



IMPACT OF INFORMATION TECHNOLOGY INFRASTRUCTURE FLEXIBILITY ON MERGERS AND ACQUISITIONS

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Appendix A

Difference between Post-M&A IT Integration Capability and IT Integration Capability in the Supply Chain

Post-M&A IT integration capability is a different construct compared to IT integration capability in the supply chain presented in prior literature (e.g., Rai et al. 2006; Rai and Tang 2010; Ward and Zhou 2006). IT integration capability in the supply chain refers to the firm's ability to integrate systems, data, and information with the suppliers' (customers') systems, data, and information (Rai et al. 2006; Rai and Tang 2010). Post-M&A IT integration capability refers to firm's ability to integrate the IT technical infrastructure, IT personnel, and IT and business processes of the target with the IT technical infrastructure, IT personnel, and IT and business processes of the acquirer after an M&A. The scope of post-M&A IT integration capability is M&A instead of the supply chain (Suddaby 2010). While IT integration in the supply chain is mainly concerned with exchanging data and information with suppliers (customers) to achieve integration of the supply chain; post-M&A IT integration pursues integration of the technical, human, and business process infrastructures of the acquirer and the target firm to develop one integrated IT infrastructure for the merged firm. In this way, the difference between IT integration capability for supply chain and post-M&A IT integration capability is analogous to the difference between arms-length coordination between two separate organizations and internal coordination between two independent business units that are co-owned. Specifically, IT integration in the supply chain involves interconnected processes and standardization in the information that is exchanged between independent firms to achieve coordination in the supply chain (Gosain et al. 2005). However, in post-M&A IT integration, the acquirer and the target strive for standardization in all the data and business processes in the merged firm, not just the supply chain processes, and the integration of the human infrastructure of the target into the human infrastructure of the acquirer. Similarly, the scope of M&A integration is greater than supply chain integration. The maximum level of supply chain integration would be vertical integration. However, an M&A integration can also be horizontal or a conglomerate acquisition (Fan and Lang 2000).

| Table A1. Detailed Information on Survey Items | | | |
|---|-----------|---------------|----------|
| Except where otherwise indicated in the table below, the possible range for measures was | from 1 to | 5 (1 = Strong | lly |
| disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree) | | | |
| Construct/Indicator | VIF | Weight | Loading |
| IT compatibility (mean = 3.527, standard deviation = 0.887) | 1.744 | 0.27*** | 0.77*** |
| Software applications can be easily transported and used across multiple platforms | 1.316 | 0.266*** | 0.663*** |
| Our firm provides multiple interfaces or entry points (e.g., web access) for external end users | 1.794 | 0.29*** | 0.81*** |
| Our firm establishes corporate rules and standards for hardware and operating systems to ensure platform compatibility | 1.718 | 0.429*** | 0.849*** |
| Data captured in one part of our orgn. are immediately available to everyone in the firm | 1.488 | 0.299*** | 0.755*** |
| IT connectivity (mean = 3.807, standard deviation = 0.882) | 1.882 | 0.321*** | 0.829*** |
| Our organization has electronic links and connections throughout the entire firm | 1.299 | 0.211*** | 0.517*** |
| Our firm is linked to business partners through electronic channels (e.g., websites, e-mail, wireless devices, electronic data interchange) | 1.626 | 0.342*** | 0.79*** |
| All remote, branch, and mobile offices are connected to the central office | 1.544 | 0.434*** | 0.834*** |
| There are very few identifiable communications bottlenecks within our firm | 1.415 | 0.357*** | 0.723*** |
| Modularity (mean = 3.284, standard deviation = 0.783) | 2.003 | 0.333*** | 0.853*** |
| Our firm possesses a great speed in developing new business applications or modifying existing applications | 1.35 | 0.299*** | 0.704*** |
| Our corporate database is able to communicate in several different protocols | 1.801 | 0.349*** | 0.794*** |
| Reusable software modules are widely used in new systems development | 1.841 | 0.361*** | 0.829*** |
| IT personnel use object-oriented and prepackaged modular tools to create software applications | 1.218 | 0.33*** | 0.645*** |
| IT personnel skills flexibility (mean = 3.643, standard deviation = 0.701) | 1.576 | 0.317*** | 0.768*** |
| Our IT personnel have the ability to work effectively in cross-functional teams | 1.547 | 0.35*** | 0.76*** |
| Our IT personnel are able to interpret business problems and develop appropriate technical solutions | 1.553 | 0.293*** | 0.72*** |
| Our IT personnel are self-directed and proactive | 1.396 | 0.379*** | 0.738*** |
| Our IT personnel are knowledgeable about the key success factors in our firm | 1.523 | 0.319*** | 0.762*** |
| Operational flexibility (mean = 2.836, standard deviation = 0.945) | 1.192 | 0.336*** | 0.663*** |
| Our organization uses temporary personnel to perform/execute business activities | 1.312 | 0.221* | 0.64*** |
| Our firm uses its quick-response routines to reduce uncertainty | 1.712 | 0.468*** | 0.874*** |
| Our firm has an extensive operational repertoire | 1.21 | 0.259** | 0.577*** |
| Our firm uses crash teams (that are developed quickly to solve an unexpected problem) | 1.356 | 0.399*** | 0.753*** |
| Structural flexibility (mean = 3.511, standard deviation = 0.652) | 1.25 | 0.484*** | 0.79*** |
| Our firm has an empowerment (more decision making authority for employees) culture | 1.179 | 0.257** | 0.552*** |
| Our firm facilitates the development of self-managed teams | 1.218 | 0.252* | 0.461** |
| In our firm we apply horizontal extension of responsibilities (job enlargement), that is, the ability to perform a broader repertoire of activities | 1.84 | 0.408*** | 0.831*** |
| Our organization implements training and learning practices to stimulate flexible | 1.758 | 0.356*** | 0.785*** |

1.117

0.282**

0.441**

In our firm we create cross-functional teams

attitudes among the firm's members

| Construct/Indicator | VIF | Weight | Loading |
|--|-------|----------|----------|
| Strategic flexibility (mean = 3.502, standard deviation = 0.741) | 1.283 | 0.49*** | 0.805*** |
| Our firm can increase with ease the variety of products (good and/or services) for delivery | 1.494 | 0.229*** | 0.705*** |
| Our firm dismantles current strategies quickly with low costs | 1.458 | 0.332*** | 0.746*** |
| Our firm creates new product market combinations | 1.585 | 0.318*** | 0.786*** |
| Our firm periodically adopts new technologies | 1.309 | 0.204** | 0.599** |
| Our firm influences consumers through advertising and promotions | 1.598 | 0.292*** | 0.754*** |
| IT technical infrastructure integration (mean = 3.508, standard deviation = 0.937) | 3.066 | 0.308*** | 0.907*** |
| Our organization is able to integrate databases of both firms (acquirer and target) after the acquisition(s) | 4.582 | 0.357*** | 0.944*** |
| Our organization is able to integrate business applications of both firms after the acquisition(s) | 4.42 | 0.337*** | 0.938*** |
| Our organization is able to integrate telecommunications of both firms after the acquisition(s) | 2.79 | 0.379*** | 0.916*** |
| IT personnel integration (mean = 3.24, standard deviation = 0.92) | 3.985 | 0.418*** | 0.951*** |
| IT personnel participate in the M&A planning process | 1.862 | 0.204*** | 0.763*** |
| IT personnel have prior IT integration experience | 1.91 | 0.214*** | 0.762*** |
| Our organization retains the IT and business talent of both firms that are at the core of the acquisition(s) | 3.032 | 0.241*** | 0.839*** |
| Our organization is able to integrate IT personnel skills of both firms after the acquisition(s) | 4.815 | 0.267*** | 0.907*** |
| IT personnel are able to identify and assimilate new technologies after the M&A | 2.925 | 0.273*** | 0.869*** |
| IT and business processes integration (mean = 3.197, standard deviation = 0.775) | 3.245 | 0.35*** | 0.923*** |
| Our organization is able to integrate IT and M&A management's experience of both firms | 4.304 | 0.227*** | 0.906*** |
| Our organization is able to integrate IT planning with organizational planning of both firms | 4.358 | 0.227*** | 0.896*** |
| Our firm provides corporate-wide information accessibility to all people during and/or after the M&A process | 2.502 | 0.219*** | 0.841*** |
| Our organization is able to integrate IT strategy of both firms with M&A strategy | 3.645 | 0.236*** | 0.903*** |
| Our organization is able to integrate IT with business capabilities of both firms after the acquisition(s) | 2.702 | 0.226*** | 0.857*** |
| Post-M&A performance (mean = 3.324, standard deviation = 0.798): Since the acquisition(s), how the following issues have changed? (1 = Significant decline, 5 = | | | |
| Significant increase) | VIF | Weight | Loading |
| Sales | 2.592 | 0.223* | 0.816*** |
| Intrinsic profitability (profit/capital employed) | 3.371 | 0.151 | 0.79*** |
| Earnings per share | 3.423 | 0.277*** | 0.803*** |
| Cash flow | 4.237 | 0.168† | 0.789*** |
| Overall performance | 1.21 | 0.469** | 0.733*** |

| Table A2. Correlation between Individual Post-M&A Performance Indicators and RSE | | | | | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|------------------|------------------|------------------|--|--|
| Post-M&A Performance Indicator | RSE 2007 | RSE 2008 | RSE 2009 | RSE 2010 | RSE 2011 | RSE 2007–2011 | RSE 2008–2011 | RSE 2009–2011 | | |
| 1. Sales | 0.828** | 0.766*** | 0.674** | 0.811*** | 0.784*** | 0.879** | 0.831** | 0.813** | | |
| 2. Intrinsic profitability | -0.029 | -0.134 | -0.061 | 0.04 | -0.035 | -0.059 | -0.067 | -0.052 | | |
| 3. Earnings per share | 0.066 | 0.3† | 0.538** | 0.275† | 0.556** | 0.54† | 0.599* | 0.609* | | |
| 4. Cash flow | -0.022 | -0.067 | -0.467* | -0.221 | -0.319* | -0.361† | -0.403† | -0.431* | | |
| 5. Overall performance | 0.065 | 0.057 | 0.059 | 0.043 | 0.073 | 0.075 | 0.075 | 0.074 | | |

| Table A3. Results of the Confirmatory Composite Analyses | | | | | | | | | | | |
|--|---------------------------|------------------|------------|---------------------------------------|------------------|------------|----------------------------|------------------|------------|--|--|
| | First-Order Constructs | | | Instrumental and Control Variables | | | Second-Order Constructs | | | | |
| Discrepancy | Value | HI ₉₅ | Conclusion | Value | HI ₉₅ | Conclusion | Value | HI ₉₅ | Conclusion | | |
| SRMR | 0.074 | 0.14 | Supported | 0.075 | 0.11 | Supported | 0.047 | 0.058 | Supported | | |
| d _{LS} | 6.872 | 24.344 | Supported | 2.299 | 4.921 | Supported | 0.171 | 0.258 | Supported | | |
| d _G | 5.193 | 12.891 | Supported | 1.209 | 3.011 | Supported | 0.169 | 0.203 | Supported | | |

| Table A4. Correlations of the Constructs at Second- and First-Order Levels | | | | | | | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---|
| Construct | 1 | 1.1 | 1.2 | 1.3 | 1.4 | 2 | 2.1 | 2.2 | 2.3 | 3 | 3.1 | 3.2 | 3.3 | 4 | 5 |
| 1. IT infrastructure flexibility | 1 | | | | | | | | | | | | | | |
| 1.1. IT compatibility | 0.77 | 1 | | | | | | | | | | | | | |
| 1.2. IT connectivity | 0.829 | 0.594 | 1 | | | | | | | | | | | | |
| 1.3. Modularity | 0.853 | 0.57 | 0.578 | 1 | | | | | | | | | | | |
| 1.4. IT personnel skills flexibility | 0.768 | 0.39 | 0.486 | 0.572 | 1 | | | | | | | | | | |
| 2. Business flexibility | 0.531 | 0.345 | 0.419 | 0.441 | 0.48 | 1 | | | | | | | | | |
| 2.1. Operational flexibility | 0.332 | 0.135 | 0.253 | 0.343 | 0.346 | 0.663 | 1 | | | | | | | | |
| 2.2. Structural flexibility | 0.421 | 0.352 | 0.326 | 0.325 | 0.372 | 0.79 | 0.358 | 1 | | | | | | | |
| 2.3. Strategic flexibility | 0.43 | 0.276 | 0.376 | 0.361 | 0.394 | 0.805 | 0.319 | 0.402 | 1 | | | | | | |
| 3. Post-M&A IT integration capability | 0.637 | 0.458 | 0.534 | 0.553 | 0.476 | 0.413 | 0.218 | 0.327 | 0.363 | 1 | | | | | |
| 3.1. IT technical infrastructure integration | 0.466 | 0.331 | 0.396 | 0.446 | 0.323 | 0.28 | 0.142 | 0.222 | 0.254 | 0.907 | 1 | | | | |
| 3.2. IT personnel integration | 0.685 | 0.507 | 0.597 | 0.593 | 0.525 | 0.406 | 0.196 | 0.321 | 0.389 | 0.951 | 0.804 | 1 | | | |
| 3.3. IT and business processes integration | 0.572 | 0.426 | 0.474 | 0.497 | 0.462 | 0.438 | 0.273 | 0.358 | 0.363 | 0.923 | 0.749 | 0.821 | 1 | | |
| 4. M&A activities | 0.147 | 0.098 | 0.165 | 0.215 | 0.055 | 0.239 | 0.037 | 0.138 | 0.158 | 0.214 | 0.252 | 0.232 | 0.18 | 1 | |
| 5. Post-M&A performance | 0.255 | 0.212 | 0.233 | 0.158 | 0.164 | 0.214 | 0.078 | 0.142 | 0.226 | 0.262 | 0.204 | 0.228 | 0.227 | 0.245 | 1 |

Correlations that are equal or higher than 0.135, 0.18, 0.245 and 0.325 are significant at 0.10, 0.05, 0.01 and 0.001 levels respectively.

| Dependent variable | | Standardized Path Coefficient | | | |
|------------------------------------|------------|-------------------------------|--------------|--|--|
| Independent Variable | Hypothesis | Value | Significance | | |
| Business flexibility | | | | | |
| IT infrastructure flexibility | H1a | 0.573 | *** | | |
| Business process outsourcing | | 0.154 | * | | |
| IT infrastructure flexibility | | | • | | |
| Business flexibility | | 0.088 | n.s. | | |
| Data standards | | 0.381 | *** | | |
| Network standards | | 0.276 | *** | | |
| Object-oriented methodology | | 0.387 | *** | | |
| Shared knowledge | | 0.357 | *** | | |
| M&A activities | | | • | | |
| Business flexibility | H1b | 0.204 | * | | |
| IT infrastructure flexibility | | -0.087 | n.s. | | |
| Acquirer's availability of cash | | 0.172 | * | | |
| Acquirer size | | 0.387 | *** | | |
| Post-M&A IT integration capability | | | • | | |
| IT infrastructure flexibility | H2a | 0.583 | *** | | |
| Business flexibility | H2b | -0.149 | n.s. | | |
| Prior IT integration experience | | 0.368 | *** | | |
| Post-M&A performance | | | | | |
| Post-M&A IT integration capability | H3 | 0.703 | * | | |
| IT infrastructure flexibility | | -0.224 | n.s. | | |
| Pre-M&A technological relatedness | | 0.265 | ** | | |
| Acquirer's diversification | | 0.259 | * | | |
| Acquirer size | | 0.264 | * | | |
| Acquirer industry | | 0.078 | n.s. | | |
| Prior M&A experience | | 0.007 | n.s. | | |
| Method of payment | | -0.016 | n.s. | | |
| Relative target size | | -0.24 | * | | |
| IT investment | | 0.061 | n.s. | | |
| Pre-M&A performance | | 0 | n.s. | | |

*p < 0.05; **p < 0.01; ***p < 0.001 (one-tailed test)

Appendix B

Technical Detail on SEM and PLS Path Modeling, and Endogeneity

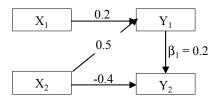
Endogeneity means that a central assumption of multiple regressions, the uncorrelatedness of the error term with the independent variables, is not met. Models containing endogeneity are called non-recursive models (Cortina 2005). There is a long history of estimating nonrecursive models by means of SEM, and PLS path modeling can also be extended to cope with non-recursive models (Dijkstra and Henseler 2015). The sometimes used term "causal modeling" stems from the notion that SEM is indeed able to uncover the direction of effects (if certain assumptions are met). Wong and Law (1999) describe in detail how structural equation models should be specified in order to cope with endogeneity.

In this appendix, we demonstrate that a correct specification of a structural equation model allows retrieving unbiased estimates. In particular, two conditions must be met:

- (1) There must be sufficient exogenous variables in the system of equations; specifically, the number of independent variables in each regression equation must not exceed the number of exogenous variables in the model. Instrumental variables are additional exogenous variables that help fulfill this condition.
- (2) Residual correlations must be allowed to be different from zero.

We present the two major instances of endogeneity, namely omitted variables and feedback loops (i.e., models in which a variable has an indirect effect on itself), and show that if the two conditions are met, it is possible to retrieve the correct parameter values.

The first important case of endogeneity is from omitted variables. Omitted variables are a source of endogeneity if a common antecedent of variables is not included in a model (for instance, because it has not been measured). In order to show that SEM is indeed able to uncover the true parameters if the two conditions are met, we consider an example, in which the world functions according to the following model:



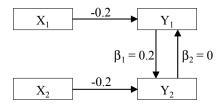
This model implies the following correlation matrix:

| | X ₁ | \mathbf{X}_2 | Y ₁ | \mathbf{Y}_2 |
|-----------------------|----------------|----------------|----------------|----------------|
| X ₁ | 1 | | | |
| X2 | 0 | 1 | | |
| Y ₁ | 0.2 | 0.5 | 1 | |
| Y ₂ | 0.04 | -0.3 | 0 | 1 |

Unfortunately, the researcher does not have data for X_2 available, and thus only a reduced correlation matrix without the second row/column is at hand. This reduced correlation matrix is analyzed using different model specifications: a simple regression of Y_2 on Y_1 , a system of equations with uncorrelated error terms, and a system of equations with correlated error terms. The estimation results are listed below:

| Parameter | True value | Estimates obta | Estimates obtained for different model specifications | | | | | | |
|----------------|------------|-------------------|---|--|--|--|--|--|--|
| | | Simple regression | System of equations with uncorrelated error terms | System of equations with correlated error terms | | | | | |
| | | Y_1 Y_2 | $X_1 \rightarrow Y_1$ \downarrow Y_2 | $X_1 \rightarrow Y_1$ Y_2 | | | | | |
| β ₁ | 0.2 | 0 | 0 | 0.2 | | | | | |

A second important case of endogeneity is that of models with feedback loops as for instance encountered in bidirectional relationships. In our paper, the relationship between the constructs IT infrastructure flexibility and business flexibility is bidirectional (i.e., it contains a feedback loop). In order to show that SEM is indeed able to uncover the true parameters if the two conditions are met, we consider another example. Let us assume that the world functioned according to the following model:



This model implies the following correlation matrix:

| | X ₁ | X ₂ | Y ₁ | Y ₂ |
|----------------|----------------|----------------|----------------|----------------|
| \mathbf{X}_1 | 1 | | | |
| X_2 | 0 | 1 | | |
| \mathbf{Y}_1 | -0.2 | 0 | 1 | |
| Y ₂ | -0.04 | -0.2 | 0.2 | 1 |

This correlation matrix is analyzed using different model specifications. The estimation results are listed below:

| Parameter | True | Estima | Estimates obtained for different model specifications | | | | | |
|-----------|-------|---|--|---|--|--|--|--|
| | value | Two separate simple regressions | Two separate multiple regressions | System of equations with correlated error terms | | | | |
| | | $\begin{array}{c c} Y_1 & Y_1 \\ \hline \\ Y_2 & Y_2 \end{array}$ | $\begin{array}{c} X_1 \longrightarrow Y_1 \\ \downarrow \\ Y_2 \end{array} \begin{array}{c} Y_1 \\ \downarrow \\ Y_2 \end{array} \begin{array}{c} Y_2 \end{array} \end{array}$ | $\begin{array}{c} X_1 \longrightarrow Y_1 \\ \hline \\ X_2 \longrightarrow Y_2 \end{array}$ | | | | |
| β_1 | 0.2 | 0.2 | 0.192 | 0.2 | | | | |
| β_2 | 0 | 0.2 | 0.2 | 0 | | | | |

As this example illustrates, a structural equation model with correlated error terms and instrumental variables is able to correctly uncover the true population parameters, whereas two separate models are not.

Appendix C

Details of Construct Measurement Specification

Table C1. Detailed Assessment of the Epistemic Relationship between First-Order Constructs and Indicators **Decision Rule/First-**IT Personnel Operational Structural **Order Construct IT Compatibility IT Connectivity** Modularity **Skills Flexibility** Flexibility Flexibility (1) Direction of Item → Construct causality from construct (compatible (electronic channels (reusable modules (proactive IT (operational (empowerment → applications → IT to indicator/item implied → IT connectivity) → Modularity) personnel → IT repertoire → Structural flexibility) by the conceptual compatibility) personnel skills Operational flexibility) flexibility) definition: · Are the indicators Characteristics Characteristics (use Characteristics Characteristics Characteristics Characteristics (a) defining (multiple interfaces) of wireless devices) (modular) (proactive IT (auick-response (iob enlargement) characteristics or operational personnel) (b) manifestations of routines) the constructs? · Would changes in Yes (compatible Yes (electronic links Yes (communica-Yes (knowing key Yes (working with Yes (using selfthe indicators applications) with business tion in different business success multiple suppliers) managed teams) partners) protocols) factors) cause changes in the construct or not? · Would changes in the No No No No No No construct cause changes in the indicators? (2) Interchangeability No No No No No No of the indicators: · Should the indicators No (compatible No (external and No (multiple No (working in No (using tempo-No (empowerment internal electronic and iob have the same or applications and protocols and cross-functional rary personnel and extensive operasimilar content? multiple interfaces) channels) reusable modules) teams and interpreenlargement) tional repertoire) ting business problems) · Do the indicators No No No No No No share a common theme? Would dropping one Yes (dropping Yes (dropping Yes (dropping Yes (dropping Yes (dropping using Yes (dropping reusable software empowerment) of the indicators alter compatible external electronic working in crossof temporary the conceptual applications) channels) modules) functional teams) personnel) domain of the construct? (3) Covariation among Not necessarily Not necessarily Not necessarily Not necessarily Not necessarily Not necessarily the indicators: Should a (between working in (between working (compatible (between external (between number of (between empower with multiple supchange in one of the applications and and internal protocols and cross-functional ment and training) multiple interfaces) indicators be assoelectronic channels) reusable modules) teams and selfpliers and crash ciated with changes in organization) teams) the other indicators? Overall conclusion: Formative Formative Formative Formative Formative Formative

Table C1. Detailed Assessment of the Epistemic Relationship between First-Order Constructs and Indicators (Continued)

| Indicators (Contin | | | | | |
|---|---|---|---|---|---|
| Decision Rule/First- Order Construct | Strategic Flexibilty | IT Technical Infrastructure Integration | IT Personnel Integration | IT Business Process Integration | Post-M&A Performance |
| (1) Direction of causality from construct to indicator/item implied by the conceptual definition: | Item → Construct (variety of products → Strategic flex.) | Item → Construct (databases integration → IT technical infrastructure integration) | Item → Construct (IT talent integration → IT personnel integration) | Item → Construct (IT and business plan integration → IT and business processes integr.) | Item → Construct (sales → Post-M&A performance) |
| Are the indicators (a) defining characteristics or (b) manifestations of the constructs? | Characteristics (product market combination) | Characteristics (applications integration) | Characteristics (IT skills integration) | Characteristics (IT and business capabilities integration) | Characteristics (sales) |
| Would changes in the indicators cause changes in the construct or not? | Yes (adoption of new technologies) | Yes (databases integration) | Yes (participation in M&A planning process) | Yes (IT and M&A strategy integration) | Yes (profitability) |
| Would changes in the construct cause changes in the indicators? | No | No | No | No | No |
| (2) Interchangeability of the indicators: | No | No | No | No | No |
| Should the indicators have the same or similar content? | No (variety of products and changing strategies) | No (databases and telecommunications integration) | No (M&A planning IT integration experience) | No (inf. accessibility and, IT and M&A strategy integration) | No (sales and earnings per share) |
| • Do the indicators share a common theme? | No | No | No | No | No |
| Would dropping one of the indicators alter the conceptual domain of the construct? | Yes (adoption of new technologies) | Yes (databases integration) | Yes (retaining IT and business talent) | Yes (IT and business capabilities integration) | Yes (profitability) |
| (3) Covariation among the indicators: Should a change in one of the indicators be associated with changes in the other indicators? | No (covariation between changing strategies and advertising) | Not necessarily (covariation between integration of databases and telecommunications) | Mostly no (covariation between M&A planning and IT skills integration) | No (covariation between inf. accessibility and, IT and M&A strategy integration) | No (covariation between sales and earnings per share) |
| Overall conclusion: | Formative | Formative | Formative | Formative | Formative |

| Constructs | | | | | | | | |
|--|---|---|---|--|--|--|--|--|
| Criteria/Second-Order Construct | IT Infrastructure Flexibility | Business Flexibility | IT Integration Capability | | | | | |
| Direction of causality from second- to first-order/dimension construct implied by the conceptual definition: | Dimension → Second-order construct (IT compatibility → IT infrastructure flexibility) | Dimension → Second-order construct (operational flexibility → Business flexibility) | Dimension → Second-order construct (IT personnel integration → IT integration capability) | | | | | |
| Are the dimensions (a) defining characteristics or (b) manifestations of the second- order constructs? | Characteristics (modularity) | Characteristics (structural flexibility) | Characteristics (IT and business processes integration) | | | | | |
| Would changes in the dimensions cause changes in the construct or not? | Yes (IT personnel skills flexibility) | Yes (strategic flexibility) | Yes (IT technical infrastructure integration) | | | | | |
| Would changes in the second- order construct cause changes in the dimensions? | No | No | No | | | | | |
| (2) Interchangeability of the dimensions: | No | No | No | | | | | |
| Should the dimensions have the same or similar content? | No (IT connectivity and modularity) | No (operational and strategic flexibility) | No (IT technical infrastructure and IT personnel integration) | | | | | |
| Do the dimensions share a common theme? | No | No | No | | | | | |
| Would dropping one of the dimensions alter the conceptual domain of the second-order construct? | ensions alter the conceptual flexibility) nain of the second-order | | Yes (dropping IT technical infrastructure integration) | | | | | |
| (3) Covariation among the dimensions: Should a change in one of the dimensions be associated with changes in the other dimensions? | IT compatibility and modularity) f the dimensions be diated with changes in the | | No (covariation between IT technical infrastructure, and IT and business processes integration) | | | | | |
| Overall conclusion: | Formative | Formative | Formative | | | | | |

Table C2. Detailed Assessment of the Epistemic Relationship between Second- and First-Order Constructs

Table C3. Descriptive Statistics for the Instrumental and Control Variables

| and Control variables | | | | | | | | |
|-----------------------------------|-------|-----------------------|--|--|--|--|--|--|
| Variable | Mean | Standard Deviation | | | | | | |
| Business process outsourcing | 4.167 | 0.949 | | | | | | |
| Data standards | 3.788 | 1.001 | | | | | | |
| Network standards | 3.22 | 1.292 | | | | | | |
| Object-oriented methodology | 3.67 | 1.101 | | | | | | |
| Shared knowledge | 3.806 | 0.84 | | | | | | |
| Acquirer's availability of cash | 4.572 | 12.435 | | | | | | |
| Acquirer size | 4.625 | 1.755 | | | | | | |
| Prior IT integration experience | 2.23 | 1.37 | | | | | | |
| Pre-M&A technological relatedness | 3.132 | 1.266 | | | | | | |
| Acquirer's diversification | 0.266 | 0.391 | | | | | | |
| Prior M&A experience | 1.962 | 1.245 | | | | | | |
| Method of payment | 0.867 | 0.324 | | | | | | |
| Relative target size | 0.887 | 1.218 | | | | | | |
| IT investment | 2.72 | 0.975 | | | | | | |

| Construct | | | | | | | | | | | |
|-----------|--------|-------|-------|-------|-------|--------|-------|-------|-------|-------|--------|
| Indicator | ITCOM | ITCON | MOD | ITPSF | OPF | STRF | STRAF | ITTII | ITPI | ITBPI | PMAP |
| ITCOM1 | 0.663 | 0.354 | 0.409 | 0.22 | 0.106 | 0.168 | 0.125 | 0.271 | 0.315 | 0.244 | 0.113 |
| ITCOM2 | 0.81 | 0.45 | 0.369 | 0.208 | 0.12 | 0.347 | 0.152 | 0.188 | 0.335 | 0.276 | 0.144 |
| ІТСОМ3 | 0.849 | 0.592 | 0.523 | 0.371 | 0.075 | 0.37 | 0.294 | 0.331 | 0.521 | 0.448 | 0.294 |
| ITCOM4 | 0.755 | 0.389 | 0.438 | 0.375 | 0.133 | 0.163 | 0.243 | 0.21 | 0.344 | 0.3 | 0.048 |
| ITCON1 | 0.405 | 0.517 | 0.156 | 0.204 | 0.11 | 0.366 | 0.319 | 0.057 | 0.212 | 0.157 | 0.034 |
| ITCON2 | 0.513 | 0.79 | 0.39 | 0.324 | 0.111 | 0.231 | 0.194 | 0.267 | 0.434 | 0.398 | 0.204 |
| ITCON3 | 0.531 | 0.834 | 0.523 | 0.422 | 0.237 | 0.296 | 0.312 | 0.366 | 0.538 | 0.438 | 0.242 |
| ITCON4 | 0.287 | 0.723 | 0.517 | 0.418 | 0.25 | 0.115 | 0.299 | 0.374 | 0.475 | 0.32 | 0.144 |
| MOD1 | 0.349 | 0.35 | 0.704 | 0.437 | 0.24 | 0.216 | 0.304 | 0.236 | 0.41 | 0.372 | 0.062 |
| MOD2 | 0.4 | 0.466 | 0.794 | 0.49 | 0.252 | 0.222 | 0.175 | 0.422 | 0.466 | 0.349 | 0.126 |
| MOD3 | 0.475 | 0.449 | 0.829 | 0.395 | 0.268 | 0.302 | 0.305 | 0.385 | 0.444 | 0.396 | 0.21 |
| MOD4 | 0.47 | 0.451 | 0.645 | 0.387 | 0.264 | 0.226 | 0.299 | 0.272 | 0.447 | 0.367 | 0.059 |
| ITPSF1 | 0.248 | 0.386 | 0.465 | 0.76 | 0.289 | 0.248 | 0.254 | 0.313 | 0.408 | 0.359 | 0.18 |
| ITPSF2 | 0.3 | 0.309 | 0.356 | 0.72 | 0.241 | 0.208 | 0.2 | 0.184 | 0.368 | 0.296 | 0.135 |
| ITPSF3 | 0.304 | 0.417 | 0.446 | 0.738 | 0.196 | 0.316 | 0.363 | 0.301 | 0.452 | 0.423 | 0.14 |
| ITPSF4 | 0.313 | 0.321 | 0.427 | 0.762 | 0.313 | 0.327 | 0.34 | 0.143 | 0.323 | 0.28 | 0.026 |
| OPF1 | -0.057 | 0.1 | 0.204 | 0.108 | 0.64 | 0.085 | 0.217 | 0.104 | 0.12 | 0.122 | 0.153 |
| OPF2 | 0.165 | 0.259 | 0.327 | 0.283 | 0.874 | 0.331 | 0.307 | 0.143 | 0.167 | 0.308 | 0.051 |
| OPF3 | 0.019 | 0.059 | 0.165 | 0.283 | 0.577 | 0.228 | 0.083 | 0.1 | 0.118 | 0.159 | -0.018 |
| OPF4 | 0.163 | 0.238 | 0.258 | 0.292 | 0.753 | 0.315 | 0.265 | 0.066 | 0.153 | 0.151 | 0.063 |
| STRF1 | 0.126 | 0.116 | 0.156 | 0.126 | 0.257 | 0.552 | 0.262 | 0.126 | 0.177 | 0.204 | 0.053 |
| STRF2 | 0.171 | 0.242 | 0.179 | 0.228 | 0.098 | 0.461 | 0.182 | 0.141 | 0.177 | 0.132 | 0.051 |
| STRF3 | 0.294 | 0.319 | 0.216 | 0.298 | 0.221 | 0.831 | 0.303 | 0.202 | 0.276 | 0.367 | 0.072 |
| STRF4 | 0.245 | 0.215 | 0.232 | 0.279 | 0.294 | 0.785 | 0.309 | 0.067 | 0.215 | 0.233 | 0.134 |
| STRF5 | 0.248 | 0.103 | 0.247 | 0.217 | 0.258 | 0.441 | 0.196 | 0.168 | 0.149 | 0.142 | 0.138 |
| STRAF1 | 0.174 | 0.127 | 0.19 | 0.236 | 0.177 | 0.196 | 0.705 | 0.175 | 0.238 | 0.273 | 0.203 |
| STRAF2 | 0.231 | 0.371 | 0.261 | 0.365 | 0.29 | 0.308 | 0.746 | 0.175 | 0.348 | 0.324 | 0.153 |
| STRAF3 | 0.216 | 0.308 | 0.434 | 0.353 | 0.366 | 0.205 | 0.786 | 0.24 | 0.291 | 0.275 | 0.043 |
| STRAF4 | 0.204 | 0.199 | 0.158 | 0.15 | 0.038 | 0.238 | 0.599 | 0.124 | 0.214 | 0.235 | 0.188 |
| STRAF5 | 0.167 | 0.294 | 0.208 | 0.26 | 0.198 | 0.484 | 0.754 | 0.188 | 0.286 | 0.197 | 0.263 |
| ITTII1 | 0.301 | 0.402 | 0.411 | 0.29 | 0.096 | 0.181 | 0.251 | 0.944 | 0.767 | 0.672 | 0.194 |
| ITTII2 | 0.286 | 0.333 | 0.404 | 0.264 | 0.178 | 0.15 | 0.204 | 0.938 | 0.728 | 0.649 | 0.207 |
| ITTII3 | 0.336 | 0.371 | 0.432 | 0.345 | 0.126 | 0.282 | 0.253 | 0.916 | 0.751 | 0.768 | 0.171 |
| ITPI1 | 0.31 | 0.406 | 0.373 | 0.337 | 0.127 | 0.202 | 0.297 | 0.648 | 0.763 | 0.603 | 0.097 |
| ITPI2 | 0.431 | 0.515 | 0.505 | 0.4 | 0.197 | 0.226 | 0.222 | 0.581 | 0.762 | 0.493 | 0.142 |
| ITPI3 | 0.442 | 0.558 | 0.518 | 0.511 | 0.131 | 0.288 | 0.341 | 0.535 | 0.839 | 0.676 | 0.182 |
| ITPI4 | 0.433 | 0.49 | 0.51 | 0.481 | 0.126 | 0.313 | 0.383 | 0.74 | 0.907 | 0.829 | 0.207 |
| ITPI5 | 0.474 | 0.506 | 0.541 | 0.436 | 0.232 | 0.289 | 0.355 | 0.809 | 0.869 | 0.764 | 0.29 |
| ITBPI1 | 0.375 | 0.407 | 0.429 | 0.418 | 0.227 | 0.28 | 0.284 | 0.681 | 0.767 | 0.906 | 0.138 |
| ITBPI2 | 0.392 | 0.448 | 0.48 | 0.374 | 0.286 | 0.314 | 0.336 | 0.648 | 0.707 | 0.896 | 0.154 |
| ITBPI3 | 0.303 | 0.369 | 0.424 | 0.439 | 0.306 | 0.372 | 0.337 | 0.603 | 0.673 | 0.841 | 0.183 |
| ITBPI4 | 0.409 | 0.415 | 0.422 | 0.404 | 0.198 | 0.358 | 0.346 | 0.704 | 0.736 | 0.903 | 0.298 |
| ITBPI5 | 0.395 | 0.446 | 0.435 | 0.399 | 0.188 | 0.253 | 0.295 | 0.66 | 0.732 | 0.857 | 0.221 |
| PMAP1 | 0.116 | 0.099 | 0.063 | 0.085 | 0.085 | -0.023 | 0.203 | 0.101 | 0.087 | 0.136 | 0.816 |
| PMAP2 | 0.149 | 0.108 | 0.081 | 0.039 | 0.031 | 0.065 | 0.148 | 0.031 | -0.02 | 0.033 | 0.79 |
| PMAP3 | 0.161 | 0.132 | 0.101 | 0.133 | 0.089 | 0.158 | 0.157 | 0.118 | 0.103 | 0.179 | 0.803 |
| PMAP4 | 0.193 | 0.04 | 0.047 | 0.093 | 0.012 | 0.161 | 0.069 | 0.069 | 0.013 | 0.096 | 0.789 |
| PMAP5 | 0.186 | 0.323 | 0.205 | 0.185 | 0.059 | 0.142 | 0.22 | 0.282 | 0.386 | 0.268 | 0.733 |

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