CFO's top agenda items are same

Both cost efficient companies and flexible response companies gave utmost importance to profitability. The best performers focused more on operating margin, rather than EBIT, across both the groups.

Another important focus of the CFOs was on costs. Both cost efficient and flexible response companies focused on cost of goods sold, operational efficiency and sales, general and administrative expenses. As expected, the primary focus of cost efficient companies was on operational efficiency, while that of flexible response companies was on COGS and SG&A.

Liquidity was the third most important strategy for the CFO. Working Capital, operating cash flow and corporate cash were the most important strategies for liquidity.

Notice that the contrast observed among the supply chain strategies was not observed among the strategies of CEOs or CFOs.

4.5 Supply Chain Strategies that support better financial performance.

Using the subset of best-in-class companies, we ran Spearman rank correlations (see Appendix 8.1) of supply chain strategies against the financial key performance indicators. This was done for cost efficient and flexible response companies separately. We thus identified the top few strategies that are highly correlated to financial performance.

4.5.1 Strategies of Best-in-Class Cost Efficient Companies

For the cost-efficient group of companies, five areas appear to be positively correlated with high financial performance in all KPIs (see Figure 26 Cost Efficient Supply Chain Focus Areas Correlated with Financial Performance) suggesting that highly successful companies are placing their supply chain focus on:

- Design for Supply Chain
- Network Redesign to Support Faster Time to Market
- Forecast Accuracy
- Optimal Positioning of Inventory

- Reduction of Ownership of Manufacturing Plants

The focus of supply chain executives in some of the above areas clearly highlights a change of strategy for traditional cost-efficient companies; they increasingly aim at improving their flexibility and responsiveness in order to adapt to high volatility and uncertainty on one hand but also in order to adapt to an industry shift towards faster clock-speed, i.e. a diversification of the customer value proposition and gradual shift from functional to innovative products and services.

In the remainder of this section, we discuss why best in class cost efficient supply chains that excel in their financial KPIs may consider these elements as key ingredients of a winning supply chain strategy.

	Return on Equity	**Return on Assets**	**Inventory Turnover**	**Total Asset Turnover**	**Operating Cash Flow**	**Net Working Capital to Assets**	**Operating Margin**	**Debt to Equity ratio**	**Total debt ratio**
Design for Supply Chain	+++	+++	+++	+++	+++	+++	+++	+++	+++
Network Redesign to support faster time to market	+++	+++	++	+++		+++	+++	+++	+++
Forecast Accuracy	+++	+++	+++	+++	+	+++	+++	+++	+++
Optimal Positioning of Inventory	+++	+++	++	+++	+++	+++		+++	+++
Reduction of ownership of manufacturing plants	+++	+++	++	+++	++	+++	+++	+++	+++

Legend:

+++ Positive Correlation with Spearman Correlation coefficient >0.3 and significance <0.1

++ Positive Correlation with Spearman Correlation coefficient between 0.2 and 0.3

+ Positive Correlation with Spearman Correlation coefficient between 0 and 0.1

Figure 26 Cost Efficient Supply Chain Focus Areas Correlated with Financial Performance

4.5.1.1 Design for Supply Chain

Initiatives in the area of *Design for Supply Chain* aim at providing increased flexibility without sacrificing efficiency. In principle, there is always a cost trade-off between efficiency and responsiveness. Flexibility is not free of charge; it requires additional investments in assets and resources which have an impact on the working capital and capital and operational expenditure.

With Design for Supply Chain initiatives companies innovate their products, systems and processes in ways that minimize the cost trade-offs. These initiatives require the set up of cross-functional teams with the involvement of engineering-product development, supply chain, manufacturing and logistics, purchasing, sales, marketing and business development in order create products and processes that are agile and efficient at the same time.

Product or process modularization or postponement strategies typically result from Design for Supply Chain initiatives allowing for the simplification of product and component portfolio, supplier rationalization, reduction of lead-times, economies of scale and minimization of risk of obsolescence.

It is not surprising, therefore, that in the survey findings we observe a strong correlation between Design for Supply Chain and impact on the financial performance of cost-efficient companies.

4.5.1.2 Network Redesign to Support Faster Time to Market

The need to improve responsiveness and maintain efficiency is also behind the focus on redesigning the supply chain network for reducing time to market.

Companies are investing in carefully examining their strategy for different segments of their product and services portfolio. Different value propositions drive decisions such as local-for-local, multi-tier distribution strategies, multi-modal transportation and partnerships with 3PLs and 4PLs with an increasing focus on higher labour and transportation costs in emerging markets as well as the need for tax-efficiency.

4.5.1.3 Forecast Accuracy

High forecast accuracy is one of the biggest drivers of efficiency in the supply chain; it allows for the deployment of Make-to-Stock strategies, larger manufacturing and transportation lot-sizes and economies of scale in manufacturing, distribution and purchasing; it is not surprising, therefore, that we observe a correlation between a focus on making demand more predictable and good financial performance for cost-efficient companies.

Key ingredients of improving the forecast are supply chain integration and collaboration with customer and suppliers, segmentation and end-product forecasting and investments in more sophisticated demand planning capabilities.

It is important to note, however, that uncertainty is inherent in the forecast and as a result flexibility in the supply chain is always required.

4.5.1.4 Optimal Positioning of Inventory

The shift towards frequent product innovation and market segmentation observed in traditional cost-efficient companies leads to increasing supply chain complexity in terms of network, service levels, lead-times, holding costs, supplier cost, supplier risk and risk of obsolescence; this shift can potentially have grave implications on working capital, stock risk and operational expenses resulting from expediting.

The identification of the appropriate buffer points and levels of inventory is a key ingredient of a successful supply chain strategy; it provides the required level of responsiveness and at the same time maintains working capital efficiency and low financial risk.

4.5.1.5 Reduction of ownership of manufacturing plants

Cost-efficient companies are traditionally heavy on fixed assets, manufacturing plants in particular. A bigger number of these companies are re-assessing their core competencies focusing also on brand, supplier selection and supply chain co-ordination in order to gain competitive advantage and protect profit margins.

In many cases, outsourcing certain manufacturing activities is a preferred strategy in order to reduce operational expenses and fixed asset efficiency, especially when those manufacturing activities are becoming a commodity in the market.

Note, however, that outsourcing requires investment in building internal supply chain capabilities; experience with outsourcing without prior development of the appropriate skill-set has not always been pleasant.

4.5.2 Strategies of Best-in-Class Flexible Response Companies

For the best-in-class supply chains flexible-response group of companies five areas appear to be positively correlated with strong financial performance in most KPIs (see Figure 27 Flexible Response Supply Chain Focus Areas Correlated with Financial Performance), suggesting that highly successful companies are placing their supply chain focus on:

- Response to Customer Lead Time Reduction
- Life Cycle Management (LCM)
- Information and Risk Sharing
- Design for Supply Chain
- Sales and Operations Planning (S&OP) – Internal Supply Chain capabilities

The focus of supply chain executives in the above areas is driven primarily by

- the need to improve the fulfilment side of the supply chain in order to successfully compete in innovative industries with shorter customer lead times
- to manage the implications of high volatility and uncertainty in the business on key financial variables such as working capital and risk
- to co-ordinate a sophisticated network of partners and customers by focusing on the core competencies in line with the company value proposition

In the remainder of this section, we provide insight on why best in class flexible-response supply chains that excel in their business and financial KPIs may consider these elements as key ingredients of a winning supply chain strategy.

	Return on Equity	Return on Assets	Inventory Turnover	Total Asset Turnover	Operating Cash Flow	Net Working Capital to Assets	Operating Margin	Debt to Equity ratio	Total debt ratio
Customer Lead Time Reduction	+	+	++	+++	++	+++	+	--	
Life Cycle Management (LCM)	+		+++	+++		+	+++	+++	+++
Risk Sharing	+++		+	+++	++	+	+++	+++	+++
Design for Supply Chain	+++		-	+++	++	+++	+	++	+++
Collaboration with Suppliers	++		+++	++			++	++	+

Legend:

+++ Positive Correlation with Spearman Correlation coefficient >0.3 and significance <0.1

++ Positive Correlation with Spearman Correlation coefficient between 0.2 and 0.3

+ Positive Correlation with Spearman Correlation coefficient between 0 and 0.1

Figure 27 Flexible Response Supply Chain Focus Areas Correlated with Financial Performance

4.5.2.1 Customer Lead Time Reduction

A key ingredient of a successful strategy for flexible response supply chains is the ability to react to increasingly shorter customer order lead times.

The reduction of physical lead times across the supply chain is naturally a key in order to maintain high levels of responsiveness as well as to reduce cycle and safety stock. Alignment (potentially leading to redesign) of the supply and distribution network is critical in that respect; different value propositions drive decisions such as local-for-local, multi-tier distribution strategies, multi-modal transportation and partnerships with 3PLs and 4PLs with the aim to reduce time to market.

At the same time, emphasis is placed on the fulfillment side of the supply chain to improve supply and capacity allocation, order promising and order planning processes; focus is there with the objective to provide response to customer demand at minimum total costs to increase

customer order profitability on one hand and, on the other hand, to reduce planning lead-times that make up for a significant part of the total order lead-time.

4.5.2.2 Lifecycle Management

Flexible response companies traditionally emphasize innovation and frequent new product introductions to accommodate highly changing demand patterns and underlying market conditions (e.g. technology paradigm shifts). Shorter life cycles may introduce significant cost of obsolescence and price erosion; capturing demand and positioning supply at the right moment at the right place is critical for profitability. At the same time, the proliferation of final products increases the risk of carrying too much inventory.

As a result, phase in and phase out of different customer offerings need to be carefully managed in order not to adversely impact profitability, working capital and write-offs and put the financial position of the company at risk.

The life cycle of a product typically consists of four stages: *introduction*, *growth*, *maturity* and *decline*. Each life cycle stage requires a different operational strategy. During the growth and part of the maturity section profit margins are higher and competition is lower; therefore, the supply chain focus is on demand fulfillment to capture sales and market-share. In the final stages of the product life cycle price is dropping and competition is increasing, the focus is therefore on efficiencies in manufacturing and distribution to reduce costs and sustain margins.

Companies must be in a position to monitor the stage of the life cycle and control its duration, have good visibility into the profitability potential of the multiple products throughout the different stages of their lifecycle and align their supply chain strategies accordingly.

4.5.2.3 Information and Risk Sharing

Flexible-response supply chains often compete in highly volatile environments in which good demand predictability is typically hard to achieve.

For that purpose, companies innovate the supply chain by pursuing collaboration and information sharing schemes that will allow for better visibility into changing market conditions.

Risk and information sharing with suppliers and customers are explored to allow for the required capacity reservation on the supplier side and to provide visibility into the demand pattern of the new products on the customer side.

Vendor-Managed-Inventory (VMI) is an example of such a scheme; members downstream the supply chain share their market view with suppliers upstream, allowing the latter to improve response lead-times and capture revenue and market-share, in exchange for the former reducing their exposure to high working capital and stock risk.

There is a multitude of information and risk sharing schemes that in principle can be deployed in the environments in which flexible response companies compete; companies, however, should carefully segment their supply chain strategies to match their value propositions in order to decide what scheme and under which circumstances is most beneficial.

4.5.2.4 Design for Supply Chain

In principle, there is always a cost trade-off between efficiency and responsiveness. Flexibility is not free of charge; it requires additional investments in assets and resources which have an impact on the working capital and capital and operational expenditure.

With *Design for Supply Chain* initiatives companies innovate their products, systems and processes in ways that minimize the cost trade-offs. These initiatives require the set up of cross-functional teams with the involvement of engineering-product development, supply chain, manufacturing and logistics, purchasing, sales, marketing and business development in order create products and processes that are agile and efficient at the same time.

Product or process modularization or postponement strategies typically result from Design for Supply Chain initiatives allowing for the simplification of product and component portfolio, supplier rationalization, component life cycle extension, reduction of lead-times, economies of scale in manufacturing, distribution and transportation and minimization of risk of obsolescence.

It is not surprising, therefore, that in the survey findings we observe a strong positive correlation between design for supply chain and most financial KPIs of flexible response companies.

4.5.2.5 Internal Supply Chain Capabilities – S&OP

Flexible-response companies often focus on innovation and design in order to gain competitive advantage, grow sales volumes and market-share and protect profit margins.

Outsourcing of the remaining non-core activities is a preferred strategy especially when those activities are becoming a commodity in the market; supplier and partner reliability is critical in helping the company illustrate its core competencies and strengthen its brand name.

Supply chain network power for such companies is therefore a key and the ability to manage, integrate and co-ordinate a multitude of supply chain partners is very important. As a result, significant effort in building the right set of supply chain capabilities within the organization is required together with a highly effective Sales and Operations Planning (S&OP) process.

4.6 Relationship between Executive strategies and Operations strategy

Having noticed the differences between cost efficient companies and flexible response companies, we analyzed the companies to identify links between the executive agenda and supply chain strategies. We focused on the top three items in the executive agenda – growth, competitive differentiation and shareholder return, this time in a slightly different way. In the last few sections, we have identified the best performers from the perspective of their operational performance. In this section, we are using an alternate definition for the best performers, specific to the executive strategy. In each case, the subset of best performers was about 25 in number.

4.6.1 Executive Strategy: Growth

First, we defined best performers in growth as those companies who scored high on growth in revenue and market share. We examined the growth focused strategies of CEOs (see figure below).

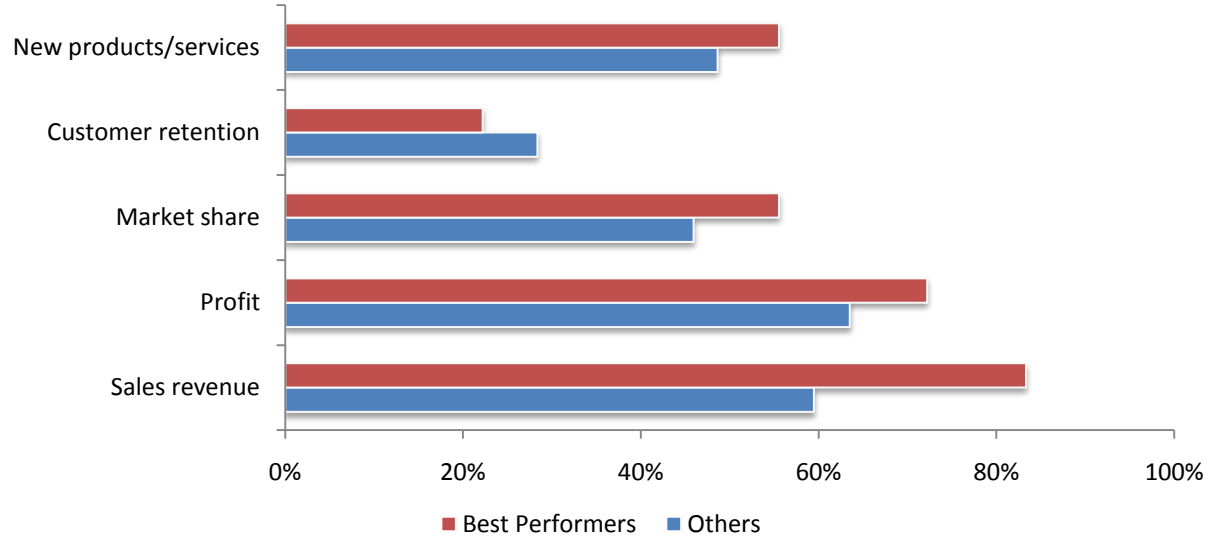

Figure 28 Focus on revenue, profit and new products differentiates best performers in growth

This indicates that the best performers and others have the same top two agenda items, but the key difference between best performers and others is their stronger focus on sales growth, profit growth, growth in market share and new products/services.

The figure below represents the top supply chain strategies of the best growth performers.

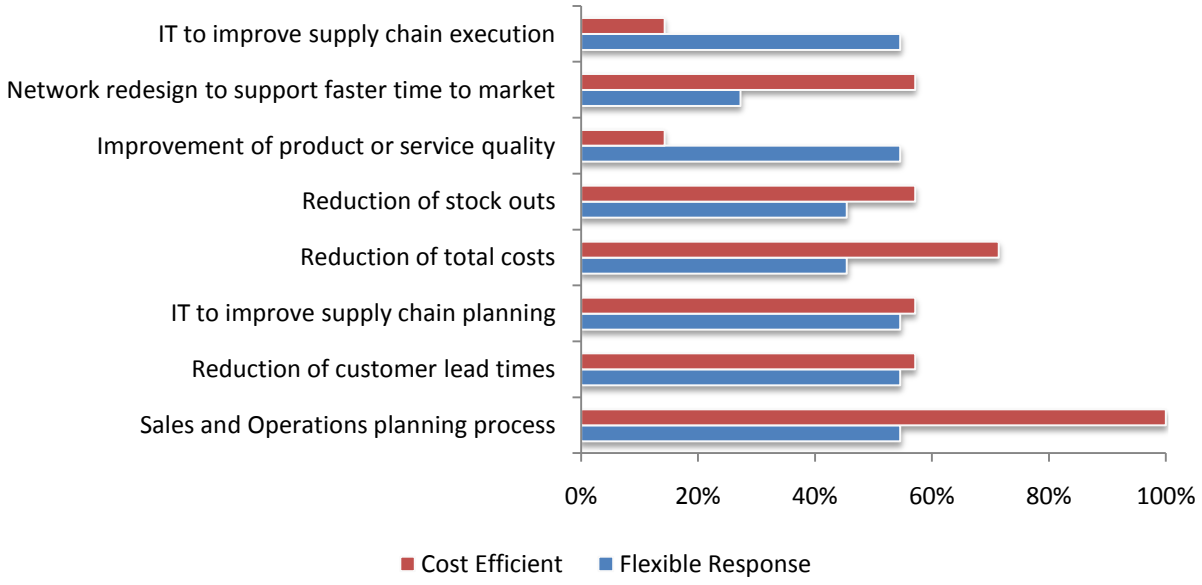

Figure 29 Top Supply Chain Strategies of Best Growth Performers

It is interesting to note that for both cost efficient and flexible response companies that are growth focused, satisfying customer demand, supply chain innovation and supply chain organization, processes and technologies dominate the focus areas. Note that when cost efficient companies compete on growth, they focus significantly on sales and operations planning and reduction of total costs.

4.6.2 Executive Strategy: Competitive Differentiation

First, we defined best performers in competitive differentiation as those companies who scored high on customer satisfaction and market share. We examined the strategies of CEOs focused in competitive differentiation (see figure below).

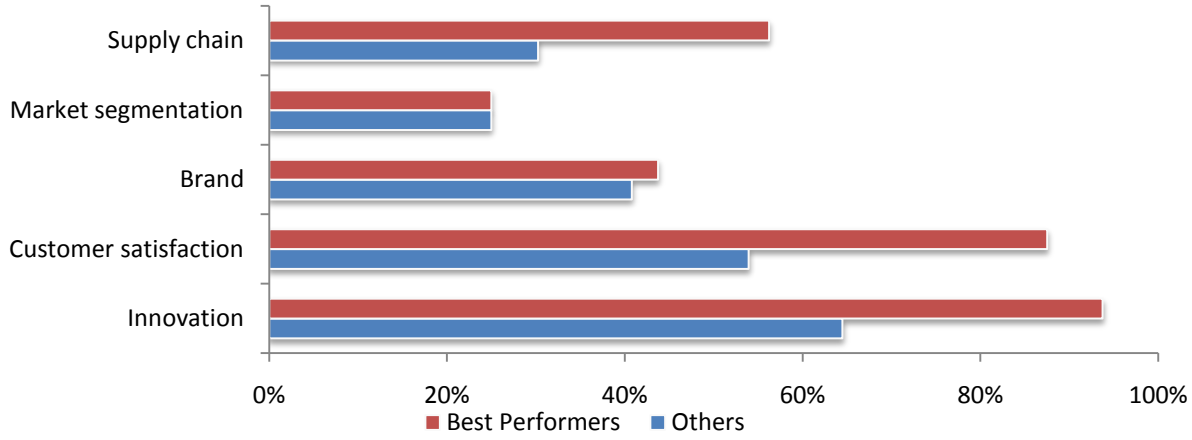

Figure 30 Focus on innovation, customer satisfaction and supply chain differentiates best performers in competitive differentiation

The top two focus areas of best performers and others are the same. The key difference between best performers and others is the former's strong focus on supply chain.

The figure below represents the top supply chain strategies of the best performers.

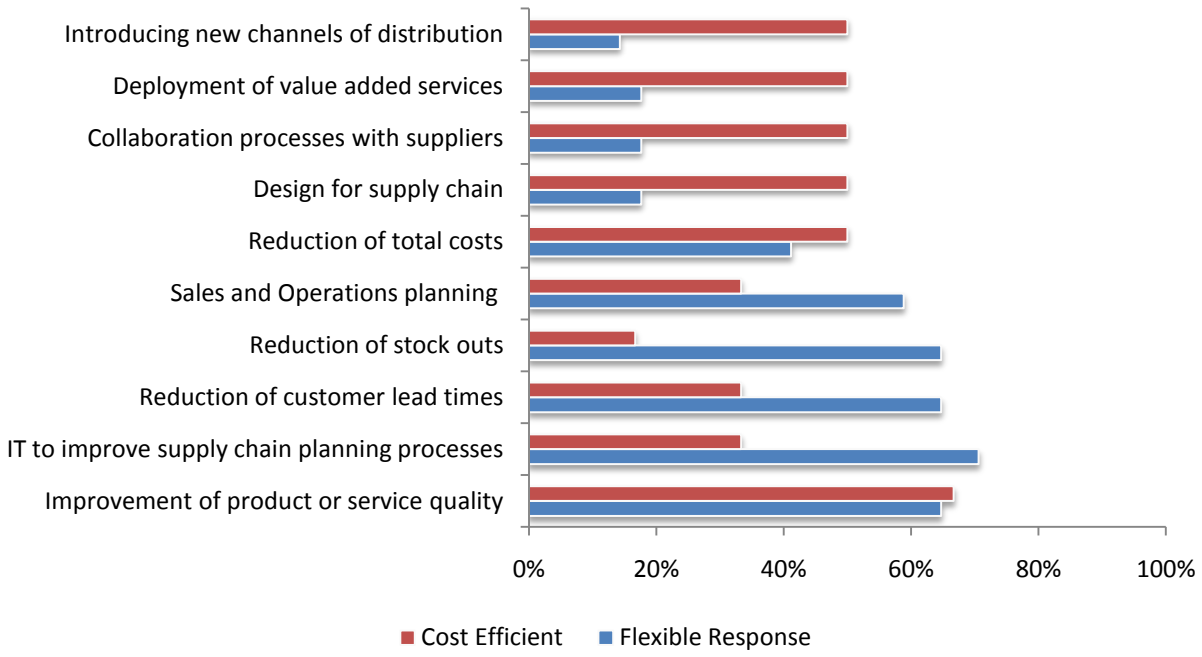

Figure 31 Top Supply Chain Strategies of Best Performers in Competitive Differentiation

4.6.3 Executive Strategy: Shareholder Return

In the case of shareholder return, we defined best performers as those companies who scored high on Return on Equity. We examined the strategies of CEOs focused in shareholder return (see figure below).

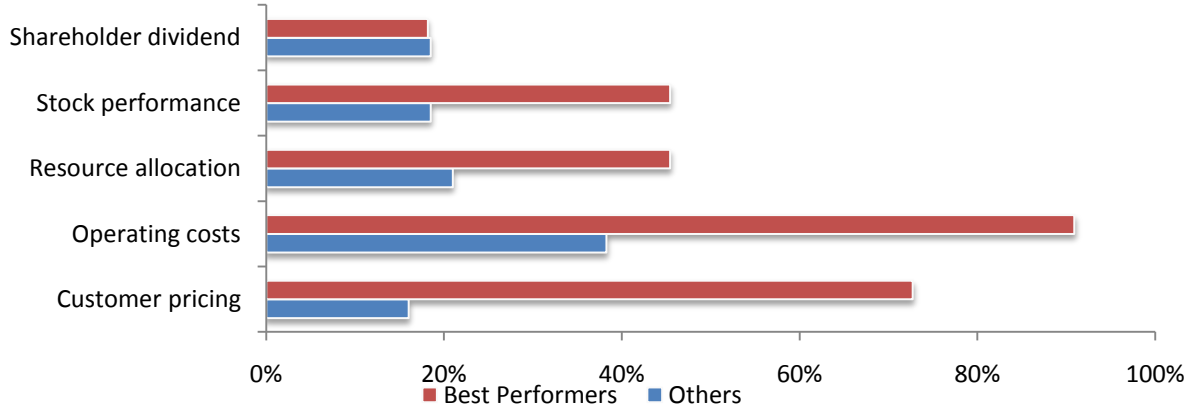

Figure 32 Focus on operating costs and customer pricing differentiates best performers in shareholder return

This indicates that the key difference between best performers and others is their strong focus on operating costs and customer pricing.

The figure below represents the top supply chain strategies of the best performers.

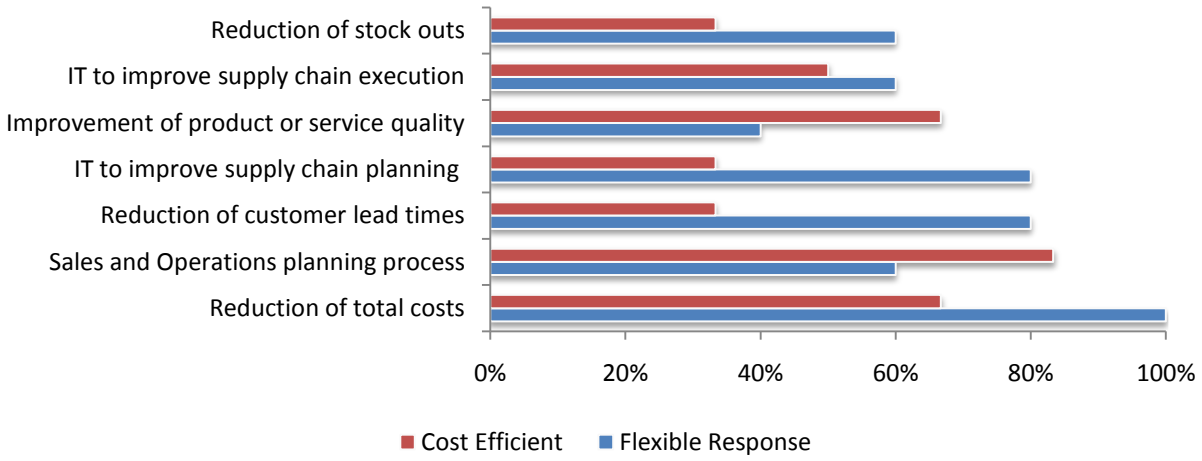

Figure 33 Top Supply Chain Strategies of Best Performers in Shareholder Return

4.6.4 Common Themes in supply chain strategies that support executive agenda

To summarize, the most important supply chain strategies and that matches with the three most popular executive strategies are given below.

	Executive Focus Areas					
	Growth		Shareholder Return		Competitive Differentiation	
Supply Chain Strategy	Flexible Response	Cost Efficient	Flexible Response	Cost Efficient	Flexible Response	Cost Efficient
Satisfying Customer Demand Focus						
Reduction of customer lead times	*	*	***		*	
Reduction of total costs		**	***	**		*
Reduction of stock outs		*	*		*	
Improvement of product or service quality	*			**	*	**
Deployment of value added services						*
Supply Chain Innovation Focus						
Network redesign to support faster time to market		*				
Design for supply chain						*

Introducing new channels of distribution						*
Supply Chain Organization, Processes & Technology Focus						
Sales and Operations planning process	*	***	*	***	*	
IT to improve supply chain planning	*	*	***		**	
IT to improve supply chain execution	*		*	*		
Supply Chain Risk Management Focus						
Collaboration processes with suppliers						*

Legend: *** >80% **>66% *>50%

Table 3 Summary of linkages between top executive strategies and top supply chain strategies

We can observe some common themes emerging, as these executive strategies themselves are not mutually exclusive.

4.6.4.1 Sales and Operations Planning Process to bring alignment between plans.

Consistently observed by all the best performers in business strategy, Sales and Operations Planning is at the heart of alignment of the executive, finance and supply chain. This may have larger impact to the organization such as financial forecasts and earnings guidance. Sales and marketing is the primary source of information on actions being taken to stimulate demand, while operations provide critical information on product supply. The forecast should reflect the most likely pattern and level of future demand given history, market intelligence and planned actions. Many companies fall into the trap of forcing the forecast to equal sales objectives or the business plan, or reflect some other functional objective.(Gattorna, 1998)One of the key challenges is trade-off between the accuracy of the forecast and organizational resources required to change the forecast. One of the solutions is to operate two sub-processes on different frequencies – a monthly or quarterly consensus meeting and a weekly or monthly forecast adjustment. Companies today are faced with consumers who expect global access to high quality and reliable products. Getting the right product, when and where it is needed, is becoming a competitive advantage for many organizations. It is no wonder that Sales and Operations Planning has emerged as a critical factor in business success.

4.6.4.2 Role of IT in Supply Chain Planning and Execution

Another common theme, across all business strategies and supply chain types, IT itself may not provide any competitive advantage. To cite an example, it was Walmart's combined business processes (particularly continuous replenishment) and IT infrastructure (specifically, the satellite communication system) that enabled them to do what no other retailer has done before – reduce inventory levels and cut the cost of sales by 2-3% compared with industry average, thus offering everyday low pricing to its customers. (Simchi-Levi, 2010)

IT is so commoditized that limping behind in IT investments can have serious implications on operational efficiency. IT investments should *enable*, *support and enforce* the company's business strategy. According to Prof. David Simchi-Levi (Simchi-Levi, 2010), there are five core capabilities that should be enabled by the firm's IT infrastructure

- Supply Chain collaboration and integration – Designing business processes that cut across organizations, geographies, conflicting objectives and inflexible technologies enabled by 'cloud based' infrastructure can have enormous impact
- Centralized and decentralized decision making – IT should enable the organization's core capability of making decisions at the appropriate level.
- Synergies across multiple supply chains – Depending on the customer value, a firm might require multiple supply chains. For example, if the firm supports two channels (retail and online) or if it has a portfolio of products (functional and innovative), it often requires multiple supply chains. IT can enable the firm to take advantage of the synergies in procurement, product design, manufacturing, logistics and distribution.
- Supply Chain Visibility – The drivers for investing in visibility are efficiency (to reduce inventory levels, improve asset utilization or to co-ordinate deliveries), responsiveness (to reduce out-of-stock or decrease lead time or improve on time delivery), risk (shipment delays and other logistics problems) and regulations (eg. ePedigree to prevent counterfeit drugs). Often, visibility enabled by IT comes from three major categories – shipment tracking, pipeline visibility (that gives the ability to react to delays and disruptions) and more advanced capabilities such as track-and trace.

- Performance monitoring and optimization – IT infrastructure allows the companies, not just to track various key performance indicators, but also predict what is likely to happen.

Thus, IT investments along with the complementary investments in business processes help the firm, obtain a competitive advantage in the dynamic market place

4.6.4.3 Total Costs Reduction

This was the strategy most pursued by cost efficient companies to support all the executive strategies, and by flexible response companies focused on share holder return. One of the most important goals of SCM is to meet the end-user satisfaction expectations while costs are optimized. If the most effective cost profile is to be achieved, trade-offs analysis should be implemented and an optimal solutions must be explored. Firms should consider various costs that impact (Gattorna & Walters, 1996) such as:

- Customer service costs – sales and profit loss when the opportunity is missed due to lack of product availability.
- Inventory holding costs – includes capital costs, storage space, servicing (insurance), risk (obsolescence, shrinkage and damage), opportunity costs and the costs of incremental infrastructure.
- Transportation costs – includes investment, labor, insurance, risk
- Order size costs – costs involved in processing, handling and progressing activities required to service customer orders.

Supply chain strategy development should consider these underlying costs in order to reduce the total costs to customer.

4.6.4.4 Product/Service Quality Improvement

Regardless the supply chain type, product/service quality is the cornerstone of competitive differentiation. Product quality also contributes significantly to better performance in shareholder return and growth. It should come as no surprise that product quality is the most important factor in supply chain strategies for competitive differentiation, while the CEO focus is on innovation and customer satisfaction.

The data in this study provides further supports of the connection between the executive agenda and supply chain strategy. For example, when the executive agenda included building capabilities, the supply chain focused on investing and utilizing supply chain assets effectively. Additionally, across all our best-in-class companies we found a strong correlation between a business focus on Corporate Social Responsibility and innovation in the supply chain. This is indeed appropriate since Corporate Social Responsibility includes, among others, a focus on carbon footprint reduction, elimination of waste, and energy and water conservation—all of which require innovative in product design, manufacturing and supply chain strategies.

4.7 Better Operations Strategies lead to better business and financial performance

Next, we focused on quantifying the magnitude of the link between executive agenda and supply chain performance. For this purpose, we applied a statistical technique called Categorical Principal Component Analysis (CATPCA) (See Appendix Section 8.2). The goal of CATPCA is to reduce an original set of variables to a smaller set of uncorrelated components that capture most of the information found in the original variable. Specifically, the four executive performance measures—revenue, market share, customer satisfaction and Return on Equity—were extracted to a single performance indicator referred to as the Business Performance Indicator (BPI).

Our objective is to compare the BPI of the 30 best-in-class supply chains to that of the remaining 62 companies. This is done in figure below where we can see the fraction of best-in-class companies with different BPI values alongside the fraction of the remaining companies with the same BPI.

As we can see, a large fraction of the best-in-class companies exhibits high BPI, compared with a much smaller fraction across the remaining companies. For example, 63% percent of the best-in-class companies exhibit a positive BPI compared to 50% percent of the remaining companies. Similarly, 60% percent of the best-in-class companies are in the top one third of the BPI ranking compared to 40% percent of the remaining companies.

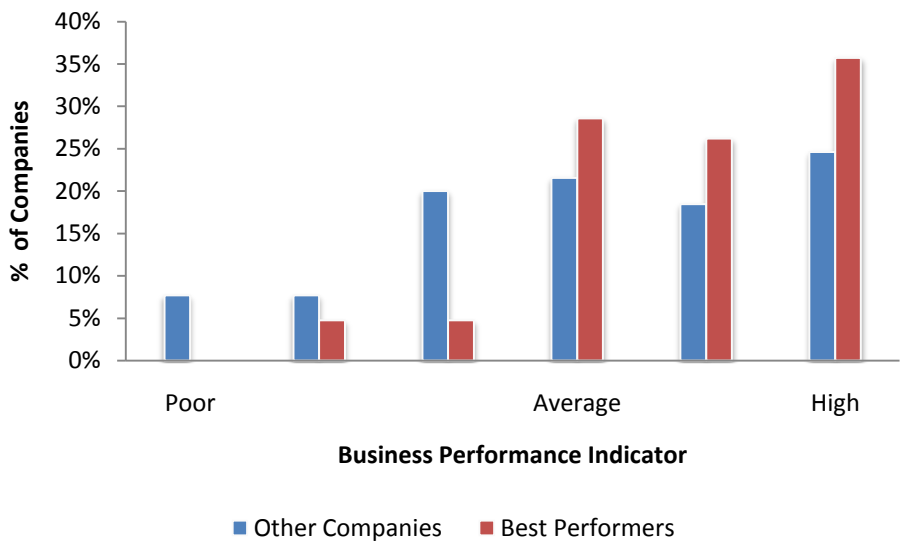

Figure 34 Comparing BPI of best-in-class companies with that of other companies

Similarly, the CFO's performance metrics—Return on Equity, Return on Assets, Total Assets Turnover, Inventory Turnover, Operating Cash Flow, Net Working Capital to Assets, Operating Margin, Debt to Equity Ratio, and Total Debt Ratio—were also extracted to a single performance metric referred to as the Financial Performance Indicator (FPI). This indicator is plotted in figure below, where we provide information on the fraction of best-in-class companies and the remaining companies with different FPI values. Again, most of the best-in-class companies exhibit a significantly higher financial performance.

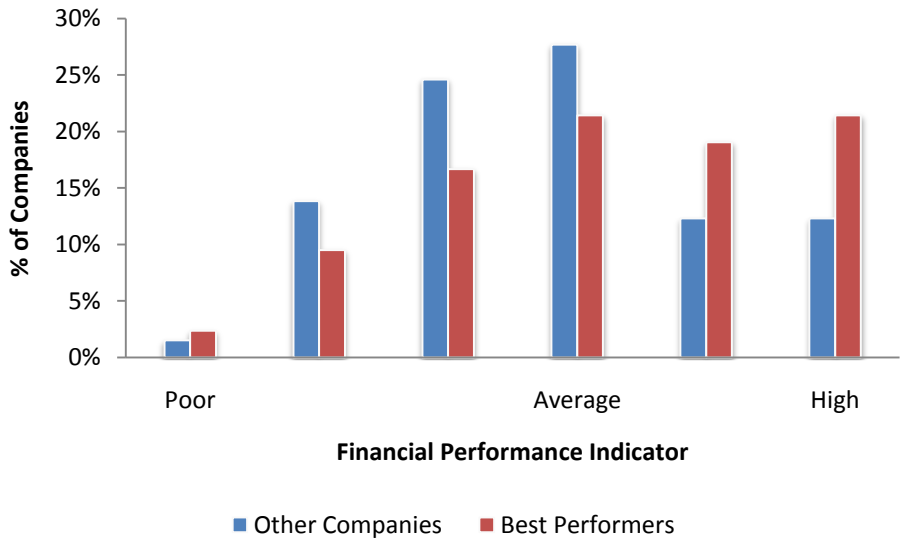

Figure 35 Comparing FPI of best-in-class companies with that of other companies

Our results indicate not only a link between the executive agenda and supply chain strategies but also that business and financial performance go hand in hand with supply chain performance.

4.8 What combination of supply chain strategies makes a best performer?

After performing statistical correlations between strategies and Key Performance Indicators, we found a number of strategies that are correlated positively. However, many strategies were correlated to each other as well. Additionally, strategies imply trade-offs. One cannot think of implementing all 50+ supply chain strategies at the same time. Obtaining the right combination of strategies seemed like an interesting challenge.

We performed another statistical technique called Categorical Regression (See Appendix Section 8.3) with each of the KPIs as dependent variables and all the supply chain strategies as dependent variables. The models were revised iteratively till only statistically significant variables remained, while keeping a watch on the R square. The model formulation is as per the equation below:

$$KPI = f\left(C + \sum_{i=1}^{i=N} (\beta_i * S_i) \right)$$

Where

KPI is the performance indicator under consideration (Inventory Turns, for example)

N is the number of strategies selected in the particular iteration of the model

S is the value for the particular strategy (whether the firm has the strategy or not)

β is the regression coefficient of the strategy

C is the intercept that accounts for the fixed effects

To illustrate an example, categorical regression was performed with SCM KPI of Supply Chain Costs as dependent and all supply chain strategies as independent variables. After multiple iterations, the model was reduced to nine independent variables.

Variable	Standardized Coefficients		df	F	Sig.
	Beta	Std Error			
Satisfying Customer Demand Focus: Reduction of customer lead times	-.150	.094	1	2.555	.114
Supply Chain Innovation Focus: Introducing new channels of distribution*	.167	.120	2	1.936	.151
Supply Chain Innovation Focus: Product or service design for supply chain*	.191	.091	2	4.360	.016
Purchasing Focus: Supplier quality	.142	.126	2	1.261	.289
Purchasing Focus: Optimal positioning of inventory*	.209	.102	2	4.144	.020
SC Assets Focus: Competitive differentiation through transportation	-.386	.257	1	2.247	.138
Risk Mgmt Approach: Contingency in Manufacturing	-.415	.159	2	6.790	.002
Risk Mgmt Approach: Risk sharing with customers*	.214	.128	1	2.775	.100
Risk Mgmt Approach: Unknown risks	-.251	.097	1	6.720	.011
Model Summary					
Multiple R	R Square		Adjusted R Square		
0.671	0.450		0.350		

Table 4 Categorical Regression Coefficients of supply chain strategies

The above table indicates that Supply Chain Innovation Focus on *design for supply chain,* Purchasing focus on *optimal positioning of inventory*, Innovation Focus on *introducing new channels of distribution* and Risk management focus on *risk sharing with customers* are the most important strategies that contribute to better performance on supply chain costs. The adjusted R square implies that once we know that a company has these strategies, 35% of time, we can predict the outcome of their performance against ROE. We don't worry much about the R square, as our goal is to identify the top few strategies that contribute to the KPI, than to create a model that gives a good fitment.

Likewise, the most important supply chain strategies for indicating a higher performance in each of the supply chain KPIs are summarized below:

	Supply Chain KPI

Supply Chain Strategy	Inventory Turns	Order Fill Rate	Order Lead Time	Supply Chain Costs	Customer Order Profitability	Forecast Accuracy
Satisfying Customer Demand Focus Areas						
Reduction of stock outs	**					
Reduction of total costs		*			*	
Improvement of product or service quality					*	
Deployment of value added services					***	
Visibility Focus Areas						
Expedite shipment					***	
Adjust production schedule						***
Supply Chain Innovation Focus Areas						
Introducing new channels of distribution				*	***	
Product or service design for supply chain				***		
Forecast accuracy	**				*	
Purchasing Focus Areas						
Reduction of supplier lead-times			*			
Supplier timeliness		**				**
Supplier reliability						***
Optimal positioning of inventory				***		
Supply Chain Assets Focus Areas						
Reduce ownership of distribution centers		*				
Reduce ownership of retail stores	**		*			
Competitive differentiation through manufacturing	***				***	
Competitive differentiation through retail locations					*	
Organization, Process and Technology Focus Areas						
Collaboration processes with suppliers		***				
IT to improve supply chain planning processes		**				
IT to improve supply chain execution processes						***
Risk Management Focus Areas						
Contingency in Purchasing		**				
Contingency in Distribution			***			

	Supply Chain KPI					
Supply Chain Strategy	Inventory Turns	Order Fill Rate	Order Lead Time	Supply Chain Costs	Customer Order Profitability	Forecast Accuracy
Contingency in Retail locations		**			***	
Risk sharing with customers			***	**		
Qualitative approach towards risk management						*
Risk Management: Unknown risks	*					

Legend: *p <0.25 **p<0.1 ***p<0.05

Table 5 Important supply chain strategies that indicate a higher performance in Supply Chain KPIs

Forecast accuracy and reduction in stock outs are the cornerstones of good performance in inventory turns. Reducing ownership of under-performing retail stores should help in reducing inventory turns, as retail stores carry significant inventory. Competitive differentiation through manufacturing includes postponement strategies (delayed differentiation) that reduce the overall inventory levels.

Supplier collaboration programs such as VMI and transferring data from Point of sales and contingency in purchasing, obviously facilitate a high performance in order fill rate. Supplier timeliness and IT to improve supply chain planning processes ensure a good performance in customer order fill rate. Risk management by having contingency in retail locations, can help by customers buying from alternate locations and thus ensures a higher order fill rate. To cite and example, Target Corp, diverts the potential lost sales from customers who cannot find an item in the stores by enabling an IT infrastructure that retrieves information of the nearby stores that carry the item.

Having contingency in distribution obviously helps reduce the lead time. Often this comes with the tradeoff of holding more inventories at the additional distribution centers. As discussed in

section 4.5.2.3, information and risk sharing with customers helps suppliers reduce the customer order lead times.

As seen in earlier section 4.5.1.1 and 4.5.1.4, Design for supply chain and optimal positioning of inventory can bring about huge reduction in supply chain costs. Risk and information sharing with customers also reduces lead time and in turn reduces supply chain costs.

The top strategies for customer order profitability turned out to be Value added services, using visibility to expedite shipments, introducing new distribution channels such as online channels, and contingency in retail locations. Differentiation by manufacturing strategies such as delayed differentiation, or even by having better control on the manufacturing process itself, a firm can improve the customer order profitability.

It is interesting to note the top drivers for forecast accuracy. IT to improve supply chain execution, supplier reliability, supplier timeliness and the ability to adjust production schedule, show that forecast accuracy is determined more by the firm's ability to execute than by using sophisticated forecasting models.

The emergence of risk management strategies as a critical driver for success in supply chain KPIs is another interesting observation.

4.8.1 Risk Management – an aside.

Given the importance of risk management, let's take an aside into what the survey respondents thought about risk management. Sadly, only 11% of the survey respondents stated that Risk management is a focus area for them. However, they responded to the sources of risks that they see. Demand risk and supply risk came as the most prominent, followed by process/technology failure and industry wide trends.

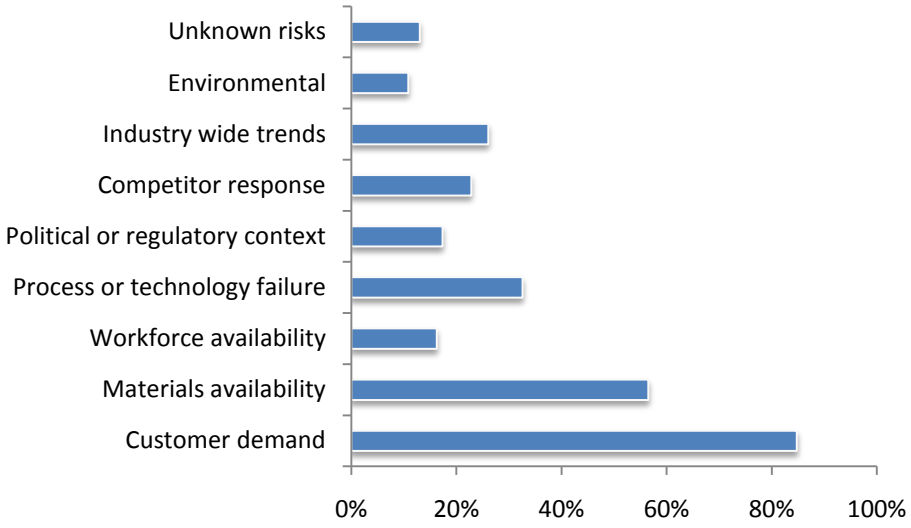

Figure 36 Sources of Risk

According to the survey respondents, risk had impact on their ability to meet customer demand and cost fluctuations. Obsolescence, price erosion and inefficient use of assets were the other consequences.

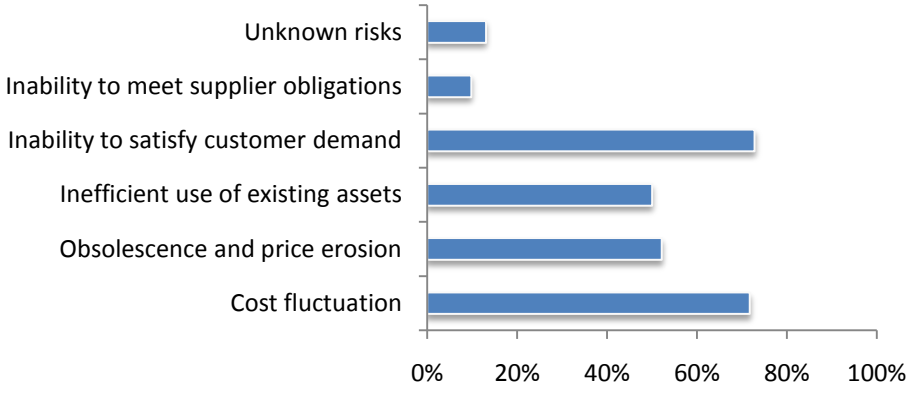

Figure 37 Impact of Risks

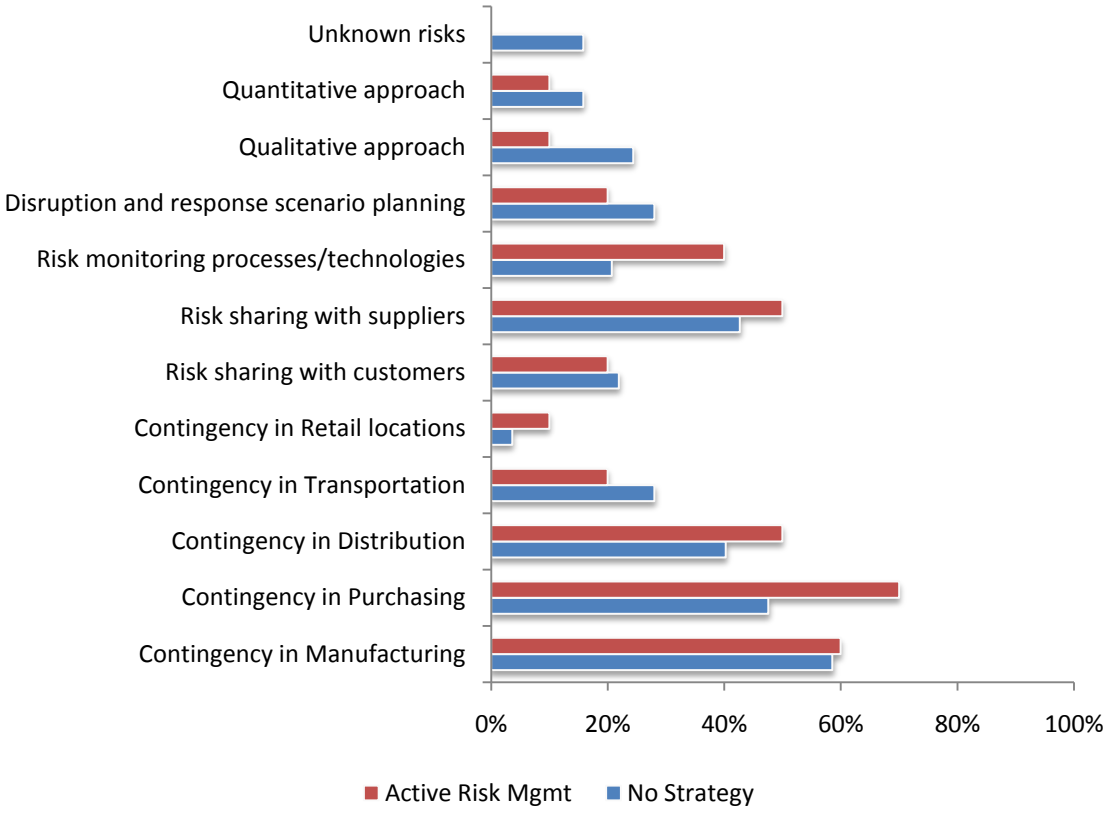

Figure 38 Risk Management Techniques

We asked the respondents for their risk management focus areas. Most of them had contingencies as the most prominent set of techniques. This shows that many companies have not started focusing on the most beneficial risk management techniques such as risk sharing with suppliers and customers.

4.9 Supply Chain Strategies and Financial Performance of public companies

We have analyzed the impact of supply chain strategies on business and finance, based on the self rating of the executives against their own targets. However, this part of our work is distinct in that, we analyze corporate data along with the survey responses on their strategies and utilize our analysis to determine the optimal supply chain strategic focus areas. Using Capital IQ, we focused on several financial metrics that we believe are of significant relevance to corporate supply chains. As described in Section 2.2, we calculated the relative performance of the firm to their industry peers and market value over book value (Tobin's Q).

We conducted panel regression analysis (using a technique called GENLIN, see Appendix section 8.4) of 52 supply chain strategies as predictor variables and relative revenue growth, relative return on equity, relative return on assets, relative return on capital, relative debt to equity ratio, relative total asset turnover, and relative gross margin, individually as the dependent variable. The panel regression analysis model was formulated as below.

$$\text{Relative Performance Indicator (RPI)} = f\left(C + \sum_{i=1}^{i=N} (\beta_i * S_i) + \alpha * \text{Year} \right)$$

Where

RPI is the relative performance indicator under consideration (Relative ROE, for example)

N is the number of strategies selected in the particular iteration of the model

S is the value for the particular strategy (whether the firm has the strategy or not)

β is the regression coefficient of the strategy

C is the intercept that accounts for the fixed effects of the firm

α is the regression coefficient of the Year

Among the strategies, we identified 25 strategies that have statistically significant influence on the dependents (Saxena, 2010). Using principal components analysis, the metrics for relative performance were reduced to one single metric called overall relative performance.

The same analysis was performed again with the model now consisting of these 25 strategies as predictors and relative performance as dependent. We ran multiple models by progressively weeding out the predictor variables with the least statistical significance till all the variables in the model had a p value less than 0.1, while keeping a watch on the pseudo-R square called QIC. We subsequently identified a subset of supply chain strategies that were consistently the most significantly correlated with our relative financial metrics. Although correlation alone cannot be used to justify causality, the robust and significant correlation of the identified supply chain strategies with multiple, uncorrelated financial metrics implies that these strategies do play a role

in positively affecting financial performance. The final model with their coefficients and significance is given below.

Parameter	B	Std Error	95% Wald Confidence Level		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	84.34	205.04	-317.53	486.21	0.17	1.00	0.68
Visibility – Track and Trace	-0.29	0.07	-0.42	-0.16	18.60	1.00	0.00
Supply Chain Innovation – New products or services	-0.88	0.09	-1.06	-0.70	93.87	1.00	0.00
Supply Chain Innovation – New distribution channels*	0.34	0.06	0.22	0.46	30.69	1.00	0.00
Supply Chain Innovation – Design for supply chain	-0.09	0.05	-0.18	0.00	3.86	1.00	0.05
Purchasing – Supplier capability or knowhow	-2.08	0.18	-2.42	-1.73	139.07	1.00	0.00
Purchasing – Optimal Positioning of Inventory*	0.18	0.08	0.02	0.34	4.59	1.00	0.03
Supply Chain Assets – Reduce Transportation Assets	-1.07	0.17	-1.40	-0.74	40.57	1.00	0.00
Supply Chain Assets – Competitive differentiation through manufacturing	-0.58	0.21	-0.99	-0.17	7.62	1.00	0.01
Supply Chain organization – IT to improve supply chain execution	-0.59	0.05	-0.68	-0.50	151.82	1.00	0.00
Risk Management – Contingency in manufacturing*	1.17	0.13	0.93	1.42	86.97	1.00	0.00
Risk Management – Risk sharing with customers	-1.42	0.29	-1.98	-0.85	24.15	1.00	0.00
Risk Management – Risk sharing with suppliers*	0.99	0.11	0.78	1.20	83.53	1.00	0.00
Risk Management – Qualitative approach*	0.43	0.11	0.21	0.64	14.96	1.00	0.00
Risk Management – Quantitative approach	-1.32	0.19	-1.70	-0.94	47.21	1.00	0.00
Risk Management – Planning for unknown risks	-0.23	0.09	-0.42	-0.05	6.28	1.00	0.01
Year	-0.04	0.10	-0.24	0.16	0.17	1.00	0.68
(Scale)	0.87						
Goodness of Fit							
Quasi likelihood under independence model criterion (QIC)					64.791		
Quasi likelihood under independence model criterion corrected (QICC)					92.999		

Table 6 Coefficients of Generalized Linear Model analysis of supply chain strategies for relative performance

From the model above, ***Risk Management –*** *Contingency in manufacturing, Risk sharing with suppliers, Qualitative approach to risk management* ***Supply Chain Innovation –*** *New Distribution channels,* ***Purchasing –*** *Optimal positioning of inventory* (marked with *) turned out to be the most power supply chain strategies that would yield a better relative performance over the industry. This reiterates our earlier findings on risk management.

Similar analysis was done for finding the relationship between supply chain strategies and Tobin's Q. Spearman correlations were run to find out which supply chain strategies were most correlated to Tobin's Q. The panel regression analysis model was formulated as below.

$$\text{Tobin's Q} = f\left(C + \sum_{i=1}^{i=N} (\beta_i * S_i) + \alpha * \text{Year} \right)$$

Where N is the number of strategies selected in the particular iteration of the model

S is the value for the particular strategy (whether the firm has the strategy or not)

β is the regression coefficient of the strategy

C is the intercept that accounts for the fixed effects of the firm

α is the regression coefficient of the Year

Parameter	**B**	**Std Error**	**95% Wald Confidence Level**		**Hypothesis Test**		
			Lower	**Upper**	**Wald Chi-Square**	**df**	**Sig.**
(Intercept)	452.92	87.370	281.68	624.164	26.873	1	.000
Satisfying Customer Demand - Reduction of stock outs*	.211	.0745	.065	.357	7.992	1	.005
Satisfying Customer Demand - Improvement of product or service quality*	.235	.0592	.119	.351	15.810	1	.000
Visibility - Track and trace product (RFID, 2D barcode)*	.489	.0942	.305	.674	26.975	1	.000
Supply Chain Innovation - Launch of new products or services*	.324	.0513	.224	.425	39.976	1	.000
Supply Chain Innovation - Introducing new channels of distribution	-.327	.0736	-.471	-.182	19.674	1	.000

Supply Chain Assets - Reduce ownership of distribution centers	-.600	.0607	-.719	-.481	97.677	1	.000
Supply Chain Assets - Competitive differentiation through distribution*	.586	.1474	.297	.875	15.812	1	.000
Supply Chain Organization - Collaboration processes with customers	-.390	.0653	-.518	-.262	35.584	1	.000
Supply Chain Organization - Build internal supply chain competencies	-.592	.0926	-.773	-.410	40.856	1	.000
Supply Chain Organization - Minimize internal cross-functional conflicts*	.253	.0982	.060	.445	6.618	1	.010
Risk Management - Contingency in Transportation	-.420	.0859	-.588	-.251	23.884	1	.000
Risk Management – Risk sharing with customers	-.571	.1300	-.826	-.316	19.291	1	.000
Risk Management - Risk monitoring processes or technologies	-.341	.1020	-.541	-.141	11.167	1	.001
Risk Management - Disruption and response scenario planning	-.480	.1642	-.801	-.158	8.527	1	.004
Risk Management - Qualitative approach towards risk management	-.440	.1291	-.693	-.187	11.631	1	.001
Quantitative approach towards risk management	-.428	.1659	-.753	-.103	6.653	1	.010
Year	-.225	.0435	-.310	-.140	26.675	1	.000
(Scale)	.178						

Goodness of Fit	
Quasi likelihood under independence model criterion (QIC)	51.215
Quasi likelihood under independence model criterion corrected (QICC)	51.115

Table 7 Coefficients of Generalized Linear Model analysis of supply chain strategies for Tobin's Q

From the above table, ***Supply Chain Innovation*** *- Launch of new products or services,* ***Visibility*** *- Track and trace product,* ***Satisfying Customer Demand*** *- Improvement of product or service quality,* ***Supply Chain Assets*** *- Competitive differentiation through distribution,* ***Supply Chain Organization*** *- Minimize internal cross-functional conflicts* (marked with *) are the most important strategies that support high market value over book value for public companies. It is interesting to note that the strategies are highly process focused.

The above two models yielded two different sets of strategies. The first metric represented a relative measure compared to the industry. The second metric represented a higher market valuation. The data set for the first analysis consists of public companies and private companies with financial data, most of them innovating in their own domains. The data set for the second

analysis consists of public companies only. The first one gave a set of strategies that are tending towards risk management, innovation and purchasing. The second one gave a set of strategies that are highly process focused. This is expected as the first one has a higher mix of innovative companies, and the second set is composed of companies that are governed by corporate laws and internal standard operating processes and procedures.

5 Linking Value Proposition and Operations Strategy

Finally, to illustrate the link between customer value proposition and operations strategy, below given table lists the value propositions, products/services that they compete on and the key elements of their operations strategy for a select set of survey respondents. Entries given in italics are potentially not aligned with their customer value proposition.

Notice that the companies that have described themselves as cost efficient supply chain type are either selling functional products or providing services at a cheaper cost to their customers. Similarly, companies that have described themselves as flexible response supply chain type either sell innovative products or are in high clock-speed industries.

Value Proposition	Products/Businesses	Supply Chain Type	**Best in Class**	**Customer Demand**	**Visibility**	**Innovation**	**Purchasing**	**Assets**	**Organization, Process**	**Risk Mgmt**
reliability, quality and innovation	Wireless Communications Products	Efficient		*		*			*	
ubiquitous distribution	pharmaceutical wholesaling	Efficient	*	*			*		*	
innovation, cost productivity, product quality and consumer value	Microwaves	Efficient		*					*	*
design, experience and technology	Kitchen Hoods	Efficient	*			*	*		*	
Efficiency (cost) Effectiveness (service) Sustainability (carbon footprint)	Supply Chain Integration	Efficient	*	*		*				
innovative products and services to create sustainable and ever-increasing value	Chemicals	Efficient		*			*		*	
Ease of use	consumer products, graphics and display	Efficient	*	*	*				*	

Value Proposition	Products/Businesses	Supply Chain Type	Best in Class	Customer Demand	Visibility	Innovation	Purchasing	Assets	Organization, Process	Risk Mgmt
reliability, quality and innovation	Wireless Communications Products	Efficient		*		*			*	
ubiquitous distribution	pharmaceutical wholesaling	Efficient	*	*			*		*	
innovation, cost productivity, product quality and consumer value	Microwaves	Efficient		*					*	*
design, experience and technology	Kitchen Hoods	Efficient	*			*	*		*	
Innovation in materials and technologies	Performance Plastics	Efficient	*	*	*				*	
Tools that help extend the customer's personal power and abilities.	Electronic test and measurement	Efficient	*			*	*		*	
Value creation and corporate citizenship	steel	Efficient	*		*		*		*	
Innovative, distinctive products and services that save and improve lives	Opto Electronics, Pigments, Life Science	Responsive		*	*			*	*	
Access to effective and affordable medicines	Internal medicines	Responsive	*	*		*			*	
Best and broadest assortment for customers, lowest cost for producers	Flower Auction	Responsive	*	*				*	*	
Brands that make people smile	Candy and Gum	Responsive	*	*					*	
Bringing plant potential to life by science and global reach	Herbicides	Responsive		*	*				*	
Product Innovation - Continuous development till perfection	Sports cars	Responsive		*			*		*	
Deliver competitive advantage to client's supply chains	Transportation	Responsive	*	*						

Value Proposition	Products/Businesses	Supply Chain Type	**Best in Class**	**Customer Demand**	**Visibility**	**Innovation**	**Purchasing**	**Assets**	**Organization, Process**	**Risk Mgmt**
reliability, quality and innovation	Wireless Communications Products	Efficient		*		*			*	
ubiquitous distribution	pharmaceutical wholesaling	Efficient	*	*			*		*	
innovation, cost productivity, product quality and consumer value	Microwaves	Efficient		*					*	*
design, experience and technology	Kitchen Hoods	Efficient	*			*	*		*	
Exceptional value in a sustainable way	Paper & packaging products	Responsive	*	*	*	*		*	*	
Fashion with style, quality and passion	Apparel	Responsive		*			*		*	
Logistics tailored to customers' individual needs	Transportation	Responsive	*	*		*			*	
Health through food – Product innovation	Dairy products	Responsive	*	*		*			*	
Improving the mobility of people and goods through the quality of products	*Tires*	*Responsive*		*				*		
Innovation, Quality, and Supply Chain	Baby Products, Health and beauty products	Responsive	*	*		*	*			
Product and service Innovation	Thermal Spray Materials	Responsive	*	*			*		*	
Product Innovation in ultra rare diseases	Pharmaceuticals	Responsive	*	*	*				*	
Quality, Consistency, and Innovation	*Frozen potato products*	*Responsive*	*	*			*			
Efficiency and safety of customer vessels.	*Maritime Electronics*	*Responsive*		*		*	*			
Product Innovation - Uniquely high quality, easy to prepare	Coffee Capsules	Responsive	*	*		*			*	

Table 8 Customer value proposition and Operations Strategy of select survey respondents

6 Conclusion, Limitations and Future Work

Our research started with the primary objective of understanding the agenda items of executive, financial and supply chain arms of the organization. Our secondary objective was to determine the supply chain strategies that would facilitate optimal performance not only in supply chain, but also in the realms of the CEO and CFO. We analyzed the most important agenda items and the drivers and strategies for the same. The research brought to light, not only the key distinctions between flexible response supply chains and cost efficient supply chains in terms of strategies and performance, but also an increasing drive towards flexibility.

We used different lenses and analytical techniques to evaluate the link between executive strategy and supply chain strategy. We identified the key strategies that can give superior performance with respect to operational, business and financial key performance indicators. We validated the research findings with publicly available financial data for a smaller subset of companies. Our results indicate not only a link between the executive agenda and supply chain strategies but also that business and financial performance go hand in hand with supply chain performance. Indeed, the business and financial performance of most of the 30 best-in-class supply chains outperform that of the remaining companies.

However, there are number of limitations in our research approach. Most of the survey participants are Europe based, medium to large size companies. Such constraints often impose limitations on the representativeness and significance of the research findings. As we dissected the groups of companies smaller and smaller to bring about the key characteristics, we may not have had sufficient sample size to detect many of the underlying patterns. Although our research yielded many significant and novel results, we also came across several unexpected results such as the lack of correlation between many strategies and performance indicators. A likely explanation for this is that the nature of our survey results was quite subjective and noisy and could have served to convolute and skew some of our results.

We combined a number of KPIs to indicate the performance in business, supply chain and finance. The combinations are un-weighted and consider the variance in each KPI. They provide an approximate indication for performance. Furthermore, the optimal scaling regression methods

on a set of strategies that are already correlated may have resulted in one strategy substituting for another. They need to be considered as a directional approach towards strategy than a specific strategy.

While analyzing panel data, we did not have the historical information about the companies' strategies. We used the survey information as the proxy for prior year's strategy as strategies do not change that dynamically. This and the potential error in panel analysis of serial correlation, (the correlation of a variable with itself over a time interval), may also have skewed our results.

Potential future work could include bringing more objectivity into the analysis and dynamic monitoring of the strategies of the companies across time. That would give us a more complete picture of the effect and contribution of various supply chain strategies on the business and financial performance.

7 Appendix A: Survey Questionnaire

The complete online three part survey is given below:

7.1 Common Questionnaire

Supply chain and the Executive agenda

Dear Sir/Madam,

We would like to express our appreciation for having accepted the invitation to become member of our SCM research community! One of the key activities within this membership is participating in the research TruEconomy and the Massachusetts Institute of Technology (MIT) are conducting into the interaction between the agenda of the CEO and supply chain management. The objective of the research is to identify a framework that links the firm's value proposition to its supply chain strategy.

Below you will find a link to the actual survey. The survey itself consists of 3 parts: one part for the Supply Chain executive, one part for the CEO and one part for the CFO. The Supply Chain executive should fill his/her section first and then forward the link to the CEO mentioning the product lines or business unit he/she has focused the response on. After completing his/her section, the CEO should forward the link to the CFO to complete the remainder of the questionnaire. The response is valid when all 3 parts are concluded. Each part won't take longer than 15 minutes.

If you are uncertain about your answer to a question, please select your best opinion and continue to the next question. Please note that, your company or participant names will not be linked to any answers. For analysis purposes we will assign a tracking number to each questionnaire and then aggregate all answers from a cohort to focus on summary statistics.

If you need additional clarification or have any further questions, please do not hesitate to contact Costas Vassiliadis (cvassiliadis@trueconomy.com)

Sincerely,

Massachusetts Institute of Technology
Forum for Supply Chain Innovation
77 Massachusetts Avenue Rm. 1-179
Cambridge, Massachusetts, USA 02139

TruEconomy
Villa Beau Coin
Stationstraat, 2
4000 AM Tiel, The Netherlands

Question	Answer Options
Your information	Your Name
	Company Name
	Work Phone
	Email Address
2. What is your role at the company?	
	If other, please specify
3. Which part of study would you like to participate in?	

7.2 Questionnaire for the COO/Supply Chain Director

Question	Answer Options
4. Briefly describe the business unit or product/service line and its supporting supply chain. Note: Please select one of your company's top product lines or business divisions in terms of revenue or margin contribution. Please focus your responses in the remainder of the questionnaire on this business unit or product line.	a. Business Unit name (Division)
	b. Product/Service line name (if applicable)
	c. Description of the supporting supply chain for this business unit or product/service line
	d. Annual Sales Revenue of this business unit or product/service line (Millions of Euros)
5. This industry is best described as (check one)	Cost Efficient
	Flexible Response
6. This industry is best described as (check one)	Retail
	High technology
	Consumer packaged goods
	Healthcare
	Industrial
	Transportation
	Services
	If other, please specify

7. The type of this supply chain is (check all that apply)	Manufacturing: Make to Order
	Manufacturing: Make to Stock
	Manufacturing: Assemble to Order
	Wholesale
	Distributor
	Retail
	3PL/4PL provider
	Service
	If other, please specify
8. The top three demand regions by revenue are (Please select three)	Western Europe
	Eastern Europe
	North America
	South America
	Japan
	Asia
	Middle East
	Africa
	If other, please specify
9. The top three supply sources by spending are (Please select three)	Western Europe
	Eastern Europe
	North America
	South America
	Japan
	Asia
	Middle East
	Africa
	If other, please specify
10. The top two inbound transportation modes by spending are (Please select two)	Air
	Road
	Rail
	Water
11. The top two outbound transportation modes by spending are (Please select two)	Air
	Road
	Rail
	Water

12. Supply Chain Director's focus areas (Please select three)	Satisfying customer demand
	Visibility
	Supply chain innovation
	Purchasing
	Supply chain assets
	Supply chain organization, processes and technology
	Risk management
	If other, please specify
13. Focus areas for satisfying customer demand (Please select three)	Reduction of customer lead times
	Reduction of stock outs
	Reduction of total costs
	Improvement of product or service quality
	Deployment of market or product or service segmentation strategies
	Deployment of value added services
	If other, please specify
14. Focus areas for getting visibility (please select two)	Shipment plan
	Inventory plan
	Production schedule
	If other, please specify
15. Focus areas for using visibility (please select two)	Expedite shipment
	Adjust inventory level
	Adjust production schedule
	Track and trace product (RFID, 2D barcode)
	If other, please specify
16. Focus areas for supply chain innovation (Please select three)	Launch of new products or services
	Introducing new channels of distribution
	Sustainability and CO2 footprint initiatives
	Product or service design for supply chain to support environmental policy, stock keeping unit rationalization or logistics cost reduction
	Product or Service lifecycle management to support premium pricing at launch or price erosion due to obsolescence

	Network redesign to support faster time to market by implementing postponement strategies or proximity to suppliers or new value added services
	Forecast accuracy
	If other, please specify
17. Focus areas for purchasing (Please select three)	Reduction of supplier lead-times
	Reduction of supplier costs
	Supplier timeliness
	Supplier reliability
	Supplier quality
	Supplier capability or knowhow
	Optimal positioning of inventory
	If other, please specify
18. Focus areas for supply chain assets (Please select three)	Reduce ownership of manufacturing plants
	Reduce ownership of distribution centers
	Reduce ownership of transportation assets
	Reduce ownership of retail stores
	Competitive differentiation through manufacturing
	Competitive differentiation through distribution
	Competitive differentiation through transportation
	Competitive differentiation through retail locations
	If other, please specify
19. Focus areas for supply chain organization, processes and technology (Please select three)	Sales and Operations planning process to align operating plans with business and financial plans
	Collaboration processes with customers
	Collaboration processes with suppliers
	Information technology to improve data visibility and integrity of the supply chain planning processes
	Information technology to improve data visibility and integrity of the supply chain execution processes
	Build internal supply chain competencies
	Minimize internal cross-functional conflicts
	If other, please specify
20. Risk management - sources of uncertainty in the supply chain (Please select three)	Customer demand
	Materials availability
	Workforce availability
	Process or technology failure

	Political or regulatory context
	Competitor response
	Industry wide trends
	Environmental
	Unknown risks
	If other, please specify
21. Risk management - risks from uncertainty in the supply chain (Please select three)	Cost fluctuation
	Obsolescence and price erosion
	Inefficient use of existing assets
	Inability to satisfy customer demand
	Inability to meet supplier obligations
	Unknown risks
	If other, please specify
22. Risk management - assessment of supply chain risk management (Please select four)	Contingency in Manufacturing
	Contingency in Purchasing
	Contingency in Distribution
	Contingency in Transportation
	Contingency in Retail locations
	Risk sharing with customers
	Risk sharing with suppliers
	Risk monitoring processes or technologies
	Disruption and response scenario planning
	Qualitative approach towards risk management
	Quantitative approach towards risk management
	Unknown risks
	If other, please specify
23. Please indicate the achievement of business targets with respect to the following metrics	Inventory turns
	Customer order fill rate
	Customer order lead-time
	Supply chain costs
	Customer order profitability
	Forecast accuracy
24. Please indicate any other metrics you are using to reflect business targets and their achievement (High, Medium, Low)	

7.3 Questionnaire for the CEO

Question	Answer Options
25. Briefly describe the business unit or product/service line and its supporting supply chain. Note: Please select one of your company's top product lines or business divisions in terms of revenue or margin contribution. Please focus your responses in the remainder of the questionnaire on this business unit or product line.	a. Business Unit name (Division)
	b. Product/Service line name (if applicable)
	c. Annual Sales Revenue of this business unit or product/service line (Millions of Euros)
26. Chief Executive Officer's focus areas (Please select three)	Competitive differentiation
	Growth
	Building capabilities through own resources or alliances
	Shareholder return
	Corporate social responsibility
	Risk management
	If other, please specify
27. Focus areas for competitive differentiation (Please select three)	Innovation
	Customer satisfaction
	Brand
	Market segmentation
	Supply chain
	If other, please specify
28. Focus areas for growth (Please select three)	Sales revenue
	Profit
	Market share
	Customer retention
	New products/services
	If other, please specify
29. Focus areas for building capabilities through own resources or alliances (Please select three)	Staying ahead of competition

	Customer response time
	Stronger supplier relationships
	Stronger customer relationships
	Ownership of assets or resources
	If other, please specify
30. Focus areas for shareholder return (Please select three)	Customer pricing
	Operating costs
	Resource allocation
	Stock performance
	Shareholder dividend
	If other, please specify
31. Focus areas for corporate social responsibility (Please select three)	Responsibility for social needs
	Brand image benefits
	Customer value
	Shareholder value
	Compliance to regulatory requirements
	Internal standard operating procedures
	Environmental policy
	If other, please specify
32. Focus areas for risk management (Please select three)	Volatility of supply
	Volatility of demand
	Detecting disruption
	Impact of disruption
	Mitigating disruption
	If other, please specify
33. Please indicate the achievement of business targets with respect to the following metrics	Revenue
	Market share
	Customer satisfaction
	Return on equity
34. Please indicate any other metrics you are using to reflect business targets and their achievement (High, Medium, Low)	

7.4 Questionnaire for the CFO

Question	Answer Options
35. Briefly describe the business unit or product/service line and its supporting supply chain. Note: Please select one of your company's top product lines or business divisions in terms of revenue or margin contribution. Please focus your responses in the remainder of the questionnaire on this business unit or product line.	a. Business Unit name (Division)
	b. Product/Service line name (if applicable)
	c. Annual Sales Revenue of this business unit or product/service line (Millions of Euros)
36. Chief Financial Officer's focus areas (Please select three)	Profitability
	Liquidity
	Costs
	Restructure of operational assets or debt
	Variance
	If other, please specify
37. Focus areas for profitability (Please select three)	Return on equity (ROE)
	Return on invested capital (ROIC)
	Earnings before interest and taxes (EBIT)
	Operating margin
	If other, please specify
38. Focus areas for liquidity (Please select three)	Corporate cash
	Working capital
	Cash-to-cash cycle time
	Sales scenario planning
	Operations scenario planning
	Operating cash flow
	If other, please specify
39. Focus areas for costs (Please select three)	Cost of goods sold
	Purchasing spend
	Operational efficiency
	Sales, general and administrative expenses

	Research and development expenses
	Capital expenses
	If other, please specify
40. Focus areas for restructure of operational assets or debt (Please select three)	Lower costs
	Capacity at better terms
	Growth
	Better quality
	Customer retention
	Tax efficiency
	Risk mitigation
	Merger, acquisition or divestiture
	If other, please specify
41. Focus areas for variance (Please select three)	Budget variance
	Earnings variance
	Customer response
	Supplier response
	Compliance
	If other, please specify
42. Please indicate the achievement of business targets with respect to the following metrics	Return on Equity
	Return on Assets
	Inventory Turnover
	Total Asset Turnover
	Operating Cash Flow
	Net Working Capital to Assets
	Operating Margin
	Debt to Equity ratio
	Total debt ratio
43. Please indicate any other metrics you are using to reflect business targets and their achievement (High, Medium, Low)	

8 Appendix B Statistical Tests

8.1 Spearman Correlations

In statistics, dependence refers to any statistical relationship between two random variables or two sets of data. Correlation refers to any of a broad class of statistical relationships involving dependence. Spearman Correlation is the correlation between 'ranked' variables. (Conventional Pearson's correlations are applicable only to continuous variables and not for ranked variables). It measures the extent to which, as one variable increases, the other variable tends to increase, without requiring that increase to be represented by a linear relationship. If, as the one variable increases, the other decreases, the rank correlation coefficients will be negative. The Spearman correlation increases in magnitude as the variables become closer to being perfect monotone functions of each other. Note that a correlation can be taken as evidence for a possible causal relationship, but cannot indicate what the causal relationship, if any, might be.

8.2 Categorical Principal Components Analysis (CATPCA)

CATPCA is a technique to find hidden dimensions in the data. It simultaneously quantifies categorical data using optimal scaling while reducing dimensionality of data using principal component analysis. The goal of principal component analysis is to reduce an original set of variables into a smaller set of uncorrelated components that capture most the variance or information found in the original variables. This technique is most useful in cases where there is large number of variables and effort involved in interpreting them is prohibitive. By reducing the number of dimensions, one can interpret few variables rather than the large initial variables.

Standard principal component analysis assumes that the data is scaled (i.e. continuous) and there are linear relationships between numeric variables. On the other hand, CATPCA optimal scaling approach allows variables to be scaled at different levels allowing optimal quantification of categorical variables in the specified dimensionality.

As a result, nonlinear relationships between variables can be modeled. In CATPCA, optimal quantification of each variable is obtained through an iterative method called alternating least squares in which, after the current quantifications are used to find a solution, the quantifications

are updated using that solution. This process is repeated until ending criteria is reached that signals the process to stop.

After reducing the initial set of variables into few dimensions, CATPCA can also generate factor score for each dimension. A factor score is a weighted score based on responses to the variables included in the dimension. The factor score method used in our analysis was regression in which the mean score is 0 and variance is the squared multiple correlation between estimated factor scores and the true factor values. The factor scores can be used as a measure of strength of that particular dimension.

8.3 Categorical Regression (CATREG)

Linear multiple regression has since long been a major data analytic tool in many scientific fields for predicting a response variable from a linear combination of predictor variables. The linear regression model arises from assuming a linear relation between a response variable and a set of predictor variables. In a graphical representation, the plot of the response variable against the linear combination of the predictors is assumed to show a linear trend. Often, however, the response-predictors relation is not linear. One of the approaches to deal with this is 'Regression with Transformations' approach, where the predictors and/or the response variable themselves are nonlinearly transformed and no distributional assumptions are made. The relation between the response and the predictors is linearized through separate nonlinear transformations of the variables, allowing for flexible modeling of nonlinear relations. (van der Kooij, Anita J., 2007)

CATREG was developed as a method for linear regression analysis involving categorical variables, exclusively or in addition to numeric variables. The categories of nominal variables have labels and ordinal categories have rank numbers or ordered labels (such as low, medium, high, or never, sometimes, often, always) that cannot be regarded as numeric values. Optimal scaling is a method to find optimal numeric values to replace category values, thus transforming categorical data to numeric data. This process of transformation is known as quantification. The transformations (quantifications) of categorical variables are estimated simultaneously with the estimation of the regression coefficients, using an alternating least squares procedure that maximizes the squared multiple regression coefficient, R^2, for linear regression on the transformed variables. As a result of this optimization criterion, the optimal scaling

transformations linearize the relation between the response and the predictors. (van der Kooij, Anita J., 2007), (Meulman & Heiser, 2007)

There are multiple scaling options in CATREG depending on the type of input data. We used Spline Ordinal and Ordinal as the Optimal Scaling level as the variables were ordinal. This method preserves the order of categories of the observed variable.

8.4 Generalized Linear Models (GENLIN)

Generalized Linear Models represent a grand synthesis that includes widely used statistical models such as linear regression for normally distributed responses, logistic models for binary data, and log-linear models for count data, but also many other statistical models via its very general model formulation. Generalized linear models consist of three components (Fox, 1997)

1. A random component representing the conditional distribution of the dependent variable, selected from the family of exponential distributions
2. A linear predictor – a linear function of regressors on which the dependent variable depends
3. A linearizing link function that transforms the expectation of the dependent variable to the linear predictor.

We used the GENLIN model to do panel data analysis of actual public financial data and the strategies. Panel data analysis, also known as cross-sectional time-series analysis, looks at a group of observations, the 'panel', on more than one occasion. Panel studies are essentially equivalent to longitudinal studies, although there may be many response variables observed at each time point.

We used normal distribution as the conditional distribution, a linear function of all the strategies and an identity link function ($f(x) = x$) for finding the relationship between the relative performance of the company and their strategies.

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