

# Market reactions to E-business outsourcing announcements: An event study

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## Abstract

Stock markets have reacted favorably to firms who announced their implementation of E-business projects for commercial exploitation. Those that outsourced E-business projects in order to achieve swift execution also achieved abnormal positive returns. Contrary to expectations, outsourcing E-business projects with high task complexity also led to positive results. We analyzed the process and found that these three factors explained more than 20% of the variance in abnormal returns. The results were obtained from an event study of 96 E-business-related announcements, including those made by firms in the S&P500 index during 1999–2002. This paper contains information that should therefore help firms identify E-business projects for outsourcing.

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## 1. Introduction

E-business projects have generated significant top-management attention recently. Indeed, outsourcing such projects has required management attention to ensure their success, because of their dynamic environments [8,10,33]. However, no research has been reported on this in the literature. Our work used E-business outsourcing announcements as the data used to investigate market reactions.

IS researchers have studied outsourcing from multiple perspectives to understand the contractual aspects and their consequences [23,49]. A number focused on

contingency factors that have a bearing on outsourcing a particular IT asset; the factors have included internal IT cost structure, internal IT performance, production and transaction costs, firm cash needs, characteristics of IT portfolio to be sourced, internal IT capability factors, etc. [27,32,35,42,50,53]. While some studies have utilized objective firm-level data and metrics, most involved either a case study or a survey. Further, in almost all, the dependent variable of interest was the extent of outsourcing (e.g., in terms of ratio of outsourcing expenditure and total IT expenditure).

However, while the studies attempted to overcome response bias, key informant approaches have suffered from limitations. Respondents may have provided reasons that they *believe* to be the drivers of outsourcing and *considered* to be socially-acceptable reasons, but the arguments may have little to do with the real

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decision making process. Further, whether outsourcing is or is not appropriate cannot be discerned until the firm performance is studied in the context of the contingency factors of interest.

This paper adds to the research published in *Information and Management* by using financial metrics to evaluate IS decisions. For example, in [38], it was found that changes in textual data in financial reports indicated a stock change in the following quarter, while [17] presented a financial model to analyze IT investments and modeled their impacts on firm value after considering risk and industry or company events. Also [16] examined whether the market recognized competitive advantages earned from IT investments. Such studies are becoming common in the literature; e.g., the effect of CIO changes [12], IT infrastructure investments, IT investments [18,28], ERP systems [26] and E-commerce [51].

## 2. Theoretical development

### 2.1. Research model

Outsourcing is a term that includes contracting, minority equity arrangements, and joint ventures [24]. The decision to outsource an E-business project has significant influence on a firm's ability to balance competing needs and deploy its best talent and prevent leakage of knowledge embedded in assets. Therefore, the outsourcing decision may be expected to have a significant influence on market returns. However, the decision is contingent upon a number of factors including transaction costs [3], performance of internal IT operations, prior relations, and core competencies [39].

We argue that three contingencies – the strategic intent behind outsourcing, the project execution swiftness and the project task complexity – influence the stock market reactions to an E-business outsourcing decision. *Strategic intent* [19,25] in the context of investments in new E-business assets and capabilities indicates a firm's goals for producing returns. Rapidly changing corporate environments make business requirements a moving target, creating instabilities in system projects [5,48]. In such a scenario, time and *project execution swiftness* is of the essence, because E-business systems must be developed and delivered before the business environments have shifted and the delivered systems have become obsolete. *Project task complexity* arises from an increase in information load, information diversity, or the rate of information change during execution [9,46]. High task complexity will require a high degree of user participation, which

creates greater task interdependence and task uncertainty and a consequent need for a higher degree of coordination. Markets react to information about these contingencies and penalize or reward the firm.

#### 2.1.1. Project strategic intent

Following DiRomualdo and Gurbaxani, we identified two distinct IT project strategic intents—IS/IT improvement and commercial exploitation. These are at the extreme ends of a spectrum. IT improvement projects are focused on upgrading or acquiring IT capabilities; they serve to enhance a firm's IT competence in providing it with the capacity and the platform for using IT for business innovation [4,22]. Firms may go a step further and exploit their new E-business assets commercially by creating businesses that sell information products and services, and this will provide the firms with the most direct and tangible returns on investment. Such commercially-exploitable assets involve initiatives that break new ground, such as in the area of on-line auctions, on-line banking, trade exchanges, etc., and possess a high degree of rent generation potential.

Prior event studies suggest that stock markets react positively to investments that provide firms with strategic and innovative IT assets [20]. We postulated that stock markets could recognize the potential capabilities of various E-business projects based upon their strategic intent, as provided in firm announcements, and factor future returns into current stock prices. Announcements of E-business outsourcing projects with a strategic intent of commercial exploitation that provide firms with the most tangible and direct future rent generation capabilities would be rewarded with premium stock pricing resulting in above average returns for those firms. On the other hand, E-business improvement intents are only indirectly linked to firm's rent generation capabilities. Therefore, stock markets are expected to reward E-business projects with the strategic intent of commercial exploitation to a greater degree than projects with other non-commercial strategic intents. We, therefore, hypothesize that:

**H1.** E-business outsourcing announcements for projects that are launched with a commercial exploitation intent will generate a higher degree of significant positive abnormal returns for the announcing firms as compared to projects that are launched with no commercial exploitation intent.

#### 2.1.2. Project execution swiftness

The mantra “on-time within-budget as-committed functionality” captures and signifies the three corner-

stones of IS project management – time, cost, and functionality – and projects that miss meeting their goals on one or more of these dimensions are deemed unsuccessful [41]. An important managerial response is to introduce E-business innovations before or at the same time as competitors, thereby placing a premium on rapid development and fast execution [1]. A number of software risk management frameworks have been developed to help firms manage and improve software development in this way [30,36], but two risks – corporate environment and technology risks – are especially germane in the context of E-business projects. As real-time needs become critical and enterprises focus on end-to-end business processes, managers will need to ensure the successful sourcing and deployment of E-business solutions [52].

The rate of technological innovation has been relentless in the past 40 years and the pace of technological change and thus obsolescence only seems to quicken. While using new technology in software projects has been recognized as a risk in the literature, E-business projects have to use leading edge technologies in order to utilize new E-business infrastructures and integrate and communicate with other E-business systems. Once again, E-business projects have to be developed and delivered in a very rapid manner in order to ensure that the underlying technologies do not become obsolete before they are delivered.

Prior research suggests that one of the effective mechanisms that can help to execute projects rapidly is outsourcing. Outsourcers have experience in implementing many projects using diverse technologies in a wide range of industries [34]. As a result, they are able to deliver solutions rapidly. Indeed, one of the unique advantages they offer is their ability to deliver functionality rapidly.

Therefore, when companies plan to execute their E-business outsourcing projects in a swift and expeditious manner, we expect the stock markets to be able to discern that this decision improves the likelihood of project success. Hence, we expect stock markets to reward firms that outsource the execution of E-business projects in need of swift execution. We therefore, hypothesize:

**H2.** E-business outsourcing announcements for projects that are planned to be executed in a swift manner will generate a higher degree of significant positive abnormal returns for the announcing firms as compared to projects that are planned to be executed in a regular manner.

### 2.1.3. Project task complexity

The rapid changes and complexity of E-business technologies create solution scheme multiplicity [55]. This kind of task complexity arises because the knowledge about technologies and methodologies is continuously changing.

As task complexity increases, so does the need for increased coordination using personal and group based coordination modes instead of impersonal rule-based coordination modes [54]. Intensive user participation required for completing complex E-business projects will yield positive abnormal returns when executed within organizational hierarchies. Outsourcing is expected to adversely affect the success of E-business projects when the associated task complexity increases. Therefore, we expect to find negative abnormal reactions to E-business project outsourcing announcements when the associated project complexity is high. Thus, we hypothesize:

**H3.** E-business outsourcing announcements for projects with a high degree of task complexity will generate a higher degree of significant negative abnormal returns for the announcing firms as compared to projects with lower degree of project task complexity.

These hypotheses are summarized in the model shown in Fig. 1.

## 3. Research method

### 3.1. Sample

E-business initiatives received considerable attention in the press during the period under study. Information was collected using a full text search of announcements made by companies between 1999 and 2002 in the two leading newswires: PRNewswire and BusinessWire. These sources are commonly used in event studies and were accessed through the Dow Jones Interactive database. We tried to be consistent with the methods used in prior event studies.

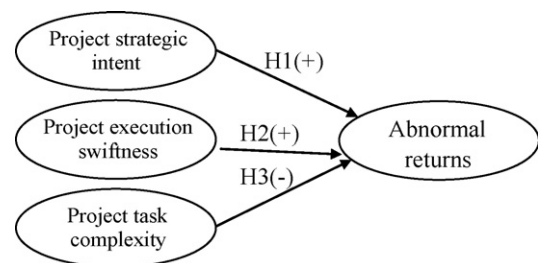


Fig. 1. Research model.

We were aware of the potential confounding effects of the dot-com bubble on our results and took precautions to minimize such factors. One precaution included data collection from the post-bubble phase. It is generally accepted that the phase ended on 10 March 2000 when the NASDAQ index peaked at 5048. Our data-set contained 35 (out of 96) announcements in 2001 and 2002. An additional 30 announcements in our sample are from the months of April to December of 2000. Therefore, 65 of the 96 announcements are from the post-bubble phase.

Another deliberate step to prevent extraneous effects from affecting our results is to focus on large companies. Our sample is largely composed of announcements by firms in the S&P500. As a result of these precautions, we believe that investor exuberance has only a small effect on our results.

Our data collection period of 4 years is commonly used in event studies in the IS and Finance literatures. One study [14] used a 1-year period from June 1998 to July 1999. Relevant announcements were retrieved using a search string to match words in announcements of interest. After examining a number of candidate announcements, we identified the following search string:

```
(co = <list of companies>) and ((dns = internet) or
(key = electronic commerce)) and (wc > 300) and
(lp = E-business or electronic commerce or E-
business or e commerce or (online near1 business)
or (online near1 sales))
```

We used the list of firms in the S&P 500 index at the time of initial data collection to collect announcements. As a result, the announcements were mostly for firms in the S&P 500, though we also retained announcements made by non-S&P500 firms if they were relevant to our research (about 23% of the total sample). Most of these were larger firms, in contrast to the set of net firms used in prior event studies, many of which have gone out of existence. The keywords “dns” and “key” denote the news category descriptor and keywords, respectively, and were used to restrict the search to those announcements that related to the Internet or Electronic Commerce. This eliminated announcements made by companies that were not directly related to E-business activities.

Since the study related to outsourcing decisions, the announcements were scanned to select those that specifically contained reference to outsourcing decisions by firms for an E-business project. The choice in our sample included any form of association with an

external partner where it had an oversight role. The selection of this set of firms and the elimination of announcements with confounding announcements or missing information resulted in a data set of 96 firms. They are listed in the appendix. The sample size is consistent with recent event studies.

### 3.2. Content analytic classification scheme

Content analysis is a technique used increasingly in IS research; it aids in classifying the content of documents [47], helping to code or classify pieces of textual data, such as public announcements. Examples of the classification scheme are presented in the appendices; for more details refer to [31].

#### 3.2.1. Project strategic intent

E-commerce project announcements were content analyzed for their strategic intent using a three-tier strategic intent framework developed by DiRomualdo and Gurbaxani and the hierarchical framework of E-commerce developed by Zwass [56], whose framework provided for three hierarchical meta-levels of E-commerce with products and structures at the highest level followed by services and ending with infrastructure. E-commerce products and structures are business-focused E-commerce assets developed with the strategic intent of either business impact or commercial exploitation.

Therefore, the announcements were coded from high to low. They were high (commercial exploitation) if the announcement explicitly alluded to a commercial intent, which was evident when the announcement included statements referring to the sale of information products or services in the market place or starting new lines of business. E-commerce services and infrastructure are foundational assets that include the platform, which is seldom sold by the client firm who possesses domain expertise and sells E-commerce products and structures. Therefore, services and infrastructure type of E-commerce projects are developed with the intent of E-commerce system improvement and were coded low (for improvement intent).

- *Commercial exploitation* therefore occurred in electronic marketplaces and electronic hierarchies (electronic auctions, brokerages, dealerships, and direct search markets; and supply-chain management) or products and systems (remote consumer services including retailing, banking, stock brokerage); infotainment-on-demand (fee-based content sites, educational offerings); supplier–customer linkages; on-line

marketing; electronic benefit systems; intranet- and extranet-based collaboration). Coding was thus high only if the announcement clearly made statements about selling information products or services or starting new lines of business, etc.

- *E-commerce improvement* involved categories with no reference to new sales or enabling services (electronic catalogs/directories, smart agents; E-money, smart-card systems; digital authentication services; digital libraries, copyright-protection services; traffic auditing), telecommunications infrastructure.

### 3.2.2. Project execution swiftness

The emphasis on swift execution was inferred in one of two ways. If the announcement made specific reference to steps being taken by the firm to complete the project more expeditiously than for similar projects at the firm or it mentioned aggressive deadlines and efforts to meet them, it was considered to be attempting a swift execution. Rapid deployment was also inferred if the process suggested that it was. Prior research has suggested that when deciding and acting quickly, managers make decisions without generating all the available alternatives, using simpler rules to make decisions, and reducing information searching and processing [2].

Based on these criteria, execution swiftness was coded as 1 (regular execution planned) when the speed of project execution was not significantly different than other comparable IT projects or when information searched about the E-business project decision was detailed and thorough, suggesting that time pressures were minimal. Execution swiftness was coded as 2 when there was some explicit reference to fast deployment in the announcement or managers made an incomplete survey or used simpler rules indicating time pressure.

### 3.2.3. Project task complexity

Task complexity can be viewed as either

- a primarily psychological perception of the task performer about the task to be performed or;
- a person-task interaction that acknowledged both the objective complexity of the task and the perception of its complexity by the task performer or;
- as emanating purely from objective task characteristics.

We considered task complexity as emanating from objective task characteristics, objective task complexity,

because a task can be labeled by a researcher as less or more complex compared to another task.

Following McKen and colleagues, we divided task complexity into two categories:

- (1) business task uncertainty, pertaining to the business tasks (processes) for which the E-commerce solution was being developed, and
- (2) technology task uncertainty, depending on the technologies used in developing and implementing the solution.

By definition, task complexity is low when the likelihood of a task achieving its desired outcome is high (due to industry familiarity and experience with the particular task) and empirical evidence gained over time has been used to refine the task to achieve its intended outcomes with near certainty. For business task complexity, this implies that the business processes to be supported by a proposed E-commerce solution have been in vogue for some time are well understood.

- *Low business or technology complexity* therefore occurred when the task entailed automating or linking existing processes, using out-of-the-box functionality, or using proven technologies.
- *High business/technology complexity* similarly involved the development or modification of online strategy, building “industry-first” applications, integrating multiple technology platforms, navigating rapid technology change, developing new infrastructure for E-business, etc.

We coded overall task complexity as *low* when both the project’s business and technology complexity was judged to be low. The task complexity was coded as *high* when either its business task complexity, or its technology complexity, or both were judged high. This ensured that E-commerce projects that were primarily infrastructural in nature and had no direct business component could be coded with high overall task complexity when their technology complexity was high.

### 3.3. Coding precautions

Several steps were taken to prevent data coding from being influenced by researchers’ subjective biases. First we developed a precise coding scheme; this provided a clear definition of each construct. As a rule, only specific references to variables of interest were coded, resulting in a small data set.

The coder checked for test-retest reliability by recoding announcements about a week after the initial coding. In every case, the recoding was very close to the initial one and more than 95% of the values were identical. To further check for stability and reliability, two other coders not involved with the study also independently coded the announcements. Each of the coders had experience in software development and one had an additional 2 years of experience in leading IS development at a major multinational bank. To assess the inter-rater reliability, we calculated Cohen's kappa coefficient for each construct between each pair of coders. This coefficient reflects the extent to which the observed agreement between coders is superior to that obtained by chance [13]. Following Ang et al., the coders first coded 15 documents, yielding a kappa coefficient exceeding 0.8 for each construct. The observed disagreements were then reconciled by discussion between the coders moderated by a faculty member with over 10 years of experience in IS research. Then the two coders worked on the remaining documents, yielding a kappa exceeding 0.95 for each construct. Since coding is necessarily subjective, to verify it we sent emails to all company contacts in the announcements. Our scheme was consistent with the responses received.

As a result of these precautions, the coding was expected to be highly reliable. The appendices show examples of the coding.

### 3.4. Abnormal returns

The Center for Research on Securities Prices (CRSP) provides detailed daily data on stock prices of all publicly traded firms in the US. Stock price information was collected from their database following the precautions recommended for conducting event studies [40]. We checked near the dates of the announcements ( $t = -2, +2$ ) to eliminate confounding announcements, such as mergers, stock-splits and analyst upgrades that were likely to influence any abnormal returns during the event window. This resulted in the deletion of one announcement from the sample. Further, the length of the event window was an important design issue. As summarized by McWilliams and Siegel, longer event windows severely reduce the power of the test statistic, which in turn leads to false inferences about the significance of the event. However, it is important to choose a window that captures the effect of an announcement; if the information content of an announcement is leaked before it is released to the press, the effect of the information will occur before the announcement is released. Shorter windows help to

control for confounding effects of other announcements that can affect firm performance. It has also been shown empirically that a short event window usually captures the significant effect of an event. Therefore, following a recent study, we used an event window of  $t = (-1, +1)$  to capture the effects of the E-business project announcements on firms' abnormal returns.

There are three common procedures to calculate abnormal returns—mean adjusted, market adjusted and the market model returns [7]. The most commonly used procedure for calculating abnormal returns is the market model, which controls for the historical relationship between the abnormal returns of a firm with the abnormal returns to an index. Market adjusted returns are the difference between the firm's abnormal returns and those of an index on a given day. It has been shown that there is little difference in test statistics between the market model and market adjusted models for abnormal returns in event studies under a wide range of applications [37]. Since market adjusted returns are easier to compute, they are increasingly popular in event studies and several studies have been conducted with the market adjusted model [45]. We have presented results with both the complete and market adjusted model. Abnormal returns and test statistics were collected using Eventus, a software package that interfaces between SAS and the CRSP database and computes the abnormal returns for specified event windows using specified models. Abnormal returns for firm  $i$  on Day  $t$ ,  $A_{i,t}$  are:

$$\begin{aligned} A_{i,t} &= R_{i,t} - (\alpha_i + \beta_i R_{m,t}) \quad (\text{market model}) \\ A_{i,t} &= R_{i,t} - R_{m,t} \quad (\text{market adjusted model}) \end{aligned} \quad (1)$$

where,  $\alpha_i$ ,  $\beta_i$  are the coefficients from the market model for firm  $i$ ;  $A_{i,t}$  the abnormal returns for firm  $i$  on Day  $t$ ;  $R_{i,t}$  the returns to firm  $i$  on Day  $t$ ;  $R_{m,t}$  the returns to the S&P 500 composite index on Day  $t$ .

The index used was the S&P500 composite index obtained from the CRSP database (see [6,7,11]).

To test for the influence of our contingency factors on market reactions to outsourcing announcements, a cross-sectional regression model suggested by MacKinlay was used. Firm size was used as a control variable in the regression [21]. In the cross-sectional regression, given a sample of  $N$  abnormal return observations and  $M$  characteristics, the regression model was:

$$E(\text{AR}_j) = \delta_0 + \delta_1 \cdot x_{1j} + \dots + \delta_M \cdot x_{Mj} \quad (2)$$

where,  $\text{AR}_j$  is the  $j$ th abnormal return observation;  $X_{Mj}$  the  $M$  characteristics for the  $j$ th observation;  $\delta_M$  the regression coefficients estimated using a linear regression model.

Table 1  
Tabulation of announcements (total N = 96)

Variable	Levels	Frequency
Project strategic intent	Other	65
	Commercial	31
Project task complexity	Low	62
	High	34
Project execution swiftness	Regular	73
	Swift	23

Inferences were drawn from the sign, magnitude and significance of the regression coefficients. Summarizing the above, the equation estimated in the research was:

$$CAR_j(-1, 1) = \beta_0 + \beta_1 intent_j + \beta_2 swiftness_j + \beta_3 complexity_j + \beta_4 \log asset_j \quad (3)$$

where,  $CAR_j$  is the cumulative abnormal returns for firm  $j$ ;  $intent_j$  the project strategic intent for E-business project (i.e., firm)  $j$ ;  $swiftness_j$  the project execution swiftness for E-business project (i.e., firm)  $j$ ;  $complexity_j$  the task complexity for E-business project (i.e., firm)  $j$ ;  $\log asset_j$  the log of assets of firm  $j$  at the end of the year preceding the announcement.

#### 4. Results

Table 1 provides a cross tabulation of the announcements analyzed for project execution swiftness with project strategic intents and project task complexity. Table 2 presents the Spearman rank correlations

Table 2  
Spearman rank correlations among independent variables

	Project execution swiftness	Project task complexity
Project strategic intent	0.134	0.28 <sup>a</sup>
Project execution swiftness		0.146

<sup>a</sup> Significant at the 0.01 level.

between the independent variables. The nonparametric correlation coefficient was particularly useful for coded variables since they are generally not normally distributed [43]. Table 2 indicates that there was no significant problem of multi-collinearity between the independent variables.

#### 4.1. Eventus results

We first estimated the mean cumulative abnormal returns for both the market and market adjusted models for the (-1, +1) window using the Eventus software [15] for each level of project strategic intent, project execution swiftness and project task complexity. These models were run to estimate the mean CARs and to test whether they were different from 0 for the full sample and for the various rows and columns in Table 1 using Patell’s  $z$  statistic [44]. Results of this analysis were presented in Table 3. The first line in a cell indicates the CAR and its significance while the second indicated the sample size for that cell.

The CARs and significance of the  $z$  statistic shown in Table 3 provided support for hypotheses H1 and H2 while contradicting H3. As hypothesized in H1, the CARs for firms with the commercial exploitation

Table 3  
CARs and  $z$ -statistics

Strategic intent	Other intents		Commercial exploitation intent	
	Market	Market	Market	Market
	Model (-1, +1)	Adjusted model (-1, +1)	Model (-1, +1)	Adjusted model (-1, +1)
CAR	-1.75%**	-1.57%**	2.05%**	2.12%**
N	n = 65	n = 65	n = 31	N = 31
Project execution swiftness	Regular execution	Market adjusted model (-1, +1)	Swift execution	Market adjusted model (-1, +1)
CAR	-1.73%**	-1.38%*	3.3%***	2.81%***
N	n = 73	n = 73	n = 23	n = 23
Task complexity	Low	Market adjusted model (-1, +1)	High	Market adjusted model (-1, +1)
CAR	-2.28%*	-1.71%*	2.08%*	1.65%*
N	62	62	34	34

\*\*\* Significant at 0.001; \*\* significant at 0.01; \* significant at 0.05.

strategic intent (2.05% and 2.12% for market and market adjusted models, respectively), were not only positive and highly significant, they were also much higher than the CARs for non-commercial strategic intents (−1.75% and −1.57% for market and market adjusted models, respectively). In fact, the CARs for non-commercial intents were negative, indicating that markets punished firms for investing in E-business outsourcing projects without commercial intent. H2 was also supported as the CARs for swift execution (3.3% and 2.81% for market model and market adjusted models, respectively), were positive and significant while the CARs for regular execution are negative and significant (−1.73% and −1.38% for the two models). However, contrary to H3, the CARs for high task complexity were positive and significant (2.08% and 1.65%) whereas CARs for low task complexity (−2.28% and −1.71%) were negative and significant.

#### 4.2. Multiple regression results

To test the hypotheses, we also used the cross-sectional linear regression test. The results of this are reported in Table 4. Whereas the sub-sample statistics indicated the trends in the ARs, the regression allowed us to test for the statistical significance of these differences. The significance of the overall model during the event window indicated that at least one of the hypothesized predictors significantly influenced abnormal stock market reactions around the event date in each model. The adjusted  $R^2$  of the model exceeds 0.20, indicating that 20% of the variance observed in the abnormal returns during the event window is explained by the predictors in our model. This compared satisfactorily with comparable reported event studies.

Table 4  
Standardized regression coefficients for (−1, +1) window ( $N = 96$ )

	Market model ARs	Market adjusted model ARs
Dependent variable		
Model F	7.77***	7.21***
Adjusted $R^2$	0.22	0.21
Independent variables		
Constant		
Strategic intent	0.23**	0.26***
Project execution swiftness	0.36***	0.34***
Task complexity	0.16*	0.12
Log (assets)	−0.12	−0.17*

\*Significant at 0.05; \*\* significant at 0.01; \*\*\* significant at 0.001. All significance levels are one-sided.

Examining the coefficients of the independent variables for both models indicated the directionality and significance of their impact on the market reaction. The results indicated that the stock markets were sensitive not only to the strategic intent of E-business outsourcing announcements but also to other drivers. We found a significant and positive influence of strategic intent on abnormal market returns, which indicated that the market rewards were greater for initiatives with the intent of commercial exploitation than for initiatives intended to improve internal IT or business operations. Whereas prior event studies suggested that transformative IT investments yielded positive abnormal returns, we found that the intent of commercial exploitation generated positive abnormal returns.

The coefficient of project execution swiftness was positive and significant, as expected from H2. This supported the view that outsourcing was an effective strategy for firms in mobilizing business and technical resources for projects when there was a need to execute projects swiftly.

Contrary to expectations, however, the coefficient for project task complexity was positive. Though this coefficient was only significant in one model, the results suggested that stock markets were not adversely affected by the level of coordination necessary to execute projects with high task complexity.

As expected, larger firms had smaller abnormal returns, though this result was significant only in one model. We also examined the sensitivity of the results by looking at abnormal returns for the pre-announcement period (−30, −2). The regression was insignificant, indicating that the effects were observed only around the dates of the announcements.

## 5. Discussion and managerial implications

We have presented the results of an event study that examined stock market reactions to characteristics of publicly announced E-business projects. Table 5 summarizes the hypotheses and corresponding findings.

Our paper first addressed the question:

- Do stock markets recognize the role of the drivers of E-business outsourcing decisions and reward firms that make appropriate outsourcing choices with positive abnormal returns?

We used cumulative abnormal returns as a dependent variable to provide an objective firm-level performance measure to evaluate appropriateness of the outsourcing decision.

Table 5  
Research hypotheses and findings

Hyp.	Variable hypothesized to influence abnormal stock market returns associated with E-business sourcing announcements	Hypothesized influence on abnormal returns	Confirmed?	Significance level and test (from Table 3 and Table 4)
H1	Strategic intent	(+)	Yes	0.001 (Table 3 and Table 4)
H2	Execution swiftness	(+)	Yes	0.05 (Table 3 and Table 4)
H3	Task complexity	(–)	No	0.05 (Table 3)

The literature on corporate announcements suggested that stock markets react to certain categories of strategic announcements more than others. For example, yearly many firms spend large amounts to change their names. These changes require significant top-management attention and effort and are intended to provide better signals to investors about the primary business activities of the company. However, in a study of the 147 name changes reported in the Wall Street Journal from 1979 to 1987, it was found that the announcement yielded insignificant positive returns [29] though another study found that name changes yielded positive abnormal returns.

We also studied, for the first time, three outsourcing contingency factors – project strategic intent, project execution swiftness and project task complexity – in the context of E-business outsourcing. We found that stock markets reacted positively to E-business outsourcing announcements with the strategic intent of commercial exploitation. Also, such projects that were planned to be swiftly executed to overcome the potential risks of business requirements obsolescence and technology change and obsolescence triggered positive stock market reactions. Finally, outsourced E-business projects with high task complexity achieved positive abnormal returns. These contingency factors explained more than 20% of the variance in abnormal returns, which is very satisfactory.

One of our most important contributions was the identification of stock market rewards to E-business outsourcing decisions when projects need swift execution; our results showed that stock markets reward firms for outsourcing when it is necessary. The contradictory results for task complexity suggest that stock markets are not influenced by concerns over coordination.

It is necessary to point out the limitations of the research. The first is associated with the use of stock market reactions as measures of the business impact of E-business initiatives. Though our data sample includes pre- and post-bubble period announcements, stock markets were volatile during the period of data collection. Also, the novelty of electronic commerce

led to significantly high valuations for E-business initiatives then.

The results have important implications for IS managers. They provide a basis for deciding upon the kinds of electronic commerce projects likely to increase the firm's value and also to help decide whether to outsource them. We have provided support for recent suggestions that IS managers should focus their attention on identifying and implementing bread and butter E-business projects that bring measurable financial returns. Good projects directly impact the business by increasing revenue or by developing and marketing new services that can generate new revenue streams.

#### Appendix A. Companies and dates of announcements

Sl. no	Company	Date of announcement
1	ADC Telecommunications	9/21/2000
2	Autodesk Inc.	6/14/2000
3	Ameren Corp.	3/23/2000
4	Ameren Corp.	10/3/2000
5	Aetna Inc.	11/17/1999
6	American Power Conversion	12/10/1999
7	Air Products & Chemicals	7/27/2000
8	American Express Co.	8/3/2000
9	Boeing Co.	7/21/2000
10	Bank Of America Corp.	1/10/2000
11	Bank Of America Corp.	5/22/2000
12	Best Buy Company Inc.	1/20/2000
13	Best Buy Company Inc.	6/7/2000
14	Burlington Coat Fact	7/17/2000
15	Bard CR Inc.	5/22/2000
16	Budget Group Inc.	3/2/1999
17	Black & Decker Corp.	11/8/2000
18	BP Amoco	5/24/2000
19	BEC Energy	3/24/1999
20	Caterpillar Inc.	10/10/2000
21	Corporate Express	2/1/1999
22	Cinergy Corp.	1/5/2000
23	Celadon Group Inc.	2/7/2000
24	Chase Manhattan Corp.	11/2/1999
25	CSG Systems Intern	6/5/2000
26	Centex Corp.	3/23/2000
27	Dominion Resources	8/9/2000

**Appendix A (Continued)**

Sl. no	Company	Date of announcement
28	Delta Airlines	3/1/1999
29	Dow Chemical Co.	7/17/2000
30	Dow Chemical Co.	8/28/2000
31	Emerson Electric Co.	8/21/2000
32	Just For Feet Inc.	2/3/1999
33	Frontier Airlines In	3/24/1999
34	First Union Corp	3/22/2000
35	General Electric Co.	6/6/2000
36	General Motors Corp.	5/17/2000
37	General Motors Corp.	12/20/1999
38	Glaxosmithkline Plc	8/24/2000
39	Halliburton Company	8/3/2000
40	Hilton Hotels Corp.	6/1/2000
41	Kaufman & Broad Home	5/4/2000
42	Kansas City Pwr & Lt	3/23/2000
43	Kinder Morgan Inc.	2/7/2000
44	Liz Claiborne Inc.	7/19/2000
45	Louisiana Pacific Co.	9/21/2000
46	McDonalds Corp.	6/22/2000
47	Merrill Lynch & Co. I	1/19/2000
48	McGraw Hill Cos Inc.	8/29/2000
49	Progressive Corp.	6/5/2000
50	Pulte Corp.	1/18/2000
51	Portugal Telecom	12/20/2000
52	Praxair Inc.	4/20/2000
53	Royal Bank Canada	1/18/2000
54	Royal Bank Canada	2/25/1999
55	Scana Corp New	10/5/1999
56	Staples Inc.	3/8/2000
57	Southern Union Co.	1/7/1999
58	Transmation Inc.	2/25/1999
59	Textron Inc	1/10/2000
60	Wells Fargo & Co.	8/1/2000
61	Wells Fargo & Co.	12/6/1999
62	AOL Time Warner In	11/26/2002

**Appendix A (Continued)**

Sl. no	Company	Date of announcement
63	Best Buy Company Inc.	5/22/2002
64	Best Buy Company Inc.	9/16/2002
65	Brunswick Corp.	3/12/2001
66	Black & Decker Corp.	2/21/2001
67	Delta Air Lines Inc.	3/29/2001
68	Du Pont	2/15/2001
69	Deere & Co.	8/6/2001
70	Eastman Chemical Co.	1/8/2001
71	Eastman Chemical Co.	5/7/2002
72	Eastman Chemical Co.	5/8/2001
73	Ford Motor Co. Del	9/23/2002
74	General Motors Corp.	3/29/2001
75	General Motors Corp.	11/5/2001
76	Grainger WW Inc.	2/27/2001
77	Grainger WW Inc.	3/19/2001
78	Hilton Hotels Corp.	1/16/2001
79	Hershey Foods Corp.	9/18/2001
80	JP Morgan Chase & C	1/18/2001
81	K Mart Corp.	8/21/2001
82	Matsushita Electric	3/27/2002
83	Metlife Inc.	8/1/2001
84	Mcgraw Hill Cos Inc.	3/12/2001
85	Motorola Inc.	6/6/2001
86	Marathon Oil Corp.	8/9/2001
87	Pitney Bowes Inc.	2/12/2001
88	Procter & Gamble Co.	2/15/2001
89	Safeway Inc.	7/16/2001
90	Timberland Co.	3/5/2001
91	TRW Inc.	6/18/2001
92	Union Pacific Corp.	2/8/2001
93	United Technologies	2/1/2001
94	Wellpoint Health Net	6/19/2001
95	Wal Mart Stores Inc	10/21/2002
96	Xerox Corp.	1/17/2001

**Appendix B. Coding examples**

Construct	Classification	Example
Strategic intent	IS improvement	DOW (07/17/2000) ... the Dow Chemical Company (NYSE: DOW) will utilize CrossWorlds Software to better integrate its systems infrastructure. ... Together, CrossWorlds and Andersen Consulting ... will provide a critical link between our internal applications and the external world of the Internet." Dow will use a number of CrossWorlds' pre-built integration modules and process design tools to enable the integration of data such as customer, orders, bill of material and employee information.
	Commercial exploitation	KLT (03/23/2000) KLT Inc. ... signed on as partner in the development [of Enporion], which is expected to go live in second quarter 2000. The vertical exchange seeks to streamline companies' purchasing processes while aggregating companies for increased buying power of equipment and services ranging from office supplies to transformers to heavy machinery. "This joint venture is consistent with Kansas City Power & Light's strategy of maximizing shareholder value by capturing growth opportunities outside our core regulated utility business," said Greg Orman, president of KLT Inc. "This vertical exchange for the electrical utilities industry effectively brings an old economy market into the new economy."

**Appendix B** (Continued)

Construct	Classification	Example
Project execution swiftness	Existence of time pressure and proactive managerial response	TXT (01/10/2000) As part of a continuing company-wide initiative to further accelerate and support its E-business activities, Textron Inc. today announced an agreement in principle to form a strategic alliance with Safeguard Scientifics, an internet holding and operating company with a network of 250 internet-related technology companies. Textron Chairman and Chief Executive Officer Lewis B. Campbell said, “As a multi-industry company with a common operating and management focus, Textron is able to maximize its diversity and drive its E-business strategy throughout the enterprise. By accessing and leveraging the broad technological expertise of Safeguard’s partner network, Textron is making E-progress at E-speed.” . . . “We don’t have time to wait. I happen to think this technology is going to sweep over us,” explained Lewis Campbell, Textron’s chief executive officer.
	No discernible time pressure and no managerial response for swift action	AET (11/17/1999) Infosys will support Aetna’s offshore initiatives and assist the company in transforming itself into an E-Business enterprise. . . . After 6 months of evaluation and a short list of three companies, Aetna management chose Infosys as its long-term partner
Task complexity	Low	Xerox 01/17/2001 To communicate more consistently and effectively with customers around the world, Xerox Corporation (NYSE: XRX) has redesigned its corporate Web site and infrastructure to serve more countries and to offer more online features, customizable services and speed. The global site . . . increases the site’s speed, flexibility and reliability. It also makes it easier for the xerox.com team to manage and update pages for each country now served. The site will recognize when an Argentine customer, for instance, comes to <a href="http://www.xerox.com">www.xerox.com</a> . It will then display all Web pages in Spanish, with up-to-date pricing in local currency.
	High	TRW 06/18/2001 TRW Aeronautical Systems has launched its E-business portal, AeroVantix(TM), using Izodia InTrade(TM) as their strategic E-commerce platform . . . AeroVantix is the world’s first fully functional, all-encompassing aerospace E-business portal that ensures TRW Aeronautical Systems’ customers have 24 × 7 access to the company and its supply base. “We listened and talked to many companies in the industry, and then decided to move forward and implement a fully integrated, benefits-derived solution which should significantly improve our service and performance to all our customers,” said Ken Maciver, President and CEO, TRW Aeronautical Systems. “E-Business fundamentally changes the way you do business and can streamline processes if properly deployed. We are a long-term player in the industry and see this launch as a significant investment in our future.”

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