SUPPLY ORGANIZATIONS IN NORTH AMERICA: A TWENTY FOUR YEAR PERSPECTIVE ON ROLES AND RESPONSIBILITIES 1987-2011

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Abstract

The recent completion of a major survey of 249 large North American supply organizations in 2011 permits a longitudinal perspective on supply roles and responsibilities over a 24 year period. The latest survey complements three earlier CAPS studies in 1987, 1995 and 2003, thereby providing a valuable opportunity to examine trends and changes over time. Data was collected from 112 firms that responded in 2003 and 2011, which included 53 firms that responded in 1995, 2003 and 2011 and 24 firms that responded to all four surveys. Major areas of investigation included supply organizational structure, purchase category and supply chain responsibilities, supply involvement in major corporate activities, teams, and CPO reporting line, title and background. Findings indicate that the pace of organizational change remains high, which can represent significant challenges for supply executives. Cluster analysis was used to assess the relationship between supply organizational changes and firm performance. Firms in the “underperforming” category more frequently changed their supply organizational structure, and these changes were more likely directed towards greater centralization, compared to the “growing” and “profitable” clusters. Findings provide important implications for supply executives and opportunities for future research are also identified.

Key Words: Organizational Structure Change, Purchasing, Supply Chain Management

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This is the authors' manuscript of the work published in final form as:

Johnson, P.F. Shafiq, A, Awaysheh, A., Leenders, M.R. (2014) “Supply organizations in North America: a twenty-four year perspective on roles and responsibilities 1987-2011.” *Journal of Purchasing and Supply Management*, 20 (2), 130-141.

Introduction

Chief purchasing officers (CPOs) in large companies are confronted with a wide range of demanding issues and responsibilities, such as pressures to reduce costs, increased globalization of supply chains and sustainability. To address the challenges and opportunities in their supply chains, firms have been making major changes to their supply organizational structures, and to internal supply chain responsibilities and supply leadership (Johnson and Leenders 2009; Johnson and Leenders 2004). Understanding the changes occurring in supply organizations in these areas is of significant interest to academics and practitioners alike.

This paper updates research presented at the 14th Annual IPSERA Conference at Archamps, France in March 2005. The 2005 paper, which was subsequently published in the *Journal of Purchasing & Supply Management* in 2006, provided a 16 year perspective on organizational change, tracing changes made at large North American companies from survey data collected in 1987, 1995 and 2003 (Johnson and Leenders 2006). Given the eight year interval in data collection, 2011 was the logical year to replicate the study.

Our research for this paper traced changes in 112 firms that responded in 2003 and 2011, which included 53 firms that responded in 1995, 2003 and 2011 and 24 firms that responded to all four surveys. Major areas of investigation included supply organizational structure, purchase category and supply chain responsibilities, supply involvement in major corporate activities, teams, and CPO reporting line, title and background. In doing so, this paper focuses on the following research question: How frequently and what kinds of changes are large North American firms making to these areas?

This paper makes two important contributions to the supply literature. First, rather than reporting aggregate figures, this research is able to trace the specific individual changes occurring at these organizations that responded to multiple surveys. It updates earlier research by Johnson and Leenders (2006) and Johnson et al. (1998) to provide a current context for the changes that large companies are making in their supply organizations over a period that spans nearly a quarter of a century.

Second, cluster analysis for 92 firms was used to identify three groups of firms from the 2003-2011 dual respondent group. Findings indicate a relationship between financial performance and the types of organizational changes made in the supply organization.

The following section draws from the strategy, organizational behaviour and supply chain literatures to define the dominant research issues in supply organizational change. Next, the survey methodology and construct measurement are detailed. In the final sections, the results are presented and the implications for theory and managerial practice are discussed along with implications for future research.

Previous Research

Organizational issues have been researched extensively by academics in the strategy, organizational sciences and supply chain disciplines. Contingency theory and the resource-based view (RBV) have become well-established as foundational for research in supply chain management dealing with organizational change and alignment of organizational capabilities and corporate strategy.

Contingency theory indicates that companies must align their organizational structure and management processes with their strategy in order to maximize performance (Galunic and Eisenhardt, 1994). Contingency theory follows Chandler's (1962) dictum that structure follows strategy, and much of this research has examined the relationship between firm size, technology, or environmental complexity with organizational variables such as structure and formalization.

Structure is also influenced by the need to have a complementary alignment among the internal structural elements of the organization (Miller, 1982). Factors such as task specialization, technology, span of control, size and responsibility of the administrative function, levels of hierarchy and integration, must be balanced among each other.

Most contingency theory research has tended to focus on corporate level variables. However, there has been an increasing amount of attention to the application of contingency theory to supply chain management in areas such as integration (Terjesen et al. 2012; Boon-itt and Wong 2011), risk management (Trkamn et al. 2009), e-commerce adoption (Huang et al. 2010) and supply chain information technology (Buttermann et al. 2008). The focus of this research has been to assess the fit of factors under the short term control of the firm to the strategy and environmental context of the organization.

The resource-based view (RBV) proposes that firms seek to acquire and control bundles of resources that when combined become sources of competitive advantage. Strategic resources are defined as assets, capabilities and organizational processes controlled by a firm, which have value, are rare, are difficult to imitate and have few substitutes (Barney, 1991). A firm's resources can either be acquired in the case of tradable resources, e.g., patents, or can be path-

dependent, accumulating over time, e.g., supply expertise (Black and Boal, 1994; Dierickx and Cool, 1989).

While RBV is a widely applied perspective for studying firm strategy, it also has clear implications for internal firm organizational structure. Firms must have internal organizational structures, with established hierarchies, cross-functional teams and reporting relationships. Organizational structures must align with business processes, which represent capabilities critical to the production and delivery of goods and services. Furthermore, firms can create competitive advantage when they are able to create linkages with critical suppliers that successfully exclude competitors from forming the same relationships (Rungtusanatham et al., 2003). The ability to be able to assess opportunities and execute accordingly, implies the existence of appropriate structures and processes to identify and assess opportunities for new supply sources, relationships, improvement prospects, and performance advantages (Mol, 2003).

The relational view is a more recent perspective that has emerged from the growing literature related to trust and the benefits of relationship-building to obtain mutual benefits. It proposes that a firm's critical resources may be boundary spanning and embedded in inter-firm resources, thereby representing "relational rents" (Dyer and Singh, 1998). Whereas RBV focuses on how individual firms acquire sources of competitive advantage, the relational view focuses on how partnering firms jointly generate relational rents. One example of empirical research involving relational rents is Dyer's (1996) article on Chrysler's keiretsu supplier network. He argues that the Japanese model of cooperative relationships can be a potential source of competitive advantage.

The relational view identifies four potential sources of inter-organizational competitive advantage: relation-specific assets, knowledge-sharing routines, complementary resources and capabilities, and effective governance (Dyer and Singh, 1998). Consequently, capturing relational rents requires organizational capabilities with respect to external relationship management (e.g., key suppliers). Firms must be capable of not only successfully managing their internal organization, but also of accurately anticipating the value provided from investing in supply network relationships.

Supply Organizational Structure

The traditional debate regarding supply organizational structure has been the level of centralization. Factors favoring centralization include standardization of products and business processes (Pfohl and Zollner 1987), cost reductions created through opportunities to allocate resources efficiently and economies of scale (Dröge and Germain 1989; Rheem 1997) and improved levels of knowledge and expertise through the dedication of staff and resources (Dröge and Germain 1989). Meanwhile, decentralization provides the benefits of improved service and lower costs by pushing decision-making responsibility closer to the end user, promotes closer working relationships between suppliers and end-users and provides increased opportunities for end users to manage total cost of ownership factors (Leenders and Johnson 2000). However, despite the potential benefits of decentralization, research does indicate that some level of centralization is required to support strategic initiatives of the supply organization (Johnson et al. 2002).

The primary benefit of using a hybrid organizational structure approach is that it provides the opportunity to combine the key features of centralized and decentralized structures (Leenders

and Johnson 2000). While the hybrid organizational model is the most commonly used within large supply organizations, there is still considerable variation with respect to how the hybrid model can be structured and implemented. For example, Rozemeijer (2000) developed five organizational structure design rules to help determine the appropriate corporate purchasing approach, summarized as: consideration of organizational goals and strategies, take business unit concerns into account, early cross-functional involvement in sourcing projects, build mutual trust and credibility with business unit managers and address the side effects of purchasing initiatives.

Contingency theory suggests that companies will make changes in their organizational structure and management processes to adapt to changes in their external competitive environment and/or to changes in strategy, with the objective of maximizing performance (Galunic and Eisenhardt 1994; Chow et al. 1995). Changes in corporate structure towards greater centralization or decentralization are implemented to align structure with strategy, ultimately with the objective of improving the competitive position of the firm. The resulting alignment between supply organizational structure and corporate structure represents a challenge for the CPO, who must deliver value regardless of the structure of the supply function (Johnson and Leenders, 2001).

The relational view proposes that firms will make changes to internal supply processes and responsibilities that create relationships with suppliers which in turn generate relational rents. Firms constantly search for and evaluate opportunities to establish innovative relationships with key suppliers and customers that can provide competitive advantage. Capturing such opportunities may not necessarily require organizational structural changes, but affect the supply organization in areas where supply chain linkages can be created, such as cross-functional teams, supply chain responsibilities and purchase category responsibilities.

Functional Leadership

The status and background of the CPO has been used to evaluate the relative standing of the function within the organizational hierarchy (Johnson et al. 2006). Questions such as, to whom does the CPO report? and, what is the title of the CPO? are used to trace functional evolution. In addition, resource dependence theory indicates that the selection of individuals to fill critical management positions can be influenced by the challenges facing the organization (Salanick and Pfeffer 1977; Salanick and Pfeffer 1978). Consequently, previous experience and background of an executive can be important factors at the time of hiring. Criteria, based on such factors, may change over time based on the strategic and tactical needs of the organization.

Changes at the senior executive ranks have been accelerating, with the average tenure of a CEO standing at approximately seven years, compared to more than 10 years a decade ago. In 2011, 14.2 percent of CEOs at the world's 2,500 largest public companies were replaced, compared to a 12-year average of 13.2 percent (Booz & Co. 2011).

Previous research has also found a high incidence of CPO and reporting line changes, showing that leadership at the top of the supply function is in a state of constant flux (Johnson and Leenders 2009). Getting up to speed quickly at a new position is just as important for the CPO as other top level management positions, a topic of high interest in current management literature. In addition, an effective CPO-executive report team has an important role in ensuring the effective contribution of the supply function to organizational goals and strategies. The person to whom the CPO reports plays a vital role in breaking down corporate roadblocks, setting priorities and ensuring the proper profile for supply within the organization (Johnson and

Leenders 2003). Consequently, the challenge of managing the supply function in this rapidly changing environment is to pay appropriate attention to longer term strategies while dealing with the high pressure for short term results.

Previous CAPS Research Studies on Supply Organizational Change

In 1987, the first CAPS Research focus study by Hal Fearon examined purchasing's organizational roles and responsibilities using a sample of 297 companies (Fearon 1988). Prior to 1987, almost no research into supply organizational relationships had been done, and certainly not on the scale undertaken by CAPS. In 1995, Hal Fearon and Michiel Leenders duplicated the 1987 study with some modifications in the questionnaire (Fearon and Leenders 1995). A total of 308 firms responded to the 1995 survey. Because a subgroup of 119 companies responded to both surveys, the 1987-1995 comparison provided particularly fruitful insights of change that had taken place over the intervening eight-year period. A third study was conducted in 2003 (and published in 2004), which collected data from 284 firms, including 116 companies from the dual respondent group (1995 and 2003) and 51 companies from the triple respondent group (1987, 1995 and 2003) (Johnson and Leenders 2004).

The questions posed were for the most part identical for all three studies, dealing with the following: firm size, CPO title and background, executive report title, purchasing's supply chain responsibilities, organizational structure of the supply function and size of the supply department. While a significant contribution to the supply management literature of the CAPS research program has been to advance our understanding of the high levels of organizational change, this research has provided insights into other areas of supply management practice as well. The 1995 and 2003 surveys differed slightly from the 1987 survey, in that some new questions were added that were related to the use of team-based purchasing, supply involvement

in corporate activities and use of e-commerce. Moreover, in 2003, the hybrid category was divided into three subgroups: centralized hybrid, hybrid and decentralized hybrid.

The 1987, 1995 and 2003 CAPS studies investigated CPO characteristics (e.g., previous work experience and tenure), and produced a number of interesting findings. Analysis of the dual respondent groups from 1995 and 2003 found high levels of change in CPO and CPO reporting line and a relationship between CPO status (reporting line and title) and supply chain activities. Findings from 2003 also indicated that a significant percentage of companies in the research, approximately one-third, chose to hire their CPO from outside the company and that significant differences existed between internal and external CPOs with respect to their previous work experience and number of years in the position.

Research Design

Data Collection Instrument

It was important that the data collection instrument used in this 2011 study conform as much as possible to the previous studies. Consequently, the basic questions dealing with firm size, CPO titles and background, reporting line and supply organizational structure were kept essentially the same.

In order to improve the quality and relevance of the data collected and to build on existing research, certain refinements were made to the questionnaire. The scales used for questions related to acquisition categories and supply chain responsibilities were changed.

Designed to be filled out in 20 to 30 minutes, the eight page questionnaire had 20 key question areas. The questionnaire was pre-tested on a group of four CPOs and two academics. This group was asked to review the questionnaire for structure, readability, ambiguity and completeness. Appropriate changes were made to the survey instrument based on their feedback.

Sample

The population for this 2011 study was comprised of large firms in the United States and Canada from the 21 industry groups: manufacturing (SIC codes 20-39) and services. Issues such as structure and roles and responsibilities tend to be significant for large organizations which, therefore, represent the logical target sample for the research.

As was the case in 2003, the sample included firms based in the United States and Canada. The Title 1 membership list of the Institute of Supply Management (ISM) and the CAPS Research membership directory were used to identify U.S. respondents on the *Fortune* 1000 manufacturing and services lists and Canadian respondents from the *Financial Post* 300 list.

Considerable time was invested prior to the questionnaire mailing to ensure that the appropriate contact person was identified and questionnaires were only sent to organizations for which a senior supply executive could be identified by name and title. The principal researchers made calls to potential respondents to confirm the contact details of the CPO. Only firms where the CPO could be identified by name were included in the sample. In order to allow for comparisons across appropriate industry sectors, the North American Industrial Classification System (NAICS) codes were used at the three-digit level to compare firms within a specific industry group.

Special attention was paid to those firms that participated in the 2003 study to make sure that they were included in the research in order to provide longitudinal data. Of course, mergers, acquisitions and bankruptcies involving some companies over the past eight years shortened the list considerably and 229 firms from the 284 respondents in the 2003 study were included in the sample for the 2011 study. Included in this group were 43 firms that had responded to the 1995 and 2003 surveys and 51 that responded to all three previous surveys in 1987, 1995 and 2003.

In an effort to increase the response rate, a modified version of the methodology of Dillman (2000) was followed. In April 2011, questionnaires were mailed along with a cover letter and stamped return envelope to 760 organizations. From the initial sample frame of 760, 23 were dropped because they had been inadvertently duplicated in the database, ceased operation or moved to a new location. Consequently, the effective sample frame was 737 organizations, consisting of 616 U.S. and 121 Canadian firms.

Respondents were given four options to respond: returning the survey in the stamped return envelope, via fax, via email with a scanned copy of the survey or via the Internet. Two weeks after the initial mailing, reminder e-mails were sent to all non-respondents. For those who still did not respond, a second mailing was made four weeks after the initial mailing. Two weeks later a reminder telephone call was made to each non-respondent and a reminder email was sent.

Of the 737 potential respondents, 249 completed surveys were returned, representing a response rate of 34 percent. Approximately 48 percent of the surveys were returned in the mail and 52 percent were submitted via the Internet or email. Responses were received from 112 firms that

responded to the 2003 survey (“double respondent” group), including 52 companies that responded in 1995, 2003 and 2011, and 24 companies that participated in all four studies dating back to 1987. In addition, there were 119 companies that participated in the 1987 and 1995 studies, 116 companies that participated in the 1995 and 2003 studies and 51 companies that participated in 1987, 1995 and 2003. Repeat respondent data that spans beyond the double respondent group is referred to as the “multiple respondent” groups. Comparing responses of the dual respondent and multiple respondent groups provides additional insights beyond the analysis of the aggregate data.

Table 1 provides the number of respondents by organization size for 1987, 1995, 2003 and 2011. Respondents in 2011 included 136 firms (55 percent) from the manufacturing sector and 113 firms (45 percent) from the service sector. The largest number of respondents came from utilities (25 firms), transportation equipment manufacturing (22), chemical manufacturing (19), electronics manufacturing (18), and insurance (15 firms).

Of the 616 surveys mailed to the U.S. firms, 183 were returned for a 30 percent response rate. The Canadian responses numbered 66 out of the 121 surveys mailed, for a 54 percent response rate. The Canadian respondents were on average smaller than the U.S. respondents. Fifty-six percent of the Canadian respondents had sales revenues of less than \$5 billion compared to 37 percent of the U.S. respondents.

Nonresponse bias is the difference between answers of respondents and non-respondents (Lambert and Harrington 1990). In this study, nonresponse bias was tested by comparing the

responses of early and late waves of returned surveys (Armstrong and Overton 1977). No significant differences were encountered.

Industry Structure and Sector

From the 112 dual respondents from 2003 and 2011, Compustat (2011) data was available for 92 firms. These respondents were grouped in five industry groups based on the classification used by Johnson et al. (2007): discrete goods manufacturing, process manufacturing, resource and construction, high capital-intensive service or low capital-intensive service firms. Discrete goods included: furniture, leather, fabricated metal, machinery, electronic equipment, transportation equipment, instruments, and miscellaneous manufacturing sectors. Process industries included: primary metal, lumber, rubber and stone. Resource and construction industries included: metal, coal, oil and gas, and heavy construction industries. High capital-intensive industries included: railroad transportation, air transportation, communications, electricity and gas, eating and drinking, and automotive repair. Low capital-intensive industries included: motor freight transportation, transportation services, credit institutions, insurance carriers, insurance agents and brokers, hotel, business services, motion pictures, and engineering, accounting and research. The final sample for the 2003-2011 dual respondent group included 24 discrete goods manufacturing firms, 33 process manufacturing firms, 19 high capital-intensive service firms, 11 low capital-intensive services firms and 5 resource-based firms.

Findings

Supply Organization Structure

Figure 1 presents data from the 112 dual respondent group for organization structure changes from 2003-2011. Between 2003 and 2011, 58 firms (52 percent) changed their organization structure. Of the 58 firms, 27 (47 percent) moved towards greater centralization and 31 (53 percent) moved towards greater decentralization. The highest concentration of moves was between centralized to centralized hybrid (13 firms), decentralized to decentralized hybrid (7 firms) and decentralized hybrid to hybrid (7 firms).

The magnitude of the changes at some firms was substantial. Two firms moved from decentralization to centralization and one firm moved from centralization to decentralization. Six firms moved three levels (e.g., decentralized to centralized hybrid, decentralized hybrid to centralized, centralized to decentralized hybrid and centralized hybrid to decentralized).

Table 2 presents the data from all the repeat respondent groups for changes from 1987-2011. The surveys in 1987 and 1995 collected data on organizational structure on a three-point scale: decentralized, hybrid and centralized, whereas the 2003 and 2011 surveys used a five-point scale. In order to make comparisons across the groups, the data from 2003 and 2011 for the hybrid structure includes responses for decentralized hybrid, hybrid and centralized hybrid.

One-third of the respondents changed their organization structure at least once between 2003 and 2011, compared to 42 percent between 1995 and 2003 and 41 percent between 1987 and 1995. For the firms that responded in 1995, 2003 and 2011, 63 percent changed their organization structure at least once and 18 percent changed it at least twice. Of the 24 firms that responded to

all four surveys, 74 percent changed their structure at least once and 9 percent changed their organization structure in 1995 and/or 2003, only to return to the original structure by 2011.

Purchase Category Responsibilities

Table 3 summarizes the changes in purchase category responsibilities at the 112 firms in the 2003-2011 double respondent group. For purposes of comparison, respondents with scores of four or five (substantial or extensive on the 5-point scale) were classified as having responsibility for the item in 2011. The middle two columns in the table provide the number and percentage of respondents that changed from 2003 to 2011. It shows that underlying an overall trend of increasing levels of purchase category responsibility within the total sample, there has been a great deal of change within individual firms, with both significant gains and losses in purchase category responsibilities.

All of the categories saw gains and losses in responsibilities. The largest percentage gains were in the categories of IT services, and fleet administration services, plant maintenance services, environmental services and real estate/facility services. Categories with the largest percentage losses were promotional/advertising services (33 percent) and printing/graphics services, software/systems development and equipment for resale (all at 26 percent).

Supply Chain Responsibilities

Table 4 summarizes the changes in supply chain responsibilities at the 112 firms in the 2003-2011 double respondent group. For purposes of comparison, respondents with scores of four or five (substantial or extensive on the 5-point scale) were classified as having responsibility for the item. The middle two columns in the table provide the number and percentage of respondents

that changed from 2003 to 2011. It shows that underlying an overall trend of increasing levels of supply chain responsibility within the total sample, there has been a great deal of change within individual firms, with both significant gains and losses in supply chain responsibilities.

All of the categories saw gains and losses in responsibilities. The largest percentage gains were in the categories of supply cost management/value analysis (32 percent), logistics/warehousing (26 percent) and scrap/surplus disposal/investment recovery (25 percent). Categories with the largest percentage losses were receiving (29 percent), involvement with new product development (27 percent), material and purchasing research (26 percent) and inbound transportation (26 percent).

Major Corporate Activities

Table 5 shows how responses from the double respondent group changed between 2003 and 2011. The responses for each category show the number and percentage of responses that increased, decreased or remained the same in 2011 compared to 2003. These data were used to create a change index, which subtracts the percentage of respondents that decreased from the percentage of respondents that increased.

Each category had significant levels of changes in individual responses between 2003 and 2011, with 51 to 83 percent of respondents indicating either a higher or lower level of involvement in major corporate activities. Consequently, despite the modest increases or decreases of the overall scores between 1995 and 2011, the analysis from the double-respondent group shows a significant level of change at most firms with respect to supply involvement in major corporate activities. The change index in Table 5 shows that aggregate increases occurred in 12 of the 15

categories. The exceptions were corporate e-commerce initiative, information systems planning and revenue enhancement.

Purchasing Teams

Table 6 shows how responses from the double respondent group changed between 2003 and 2011. The responses for each category show the number and percentage of responses that increased, decreased or remained the same in 2011 compared to 2003. These data were used to create a change index, which subtracts the percentage of respondents that decreased from the percentage of respondents that increased.

Each category had significant levels of changes in individual responses between 2003 and 2011, with 51 to 71 percent of respondents indicating either a higher or lower level of involvement in team usage across the items. Consequently, despite the modest increases or decreases of the overall scores between 1995 and 2011, the analysis from the double respondent group shows a significant level of change at most firms with respect to supply involvement in team usage.

The change index in Table 6 shows that aggregate increases occurred in seven of the nine types of teams. The exceptions were consortium buying and teams with external customers.

CPO Reporting Line

Table 7 shows that changes in CPO reporting line occurred in 71 percent of the double respondents, with 33 of the 112 firms indicating that they had the same reporting line in 2011 as they had in 2003. Between 2003 and 2011, 71 percent of the firms changed their reporting line, which compares to 83 percent for the 1995-2003 group and 29 percent for the 1987-1995 group.

For the firms that responded in 1995, 2003 and 2011, 90 percent changed their reporting line at least once and 60 percent changed it at least twice. Of the 24 firms that responded to all four surveys, 95 percent changed their reporting line at least once.

CPO Title

Table 8 provides data for CPO title changes in the multiple respondent group. Thirty percent of the respondents changed their CPO title at least once between 2003 and 2011, compared to 55 percent between 1995 and 2003 and 42 percent between 1987 and 1995. For the firms that responded in 1995, 2003 and 2011, 87 percent changed their CPO title at least once and 29 percent changed it at least twice. Of the 24 firms that responded to all four surveys, 83 percent changed their CPO title at least once and 25 percent changed their title in 1995 and/or 2003, only to return to the original title by 2011.

Cluster Analysis

To further classify firms based on their performance, we used clustering algorithms in two stages using SPSS v19.0.0. The technique was used to analyze performance difference for the 92 firms in the 2003-2011 dual respondent group for which financial data was available from COMPUSTAT (2011). In the first stage of cluster analysis, we employed hierarchical clustering method, which is recommended when the number of clusters is unknown. The results from first stage of cluster analysis were used as inputs to the second stage to further refine the distinction among various clusters. The K-means clustering technique was employed for the second stage and in the K-means approach, it is assumed that the number of clusters is known (Dillon and Goldstein, 1984).

As shown in Table 9, our analyses led to a 3-cluster solution, with 37 firms classified into Cluster 1; 34 in Cluster 2 and 21 in Cluster 3 indicating good distribution of firms between the three clusters. We also explored other cluster configurations by specifying 2 and 4 as the number of clusters; however the three-cluster solution produced the best results. Figure 2 shows the centroid plot for the three clusters with “return on assets (ROA)” and “sales growth rate” as its axes. Cluster 1, labeled “underperforming”, had the lowest sales growth rate (0.1 percent) and lowest ROA (2.0 percent). Cluster 2 had the highest sales growth (10.9 percent) and ROA of 4.2 percent, and was labeled as “growing.” The third cluster had the highest ROA (11.7 percent) and sales growth of 5.9 percent, and was labeled as “profitable”. All cluster means were significantly different from each other at $p < 0.005$ level.

Table 10 provides a breakdown by cluster for the five industry sectors (discrete goods manufacturing, process manufacturing, resource and construction, high capital-intensive-service or low capital-intensive service firms). For the most part, there are no significant differences across the five industry sectors with the exception of high capital-intensive service, which did not include any respondents from Cluster 3. This indicates that cluster membership is independent of industry differences and is based on firm performance.

Further analysis examined differences among the three clusters related to changes in organization structure and CPO. As shown in Table 11, firms in the “underperforming” category more frequently changed their supply organization structure, and these changes were more likely directed towards greater centralization, compared to the “growing” and “profitable” clusters. The difference in move towards greater centralization for “underperforming” group was also

statistically different from “growing” (chi- square, $\chi^2 = 3.20$; $p = 0.074$) and “profitable” (chi- square, $\chi^2 = 5.556$; $p = 0.018$) clusters.

Differences were also observed among the clusters with respect to CPO characteristics. First, CPOs in the “underperforming” cluster had declining and shorter tenure (Table 12). CPO tenure in this cluster declined from 5.0 to 3.9 years (paired- $t_{d.f.36} = 0.863$, $p = 0.394$), compared to increases of 3.4 to 6.3 years (paired- $t_{d.f.31} = -2.246$, $p = 0.02$) in the “growing” cluster and 4.7 to 5.4 (paired- $t_{d.f.20} = -0.669$, $p = 0.511$) in the “profitable” cluster.

CPOs in the “underperforming” cluster were also most likely to come from inside the firm (81 percent), compared to the “growing” (67 percent) and “profitable” (71 percent) clusters (Table 13) and the difference is statistically significant (chi- square, $\chi^2 = 4.455$; $p = 0.035$).

Furthermore, the percentage of CPOs in the underperforming cluster hired from inside increased from 58 percent to 81 percent from 2003 to 2011 (chi- square, $\chi^2 = 3.806$; $p = 0.051$), while the other clusters remained consistent.

Discussion

This research examined the high level of change in supply organizations of large North American companies during a 24 year period. The availability of longitudinal data provided a unique opportunity to trace changes made to each company’s supply organizational structure, supply chain responsibilities, supply involvement in major corporate activities, team usage and CPO reporting line, title and background. The research serves to highlight the variety of changes that are occurring within the supply function of large North American organizations. Previous

research identified the major changes occurring at large organizations, and findings indicate that the pace of change identified by previous research in 1995 and 2003 remains high.

Furthermore, this research most likely understates the frequency of the organizational changes. Because the research was conducted in eight-year intervals, additional organizational changes may have occurred at some responding firms during the intervening time and were not documented in this research.

Previous research has emphasized the opportunities to use supply to improve performance and in some cases create competitive advantage, as suggested by RBV. The supply chain literature proposes that firms are increasingly pursuing opportunities to gain competitive advantage through supply chain initiatives designed to develop strategic assets (Hunt and Davis 2012). Our findings indicate that the supply function is adding responsibilities in most major corporate activity areas, with the exceptions being activities related to information systems (e.g., corporate e-commerce initiative and information systems planning). Consequently, the trend is for greater supply involvement in critical areas, presumably with expected pay-offs, such as lower costs, improved quality, shorter lead-times or increased flexibility.

Findings from this longitudinal study also demonstrate the volatility of supply's standing in large firms. Our research indicates that the stature of supply, reflected by the scope of supply chain responsibilities, CPO reporting line and title and involvement in MCA, moves up and down. Consequently, the path to achieving full status as an equal player among the other key functions in the organization is not a straight line up.

The research also provided an opportunity to examine the relationship between firm performance and organizational change. Contingency theory suggests that firms align strategy and structure in response to competitive pressures (Chandler 1961). Findings indicate that underperforming organizations are most likely to centralize their supply organization structure, while growing and profitable firms are more likely to decentralize. Expense control and cost reductions could be the objective of centralization of the underperforming cluster, whereas decentralization may allow greater flexibility for growth and profitable expansion for the other two clusters. Additional research is required to establish the impact of financial performance on supply organization structure change.

In addition, poor financial performance coincided with reductions in CPO tenure, with the senior supply executive most likely coming from inside the organization. Resource dependence theory proposes that senior leadership background and experience that is relevant to the strategic needs of the organization are important criteria in executive succession to cope with environmental uncertainty and dependencies (Pfeffer and Salancik 1978). This research indicates that organizational power is affected by external dependencies, and that executive succession can reduce environmental dependencies (Hillman et al. 2009). It would appear that centralization and an attention to cost and expense control frequently requires a different leader, with a familiarity of the organization and its challenges.

Managerial Implications

This research draws attention to the wide range of challenges facing the CPO resulting from internal decisions regarding changes in functional structure, resources, roles, responsibilities and activities. Beyond the day-to-day responsibilities of managing a large supply department,

anticipating and managing change may be a CPO's ultimate test. The relatively short tenure of today's CPO further exacerbates this challenge. The average CPO tenure shrunk by 25 percent to 4.6 years in 2011 from 6.1 in 1987, compared to 4 years in 2003 and 5.9 years in 1995. Thus, the responsibility for conceptualizing and implementing major and long-term supply initiatives must surely fall on the shoulders of those reporting to the CPO. Moreover, the pressure to make and implement changes quickly has undoubtedly also increased.

CPOs seeking to contribute more effectively to organizational goals and strategies can normally be expected to favor increased centralization of the supply function. This will include a greater coverage of the corporate spend, responsibility for more supply chain activities, greater involvement in major corporate activities and a more meaningful role for supply as a whole. Therefore, the decentralized supply organization, as a starting point, offers the greatest opportunities for supply improvement and growth.

Alternatively, moves towards decentralization would tend to go counter to the CPO's normal impulse and, therefore, present different challenges. Where should supply involvement be decreased? How is it still possible to meet tough savings demands with fewer opportunities to pursue? However, our research suggests that in many CPOs during different points in their tenure will be faced with implementing organizational change towards centralization and towards decentralization. In this respect, CPOs must be ambidextrous, with skills in maneuvering their organization in both directions.

The three eight year spans studied in this paper clearly show that, overall, the supply function has been growing in recognition and influence over the past 24 years. That this growth in individual

companies has not been on a steady upward trend is also evident. Supply structure changes have been frequent both towards and away from centralization. For CEOs believing in the benefits of corporate wide structure congruence and the benefits of structure changes to the firm as a whole, the idea that supply should retain a fixed structure regardless of the rest of the organization is not acceptable. Therefore, regardless of CPO preferences, supply structure changes towards decentralization or centralization are inevitable and must be accommodated effectively.

An interesting finding from the cluster analysis is the apparent tendency for the more profitable companies to move their supply organization towards a greater degree of decentralization.

Ironically, while the company is gaining greater clout in the market place with more power for negotiation and strategic sourcing, supply decentralization tends to minimize the potential supply benefits of greater size and financial strength. It may be that the expected non-supply opportunities are perceived by top executives to be more attractive. This argument in reverse would favor greater supply centralization in less profitable and slower growth companies, a phenomenon observable in the large number of troubled companies in our first cluster.

Moreover, the impression that supply growth depends on corporate hardship in the form of limited revenue growth and low profitability is difficult to avoid. The old adage that supply prospers in tough times finds reinforcement in this research.

Limitations

There are several limitations of this study that are important to note. First, the sample size, while large, is limited to large North American firms. Additional research can explore initiatives and changes among European or Asian firms, or alternatively at small and medium size enterprises. Second, the eight year time interval between data collection ignores changes in structure that

may have occurred in the intervening period. Furthermore, the 2003-2011 period included a deep global recession, which may have adversely affected certain respondents disproportionately.

While the research provides intriguing results, replication in future years can validate the research findings.

Conclusion

This paper presents longitudinal research on supply organizational change spanning a 24 year period. Findings indicate that the pace of organizational change remains high, which can represent significant challenges for supply executives charged with the responsibilities for implementing changes in structure and responsibilities while overseeing the day-to-day operations of the supply function.

Cluster analysis of the 2003-2011 dual respondents identified three groups. Firms in the underperforming cluster were more likely to centralize their supply structure and change their CPO. One possible explanation is that changes in strategy in reaction to poor performance may lead firms to favor increased centralization. Contingency theory (Chandler 1962) suggests that firms are likely to make changes to strategy in reaction to environmental pressures, leading to changes in structure and responsibilities. It is unlikely that individual supply considerations will be taken into account, and instead the CPO will have the responsibility of keeping the supply structure aligned with the corporate organization structure.

The 1987-2011 period covered by this research was one of significant political, economic, ecological, technological and social changes in our world. It included the emergence of China as a true world power, Y2K and a number of recessions. The latest financial disaster, started during

the last eight year period in our surveys, 2003-2011, has not yet run its full course. Obviously, our data reflect these contextual impacts.

The opportunities for future research are numerous. First, while this research quantified the level of change, case-based research could investigate how and why changes are occurring. Second, research could investigate the relationship between changes in the supply function and other parts of the organization, including other functions and at the corporate level. A third area of research is to examine the outcome of organizational changes, including implications for firm performance. For example, does a high level of supply changes represent evidence of a successful firm? Do certain types of supply changes correlate more with corporate performance than others?

Alternatively, stable or low supply change firms also represent an interesting research contrast. Why have they stuck to their organizational structure, supply chain activities and reporting line? Is it possible that they have made minor changes over time which they themselves did not see as worthy of reporting? Did they improve the qualification of supply staff and streamline processes so that supply performance over time improved considerably? The negative versions of these questions also could be raised.

Future research could also explore similar organizational issues in SMEs, or in large European or Asian firms.

References

Barney, J., 1991. Firm resources and sustained competitive advantage. *Journal of Management*, vol. 17(1), 99-120.

- Black, J.A., Boal, K.B., 1994. Strategic resources: Traits configuration and paths to sustainable competitive advantage. *Strategic Management Journal*, 15(summer), 131-148.
- Boon-itt, S., Chee Yew Wong, 2011. The moderating effects of technological and demand uncertainties on the relationship between supply chain integration and customer delivery performance. *International Journal of Physical Distribution and Logistics Management*, 41(3), 253-276.
- Booz & Co., *The 2011 Chief Executive Study*, www.booz.com, 2011.
- Buttmann, G., Germainn, R., Iyer, K., 2008. Contingency Theory “Fit” as Gestalt: An Application to Supply Chain Management. *Transportation Research: Part E: Logistics and Transportation Review*, 44(6), 955-969.
- Carter, P.J., Carter, J.R., Monczka, R.M., Straight, T. H., Swan, A.J., 2000. The future of purchasing and supply: A ten year forecast. *The Journal of Supply Chain Management*, 36(1), 14-26.
- Carter J.R., Narasimhan, R., 1996. Is purchasing really strategic?” *International Journal of Purchasing and Materials Management*, 32(1), 20-28.
- Chandler, A.D., 1962. *Strategy and Structure*. Cambridge, MA: MIT Press.
- Chow, G., Heaver, T.D., Henriksson, L.E., 1995. Strategy, structure and performance: A framework for logistics research. *The Logistics and Transportation Review*, 31(4), 285-308.
- Dierickx, I., Cool, K., 1989. Asset stock accumulation and sustainability of competitive advantage. *Management Science*, 35(12), 1504-1511.
- Dillman, D.A., 2000. *Mail and Internet Surveys: The Tailored Design Method*, 2nd ed. New York, NY: John Wiley and Sons.
- Dillon, W.R., Goldstein, M., 1984. *Multivariate Analysis: Methods and Applications*. Wiley, New York.
- Dröge, C.L., Germain, R., 1989. The impact of the centralized structuring of logistics activities on span of control, formalization and performance. *Journal of the Academy of Marketing Sciences*, 17(1), 83-89.
- Dyer, J.H., 1996. How Chrysler created an American keiretsu. *Harvard Business Review*, 74(4), 42-56.
- Dyer, J.H., Singh, H., 1998. The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review*, 23(4), 660-679.
- Fearon, H.E., 1988. *Purchasing Organizational Relationships*. Tempe, AZ: Center for Advanced Purchasing Studies.

- Fearon, H.E., Leenders, M.R., 1995. *Purchasing's Organizational Roles and Responsibilities*. Tempe, AZ: Center for Advanced Purchasing Studies.
- Galunic, C.D., Eisenhardt, K.M., 1994. Renewing the strategy-structure-performance paradigm. *Research in Organizational Behavior*, Staw, B.M., Cummings, L.L., ed., 16, pp. 215-255.
- Hillman, A.J., Withers M.C., Collins, B.J., 2009. Resource dependence theory: A review. *Journal of Management*, 35(6), 1404-1427.
- Huang, X., Gattiker, T., Schroeder, R.G., 2010. Do competitive priorities drive adoption of electronic commerce applications? Testing the contingency and institutional views. *Journal of Supply Chain Management*, 46(3), 57-69.
- Hunt, S. D., Davis, D. 2012. "Grounding supply chain management in resource-advantage theory: In deference of a research-based view of the firm," *Journal of Supply Chain Management*, 48 (2), 14-20.
- Johnson, P.F., Leenders, M.R., Fearon, H.E., 1998. "Evolving roles and responsibilities of purchasing organizations," *International Journal of Purchasing and Materials Management*, 34(1), 2-11.
- Johnson, P.F., Leenders, M.R., 2001. The supply organizational structure dilemma. *The Journal of Supply Chain Management*, 37(3), 2-11.
- Johnson, P.F., Klassen, R.D., Leenders, M.R., Fearon, H.E., 2002. Determinants of purchasing team usage in the supply chain. *Journal of Operations Management*, 20(1), 77-89.
- Johnson, P.F., Leenders, M.R., 2003. Visionaries at the top: Championing the supply cause. *The 14th Annual North American Research Symposium on Purchasing and Supply Management Conference Proceedings*, Tempe Arizona, 152-167.
- Johnson, P.F., Leenders, M.R., 2004. "Implementing Organizational Change in Supply Towards Decentralization." *Journal of Purchasing and Supply Management*, 10(4-5), 191-200.
- Johnson, P.F., Leenders, M.R., 2005. "Large Supply Organizations in North America: A Sixteen Year Perspective on Roles and Responsibilities," *14th Annual IPSERA Conference Proceedings*, Archamps France, 121-136.
- Johnson, P.F., Leenders, M.R., 2006. "A Longitudinal Study of Supply Organizational Change," *Journal of Purchasing and Supply Management*, 12(6), 332-342.
- Johnson, P.F., Leenders, M.R., 2009. "Changes in Supply Leadership," *Journal of Purchasing and Supply Management*, 15(1), 51-62.
- Lambert, D.M., Harrington, T.C., 1990. Measuring non-response and bias in customer service mail surveys. *Journal of Business Logistics*, 11(2), 5-25.

Leenders, M.R., Johnson, P.F., 2000. *Major Structural Changes in Supply Organizations*. Tempe, Arizona: Center for Advanced Purchasing Studies.

Miller, D., 1982. Evolution and revolution: A quantum view of structural change in organizations. *Journal of Management Studies*, 19(2), 131-151.

Mol, M.J., 2003. Purchasing's strategic relevance. *Journal of Purchasing & Supply Management*. 9(1), 43-50.

Pfeffer, J., Salancik, G.R., 1978. *The External Control of Organizations: A Resource Dependence Perspective*, New York, NY: Harper and Row.

Pfohl, H.C., Zöllner, W., 1987. Organization for logistics: The contingency approach. *International Journal of Physical Distribution & Materials Management*, 17(1), 3-16.

Rozemeijer, F., 2000. *Creating Corporate Advantage in Purchasing*. Universiteits Drukkerij: Technische Universiteit Eindhoven.

Rungtusanatham, M.; Salvador F., Forza C., Choi, T.Y., 2003. "Supply chain linkages and operational performance: A resource-based-view perspective," *International Journal of Operations & Production Management*. 23(9),1084-1099.

Salancik, G.R., Pfeffer, J., 1977. Who gets power – and how they hold on to it: A strategic-contingency model of power. *Organizational Dynamics*, 3-21.

Salancik, G.R., Pfeffer, J., 1978. *The External Control of Organizations: A Resource Dependence Perspective*. New York, NY, Harper and Row.

Terjesen, S., Patel, P.C., Sanders, N.R., 2012. Managing Differentiation-Integration Duality in Supply Chain Integration. *Decision Sciences*, 43(2), 303-339.

Trent, R.J., 2004. The use of organizational design features in purchasing and supply management. *The Journal of Supply Chain Management*, 40(3), 4-18.

Trent, R.J., Monczka, R.M., 1998. Purchasing and supply management: Trends and changes throughout the 1990s. *International Journal of Purchasing and Materials Management*, 34(4), 2-11.

Trkman, P., McCormack, K., 2009. Supply chain risk in turbulent environments - A conceptual model for managing supply chain network risk. *International Journal of Production Economics*. 119(2), 247-258.

Table 1
Firm Size by Year of Respondent 1987-2011

Sales Revenue	2011		2003		1995		1987	
	#	%	#	%	#	%	#	%
less than \$500 million	4	1.61%	22	7.75%	43	14.24%	84	28.38%
\$500 million to \$1 billion	9	3.61%	19	6.69%	53	17.55%	45	15.20%
\$1 billion to \$5 billion	92	36.95%	108	38.03%	116	38.41%	109	36.82%
\$5 billion to \$10 billion	55	22.09%	62	21.83%	46	15.23%	31	10.47%
greater than \$10 billion	89	35.74%	73	25.70%	44	14.57%	27	9.12%
Total	249	100.00%	284	100.00%	302	100.00%	296	100.00%

Figure 1
Double-respondent group organizational structure changes 2003-2011

Table 2
Multiple-respondent group organizational structure changes 1987-2011

Period	N	Findings
1987-1995	119	<ul style="list-style-type: none"> • 48 firms (41%) changed their organizational structure
1995-2003	116	<ul style="list-style-type: none"> • 49 firms (42%) changed their organizational structure
2003-2011	112	<ul style="list-style-type: none"> • 37 firms (33%) changed their organizational structure
1987-2003	51	<ul style="list-style-type: none"> • 32 firms (63%) changed their organizational structure at least once • 19 firms (37%) did not change their organizational structure • 25 firms (49%) had the same structure in 2003 as they did in 1987 • 6 firms (12%) changed their organizational structure in 1995 only to return to the same structure in 2003 that the company had in 1987 • 10 firms (20%) changed their organizational structure at least twice
1995-2011	51	<ul style="list-style-type: none"> • 30 firms (61%) changed their organizational structure at least once • 21 firms (41%) did not change organizational structure • 27 firms (53%) had the same organizational structure in 2011 as they did in 1995 • 6 firms (12%) changed their organizational structure in 2003 only to return to the same structure in 2011 that the company had in 1995 • 9 firms (18%) changed their organizational structure at least twice
1987-2011	23	<ul style="list-style-type: none"> • 17 firms (74%) changed their organizational structure at least once • 6 firms (26%) did not change organizational structure • 11 firms (48%) had the same organizational structure in 2011 as they did in 1987 • 2 firms (9%) changed their organizational structure in 1995 and/or 2003 only to return to the same structure in 2011 • 1 Firm (4%) changed its organizational structure at least three times from 1987 till 2011

Table 3

Double-respondent group changes in purchase category responsibilities 2003-2011

Activity	Total 2011		Gain between 2003 and 2011		Loss between 2003 and 2011		Change Index
	#	%	#	%	#	%	
fleet administration services	70	62.50%	20	17.86%	14	12.50%	5.36
plant maintenance services	70	62.50%	20	17.86%	16	14.29%	3.57
IT services	68	60.71%	22	19.64%	18	16.07%	3.57
temporary workforce services	67	59.82%	19	16.96%	19	16.96%	0.00
benefits	30	26.79%	16	14.29%	16	14.29%	0.00
freight/logistics/transportation	75	66.96%	14	12.50%	17	15.18%	-2.68
parts and components	89	79.46%	7	6.25%	11	9.82%	-3.57
real estate	18	16.07%	9	8.04%	13	11.61%	-3.57
IT hardware	78	69.64%	15	13.39%	19	16.96%	-3.57
travel	71	63.39%	17	15.18%	21	18.75%	-3.57
energy	53	47.32%	12	10.71%	17	15.18%	-4.46
real estate/facility services	43	38.39%	19	16.96%	25	22.32%	-5.36
software for resale	16	14.29%	12	10.71%	18	16.07%	-5.36
raw materials	69	61.61%	8	7.14%	17	15.18%	-8.04
environmental services	49	43.75%	19	16.96%	28	25.00%	-8.04
factory supplies	74	66.07%	9	8.04%	18	16.07%	-8.04
capital equipment	92	82.14%	4	3.57%	14	12.50%	-8.93
office supplies	91	81.25%	4	3.57%	14	12.50%	-8.93
administrative services	57	50.89%	16	14.29%	27	24.11%	-9.82
consulting services	57	50.89%	16	14.29%	27	24.11%	-9.82
software/systems development	61	54.46%	17	15.18%	29	25.89%	-10.71
printing/graphics services	68	60.71%	12	10.71%	29	25.89%	-15.18
equipment for resale	41	36.61%	11	9.82%	29	25.89%	-16.07
packaging	69	61.61%	5	4.46%	26	23.21%	-18.75
promotional/advertising services	41	36.61%	15	13.39%	37	33.04%	-19.64

Table 4

Double-respondent group changes in supply chain responsibilities 2003-2011

Activity	Total 2011		Gain between 2003 and 2011		Loss between 2003 and 2011		Change Index
	#	%	#	%	#	%	
supplier cost management/value analysis	80	71.43%	36	32.14%	18	16.07%	16.07
fleet administration	41	36.61%	23	20.54%	10	8.93%	11.61
material planning and control	46	41.07%	27	24.11%	17	15.18%	8.93
logistics/warehousing	60	53.57%	29	25.89%	21	18.75%	7.14
scrap/surplus disposal/investment recovery	43	38.39%	28	25.00%	22	19.64%	5.36
outbound transportation	53	47.32%	25	22.32%	21	18.75%	3.57
customer bid support	41	36.61%	7	6.25%	4	3.57%	2.68
accounts payable	19	16.96%	13	11.61%	10	8.93%	2.68
production planning/scheduling	15	13.39%	14	12.50%	11	9.82%	2.68
insourcing	33	29.46%	24	21.43%	22	19.64%	1.79
legal	9	8.04%	8	7.14%	7	6.25%	0.89
outsourcing and subcontracting	78	69.64%	16	14.29%	16	14.29%	0.00
supplier development	85	75.89%	19	16.96%	21	18.75%	-1.79
travel and expense control	48	42.86%	21	18.75%	25	22.32%	-3.57
inventory control	46	41.07%	17	15.18%	21	18.75%	-3.57
raw material procurement for suppliers	29	25.89%	18	16.07%	24	21.43%	-5.36
receiving	35	31.25%	26	23.21%	33	29.46%	-6.25
training and recruiting	41	36.61%	19	16.96%	27	24.11%	-7.14
material and purchasing research	65	58.04%	18	16.07%	29	25.89%	-9.82
quality/inspection incoming goods and services	24	21.43%	16	14.29%	29	25.89%	-11.61
inbound transportation	56	50.00%	15	13.39%	29	25.89%	-12.50
involvement with new product development	41	36.61%	8	7.14%	30	26.79%	-19.64

Table 5

Double-respondent group changes in major corporate activities 2003-2011

Major Corporate Activity	2011 Average	Increased		Decreased		Change Index
		#	%	#	%	
Risk management	3.5	54	56.25%	20	20.83%	35.42
Environmental planning	2.4	46	47.92%	18	18.75%	29.17
Capital project / investment planning	3.3	47	48.96%	22	22.92%	26.04
Financial cash flow planning	2.6	44	45.83%	19	19.79%	26.04
International countertrade / offset planning	1.8	37	38.54%	15	15.63%	22.92
New facility planning	2.6	41	42.71%	26	27.08%	15.63
Government relations	2.1	35	36.46%	22	22.92%	13.54
Technology planning	2.7	39	40.63%	27	28.13%	12.50
Corporate cost reduction initiative	4.3	28	29.17%	21	21.88%	7.29
Corporate mergers / acquisitions / alliances	2.6	36	37.50%	30	31.25%	6.25
Corporate strategic planning	3.2	34	35.42%	29	30.21%	5.21
Marketing planning	1.9	28	29.17%	27	28.13%	1.04
Revenue enhancement	2.7	33	34.38%	34	35.42%	-1.04
Information systems planning	2.7	31	32.29%	41	42.71%	-10.42
Corporate e-commerce initiative	3.0	27	28.13%	53	55.21%	-27.08

Table 6

Double-respondent group team usage changes 2003-2011

Team Usage	2011 Average	Increased		Decreased		Change Index
		#	%	#	%	
Supplier councils (primarily key suppliers)	2.3	46	47.92%	22	22.92%	25.00
Cross-functional teams	4.1	38	39.58%	25	26.04%	13.54
Teams with suppliers	3.0	39	40.63%	29	30.21%	10.42
Co-location of purchasing personnel with user	2.7	35	36.46%	27	28.13%	8.33
Purchasing councils (purchasing personnel only)	3.0	37	38.54%	31	32.29%	6.25
Commodity teams (purchasing personnel only)	3.6	33	34.38%	29	30.21%	4.17
Teams with suppliers and external customers	1.8	33	34.38%	29	30.21%	4.17
Teams with external customers	2.0	30	31.25%	33	34.38%	-3.13
Consortium buying (pooling with other firms)	1.8	22	22.92%	27	28.13%	-5.21

Table 7

Multiple-respondent group CPO reporting line changes 1987-2011

Period	N	Findings
1987-1995	119	<ul style="list-style-type: none"> 34 firms (29%) changed their CPO Reporting Line at least once
1995-2003	116	<ul style="list-style-type: none"> 96 firms (83%) changed their CPO Reporting Line at least once
2003-2011	112	<ul style="list-style-type: none"> 79 firms (71%) changed their CPO Reporting Line at least once
1987-2003	50	<ul style="list-style-type: none"> 46 firms (90%) changed their CPO reporting line at least once 4 firms (8%) did not change their CPO reporting line 10 firms (20%) had the same CPO reporting line in 2003 as they did in 1987 6 firms (12%) changed their CPO reporting line in 1995 only to return to the same reporting line in 2003 that the company had in 1987 31 firms (61%) changed their CPO reporting line at least twice
1995-2011	52	<ul style="list-style-type: none"> 47 firms (90%) changed their CPO Reporting Line at least once 5 firms (10%) did not change CPO Reporting Line 11 firms (21%) had the same CPO Reporting Line in 2011 as they did in 1995 6 firms (11%) changed their CPO Reporting Line in 2003 only to return to the same reporting line 2011 that the company had in 1995 31 firms (60%) changed their CPO Reporting Line at least twice
1987-2011	24	<ul style="list-style-type: none"> 23 firms (95%) changed CPO Reporting Line at least once 1 firms (4%) had the same CPO Reporting Line in 2011 as they did in 1987 0 firms (0.0%) changed their CPO Reporting Line in 1995 and/or 2003 only to return to the same line in 2011 2 Firms (8%) changed their CPO Reporting Line in 2011 after changing them at least three times from 1987 till 2011

Table 8

Multiple-respondent group changes in CPO title 1987-2011

Period	N	Findings
1987-1995	119	<ul style="list-style-type: none"> 50 firms (42%) changed their CPO title at least once
1995-2003	116	<ul style="list-style-type: none"> 64 firms (55%) changed their CPO title at least once
2003-2011	112	<ul style="list-style-type: none"> 33 firms (30%) changed their CPO title at least once
1987-2003	51	<ul style="list-style-type: none"> 36 firms (71%) changed their CPO title at least once 15 firms (29%) did not change their CPO title 24 firms (47%) had the same CPO title in 2003 as they did in 1987 9 firms (18%) changed their CPO title in 1995 only to return to the same title in 2003 that the company had in 1987 13 firms (25%) changed their CPO title at least twice
1995-2011	52	<ul style="list-style-type: none"> 45 firms (87%) changed their CPO title at least once 7 firms (14%) did not change CPO title 14 firms (27%) had the same CPO title in 2011 as they did in 1995 7 firms (14%) changed their CPO title in 2003 only to return to the same title 2011 that the company had in 1995 15 firms (29%) changed their CPO title at least twice
1987-2011	24	<ul style="list-style-type: none"> 20 firms (83%) changed CPO title at least once 4 firms (17%) did not change CPO title 12 firms (50%) had the same CPO title in 2011 as they did in 1987 6 firms (25%) changed their CPO title in 1995 and/or 2003 only to return to the same title in 2011 0 firms changed their CPO title in 2011 after changing it at least three times from 1987 to 2003

Table 9
Cluster Analysis 2003-2011

	Underperforming (Cluster I; N=37)	Growing (Cluster II; N=34)	Profitable (Cluster III; N=21)	F-Statistic Value	
CAGR - Sales ^a					
Cluster mean ^b	0.1%	10.9%	5.9%	50.85	***
Standard error ^c	0.64%	0.92%	0.78%		
Average ROA					
Cluster mean	2.0%	4.2%	11.7%	36.99	***
Standard error	0.057%	0.086%	0.0%		

a. CAGR: Cumulative average growth rate

b. All cluster means are significantly different from each other at the 0.01 level

c. The standard error of the estimate of the mean for the group.

Figure 2
Cluster Analysis 2003-2011

Table 10

Industry Sectors 2003-2011

	Discrete	High-Cap Service	Low-Cap Service	Process	Resource	Total
Cluster 1	8	11	5	11	2	37
Cluster 2	10	8	4	10	2	34
Cluster 3	6		2	12	1	21
Total	24	19	11	33	5	92

Table 11
Organization Structure Changes 2003-2011

	Cent. to Dec.	Dec. to Cent.	Same
Cluster 1	22%	38%	41%
Cluster 2	29%	18%	53%
Cluster 3	33%	19%	48%
Grand Total	27%	26%	47%

Table 12
CPO Years in Present Position 2003-2011

	2003	2011
Cluster 1	5.0	3.9
Cluster 2	3.4	6.3
Cluster 3	4.7	5.4
Grand Total	4.3	5.1

Table 13
CPO Hired from Inside the Firm 2003-2011

CPO from inside (N = 90)	2003	2011
Cluster 1	58%	81%
Cluster 2	70%	67%
Cluster 3	67%	71%
Grand Total	64%	73%