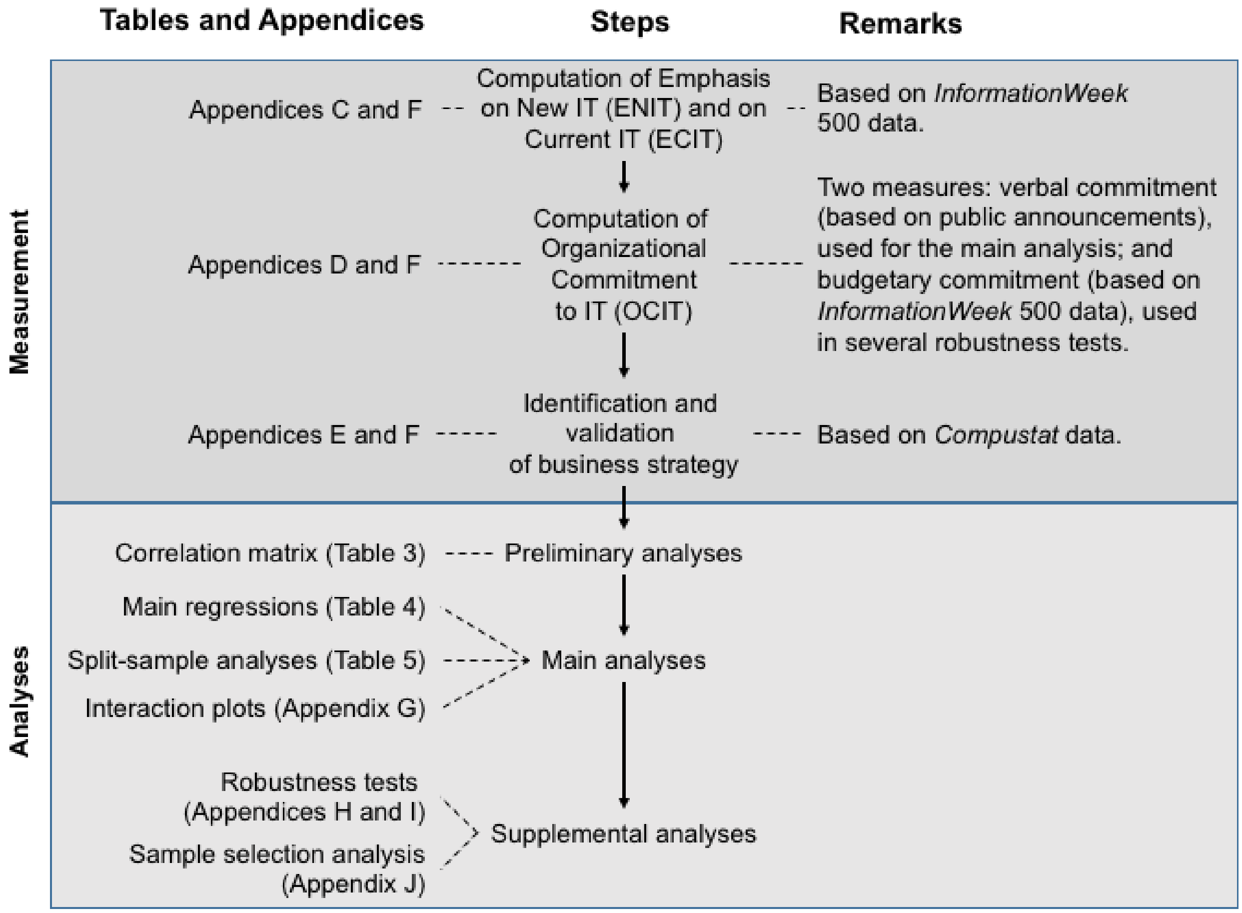
Appendix A. Information Technologies[a] in the *InformationWeek* Survey

No.	Information technologies in the *InformationWeek* survey	2000	2001	2002	2003	2004	2005	2006	2007
1	Ajax development tools							X	X
2	Applications constructed of reused components or objects			X	X				
3	Asset-management software						X	X	X
4	B2B collaboration tools			X	X				
5	Business performance-management software					X	X	X	X
6	Business process-management software				X	X	X	X	X
7	Business-intelligence tools			X	X	X	X	X	X
8	Commercial open-source software							X	X
9	Content filtering/anti-spam software					X	X	X	X
10	Content-management software					X	X	X	X
11	Customer-resource management (CRM) systems	X	X	X	X	X	X		
12	Data warehouse	X	X	X	X	X	X		
13	Dual-core/multi-core processors in PCs or servers							X	X
14	E-commerce applications	X	X	X	X				
15	Electronic business: supply chains	X	X	X	X				
16	Encrypted customer records							X	X
17	Enterprise application integration software	X	X						
18	Enterprise resource planning (ERP)	X	X	X	X	X	X		
19	Grid computing					X	X	X	X
20	Instant messaging				X				
21	Internal collaboration tools			X	X				
22	Intrusion-detection software					X	X	X	X
23	Java applications			X	X				
24	Java programming tools	X	X						
25	Knowledge management and collaborative software	X	X						
26	Linux tools or applications	X	X	X	X	X	X	X	X
27	Mapping/global positioning system technologies						X	X	X
28	Mobile commerce applications			X	X	X	X	X	
29	Mobile enterprise applications								X
30	OLAP or data mining tools	X	X						
31	Product lifecycle management software					X	X		
32	Project-portfolio management software						X		
33	Remote access software				X		X		
34	RFID (Radio frequency identification) technology						X	X	X
35	Server virtualization								X
36	Service-oriented architecture							X	X
37	Supply-chain software					X	X		
38	Virtual private network	X							
39	WAN optimization/application acceleration								X
40	Web services (Applications using SOAP, UDDI, XML)			X	X	X	X	X	X
41	XML-based applications	X	X	X					

[a] No individual year's available technologies include all 41 IT that appear in the surveys over the covered period. Sixteen infrastructural IT are excluded: fiber-optic local area networks; handhelds (using IT such as Windows CE, Palm OS); Internet application servers (PC or RISC CPUs); IP storage; networked storage (SANs); telecommunications services such as leased lines, WAN, and Internet; Unix multiprocessing servers; voice-over IP applications; Windows 2000 desktop; Windows 2000 server; Windows server 2003; Windows XP desktop (professional); wireless e-mail; wireless fidelity (Wi-Fi); wireless LANs; and wireless network services.

Appendix B. Roadmap of Analyses



Appendix C. Computation of ENIT and ECIT

The two focal constructs in this research reflect the emphasis that firms place on either new IT investments (i.e., ENIT) or continuing IT investments (i.e., ECIT). They are measured using a portion of the *InformationWeek* survey that has seen minimal use in the prior literature. The *InformationWeek* data set is collected annually through a survey and focuses on the 500 firms considered to be the most innovative by a panel of *InformationWeek* editors. The set of 500 firms varies from year to year. Estimation of both ENIT and ECIT for a year involves data for that year as well as the preceding year. Therefore, firms from the data set are dropped when they are not in the *InformationWeek* list for the preceding year. Consider Table C1, which provides a simple example of firm composition from 2000 to 2007. Firm A provides only one data point for the analyses as we cannot calculate ECIT for 2001 due to missing values of 2000. Firm B is not used at all as there are no consecutive years in the sample. Firm C provides five data points; 2000 and 2004 are not used as they miss lagged observations. Firm D provides data only for 2007 because the lagged variables for 2000 and 2006 are missing. Finally, Firm Z is not used because the lagged variables are missing for the only year (2000) for which it provides data.

--- Insert Table C1 about here ---

The *InformationWeek* data set involves considerable changes in firms from one year to next. Indeed, only nine firms in the sample have data for every year in the study. Because the preceding year's data is required for measuring ENIT and ECIT and generalized least squares estimation is used to address autocorrelation, the data for the study is reduced from 2,224 firm-year observations to 687.

After identifying the observations for estimating ENIT and ECIT, each is operationalized as the summated number of information technologies invested in the corresponding category in each year by each firm. To explain the categorization of investments by a firm as either ENIT or ECIT, we use set notation. Assume T is the global set of all 41 IT included in the *InformationWeek* survey:

$$T = \{t_1, t_2, \ldots, t_{41}\}$$

The set of available information technologies to choose from in each year's survey is denoted by AT_{t}, such that this set is a strict subset[a] of the global set of IT, T:

$$AT_{\mathrm{t}} = \{at \mid at \in T\}, (AT_{\mathrm{t}} \subset T)$$

We define a portfolio of information technologies that firm i invests in year t as a subset of each year's available information technologies, AT:

$$P_{it} = \{p \mid p \in AT\}, (P_{it} \subseteq AT_t)$$

ENIT for firm i in year t is determined as the cardinality[b] of the intersection between P_{it} and the subtraction of $P_{i(t-1)}$ from $AT_{i(t-1)}$. This maintains that the computation of *ENIT* for a firm is based on only those information technologies in which the firm invested in during the current year, did not invest in the preceding year, and were specifically included in the *InformationWeek* survey in the preceding year:[c]

$$ENIT_{it} = |((AT_{i(t-1)} - P_{i(t-1)}) \cap P_{it})|$$

ECIT for firm i in year t is determined as the cardinality of the intersection between P_{it} and $P_{i(t-1)}$. This maintains that only those information technologies in which the firm invests in the current year as well as the preceding year are counted as *ECIT:*

$$ECIT_{it} = |P_{it} \cap P_{i(t-1)}|$$

Table C1. Sample ENIT and ECIT Data Set[d]

Firms	2000	2001	2002	2003	2004	2005	2006	2007
Firm A		X	X					
Firm B	X			X				
Firm C	X	X	X		X	X	X	X
Firm D	X						X	X
…								
Firm Z	X							

[a] No individual year’s available technologies include all 41 technologies that appear in the surveys over the covered period.
[b] Number of elements of the set.
[c] No firm invested in an IT in years t and t' ($t' < = t-2$), but not in year $t-1$. Hence, tracking of two consecutive years can establish whether an investment is new to a firm.
[d] Shaded cells indicate observations used in the analysis.

Appendix D. Sample Annual Report Information

Black & Decker, Inc. 2007 Annual Report		
No.	Text	Relevance of IT
1	With an ever-growing purchase base, impressive global capabilities and new **information systems**, the procurement team is focused on optimizing cost, delivery, and quality. In a "sellers" market accompanied by substantial inflationary pressures, supply management must achieve productivity through a total cost focus, striving to manage warranty, transportation and sourced product costs.	IT is regarded as an aid to reduce the costs of procurement.
2	Transactional Process Improvement – We are successfully employing many of the foundational lean tools to transform our back office and professional processes, reducing waste and cycle times while improving efficiency. Furthermore, lean has become the language of Stanley, a common set of tools, processes and practices universally used and understood across the company that is especially powerful when combined with **information technology**.	IT is regarded as a resource complementing the improved transactional processes.
3	During 2007, we made considerable progress implementing technology both inside and outside Stanley. Internally, our platform upgrade initiatives are moving forward quickly and successfully according to our long-range **information technology** strategy. Externally, we've achieved significant successes using **IT** to improve integration and collaboration with our supply chain partners and customers. This will accelerate even further during 2008 and beyond.	Plans for IT extension are discussed internally and externally.
4	The higher capital expenditures in 2007 pertained to investments for plant productivity improvements as well as ongoing information system spending for a major **ERP** implementation under way in the Americas. The increase in 2006 capital expenditures versus 2005 was due to upgrades of **information systems**, the incremental impact of normal capital spending incurred by recent acquisitions, and equipment purchases related to new product introductions.	IT is referred to as a reason for an increase in the firm's expenditures.
5	Outsourcing and other commitments are comprised of: \$13.4 million for outsourcing arrangements, primarily related to **information systems** and **telecommunications**; and \$7.6 million in marketing obligations.	IT is referred to as a main contributor to outsourcing expenditures.

Appendix E. Identification and Validation of a Firm's Business Strategy

Each firm's business strategy in each year is classified using the popular typology of Prospectors, Analyzers, and Defenders proposed by Miles and Snow (1978). Six strategic attributes (scope, liquidity, asset efficiency, fixed-asset intensity, long-range financial liability, and research and development (R&D) intensity) are used to represent the strategic profile of each firm (Sabherwal and Sabherwal 2007). Next, we discuss these attributes, their measures, and ideal values for Prospectors, Analyzers, and Defenders.

Scope represents the diversity of the firm's lines of business. Doty et al. (1993) and Sabherwal and Sabherwal (2007) use a variable with the same name, and it is similar to Porter's (1980) "competitive scope." It is measured as the natural log of the number of four-digit Standard Industrial Classification (SIC) codes,[a] and its ideal values are set as low, medium, and high, respectively, for Prospectors, Analyzers, and Defenders, based on the prior literature (Shortell and Zajac 1990, Delery and Doty 1996, Sabherwal and Sabherwal 2007).

Liquidity represents the availability of current assets, such as cash, required to address the firm's short-term obligations (Segev 1989, Sabherwal and Sabherwal 2007). It is measured as the current ratio, that is, the ratio of current assets to current liabilities. The ideal values for liquidity are set as high, medium, and low, respectively, for Prospectors, Analyzers, and Defenders (Segev 1989, Smith et al. 1989, Sabherwal and Sabherwal 2007).

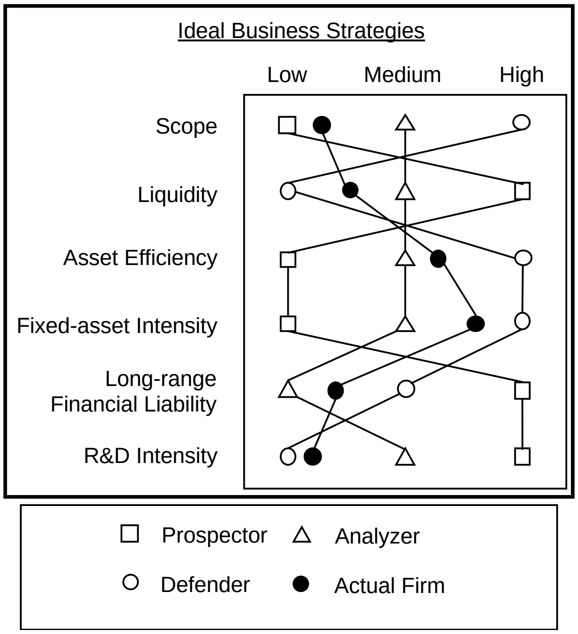
Asset efficiency represents the firm's ability to use its assets in an efficient fashion to generate greater sales (Miles and Snow 1978, Doty et al. 1993). It is measured as total asset turnover, that is, the ratio of sales to total assets. The ideal values for asset efficiency are set as low, medium, and high, respectively, for Prospectors, Analyzers, and Defenders (McDaniel and Kolari 1987, Segev 1989, Doty et al. 1993).

Fixed-asset intensity represents the extent to which the firm invests in fixed assets (e.g., plant and machinery) rather than current assets (Hambrick 1983). Similar to "capital intensiveness" (Beard and Dess 1981) and "investment in production" (Segev 1989), it is measured as the ratio of fixed assets to total assets. The ideal values for fixed-asset intensity are set as low, medium, and high, respectively, for Prospectors, Analyzers, and Defenders (Hambrick 1983, Segev 1989, Sabherwal and Sabherwal 2007).

Long-range financial liability represents the firm's long-term debt relative to its equity (Sabherwal and Sabherwal 2007). It is measured as the debt-to-equity ratio. The ideal values for long-range financial liability are set as high, low, and medium, respectively, for Prospectors, Analyzers, and Defenders (Segev 1989, Sabherwal and Sabherwal 2007).

R&D intensity represents the firm's investment in R&D relative to its net sales (Hambrick 1983, Sabherwal and Sabherwal 2007). It is measured as the ratio of R&D expense to net sales. The ideal values for R&D intensity are set as high, medium, and low, respectively, for Prospectors, Analyzers, and Defenders (Hambrick 1983, McDaniel and Kolari 1987). Figure E1 depicts the strategic profiles for Prospectors, Analyzers, and Defenders along with a hypothetical sample firm profile.

Figure E1. Ideal Business Strategies



We use the profile deviation approach, which is common in the prior literature (e.g., Sabherwal and Chan 2001, Sabherwal and Sabherwal 2007, McLaren et al. 2011), to identify the strategic type to which each firm belongs in a given year. We measure the above six attributes for each firm-year observation and compute the deviation of each firm's realized profile from the proposed ideal profiles of Prospectors, Analyzers, and Defenders. However, before computing profile deviation, we normalize each strategic attribute using the sample mean and standard deviation for that year. This provides an actual profile of strategic attributes for each firm, as shown by an actual firm-year example in Figure E1. We then compare the actual profiles with each of the three ideal profiles of Prospectors, Analyzers, and Defenders to determine the profile that best fits that firm-year observation. We operationalize high, medium, and low values for ideal business strategy attributes (shown in Figure E1) as 0.5, 0.0, and –0.5, respectively (Sabherwal and Chan 2001). We then calculate the deviations between strategic attributes by using the root mean square (RMS) distances between each firm's strategy and the ideal profiles for Prospectors, Analyzers, and Defenders. Thus, we calculate the RMS representing a firm's deviation from Prospectors as the square root of $\sum_{i=1}^{n} d_i^2$ where d_i is the distance between the firm's score in terms of business strategy attribute i and the ideal business strategy attribute for Prospectors for that attribute, with n being the number of attributes used in the analysis ($n = 6$ in this study). This procedure results in the classification of 2,224 firm-year observations in the sample into 489 Prospectors, 931 Analyzers, and 804 Defenders.

To assess the validity of the categorization of each firm-year observation into Prospector, Analyzer, or Defender based on the profile-deviation approach, we calculate two values for each firm-year observation. The first value is the average RMS between the firm-year observation and all other firm-year observations within the same strategic type; we call this value the "mean distance from own strategy." For example, if an observation is categorized as a Prospector, its distance (based on the six categories depicted in Figure E1) from each of the other observations categorized as Prospector is calculated and then averaged to calculate the distance from its own strategy. The second value estimates the "mean distance from other strategies." We calculate this by first estimating the RMS between the focal observation and all other observations that are categorized to have a business strategy different from the focal observation. For example, for the observation categorized as a Prospector, its average RMS distance from observations categorized as Analyzer or Defender is computed. Then, for each observation, we compare the value of distance from its own category to the distance from other categories. To conduct this test, for each observation we calculate the value of (mean distance from other categories – mean distance from own category). Then, we conduct a *Z*-test to check if this value is significantly greater than zero in the subsamples of Prospectors, Analyzers, and Defenders. Table E1 provides the results of this analysis. The results indicate that firms classified within each strategy are significantly closer to firms within in its own strategy than firms in the other two strategies.

--- Insert Table E1 about here ---

For a deeper exploration of the differences between business strategies, we conduct a Scheffé (1959) test to compare a series of attributes that are not used in the identification of each strategy. The results indicate that the firms pursuing each of the strategies differ as expected based on prior research. We find Prospectors to be smaller, in terms of the number of employees, than both Defenders and Analyzers ($p < 0.001$), as expected (Doty et al. 1993). Furthermore, Analyzers have a higher level of related diversification, as measured via related entropy, than both Defenders and Prospectors ($p < 0.001$) as expected based on the prior literature (Segev 1989, Shortell and Zajac 1990). We find that Defenders have a greater market share than both Analyzers and Prospectors ($p < 0.001$), which is consistent with their efforts to seal off their market competitors (Miles and Snow 1978, Sabherwal and Chan 2001). Finally, consistent with Miles and Snow's (1978) conceptualization of the strategies as equally viable for a firm, we find no significant difference ($p > 0.05$) across strategies in either return on assets or return on sales (Zahra and Pearce 1990). Thus, based on this series of analyses, we feel confident that the strategies identified in this study provide conceptually appropriate attributes for each of the three strategies.

Table E1. Validation of the Classification of Firm Strategies[b]

Strategy	Mean of distance from the other two strategies – distance from own strategy	Std. dev.	*N*	*z*	*p*-value
Prospector	1.03	0.32	142	3.22	$p < 0.001$
Analyzer	0.86	0.39	330	2.21	$p < 0.05$
Defender	0.94	0.28	215	3.36	$p < 0.001$

[a] The number of four-digit SIC codes is a proxy for the number of lines of business of a firm, which is commonly used in accounting and finance to measure firm diversification (e.g., Bhushan 1989, Campa and Kedia 2002).

[b] Std. dev. indicates the standard deviation of the difference between the distance from the other strategies and the firm's own strategy. *z*- and *p*-values pertain to the mean of the distance from the other two strategies minus the distance from own strategy being greater than zero.

Appendix F: An Illustrative Example

We illustrate the calculation of key constructs (i.e., business strategy, OCIT, ENIT, and ECIT) using the example of Black & Decker for 2007.

First, we categorize Black & Decker's business strategy in 2007 into Prospector, Analyzer, or Defender. Using the measures discussed in Appendix E, we compute the six business strategy attributes for Black & Decker in 2007 as shown in Table F1. The RMS distance of Black & Decker's profile is lowest (0.59) from the ideal profile of Analyzers. Therefore, we categorize Black & Decker as an Analyzer in 2007.

--- Insert Table F1 about here ---

Next, to estimate the levels of ENIT and ECIT for the firm in 2007, we consider the technologies from the *InformationWeek* surveys for 2006 and 2007, and identify the subset of these technologies in which Black & Decker invested in each year. As illustrated in Table F2, of the four new technologies in which Black & Decker invested in 2007, only one (mapping/global positioning system technologies, #27) was also in the list in 2006. Thereby, the count of the newly invested technologies for Black & Decker in 2007 is one (hence, ENIT = 1). On the other hand, 13 of the 17 technologies in which Black & Decker invested in 2007 can be categorized as continuing investments (hence, ECIT = 13).

--- Insert Table F2 about here ---

Finally, to assess OCIT for Black & Decker in 2007, we rely on two measures. The main measure of OCIT, verbal commitment, is based on the use of IT-related keywords in the firm's annual report of 2007. Black & Decker's annual report includes 1,453 sentences, of which 17 sentences include words pertaining to IT. Thus, the verbal measure of OCIT for Black & Decker in 2007 is 1.17%. The second measure of OCIT, budgetary commitment, is based on the proportion of annual sales the firm allocates to IT and is used for some of the robustness tests. Because Black & Decker reported this as 2.04% in the *InformationWeek* survey in 2007, the budgetary measure of OCIT is 2.04%.

Table F1. Identification of Business Strategy

Business strategy attribute	Value for Black & Decker in 2007 (normalized value in parentheses)	Ideal value for Prospectors	Ideal value for Analyzers	Ideal value for Defenders
Scope	0.69 (1.02)	High = 1.0	High = 1.0	Low = -0.5
Liquidity	1.51 (-0.16)	High = 1.0	Medium = 0	Low = -0.5
Asset efficiency	1.21 (-0.04)	Low = -0.5	Medium = 0	High = 1.0
Fixed-asset intensity	8.59 (0.05)	Low = -0.5	Medium = 0	High = 1.0
Long-range financial liability	2.70 (0.06)	High = 1.0	Low = -0.5	Medium = 0
R&D intensity	0.03 (-0.06)	High = 1.0	Medium = 0	Low = -0.5
RMS distance between Black & Decker's business strategy and ideal profiles		1.97	0.59	2.15

Table F2. Information Technologies Used to Compute ENIT and ECIT

No.	Technologies in the *InformationWeek* Survey across all years	Technologies included in the *InformationWeek* survey each year		Technologies in which Black & Decker invested each year	
		2006	2007	2006	2007
1	Ajax development tools	X	X		
2	Applications constructed of reused components or objects				
3	Asset-management software	X	X	X	X
4	B2B collaboration tools				
5	Business performance-management software	X	X	X	X
6	Business process-management software	X	X	X	X
7	Business-intelligence tools	X	X	X	X
8	Commercial open-source software	X	X	X	X
9	Content filtering/anti-spam software	X	X	X	X
10	Content-management software	X	X	X	X
11	Customer-resource management (CRM) systems				
12	Data warehouse				
13	Dual-core/multi-core processors in PCs or servers	X	X	X	X
14	E-commerce applications				
15	Electronic business: supply chains				
16	Encrypted customer records	X	X		
17	Enterprise application integration software				
18	Enterprise resource planning (ERP)				
19	Grid computing	X	X		
20	Instant messaging				
21	Internal collaboration tools				
22	Intrusion-detection software	X	X	X	X
23	Java applications				
24	Java programming tools				
25	Knowledge management and collaborative software				
26	Linux tools or applications	X	X	X	X
27	Mapping/global positioning system technologies	X	X		X
28	Mobile commerce applications	X		X	
29	Mobile enterprise applications		X		X
30	OLAP or data mining tools				
31	Product lifecycle management software				
32	Project-portfolio management software				
33	Remote access software				
34	RFID (radio frequency identification) technology	X	X	X	X
35	Server virtualization		X		X
36	Service-oriented architecture	X	X	X	X
37	Supply-chain software				
38	Virtual private network				
39	WAN optimization/application acceleration		X		X
40	Web services (applications using SOAP, UDDI, XML)	X	X	X	X
41	XML-based applications				

Appendix G. Interaction Plots[a]

Figure G1. Prospectors, OCIT, and ENIT Interaction

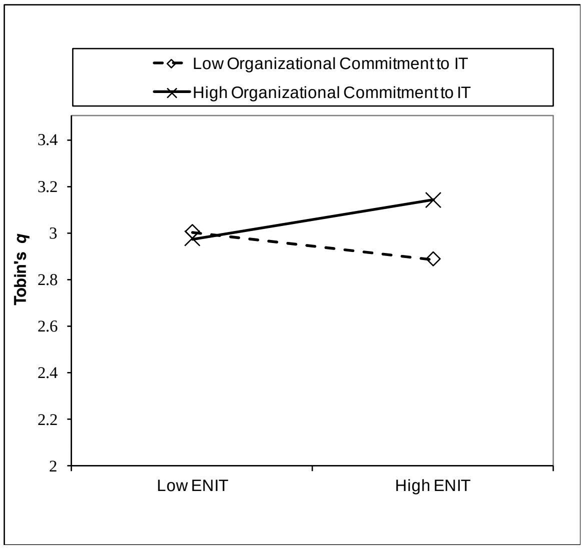


Figure G2. Prospectors, OCIT, and ECIT Interaction

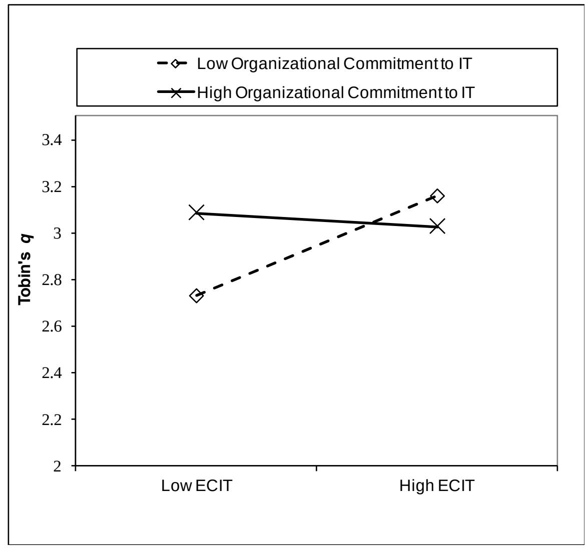


Figure G3. Defenders, OCIT, and ECIT Interaction

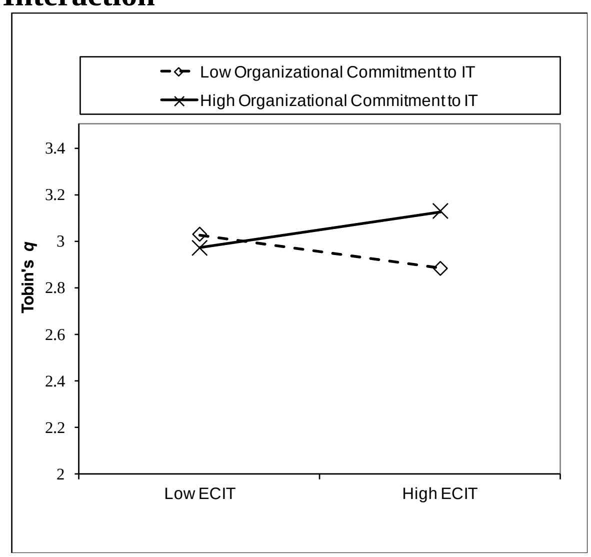
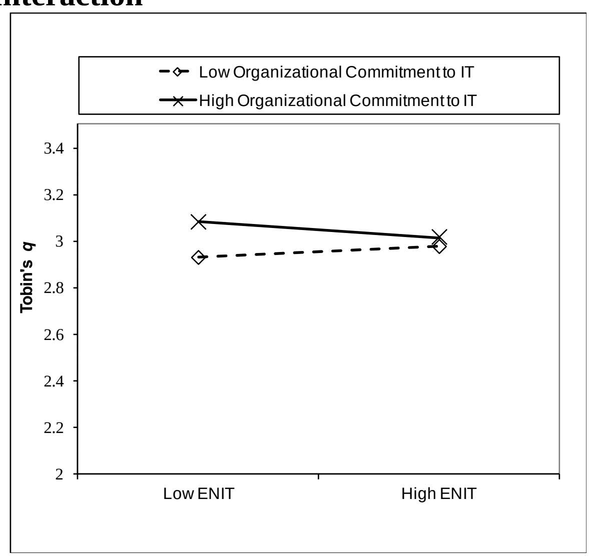


Figure G4. Defenders, OCIT, and ENIT Interaction



[a] The nonsignificant interactions for Analyzers are excluded because of space constraints but are available upon request. OCIT = organizational commitment to IT; ENIT = emphasis on new IT; and ECIT = emphasis on current IT.

Appendix H. Robustness, Endogeneity, and Causality Analyses

To alleviate potential concerns regarding the analyses, we conduct a series of robustness tests, including alternative dependent and independent variables, and tests for endogeneity, causality, and sample selection, as discussed below. The results of these tests provide results consistent with the theoretical model, providing further confidence in the robustness of the findings.[a]

Alternative Dependent Variables

To examine whether the main results are a function of the specific dependent variable, Tobin's *q*, we use alternative performance measures. Because of its forward-looking nature, Tobin's *q* may be biased against Defenders in reflecting the marginal benefits a firm receives from ENIT and ECIT. By contrast, accounting measures of performance, such as return on assets (ROA) and return on sales (ROS), may be more amenable to Defenders. We include these measures, as well as the firm's revenue, market share, and sales growth in year *t* as alternative dependent variables. Models R1–R5 in Table H1 present these results, which are consistent with the main results for the theoretical model.

--- Insert Table H1 about here ---

Alternative Independent Variables

Next, we test the robustness of the results using an alternative measure of OCIT. The original measure of OCIT focuses on the proportion of sentences mentioning IT-related keywords within the annual report. A greater proportion of sentences mentioning IT-related terms can be a proxy of verbal commitment to IT, but the distribution of these sentences across sections may also reflect OCIT. Specifically, annual reports present information in different sections, such as business, financial, or corporate sections, which may be written by different executives. Thus, appearance of IT-related keywords across a greater number of sections shows greater OCIT because a greater number of key players in the firm discuss it. Therefore, we use the proportion of sections[b] in a firm's annual report discussing IT-related keywords as an alternative measure of OCIT. The results, presented in Model R6 in Table H2 show that the results remain robust to this change in the measure of OCIT.

Additionally, we test the model with a budgetary measure of OCIT, which is computed as the ratio of the firm's yearly IT budget allocation to its annual sales revenue in Model R7 in Table H2. This information is collected from the annual *InformationWeek* survey in the response to the following question: "What percentage of your company's worldwide projected 2007 annual sales revenue does your total 2007 worldwide IT budget represent?" We adopt the budget-to-sales ratio as the budgetary measure of OCIT, consistent with the strategy literature that uses budgetary resource allocation to measure the resources dedicated to organizational functions (e.g., Swaminathan et al. 2008). The verbal and budgetary measures of OCIT have a correlation of 0.728, providing further confidence in the results, which remain robust to both verbal and budgetary measures of OCIT.

--- Insert Table H2 about here ---

Next, to ensure that the results are not a function of the measurement of ENIT and ECIT, we conduct a series of robustness tests. The primary measure of ENIT and ECIT are summated counts of IT within each category. Because the number of technologies asked about in the survey changes across years, we create ratio measures of ENIT and ECIT by dividing the counts of invested IT for each category by the total number of non-infrastructural IT in the survey during that year. The results, shown in Model R8 in Table H2, are consistent with the main results. Also, the initial estimation of ENIT is conservative, as it requires an IT to be in the survey for two years to be clearly identified as adopted. This approach, in which technologies are excluded from being potential ENIT the first year they are presented in the survey because there is no prior year, may artificially deflate the impact of ENIT. To address this concern, we estimate ENIT by counting all potential technologies in which a firm does not specifically invest during year $t-1$. This alternative measure of ENIT is computed as a ratio, as in Model R8. The results, shown in Model R9, support all four hypotheses, with all four three-way interactions remaining consistent and significant.

Finally, the method used to measure the business strategies relies on six key operational figures of a firm in a year. A potential concern with relying on these operational numbers is that aspects such as liquidity and R&D intensity may involve yearly variations that do not reflect a firm's business strategy variability. Although these operational aspects may be more turbulent across years, business strategy is known to be more stable. Therefore, estimating a firm's business strategy from these operational aspects may be noisy. To reduce this possible threat, we first estimate the extent of change in the business strategy from one year to the next. Among the 687 observations, we find only 61 (below 10%) firm-year observations where the current year's business strategy differs from the previous year's business strategy. This implies that the business strategy does not fluctuate severely. Second, instead of considering the current year's value of scope, liquidity, asset efficiency, fixed-asset intensity, long-range financial liability, and R&D intensity, we consider the average value of these aspects for the last five years ($t-4$ to t) leading to the current year (t). Averaging the values of these six aspects across five years can reduce the yearly noises that may be unrelated to the business strategy variability. Model R10 in Table H2 presents these results, which are consistent with the results of the main analysis.

Endogeneity and Causality

Reverse causality or endogeneity, which has been mentioned as a potential concern in the literature on the relationship between IT investment and firm performance, may bias the estimates through correlated residuals (Greene 2011). Approaches based on two-stage least squares (2SLS) or three-stage least squares (3SLS) require the identification of good instruments, but prior research using data similar to those used in this study indicates that the instrument candidates are limited because of the nature of the data collection (Bardhan et al. 2013). Also, the data in this study exhibit panel-specific hetereoskedasticity and panel-specific autocorrelation, which the usual 2SLS/3SLS procedures do not account for. Hence, we use the Arellano–Bover/Blundell–Bond system of generalized method of moments (AB-GMM) estimator (Arellano and Bond 1991, Arellano and Bover 1995) to address the endogeneity concerns. This method is suitable for an unbalanced panel with a relatively large number of observations, despite the presence of independent variables that are not strictly exogenous as well as heteroskedasticity and serial correlation (Roodman 2009).

We treat OCIT, ENIT, ECIT, and their interaction terms as the variables that may not be strictly exogenous (e.g., Bardhan et al. 2013). We then conduct the two-step system GMM model to obtain estimates that are robust to both heteroskedasticity and autocorrelation, and produce robust standard errors to correct for the possible biases in estimation of standard errors (using the robust option that conducts a Windmeijer correction to adjust downward biases in estimating standard errors), using the XTABOND2 command in STATA. The estimator employs a system of two equations. The first equation is the original (level) one, and the second equation is obtained by first-differencing variables in the level equation (this equation removes fixed effects). Then, the lagged values of the endogenous variables and their differences are used as instrumental variables. In setting up the two-step system, the depth of lag for instruments needs to be specified for each of the two equations. Previous studies using this technique rely on a lag (2) option (e.g., Bardhan et al. 2013, Roodman 2009), which instructs the use of the second and deeper lags of the endogenous variables (in most cases only the second lagged variables are available in the sample) as instruments in the transformed equation, whereas the first lags of the endogenous variables are used as instruments in the level equation. To ensure that the specification is correct, the exogeneity of instruments and error term must be maintained, which requires that error terms are not autocorrelated. If the error terms are autocorrelated, deeper lags should be used in the transformed equation. We test for the presence of AR(2) in the transformed equation. The results show a lack of serial correlation (Arellano–Bond test: $z = -1.52$, $p > 0.05$). Furthermore, Hansen's test of whether the instruments or a subset are exogenous as a group fails to reject the null hypothesis ($\chi^2 = 14.60$, $p > 0.05$). Finally, the difference-in-Hansen's test of exogeneity fails to reject the null hypothesis that the subset of instruments used in the level equations are exogenous ($\chi^2 = 11.71$, $p > 0.05$). The results of the AB-GMM estimation, given in Model R11 in Table H3, remain consistent with the main results.

A firm's emphasis on new IT may coincide with its propensity to acquire, or merge with, new businesses because of its general disposition to exploration. As such, benefits accrued from emphasizing new IT maybe in fact be due to the unobserved extent of a firm's merger and acquisition activities. Because organizational merger and acquisition activities vary over time, our removal of time-invariant unobserved firm heterogeneity does not account for its possible confounding effect. Therefore, we track the presence of organizational mergers and acquisitions in our sample firms by collecting firm-year information from the SDC Platinum database and including a dummy for the presence of mergers and acquisitions in a given year by a focal firm. The results are presented in Model R12 in Table H3 and show that the main findings of the study remain robust to the inclusion of the mergers and acquisitions activity dummy.[c]

Although the AB-GMM approach can result in less biased estimates of coefficients in the presence of endogenous variables, it cannot establish whether the endogenous variables affect the dependent variable. To infer such causality, a Granger causality test (1969) is conducted. In this test, variable X causes Y if the lagged values of X significantly influence Y in the presence of the lagged values of Y as covariates. First, a vector autoregression estimation model is run. Vector autoregression is a series of simultaneous regressions in which the dependent variables are each of the endogenous variables (including the dependent variable in the original regression, e.g., Tobin's *q*) and the independent variables are lagged values of the dependent variable, as well as lagged values of other endogenous variables. Then, considering the regression with Tobin's *q* as the dependent variable, we test for the significance of the lagged values of each of the endogenous independent variables. Treating OCIT, ENIT, and ECIT as endogenous, Models R13, R14, and R15 in Table H3 report each variable's effect on Tobin's *q*, return on assets, and return on sales, respectively. The results indicate that OCIT, ENIT, and ECIT, and the four three-way interaction terms affect all three measures of firm performance.

--- Insert Table H3 about here ---

[a] We thank the review panel for the detailed recommendations on the robustness tests.

[b] A section is defined as a part of the annual report's corpus of text that is separated by a heading from the other parts.

[c] We thank the associate editor for suggesting this additional analysis to address the possible confounding effect of mergers and acquisitions.

Table H1. Robustness Analyses Using Alternative Dependent Variables[a]

Variable	Model R1: Return on assets		Model R2: Return on sales		Model R3: Firm revenue		Model R4: Market share		Model R5: Sales growth	
OCIT	0.093***	(0.009)	0.057***	(0.007)	0.059***	(0.015)	0.084***	(0.009)	0.072***	(0.008)
ENIT	0.062***	(0.008)	0.053***	(0.008)	0.015**	(0.005)	0.017***	(0.002)	0.019***	(0.005)
ECIT	0.053***	(0.013)	0.039***	(0.010)	0.041***	(0.005)	0.012*	(0.005)	0.030***	(0.005)
Prospector	0.048***	(0.015)	0.018*	(0.009)	0.132***	(0.014)	0.002	(0.003)	0.090***	(0.013)
Defender	0.026***	(0.007)	0.029***	(0.006)	0.080***	(0.012)	0.018***	(0.002)	0.023**	(0.008)
*OCIT * ENIT*	-0.016	(0.013)	-0.012	(0.012)	0.007	(0.017)	0.044***	(0.006)	0.002	(0.002)
*OCIT * ECIT*	-0.075***	(0.015)	-0.043***	(0.005)	-0.022	(0.033)	-0.042***	(0.007)	-0.007	(0.006)
*OCIT * Prospector*	-0.008	(0.005)	-0.004	(0.010)	-0.018	(0.042)	0.022*	(0.010)	0.014	(0.062)
*OCIT * Defender*	0.048***	(0.004)	0.021**	(0.007)	0.014	(0.045)	0.052***	(0.007)	0.059***	(0.010)
*Prospector * ENIT*	0.001	(0.003)	0.005	(0.005)	-0.025***	(0.007)	0.001	(0.001)	-0.012*	(0.006)
*Defender * ECIT*	-0.019	(0.045)	-0.006	(0.006)	0.011	(0.010)	0.005	(0.008)	0.014*	(0.007)
*Prospector * ECIT*	0.009	(0.007)	0.012	(0.015)	0.043***	(0.004)	0.024**	(0.008)	0.037***	(0.010)
*Defender * ENIT*	-0.054***	(0.006)	-0.044***	(0.004)	-0.025***	(0.003)	-0.020***	(0.004)	-0.015*	(0.007)
*OCIT * Prospector * ENIT* (H1)	0.031**	(0.012)	0.038***	(0.008)	0.038***	(0.004)	0.080***	(0.019)	0.035**	(0.011)
*OCIT * Prospector * ECIT* (H2)	-0.112***	(0.011)	-0.030*	(0.012)	-0.087***	(0.011)	-0.057***	(0.006)	-0.040*	(0.016)
*OCIT * Defender * ECIT* (H3)	0.038*	(0.015)	0.018**	(0.007)	0.055**	(0.020)	0.040***	(0.008)	0.057**	(0.018)
*OCIT * Defender * ENIT* (H4)	-0.037**	(0.014)	-0.047***	(0.010)	-0.012*	(0.005)	-0.071***	(0.008)	-0.040**	(0.013)
Firm size	-0.107***	(0.010)	-0.040***	(0.006)	-0.078***	(0.007)	0.486***	(0.047)	0.056***	(0.005)
Advertising intensity	0.117***	(0.011)	0.107***	(0.015)	0.212***	(0.022)	0.023***	(0.006)	0.191***	(0.043)
Market share	0.147***	(0.023)	0.109***	(0.011)	0.153***	(0.021)			0.040***	(0.005)
Median Tobin's q	0.191***	(0.042)	0.109***	(0.012)	0.473***	(0.052)	-0.059***	(0.006)	0.411***	(0.078)
Median capital intensity	0.019*	(0.008)	0.167***	(0.029)	0.072***	(0.010)	-0.075***	(0.008)	0.034***	(0.006)
Concentration ratio	-0.009	(0.014)	-0.018**	(0.006)	-0.165***	(0.015)	0.338***	(0.068)	-0.122***	(0.014)
Environmental turbulence	0.057***	(0.017)	0.026***	(0.003)	0.118***	(0.023)	0.022***	(0.004)	0.117***	(0.030)
Wald's χ^2	1913.2		92283.9		55365.9		1215249.0		544067.0	

[a] * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. $N = 687$ for all models. Intercept is positive and significant in all models but excluded for space. Standard errors are reported in parentheses. The values of firm revenue (net sales) are log-transformed. The cells related to the hypotheses are highlighted in gray. OCIT = organizational commitment to IT; ENIT = emphasis on new IT; and ECIT = emphasis on current IT.

Table H2. Robustness Analyses Using Alternative Independent Variables[a]

Variable	Model R6: Alternative OCIT (sections based)		Model R7: Alternative OCIT (budgetary measure)		Model R8: Alternative ENIT and ECIT (Ratios)		Model R9: Alternative ENIT and ECIT (liberal estimate)		Model R10: Alternative strategy (5-year mean)	
OCIT	0.041*	(0.017)	0.024	(0.020)	0.060***	(0.015)	0.041***	(0.004)	0.056*	(0.027)
ENIT	0.050***	(0.006)	0.015**	(0.005)	0.062***	(0.006)	0.054***	(0.007)	0.070**	(0.023)
ECIT	0.027*	(0.013)	0.037***	(0.008)	0.050***	(0.006)	0.034***	(0.005)	0.054*	(0.022)
Prospector	-0.053*	(0.022)	0.131***	(0.015)	0.053***	(0.009)	0.017*	(0.008)	0.013*	(0.006)
Defender	-0.015*	(0.006)	0.073***	(0.020)	0.024**	(0.007)	0.025***	(0.004)	0.013*	(0.006)
*OCIT * ENIT*	-0.000	(0.003)	0.007	(0.016)	-0.010	(0.034)	-0.004	(0.003)	-0.001	(0.001)
*OCIT * ECIT*	-0.039***	(0.004)	-0.035	(0.052)	-0.075***	(0.019)	-0.044***	(0.006)	-0.048***	(0.005)
*OCIT * Prospector*	-0.046*	(0.020)	-0.002	(0.008)	-0.010	(0.011)	-0.005	(0.004)	-0.037	(0.031)
*OCIT * Defender*	0.030*	(0.012)	0.021	(0.019)	0.034*	(0.016)	0.012*	(0.005)	0.059*	(0.026)
*Prospector * ENIT*	-0.001	(0.002)	-0.024***	(0.003)	-0.018*	(0.008)	-0.004	(0.005)	-0.018*	(0.007)
*Defender * ECIT*	-0.057*	(0.022)	0.013	(0.035)	-0.008	(0.007)	-0.017	(0.019)	-0.051***	(0.007)
*Prospector * ECIT*	0.001	(0.002)	0.036***	(0.003)	0.001	(0.001)	0.007	(0.005)	0.028*	(0.014)
*Defender * ENIT*	-0.045***	(0.005)	-0.025***	(0.004)	-0.058***	(0.006)	-0.050***	(0.010)	-0.059***	(0.006)
*OCIT * Prospector * ENIT* (H1)	0.041*	(0.016)	0.028*	(0.014)	0.053***	(0.005)	0.048***	(0.008)	0.061***	(0.005)
*OCIT * Prospector * ECIT* (H2)	-0.043**	(0.015)	-0.062**	(0.022)	-0.116***	(0.012)	-0.040**	(0.015)	-0.072***	(0.009)
*OCIT * Defender * ECIT* (H3)	0.024*	(0.010)	0.038**	(0.014)	0.037*	(0.016)	0.016*	(0.007)	0.029*	(0.013)
*OCIT * Defender * ENIT* (H4)	-0.020*	(0.008)	-0.012**	(0.004)	-0.053**	(0.018)	-0.014*	(0.007)	-0.085***	(0.009)
Firm size	0.123***	(0.015)	-0.079***	(0.009)	-0.125***	(0.021)	-0.058***	(0.005)	0.152***	(0.025)
Advertising intensity	0.098*	(0.038)	0.215***	(0.037)	0.118***	(0.018)	0.099***	(0.013)	0.118*	(0.051)
Market share	0.108**	(0.036)	0.140***	(0.015)	0.154***	(0.019)	0.132***	(0.013)	0.103*	(0.044)
Median Tobin's q	0.083**	(0.028)	0.478***	(0.049)	0.190***	(0.034)	0.114***	(0.024)	0.153*	(0.075)
Median capital intensity	0.176*	(0.071)	0.057***	(0.013)	0.000	(0.004)	0.157***	(0.027)	0.051**	(0.019)
Concentration ratio	-0.019*	(0.009)	-0.159***	(0.014)	-0.021*	(0.010)	-0.023***	(0.003)	-0.103**	(0.032)
Environmental turbulence	0.014*	(0.006)	0.124***	(0.017)	0.048***	(0.007)	0.031***	(0.005)	0.040**	(0.015)
Wald's χ^2	6438.2		9689.2		2536.4		17730.72		3318.3	

[a] * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. $N = 687$ for all models R6, R8, R9, and R10. $N = 611$ for model R7 due to missing values. Intercept is positive and significant in all models but is excluded to conserve space. Standard errors are reported in parentheses. The cells related to the hypotheses are highlighted in gray. OCIT = organizational commitment to IT; ENIT = emphasis on new IT; and ECIT = emphasis on current IT.

Table H3. Additional Robustness Tests (using the verbal measure of OCIT)[a]

	Model R11: AB-GMM Endogeneity test		Model R12: Additional control		Granger causality tests with alternative dependent variables: Model R13: Tobin's *q*		Model R14: Return on assets		Model R15: Return on sales	
Endogenous variable					*F*-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value
OCIT	0.038*	(0.018)	0.025*	(0.012)	13.52	< 0.001	8.84	< 0.01	11.78	< 0.001
ENIT	0.017**	(0.006)	0.023*	(0.011)	12.32	< 0.001	13.72	< 0.001	11.09	< 0.001
ECIT	0.042*	(0.019)	0.059*	(0.027)	6.89	< 0.01	7.82	< 0.01	11.42	< 0.001
Prospector	0.025*	(0.012)	0.023*	(0.011)						
Defender	0.005	(0.007)	0.071*	(0.034)						
*OCIT * ENIT*	0.019	(0.013)	-0.044*	(0.020)	2.74	> 0.05	1.11	> 0.05	1.12	> 0.05
*OCIT * ECIT*	-0.012	(0.007)	-0.006	(0.003)	1.21	> 0.05	1.93	> 0.05	11.72	< 0.001
*OCIT * Prospector*	0.022	(0.046)	0.006	(0.005)	1.56	> 0.05	2.49	> 0.05	2.66	> 0.05
*OCIT * Defender*	0.019	(0.015)	0.009	(0.005)	1.03	> 0.05	2.23	> 0.05	1.14	> 0.05
*Prospector * ENIT*	-0.024**	(0.009)	-0.003	(0.002)	11.44	< 0.001	1.22	> 0.05	1.84	> 0.05
*Defender * ECIT*	0.009	(0.010)	0.015	(0.008)	2.24	> 0.05	3.32	> 0.05	3.07	> 0.05
*Prospector * ECIT*	0.038**	(0.012)	0.062**	(0.023)	13.72	< 0.001	1.84	> 0.05	1.93	> 0.05
*Defender * ENIT*	-0.025***	(0.006)	-0.018	(0.011)	15.63	< 0.001	9.45	< 0.01	12.28	< 0.001
*OCIT * Prospector * ENIT* (H1)	0.056***	(0.006)	0.028*	(0.012)	13.76	< 0.001	12.93	< 0.001	5.24	< 0.05
*OCIT * Prospector * ECIT* (H2)	-0.082*	(0.034)	-0.021**	(0.007)	5.03	< 0.05	6.16	< 0.01	11.09	< 0.001
*OCIT * Defender * ECIT* (H3)	0.046*	(0.021)	0.023*	(0.011)	4.43	< 0.05	4.29	< 0.05	7.31	< 0.01
*OCIT * Defender * ENIT* (H4)	-0.020*	(0.009)	-0.052**	(0.020)	12.06	< 0.001	9.25	< 0.01	12.23	< 0.001
Firm size	0.321*	(0.125)	-0.167***	(0.017)						
Advertising intensity	0.165*	(0.076)	0.078**	(0.026)						
Market share	0.150*	(0.061)	0.147**	(0.045)						
Median Tobin's q	0.449**	(0.137)	0.433***	(0.070)						
Median capital intensity	0.006	(0.005)	0.018	(0.015)						
Concentration ratio	-0.148***	(0.015)	-0.187***	(0.023)						
Environmental turbulence	0.093*	(0.043)	0.103***	(0.027)						
Mergers and acquisitions			0.012*	(0.005)						

[a] * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. N = 687 for models R11 and R12. N = 357 for models R13-R15. Standard errors are reported in parentheses. Wald's χ^2 is 3,200.4 for Model R11 and 105,423.1 for Model R12. The cells related to the hypotheses are highlighted in gray. OCIT = organizational commitment to IT; ENIT = emphasis on new IT; and ECIT = emphasis on current IT.

Appendix I. Additional Robustness Tests Using Budgetary Measure of OCIT

Appendix H includes a description of the computation of the budgetary measure of OCIT. It also includes (specifically in Model R7 in Table H2) the results for the main model using the budgetary measure of OCIT. We repeated the other robustness analyses that were conducted using the verbal measure of OCIT (specifically, models R1–R5 and R8–R15) using the budgetary measure of OCIT. These results are reported in Tables I1–I3.

Model R6 in Table H2 is based on a different way of computing the verbal measure of OCIT. No corresponding test could therefore be done using the budgetary measure of OCIT. Model R7 is itself based on the budgetary measure. Thus, Tables I1–I3 do not include models IR6 and IR7. The rest of the models are numbered to be consistent with the corresponding models in Tables H1–H3.

The results for models IR1–IR5 and IR8–IR15 are consistent with the results for the main model. Thus, they further demonstrate the robustness of the main results.

Table I1. Robustness Analyses Using Budgetary Commitment with Alternative Dependent Variables[a]

Variable	Model IR1: Return on assets		Model IR2: Return on sales		Model IR3: Firm revenue		Model IR4: Market share		Model IR5: Sales growth	
OCIT	0.031*	(0.015)	0.017*	(0.008)	0.018	(0.015)	0.026*	(0.012)	0.035*	(0.016)
ENIT	0.027*	(0.011)	0.018*	(0.009)	0.033**	(0.011)	0.019*	(0.009)	0.021*	(0.008)
ECIT	0.036**	(0.013)	0.062*	(0.025)	0.031*	(0.012)	0.038*	(0.019)	0.018*	(0.009)
Prospector	0.172***	(0.032)	0.098**	(0.034)	0.181***	(0.021)	0.132***	(0.026)	0.139***	(0.028)
Defender	0.117***	(0.023)	0.037**	(0.012)	0.097**	(0.035)	0.112***	(0.012)	0.066**	(0.022)
*OCIT * ENIT*	0.002	(0.001)	0.008	(0.006)	0.009	(0.005)	0.006	(0.004)	0.011	(0.009)
*OCIT * ECIT*	-0.011	(0.007)	-0.048	(0.032)	-0.018	(0.014)	-0.017	(0.017)	-0.042**	(0.013)
*OCIT * Prospector*	-0.001	(0.001)	-0.001	(0.001)	-0.003	(0.002)	-0.001	(0.001)	-0.002	(0.002)
*OCIT * Defender*	0.01	(0.007)	0.024	(0.017)	0.017	(0.014)	0.023	(0.013)	0.032	(0.028)
*Prospector * ENIT*	-0.028**	(0.011)	-0.021*	(0.009)	-0.036**	(0.012)	-0.009	(0.007)	-0.019*	(0.009)
*Defender * ECIT*	0.005	(0.004)	0.005	(0.003)	0.02	(0.012)	0.007	(0.004)	0.007	(0.004)
*Prospector * ECIT*	0.056**	(0.022)	0.023*	(0.009)	0.035	(0.021)	0.044*	(0.019)	0.019**	(0.006)
*Defender * ENIT*	-0.021	(0.013)	-0.011	(0.009)	-0.041	(0.021)	-0.042**	(0.015)	-0.013	(0.007)
*OCIT * Prospector * ENIT* (H1)	0.019*	(0.009)	0.034*	(0.017)	0.032*	(0.015)	0.018*	(0.009)	0.039**	(0.014)
*OCIT * Prospector * ECIT* (H2)	-0.035*	(0.015)	-0.043**	(0.013)	-0.060**	(0.023)	-0.078**	(0.027)	-0.075***	(0.016)
*OCIT * Defender * ECIT* (H3)	0.045**	(0.014)	0.057**	(0.020)	0.052**	(0.018)	0.018*	(0.008)	0.036*	(0.017)
*OCIT * Defender * ENIT* (H4)	-0.017*	(0.008)	-0.016*	(0.006)	-0.046***	(0.01)	-0.055**	(0.018)	-0.054**	(0.021)
Firm size	-0.074**	(0.028)	-0.066**	(0.024)	-0.055*	(0.027)	-0.073**	(0.026)	-0.122***	(0.012)
Advertising intensity	0.366***	(0.111)	0.280***	(0.062)	0.196***	(0.023)	0.243***	(0.062)	0.141***	(0.018)
Market share	0.099**	(0.037)	0.127***	(0.021)	0.172***	(0.034)			0.224***	(0.029)
Median Tobin's q	0.569***	(0.101)	0.191***	(0.058)	0.330***	(0.096)	0.765***	(0.091)	0.507***	(0.094)
Median capital intensity	0.062*	(0.028)	0.026*	(0.012)	0.035*	(0.015)	0.084*	(0.039)	0.033*	(0.014)
Concentration ratio	-0.081*	(0.035)	-0.215***	(0.025)	-0.072*	(0.036)	-0.113***	(0.013)	-0.229***	(0.055)
Environmental turbulence	0.182***	(0.027)	0.087**	(0.032)	0.089**	(0.033)	0.153***	(0.019)	0.156***	(0.02)
Wald's χ^2	3253.2		81312.5		62109.8		81872.9		66506.2	

[a] * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. $N = 611$ for all models. Intercept is positive and significant in all models but is excluded to conserve space. Standard errors are reported in parentheses. The values of firm revenue (net sales) are log-transformed. The cells related to the hypotheses are highlighted in gray. OCIT = organizational commitment to IT; ENIT = emphasis on new IT; and ECIT = emphasis on current IT.

Table I2. Robustness Analyses Using Budgetary Commitment with Alternative Independent Variables[a]

Variable	Model IR8: Alternative ENIT and ECIT (ratios)		Model IR9: Alternative ENIT and ECIT (liberal estimate)		Model IR10: Alternative strategy (5-year mean)	
OCIT	0.025	(0.017)	0.035*	(0.016)	0.021	(0.017)
ENIT	0.055**	(0.020)	0.024*	(0.012)	0.043*	(0.019)
ECIT	0.045**	(0.017)	0.036*	(0.016)	0.027*	(0.011)
Prospector	0.199***	(0.034)	0.072**	(0.022)	0.176***	(0.021)
Defender	0.121***	(0.018)	0.124***	(0.014)	0.076**	(0.025)
*OCIT * ENIT*	0.01	(0.005)	0.005	(0.003)	0.009	(0.006)
*OCIT * ECIT*	-0.048**	(0.018)	-0.049**	(0.017)	-0.03	(0.023)
*OCIT * Prospector*	-0.001	(0.001)	-0.003	(0.002)	-0.002	(0.001)
*OCIT * Defender*	0.026*	(0.013)	0.031	(0.021)	0.007	(0.004)
*Prospector * ENIT*	-0.031	(0.022)	-0.019	(0.016)	-0.019	(0.015)
*Defender * ECIT*	0.016	(0.008)	0.009	(0.005)	0.021	(0.019)
*Prospector * ECIT*	0.033**	(0.012)	0.036***	(0.004)	0.045***	(0.007)
*Defender * ENIT*	-0.01	(0.008)	-0.029*	(0.013)	-0.011	(0.009)
*OCIT * Prospector * ENIT* (H1)	0.036*	(0.016)	0.048**	(0.015)	0.038*	(0.017)
*OCIT * Prospector * ECIT* (H2)	-0.091***	(0.018)	-0.067**	(0.024)	-0.056**	(0.021)
*OCIT * Defender * ECIT* (H3)	0.033*	(0.017)	0.043*	(0.021)	0.022*	(0.010)
*OCIT * Defender * ENIT* (H4)	-0.028*	(0.014)	-0.075***	(0.020)	-0.019*	(0.009)
Firm size	-0.116***	(0.013)	-0.126***	(0.029)	-0.043*	(0.020)
Advertising intensity	0.133***	(0.019)	0.082*	(0.041)	0.314***	(0.089)
Market share	0.091**	(0.028)	0.064*	(0.025)	0.199***	(0.042)
Median Tobin's q	0.674***	(0.154)	0.363***	(0.069)	0.325***	(0.079)
Median capital intensity	0.055*	(0.027)	0.068*	(0.028)	0.023*	(0.009)
Concentration ratio	-0.091**	(0.029)	-0.208***	(0.055)	-0.205***	(0.037)
Environmental turbulence	0.174***	(0.021)	0.182***	(0.025)	0.154**	(0.055)
Wald's χ^2	8851.3		9663.3		6193.3	

[a] * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. $N = 611$ for all models. Intercept is positive and significant in all models but is excluded to conserve space. Standard errors are reported in parentheses. The cells related to the hypotheses are highlighted in gray. OCIT = organizational commitment to IT; ENIT = emphasis on new IT; and ECIT = emphasis on current IT.

Table I3. Additional Robustness Tests Using Budgetary Commitment[a]

	Model IR11: AB-GMM endogeneity test		Model IR12: Additional control		Granger causality tests with alternative dependent variables					
					Model IR13: Tobin's *q*		Model IR14: Return on assets		Model IR15: Return on sales	
Endogenous variable					*F*-test	*p*-value	*F*-test	*p*-value	*F*-test	*p*-value
OCIT	0.040*	(0.016)	0.020*	(0.010)	8.81	< 0.001	3.81	<0.05	13.03	< 0.001
ENIT	0.112*	(0.055)	0.029*	(0.013)	5.51	<0.01	3.49	<0.05	9.92	< 0.001
ECIT	0.302*	(0.153)	0.041**	(0.013)	6.23	< 0.01	7.53	<0.001	10.17	< 0.001
Prospector	0.101*	(0.041)	0.095**	(0.035)						
Defender	0.024	(0.017)	0.139***	(0.035)						
*OCIT * ENIT*	0.003	(0.003)	0.001	(0.001)	1.83	> 0.05	1.03	> 0.05	0.73	> 0.05
*OCIT * ECIT*	-0.05	(0.033)	-0.015	(0.013)	1.14	> 0.05	0.94	> 0.05	13.01	< 0.001
*OCIT * Prospector*	-0.003	(0.002)	-0.001	(0.001)	1.07	> 0.05	0.88	> 0.05	1.98	> 0.05
*OCIT * Defender*	0.033	(0.019)	0.014	(0.009)	1.12	> 0.05	1.07	> 0.05	1.33	> 0.05
*Prospector * ENIT*	-0.036	(0.03)	-0.034	(0.021)	5.23	<0.05	1.22	> 0.05	1.23	> 0.05
*Defender * ECIT*	0.008	(0.006)	0.008	(0.005)	1.13	> 0.05	1.33	> 0.05	3.11	> 0.05
*Prospector * ECIT*	0.086*	(0.039)	0.088**	(0.027)	14.31	< 0.001	2.91	> 0.05	1.21	> 0.05
*Defender * ENIT*	-0.018	(0.012)	-0.03	(0.022)	11.09	< 0.001	9.88	< 0.001	14.96	< 0.001
*OCIT * Prospector * ENIT* (H1)	0.132**	(0.051)	0.025*	(0.013)	10.08	< 0.001	12.93	< 0.001	4.44	< 0.05
*OCIT * Prospector * ECIT* (H2)	-0.118*	(0.054)	-0.021*	(0.010)	3.83	< 0.05	6.72	< 0.01	4.12	<0.05
*OCIT * Defender * ECIT* (H3)	0.093*	(0.040)	0.053**	(0.019)	3.96	< 0.05	4.13	< 0.05	8.87	<0.001
*OCIT * Defender * ENIT* (H4)	-0.085*	(0.039)	-0.038*	(0.015)	5.53	<0.01	4.03	<0.05	5.12	<0.05
Firm size	-0.088*	(0.038)	-0.114***	(0.013)						
Advertising intensity	0.273**	(0.095)	0.238***	(0.024)						
Market share	0.113*	(0.046)	0.135***	(0.017)						
Median Tobin's q	0.282**	(0.088)	0.603***	(0.151)						
Median capital intensity	0.048	(0.031)	0.029*	(0.012)						
Concentration ratio	-0.207**	(0.065)	-0.127*	(0.058)						
Environmental turbulence	0.177*	(0.069)	0.246***	(0.033)						
Mergers and acquisitions			0.067**	(0.023)						

[a] * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. $N = 611$ for models IR11 and IR12. $N = 344$ for models IR13-IR15. Standard errors are reported in parentheses. Wald's χ^2 is 1,307.4 for Model IR11 and 8,409.5 for Model IR12. The cells related to the hypotheses are highlighted in gray. OCIT = organizational commitment to IT; ENIT = emphasis on new IT; and ECIT = emphasis on current IT.

Appendix J: Sample Selection Bias

In building our sample, we are constrained by the availability of data regarding key variables (i.e., ENIT and ECIT). Exclusion of firms with missing data can endanger the generalizability of our findings. To assess the potential threat of selection bias, we compare the key characteristics of our final sample of firm-year observations to the characteristics of the following: firm-year observations dropped from the *InformationWeek* survey and firm-year observations dropped from the Compustat database. Specifically, we compare the mean values of all control variables between the selected and non-selected samples. As shown in Table J1, we conduct *t*-tests comparing the average value of each control variable in the selected and non-selected samples. The results of these *t*-tests suggest that although the average values of firm attributes are slightly different between the selected and non-selected samples, there are no significant differences in the nature of selected firms. Therefore, we feel confident that the results of this study are not specific to the sample firms.

Table J1. Sample Selection Analyses

	Final sample firms			Compustat excluded firms			*InformationWeek* excluded firms			Final sample firms vs. Compustat excluded firms		Final sample firms vs. *InformationWeek* excluded firms	
Variable	Obs.	Mean	Std. dev.	Obs.	Mean	Std. dev.	Obs.	Mean	Std. dev.	Mean difference	*t*-score	Mean difference	*t*-score
Tobin's q	687	0.14	0.56	18,736	0.16	0.65	1,282	0.18	0.68	-0.02	-0.94	-0.04	-1.35
Firm size	687	2.92	1.13	20,008	2.89	1.30	1,369	2.90	1.30	0.03	0.57	0.02	0.37
Advertising intensity	687	0.01	0.02	20,315	0.01	0.03	1,390	0.01	0.03	0.00	-0.38	0.00	-0.52
Liquidity	687	1.31	0.33	18,883	1.31	0.32	1,292	1.29	0.32	0.00	-0.08	0.02	1.51
Asset efficiency	687	0.03	0.61	20,315	0.03	0.67	1,390	-0.01	0.66	0.00	-0.08	0.04	1.31
Fixed asset intensity	687	0.58	0.28	18,883	0.60	0.33	1,292	0.60	0.21	-0.02	-1.54	-0.02	-1.55
Long-range financial liability	687	1.00	1.03	20,300	0.95	0.88	1,389	0.96	0.87	0.05	1.33	0.04	0.91
Market share	687	-2.99	1.25	17,363	-3.06	1.34	1,188	-3.08	1.34	0.07	1.27	0.09	1.45
Median Tobin's q	687	1.17	0.46	20,330	1.19	0.53	1,391	1.16	0.52	-0.02	-1.03	0.01	0.31
Median capital intensity	687	1.16	0.71	20,330	1.19	0.73	1,391	1.18	0.73	-0.03	-0.93	-0.02	-0.49
Concentration ratio	687	0.24	0.12	17,363	0.23	0.12	1,188	0.23	0.12	0.01	1.51	0.01	1.39
Environmental turbulence	687	0.47	0.35	16,676	0.45	0.37	1,141	0.45	0.38	0.02	1.36	0.02	1.36

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