THE IMPACT OF SUPPLY CHAIN APPLICATIONS ANNOUNCEMENTS ON THE MARKET VALUE OF FIRMS.

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Abstract

We show that the announcement of SCM applications have a positive impact on the market value of firms using event study methodology. When SCM applications are disaggregated according to whether they are stand-alone SCM applications, or part of an enterprise system (SCM-ES) implementation, we find that the latter carry a significant value enhancement, while the former do not present a significant market reaction. Investors seem to interpret SCM applications as providing a better governance structure for firms. However, signals of greater commitment to change are more valued.

Keywords

SCM Applications, Market Value, Event-study methodology

INTRODUCTION

Given the high level of investment[1] that companies have recently realized in supply chain management (SCM) packaged applications, much expectation has been raised concerning the business benefits of these systems. At the very least, one would expect SCM applications to improve the governance of extended organizational processes because of enhanced inter-organizational integration. This improvement, if relevant, should ultimately be reflected in firm value. However, there is practically no research effort that links these systems to firm value. This paper contributes to the existing literature by providing evidence on the market price impact of SCM application announcements using event study methodology.

SCM packages are novel information system applications that address supply management, demand management and integration and collaboration tasks. SCM applications encompass various functionalities that cover both the company's internal operations and the interfaces with suppliers and customers (see Figure 1). According to the Chief Supply Chain Officer (2005) the top five functionalities for 2004 in SCMs of revenue were warehouse management, transportation management, demand planning and forecasting, order management, and manufacturing and distribution management. At least 180 vendors have been surveyed by Logistics Today (2004) as major vendors worldwide. Of these vendors, a small group is acknowledged as the top five leaders. They are: Manugistics, i2, Ariba, SAP and Oracle (Grupo Penteo 2004).

<Introduce Figure 1 here>

The dissemination of these SCM applications has been reinforced by the use of technological levers such as the Internet and RFID. For example, the Internet allows companies to integrate and synchronize their intra and inter-organizational processes (Lee, *et. al.* 2004; Diaz 2002), while RFID allows cost reduction and quicker check out through better product and inventory management (Eckfeldt 2005).

The success of SCM applications in pioneering sectors such as retail, textile, automotive and high-tech has also encouraged the diffusion of these software packages. The cases of Wal-Mart, Zara, GM, and HP are well-known examples in the above-mentioned sectors (Siau 2003; McAfee 2004; Cohen, *et. al.* 2000; Feitzinger and Lee, 1997). Of special mention is the positive impact that SCM applications have had on the productivity of the retail sector. A number of studies (McKinsey Global Institute, 2001; Doms, *et. al.*, 2004) have identified that there is a positive relationship between information technology spending and the level of productivity in retail. Companies that spent more on IT had higher sales per employee than companies that spent less on IT. A simple example has been the use of scanners that read universal product codes (UPC) and allow companies to reduce checkout times. UPC has also allowed companies to easily track inventories. The massive use of RFID in a near future will allow companies in the retail sector to give a new jump in the productivity staircase.

In addition to productivity improvements, SCM applications also provide strategic advantages such increasing entry barriers and switching costs, creating service

[1] In 2005 this was a US $ 1.887 million industry (AMR Research 2005).

differentiation, eroding supplier power and creating new business opportunities. Lee *et. al.* (2004) provides the case of a no-name Hong Kong-based apparel manufacturer (TAL) that used SCM applications to gain competitive advantage.

The aforementioned examples suggest that SCM applications would add value for firms. However, they also imply increased risk. This is due to the fact that SCM packages generally bring about an extensive organizational transformation of companies, which usually present high failure rates (Standish Group 1995; Burgess 1998; Huang, et. al. 2003). These transformations can include changes of organizational roles, redesign of processes, and change of organizational culture. Because SCM applications can be difficult to adopt from a business standpoint, these systems can destroy value for firms.

In the light of the above one can ask the following question: how to measure the value of SCM applications for companies? To the best of our knowledge, the Operations Management literature is very limited in providing empirical evidence on the value impact of SCM applications. However, the information systems literature does provide a small number of frameworks that have been applied to measure the IS value for an organization. One framework is the use of three IS success measures: IS Usage, User Satisfaction, and Perceived Usefulness (see for example: DeLone and Mclean 1992; Doll and Torkzadeh 1998; Lorenzo *et. al.* 2005).

A second framework is to measure the impact of IS investment on stock market valuation using event study methodology. This methodology has been extensively used in the management and finance literature to evaluate the effects of corporate events such as mergers and acquisitions, earnings and dividend announcements, and new innovations on the market value of the firm (McWilliams and Siegel, 1997). However this type of effort has not yet been broadly used by IS or Operations Management researchers. To our knowledge, in the IS field there are only five studies that have investigated the value of IS investment using an event study methodology (see Table 1). Of the five studies listed, three concentrated on information technologies – which include software, hardware, DSS, EIS, Internet, Intranet, and client-server systems. One study concentrated on e-commerce initiatives, but these were focused on custom-made developments. Finally, the other study focuses on a breach that occurred on an IT platform. Thus, a research gap and opportunity exist for building on this prior research and applying the event study methodology to SCM applications and commercial packages.

<Introduce Table 1 here>

THEORETICAL DEVELOPMENT

To study the impact of SCM applications on business performance, we need to consider the different scenarios under which these systems can be implemented, depending on the scope of the implementation. The first scenario considers the firm value impact of SCM applications in general. The second scenario studies whether there is a firm value impact due to a stand-alone SCM implementation through a specialized vendor (e.g., Manugistics, i2 and Ariba). A third scenario considers the value impact of a SCM implementation as part of an enterprise systems (ES) adoption, such as SAP and Oracle. In this latter case, a broad scope is necessary, which implies a greater degree of institutional commitment to change. This is because ES are applied to a wider amount

of business areas, and thus greater coordination is required to overcome the resistance to change inherent in converting stand-alone units to an integrated enterprise. In these cases, the commitment and driving force of top management is a crucial component (Davenport, 1998; Davenport, 2000; Markus et. al. 2000).

This research effort aims to answer three questions: (1) Do SCM implementation announcements affect firm value?, (2) Does a stand-alone SCM implementation affect value and (3) Does a SCM implementation occurring as part of a broad ES adoption process affect firm value?

DATA AND METHODOLOGY

Our sample selection was based on initially identifying large firms that had adopted SCM applications. This generated an initial sample of 100 firms. A second filter required that the firm be publicly traded in the New York Stock Exchange, bringing our sample size to 60 firms. A third filter required that all firms in our sample had to have a publicly verifiable source of the announcement decision. To identify the date in which the first SCM implementation announcement was disseminated for each firm, we searched corporate web pages, press releases from SCM providers, internet sources using the search words "select" or "adopt" together with the name of several vendors such as SAP, ORACLE, Manugistics, Ariba, Commerce One and i2. We also used the global news provider Factiva as a source of corporate announcement information. In spite of the comprehensive nature of our sources, it is worth noting that we were unable to find the announcement dates for many firms that are known to have adopted a SCM application, thus bringing our initial sample size to 40 firms. We believe that a probable cause for this lack of dissemination information is that, in many instances, corporations include contract clauses that prohibit vendors from announcing implementation-related information. The earliest date in which an announcement was found was classified as the firm's Event Day (t=0). Daily closing prices for our sample of firms were obtained from Datastream. We use the Standard & Poor 500 Index as our market proxy.

To ensure that our results reflect the reaction of prices to the SCM announcement and not to other corporate events, we applied a fourth and final filter. We used Factiva to identify, for each firm, all other corporate news that occurred 10 days before and 10 days after the firm's event day. If an additional news event that potentially altered the stock market price of a firm occurs on or before the 10 days that surround our event day, the firm is excluded from the sample. If the additional news event occurs after our event day, then the firm is included for windows that do not coincide with the additional event occurrence. Thus, if an additional event is identified at t=+5 for a certain firm, then the firm can only be included as part of our sample for event windows up to t=+4. This filter criterion was implemented in order to prevent the loss of firms, since firms could be used for windows that did not coincide with other events instead of automatically excluding them from the sample. This is especially necessary for samples, such as ours, composed of large, actively traded concerns that typically have a high number of press events. Thus, a requirement that no other event can occur during the 20 days (-10 to +10) surrounding t=0 can potentially lead to the exclusion of virtually our entire sample. This last filter generated a loss of 16 firms. Table 2 shows our final sample of 24 firms. For each firm, we show its press announcement date, its industry classification and the type of application implemented.

<Introduce Table 2 here>

Event study methodology

To determine the market's assessment of a firm's adoption of higher corporate governance standards, we apply event study methodology as in Brown & Warner (1980). To estimate abnormal returns around the event dates, we start by estimating the following market model regression:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \ ,$$

where R_{it} is the return of asset i on day t and R_{mt} is the return of the Standard and Poor's 500 stock index on day t. In estimating the market model coefficients alpha and beta, we have adjusted for a possible ex-post selection bias (Amihud et al., 1997, Brown et al. 1995). This occurs because a firm's incorporation in the differentiated corporate governance segments may have been a natural consequence of previous efforts to progressively adopt higher governance standards. If true, the ex-ante estimation period parameters would be based on returns that already incorporate the benefits of being perceived as more transparent and protective of shareholder interests. We adjust for this possibility by using ex-post estimation period parameters. Our estimation period includes 160 observations starting on day t=+31 and ending on day t=+190.

The Abnormal return (AR) estimate of firm i at time t in the event window is calculated as:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

where R_{it} and R_{mt} are returns, on day t, for stock i and the market index, respectively. The abnormal returns for each firm i, using an event window that starts in day T_1 and ends in day T_2, are aggregated and averaged using the following average cumulative return (ACAR) calculation:

$$ACAR_{T_1,T_2} = \frac{1}{N}\sum_{i=1}^{N}\sum_{t=T_1}^{T_2} AR_{it} \ ,$$

where N is the number of firms.

We apply the standard cross sectional test proposed by Boehmer, Musumeci and Poulsen (1991) that accounts for event-induced variance increases. The test statistic is calculated as (Cowan, 2001):

$$Z_t = \frac{TSAR_t}{N^{1/2}(S_{SARot})}, where$$

$$S_{SARot} = \frac{1}{N-1}\sum_{i=1}^{N}\left(SAR_{jt} - \frac{1}{N}\sum_{j=1}^{N} SAR_{it}\right)^2$$

SAR_{it} is the standardized abnormal return firm i $= \frac{AR_{it}}{s_{A_{it}}}$. This value is aggregated for all firms so that $TSAR_t = \sum_{i=1}^{N} SAR_{it}$.

We also include the Generalized Sign Test (Cowan, 1992) as a nonparametric analysis. This procedure tests whether there is a significant difference between the number of positive and negative abnormal returns during each event window. A nonparametric test is useful in analyses that contain samples with a small number of observations that most probably do not follow normality. This procedure tests whether there is a significant difference between the number of positive and negative abnormal returns during each event window. We use this statistic given the small samples that our analysis uses.

RESULTS

Table 3 presents the event study results for selected event windows. We show Mean Cumulative Abnormal Returns and their cross-sectional Z statistics (in parenthesis) as well as Generalized Sign Test results and the corresponding generalized sign z-statistic (in parenthesis). The most immediate windows surrounding the event day present abnormal returns that are not significant at the 5% level or higher, as we require. We do observe that a positive and significant price reaction to SCM applications is captured by window (-6, +6). Our mean CAR of 1.26% presents an economically significant abnormal return that is not due to any random effect. This results provides evidence that the decision to adopt SCM applications is perceived by the market as a value enhancing event, as reflected in the positive price reaction.

<Introduce Table 3 here>

Though our filter of other informational events gives us assurance that these results are related to SCM adoptions and not to other news, we also feel that we need to interpret our results with caution. Previous work studying the impact of custom-made e-commerce announcements also finds significant abnormal returns for windows similarly distanced from the event date as ours (Subramani and Walden, 2001). However, we wonder why the market does not immediately react to the announcement? One possibility is that there may have been previous information disseminations that we have not identified. However, our results do not seem to be driven by anticipation or perhaps a lagged market price reaction, since we also analyzed windows (-6, 0) and (0, +6) separately and found no significant price movements. Certainly, the challenges and difficulties of SCM implementation are many, as are the stories of success and failure. It is this previous experience that perhaps is motivating the market to demand more information before assessing the informational content of SCM implementation announcements. This may be why, in aggregate, wider windows are required to capture the transaction consequences of SCM-related applications.

We also explore whether market price reaction is contingent on the depth of the structural reform required for implementation. Within SCM applications, there are those that require lesser degrees of change, such as those that relate to stand-alone SCM applications, while others are more demanding in the both depth and breath of changes, such as SCM as part of an ES implementation (SCM-ES). We hypothesize that changes that signal a stronger commitment (SCM-ES), should also provide a stronger information signal. To test this hypothesis, we further disaggregate the 23-firm sample studied for window (-6, +6) into firms that have implemented less wide-ranging applications (SCM) and firms that have committed to more comprehensive structural changes (SCM-ES). Our non-parametric test results in (table 4) show that the SCM-ES applications command a positive and significant price reaction. In contrast, stand-alone

SCM applications, though also showing a positive price reaction, do not show statistically significant results.

<Introduce Table 4 here>

CONCLUSIONS

This paper studies the market price reaction of corporate announcements that signal a firm's decision to adopt and implement SCM-related applications. Our final sample consists of 24 firms from an original sample of 100 firms that were known have adopted SCM applications from 1999 to 2005. Our results indicate a positive and significant market price reaction of 1.26% in the window that starts six days before and ends six days after the SCM implementation announcement. The slow market reaction raises interesting questions about the causes of the delayed response. We can hypothesize that this may be an indication that the markets needs to receive further details concerning these types of implementations, however, this is a subject for further research. Nevertheless, our results do provide evidence that investors perceive the implementation of SCM applications as value-enhancing events.

When our sample is further disaggregated according to the degree of structural changes required by implementations, we find that applications that signal greater commitment to change are welcomed positively by the market. Applications that signal modest changes in structure do not command statistically significant results, though they are observed to be positive. This is consistent with signalling theory (Riley, 1979; Ross 1977) in that, for a signal to be valid, it must be a costly one. In this case, the degree of commitment to a SCM-ES implementation implies a more costly signal than a stand-alone SCM application.

REFERENCES

Amihud, Y., Mendelson, H., Lauterbach, B., (1997). Market microstructure and securities values: Evidence from the Tel Aviv Stock Exchange. Journal of Financial Economics 45, 365-390.

AMR Research (2005). The Enterprise Resource Planning report, 2004 – 2009.

Boemer, E., Musumeci, J, and Poulsen A., (1991).Event Study Methodologyunder Conditions of Event-induced Variance. Journal of Financial Economics 30, 253-272.

Brown, S. and J. Warner (1980). Measuring Security Price Performance, Journal of Financial Econom. 8, 205-258.

Burgess, R. (1998). Avoiding SCM Failure: lessons from BPR, International Journal of Logistics Management, 9, 1.

Cavusoglu, H., Mishra, B., and S. Raghunathan (2004). The Effect of Internet Security Breach Announcements on Market Value: Capital Market Reactions for Breached Firms and Internet Security Developers, International Journal of Electronic Commerce, Vol. 9, nº 1, 69-104.

Chief Supply Chain Officer (2005). Supply Chain Application Market Sees Modest Rebound, August 3.

Cohen, M., Cull, C., Lee, H, and D. Willen (2000). Saturn`s Supply Chain Innovation: High Value in After Sales Service, Sloan Management Review, Summer 2000.

Cowan, Arnold R. (2001)Eventus software, version 7. Cowan Research LC, Ames, Iowa, 2001.

Davenport, T. (1998). Putting the enterprise into the enterprise system. Harvard Business Review, Vol. 76, 4, 121-132.

Davenport, T (2000). Mission Critical: Realizing the Promise of Enterprise Systems, Harvard Business School Press, Boston, USA.

Delone, W. and Mclean, E. (1992). Information Systems Success: The Quest for the Dependent Variable, Information Systems Research, 3, (1), 60-95.

Diaz, A. (2002). E-business: from Demand Networks to TechnoLogistics, Supply Chain Forum: An International Journal, Nº 1.

Doll, W. and Torkzadeh, G. (1998). Developing a multidimensional measure of system-use in an organizational context. Information and Management, 33.

Doms, M., Jarmin, R and S. Klimeck (2004). IT Investment and Firm Performance in US Retail Trade, Economics of Innovation and New Technology, 13 (7), pp. 595-613.

Dos Santos, B.L., Peffers, D.C., and D.C. Mauer (1993). The Impact of IT Investments Announcements on the Market Value of the Firm, Information Systems Research, 4, 1, 1 - 23.

Eckfeldt, B. (2005). What does RFID do for the consumer? Communications of the ACM, September, 48, 9.

Feitzinger, E and H. Lee (1997). Mass-customization at HP: The Power of Postponment, Harvard Business Review, 75, 116-121.

Grupo Penteo (2004). El Mercado de Soluciones SCM en España, Analítica Penteo.

Huang, A., Yen, D., Chou, D, and X. Yurong (2003). Corporate Applications Integration: Challenges, Opportunities, and Implementation Strategies, Vol. 9, 2.

Im, K.S., Dow, K., and V. Grover. (2001). Research Report: A Reexamination of IT Investment and the Market Value of the Firm – An Event Study Methodology, Information Systems Research, March 2001, 12, 1.

Lee, H., Farhoomand, A. and P. Ho (2004). Innovation through Supply Chain Reconfiguration, MIS Quarterly Executive, Vol. 3, Nº 3, September.

Lorenzo, O., Kawalek, P. and Wood-Harper, T. (2005). Embedding the Enterprise Systems into the Enterprise. A Model of Corporate Diffusion, Communications of the Association for Information Systems, Vol. 15, 609 – 641.

Logistics Today (2004). SCM Systems: How evaluate and choose the right SCM solution for your company, January, 33-34.

Markus, M., Axline, S., Petrie, D., and Tanis, C (2000). Learning from adopters experiences with ERP: problems encountered and success achieved, Journal of Information technology, Vol. 15, 245-265.

McAfee, A. (2004). Do you have too much IT? Sloan Management review, Spring 2004.

McKinsey Global Institute (2001). US productivity Growth 1995-2000: Understanding the Contribution of IT relative to Other Factors, Washington, D.C. (October).

McWilliams, A. and D. Siegel. 1997. Event studies in management research: theoretical and empirical studies. Academy of management Journal, 40 (3), 626-657.

Riley, J. (1979). Informational equilibrium. Econometrica 47, 331-360

Ross, S. (1977). The determination of financial structure: the incentive signalling approach. Bell Journal of Economics 8, 23-40

Siau, K. (2003). Inter-organizational Systems and Competitive Advantages – Lessons from History, The Journal of Computer Information Systems, Fall 2003, 44, 1.

Sriram, R. and G. Krishnan (2003). The Value Relevance of IT Investments on Firm Value in the Financial Services Sector, Information Resources Management Journal, Jan-Mar 2003, 16, 1.

Subramani, M and E. Walden, 2001. The Impact of e-commerce announcements on the market value of firms, Information Systems Research 12, pp 135-154.

The Standish Group Report (1995). Chaos Report.

Table 1. Use of the event study methodology in the IS field.

Year	Authors	Name of the Paper	Journal	Main Results
1993	Dos Santos et. al.	The impact of IT investment announcements on the market value of the firm.	Information Systems Research	This paper focused on the manufacturing and finance sectors. The overall effect of IT investment announcements on excess returns was not found to be significant. The authors also tested for the industry effect, but the results were not significantly different from zero in these two sectors. They did not study the firm size effect. However, they tested for the type of IT effect by classifying the IT investment into innovative and non-innovative. Innovative investment increased firm value, while non-innovative did not.
2001	Im et. al.	Research Report: a Re-examination of IT investment and the market value of the firm. An event study methodology.	Information Systems Research	This paper built on the study of Dos Santos et. al. (1993). The main differences are that Im et. al (2001) used a larger and more recent sample of IT announcements. They also controlled for three confounding factors such as size, industry and time lag. In addition to the stock price analysis, they also examined the reaction of trading volume to the announcements. By analysing a sample of 238 IT announcements, the results indicated no effects of price and volume. Additionally, financial companies did not have a larger impact of IT investments on their market value than non-financial companies. Although these results can seem pessimistic, further analysis and interpretations allowed them to find additional interesting results: a) there is no price reaction for larger firms and a positive price reaction for smaller firms; b) both price and volume reacted more positively to new announcements of IT investment than to old announcements; c) the industry and size effects were stronger in the sub-sample of the recent IT investment announcements .
2001	Subramani & Walden	The impact of e-commerce announcements on the market value of firms	Information Systems Research	This paper studied 251 e-commerce initiative announcements between October and December 1998. The results of this study suggested that e-commerce initiative announcements were associated with significant increases in the market value of companies. Three additional results are important to be said: a) the price reaction for conventional firms were not significantly different from those for net companies; b) the price reaction for B2C announcements were higher than those for B2B; c) the price reaction for e-commerce initiatives involving tangible goods were higher than for those involving digital goods. It is important to mention that data for this study was collected during a unique bull market period.
2003	Sriram and Krishnan	The value relevance of IT investments on firm value in the financial services sector.	Information Resources Management Journal	The paper focused on their investigation on the financial services sector. They found a positive association between IT investments and market value for firms in the financial sector.
2004	Cavusoglu et. al.	The effect of internet security breach announcements on market value: Capital market reactions for breached firms and internet security developers.	International Journal of Electronic Commerce	This paper found that announcing an Internet security breach was negatively associated with the market value of a company. In the sample under study the breached firms lost on average 2.1 percent of the market value within two days of the announcement. On the other hand, the market value of security developers was positively associated with the disclosure of security breaches by other companies.

Table 2: Descriptive Information

Firm	Announcement Date	Application	Industry	Market Cap (USD bill)
AstraZeneca	20020507	Ariba	Pharmaceuticals	73.62
Best Buy	20041208	i2	Specialty retailers	25.75
Cemex	20001010	i2	Building material	20.86
Circuit City	20020701	Manugistics	Specialty retailers	4.33
Computer Associates	20041201	SAP	Software	15.59
Dow Chemical	19991019	Ariba	Chemicals	40.54
Elektra	19990512	SAP		
Ford	19991102	Oracle	Automobile	14.78
General Motors	19991102	Commerce One	Automobile	12.37
Kohl´s	20020115	Manugistics	Apparel retailers	15.56
Kraft Foods	20020610	Manugistics	Food products	14.55
Liz Claiborne	20050929	Oracle	Clothing& access.	3.64
Manitowoc	20031217	Oracle	Vehicles & trucks	2.09
McCormick & Company	20030507	SAP	Food products	3.77
Nestle	20000614	SAP		
Novartis	20030616	SAP	Pharmaceuticals	126.33
Oxford Industries	19990928	Manugistics	Clothing& access.	0.79
PepsiCo.	20040706	SAP	Soft drinks	96.22
Pfizer	20001211	Ariba	Pharmaceuticals	189.3
Radio Shack	20010626	Manugistics	Specialty retailers	2.91
Royal Caribbean	20051011	Ariba	Recreational	9.31
Teleflex	20050614	Ariba	Diversified Indust.	2.57
Whirlpool	19990514	SAP	Durable household products	5.94
Wolverine World Wide	20030320	SAP	Footwear	1.23

Table 3: Event study results

This table presents the market price reaction observed for different event windows when firms announced their intention to implement SCM applications. All panels show Mean CARs and their respective cross-section Z statistics (in parenthesis), as well as a Signed rank test with its corresponding binomial probability (in parenthesis). The statistics are generated a 160 day ex-post estimation period starting at day +30 (30 days after the event). Our analysis tests the null of zero abnormal return when firms announce the implementation of SCM applications.
*, ** denote statistical significance at the 5% and 1% levels, respectively.

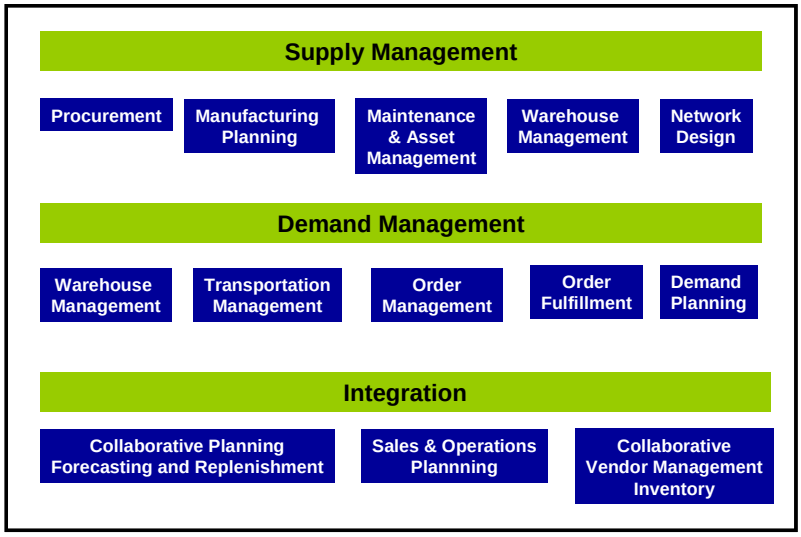
Window	N	Mean CAR (CS Z-stat)	POS:NEG (Generalized Sign Z-stat)
(0,0)	24	-0.03% (0.61)	12:12 (0.16)
(-2,+2)	23	0.39% (0.96)	13:10 (0.77)
(-4, 4)	23	-0.41% (-0.35)	8:14 (-1.11)
(-6,+6)	23	1.26% * (1.68)	16:7 * (2.02)
(-8, +8)	20	-0.92 (-0.95)	6:14 (-1.60)
(-10, +10)	15	-1.86% (-1.05)	4:11 (-1.63)

Table 4: Results according to commitment

This table presents the market price reaction that is observed when firms announced their intention to implement SCM applications. The announcements are differentiated according to the degree (high or low) of structural change required by the SCM application. For both panels, we present Mean CARs and their respective cross-section Z statistics (in parenthesis), as well as a Signed rank test with its generalized signed rank z-statistic (in parenthesis). All results are generated a 160 day ex-post estimation period starting at day +30 (30 days after the event). Our analysis tests the null of zero abnormal return in the (-6,+6) window that surrounds the announcement day.
*,** denote statistical significance at the 5% and 1% levels, respectively.

Type of Implementation	N	Mean CAR (CS Z-stat)	POS:NEG (Generalized Sign Z-stat)
Stand-alone SCM	16	1.92 * (1.84)	11:5 (1.57)
SCM-ES	6	0.15 * (1.84)	5:1 * (1.77)

Figure 1. A sample of SCM Functionalities



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