

## VERTICAL STRATEGIC INFORMATION FLOW AND MARKET ORIENTATION

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### *Abstract*

Market orientation research has accumulated a variety of findings over the past two decades, during which researchers have emphasized the importance of information flow within an organization. However, even though market information is very important for the organization's adaptation to its environment, the vertical flow of strategic information has not been the main focus of market orientation researchers. In contrast, vertical strategic information flow has been the main theme from the middle management perspective of strategy process and knowledge creation theory. Although these research streams share an interest in information flow within an organization, they have remained separate traditions up until now. This paper tries to bridge the gap between these two research traditions by using a database of Japanese business organizations. The authors contend that the downward information flow of formal strategy and the lateral flow of inter-functional information are much more important in improving market orientation than the upward information flow of emergent strategy. And, contrary to the widely shared belief, informal information flows do not contribute to organizational market adaptation.

### I. *Introduction*

Market-oriented organizations have various strategic advantages in adapting themselves to their markets. Even though there have emerged in recent years a growing number of stakeholders for an organization to take into consideration, customers remain the most important source of threats and opportunities for business organizations. This is the major reason why many researchers have spent much effort in conducting empirical studies on market orientation since the 1990s (Kohli & Jaworski, 1990; Narver & Slater, 1990).

Although there have been several somewhat different definitions of market orientation, all share common tenets of the marketing concept and emphasize market-related information processing (Deshpandé & Farley, 1998; Jaworski & Kohli, 1993, 1996; Sinkula, 1994; Slater & Narver, 1995). For example, Kohli and Jaworski (1990) defined the concept as "organization-wide generation of market intelligence pertaining to current and future customer needs, dissemination of intelligence across departments, and organization-wide responsiveness to it."

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(Kohli & Jaworski, 1990, p. 6) Other researchers, such as Sinkula (1994) and Baker and Sinkula (1999), are more inclined to focus upon information and the learning aspects of the market orientation concept. All these researchers have conceptualized market orientation in terms of organizational communication and organizational learning. In other words, market orientation is intrinsically an issue of information flow that is strategically important for an organization.

However, researchers in market orientation have not paid much attention to the organizational information flow of corporate and/or business strategy. Many papers in this tradition chose the following factors as organizational antecedents of market orientation: (1) centralization and formalization, (2) interdepartmental connectedness, (3) leadership of top management that emphasizes market orientation, (4) incentive systems that support market orientation, and (5) organizational culture and climate (Cano, Carrillat, & Jaramillo, 2004; Deshpandé & Farley, 1998; Jaworski and Kohli, 1993; Lascu, Manrai, Manrai, & Kleczek, 2006; Menguc & Auh, 2008; Narver & Slater, 1995; Slater & Narver, 1995). Even though there must be very important relationships between market information and strategic information, these researchers do not seem to have paid much attention to the relationships between market orientation and strategic information flows. For example, questions such as the following have not been much explored in this tradition:

- (1) Is a market-oriented organization full of a downward information flow of formal strategy?
- (2) Does an upward information flow of emergent strategy encourage the market orientation of an organization?

These questions have not found an important position in the market orientation literature, but they are one of the main themes in the middle management perspective on strategy process and knowledge creation theory (Floyd & Wooldridge, 1997, 2000; Nonaka, 1988; Pappas & Wooldridge, 2007; Watson & Wooldridge, 2005; Wooldridge & Floyd, 1990; Wooldridge, Schmid, & Floyd, 2008). The middle management perspective and knowledge creation theory emphasize middle managers' role in creating and implementing the organization's strategy, and thus their role in mediating upward and downward strategic information flow within an organization.

For example, based on empirical studies, Wooldridge and Floyd (1990) suggest that the reason middle management involvement improves organizational performance may not be the heightened commitment of middle managers, but an improved decision making through the utilization of their information. In a similar vein, Floyd and Wooldridge (1997) emphasize the importance of some mixture of upward influence and downward influence in achieving high organizational performance.

Knowledge creation theory is resonant with the middle management perspective. In the process of constructing knowledge creation theory, Nonaka (1988; 1994) and Nonaka, Toyama, & Konno (2000) focus upon the strategically important role of middle managers, and argue that the active role played by middle managers in creating new product concepts and new business strategies is the key to organizational self-renewal and long-term growth of the company. Nonaka and his colleagues also emphasize the role of the cross-functional team in exchanging inter-functional information and generating a new synthesis of product concepts (Imai, Nonaka, & Takeuchi, 1985; Nonaka, 1994). Nonaka's theory of knowledge creation can be interpreted

in terms of organizational communication for strategic change, i.e., strategic self-renewal through encouraging vertical and horizontal information flows.

The middle management perspective of Floyd and Wooldridge and the knowledge creation theory of Nonaka both emphasize the importance of vertical and lateral organizational communication of strategic information in creating a strategy of high adaptability to the market environment. Their research results point to the idea that vertical and horizontal flows of strategic information within an organization increase its adaptability to the market environment via increased market orientation. Even though market orientation research, on the one hand, and the middle management perspective and knowledge creation theory, on the other, have been separate research traditions, they must intrinsically share interests in communication and information flow within an organization.

There seems to be two reasons for us to combine these two research streams. First, while middle management perspective and knowledge creation theory emphasize vertical information flows and lateral information flows, it remains unclear whether these information flows are by themselves important for the organization's performance, or they are conducive to high performance via enhanced market orientation of the organization. From the view point of middle management perspective and knowledge creation theory, whether market orientation plays an intermediary role to increased organizational performance or not is one of the important research questions to address.

In addition to this, bridging these two separate traditions are very important in order for us to consider how to develop a market-oriented organization through the means of organizational rearrangements. On one hand, empowered lower and middle managers would seem to advance their organization's adaptability to the market environment (Hurley & Hult, 1998). But, on the other, strong leadership may enhance the market orientation of the organization (Kirca, Jayachandran, & Bearden, 2005). This paper tries to bridge this lack of dialogue between these two important research streams by examining the influence of organizational strategic information flows on market orientation.

## II. *Market Orientation and Intra-organizational Strategic Information Flow*

### 1. **Market Orientation and Organizational Performance**

Researchers in market orientation have made many findings based on a few standardized measurements of market orientation. One of the most important measurements, usually called MARKOR, was developed by Jaworski and Kohli (1993). Through carefully reviewing market orientation concepts that appeared in various literatures, they specified three dimensions of market orientation as follows:

- (1) **Intelligence Generation:** Market information gathering activities from outside the organization;
- (2) **Intelligence Dissemination:** Market information sharing activities within the organization;
- (3) **Responsiveness:** Changes or realization of organizational action based upon the market information.

The first two dimensions are mainly related to organizational processing of market information, while the third is related to the actions of organizations based on the processed market information. In essence, Jaworski and Kohli operationally defined market orientation from the viewpoint of market information and changes in action based upon it.

Much empirical research, including meta-analytic research, has found that market orientation measurements consistently have positive correlation with organizational performance, especially when the performance measures are subjective rather than objective (Cano et al., 2004; Deshpandé & Farley, 1998; Jaworski & Kohli, 1996; Kirca, Jayachandran, & Bearden, 2005). Thus, we would like to first confirm this positive relation between measurements of market orientation and performance.

*Hypothesis 1 (H1): The greater the market orientation (intelligence generation, intelligence dissemination, and responsiveness), the higher the organizational performance.*

## **2. The Middle Management Perspective and Market Orientation**

Research in the middle management perspective suggests that middle managers' involvement in strategy formulation leads to superior strategy because this involvement improves strategic decisions of the organization, and at the same time, improves the organizational implementation of the strategy. This dual focus on information utilization and implementation would lead to an emphasis on both upward influence and downward influence within the organizations (Wooldridge & Floyd, 1990; Floyd & Wooldridge, 1997).

Upward and downward information flow is also emphasized in knowledge creation theory. Nonaka (1988; 1994) conceived of organizational self-renewal as a process of knowledge creation through the interaction of top and middle management, which he called "middle-up-down management." In order for organizational self-renewal to take place in the face of a turbulent environment, top management must propose an energizing strategic vision of the organization's future, and middle managers must generate a new product (business) concept that mediates between the reality at the front lines and the higher-order strategic vision of top management (Nonaka et al., 2000). In this process of self-renewal through knowledge creation, Nonaka argues that both the downward information flow of strategic vision and the upward flow of real-life strategic information are very important, and that the middle managers play a critical role in mediating between these upward and downward information flows (Nonaka, 1988, 1994).

Both of these research streams pay attention to the upward and downward information flow of strategic importance because this information flow is thought to be crucial in order for an organization to adapt itself to its turbulent environment (Wooldridge & Floyd, 1990; Nonaka, 1988). Even though these research streams do not refer to market orientation concepts, the concepts seem to capture the most important aspects of firms' environments, and the vertical information flows must increase organizations' performance through encouraging the market orientation of these organizations. In addition, even though market orientation researchers do not clearly take the vertical information flows into consideration, their search for antecedents of the market orientation includes many organizational variables such as centralization, formalization, etc., and they place the former concepts as intervening variables that connect organizational variables and organizational performance (Kirca, Jayachandran, &

Bearden, 2005; Kohli & Jaworski, 1990). Following the preceding research, we would like to posit that vertical information flows advance an organization's market orientation, and this in turn increases its performance. The argument that the vertical strategic information flow improves an organization's adaptation to its environment suggests the idea that these flows improve organizational orientation toward the market environment. Thus we hypothesize as follows:

*Hypothesis 2 (H2): The greater the downward strategic information flow in an organization, the greater its market orientation.*

*Hypothesis 3 (H3): The greater the upward strategic information flow in an organization, the greater its market orientation.*

### 3. Other Types of Information Flow and Market Orientation

The knowledge creation theory and organizational communication research pay attention not only to vertical information flows within an organization, but also to horizontal or lateral information flows across different functional departments (Nonaka, 1988, 1994; Tompkins & Wanca-Thibault, 2001). Nonaka emphasizes the cross-functional team as a key device for an organization to develop autonomy within a large established and bureaucratic firm. This device would improve the sensitivity of the team to the market environment and encourage creation of new knowledge that would lead to market success. Also in the research area of market orientation, Homburg, Workman, Jr., and Jensen (2000) contend that US and German companies are in the process of reorganization for fine-tuning themselves to each customer account, and that it is becoming more and more important for a company to facilitate cross-functional coordination among functional departments toward specific customer demands. Following this research that emphasizes the importance of lateral communications, we hypothesize a positive relationship between market orientation and lateral information flow within an organization:

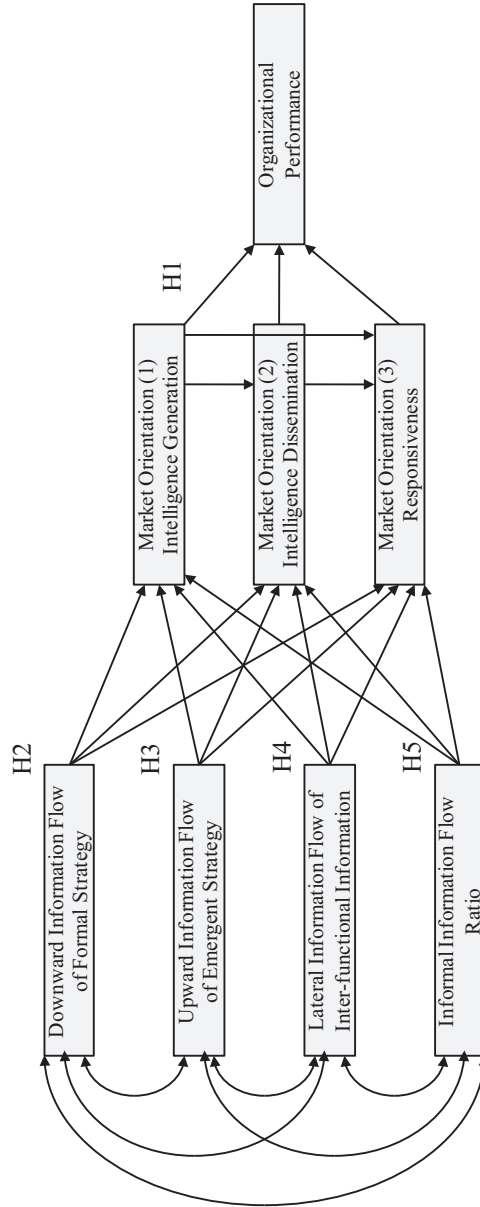
*Hypothesis 4 (H4): The greater the lateral information flow in an organization, the greater its market orientation.*

Information flows not only through formal channels but also through informal networks within an organization (Tompkins & Wanca-Thibault, 2001). Informal communication is usually thought to be a desirable process for an organization to generate new knowledge and facilitate internal coordination (Kraut, Fish, Root, & Shalfonte, 1993; Nonaka et al., 2000; Whittaker, Frohlich, & Daly-Jones, 1994). If an organization can disseminate much information through informal channels, it would benefit from this because its formal channel can be protected from information overload (Galbraith, 1977). This exemption would enable the organization to further develop its market orientation. Thus we hypothesize as follows:

*Hypothesis 5 (H5): The greater the percentage of necessary information flows that occur through informal channels, the greater an organization's market orientation.*

As a summary of the hypotheses described above, we drew a simple path diagram in Figure 1. As shown in the figure, our path analysis model basically has two-step causal relationships. The relationships among market orientation dimensions are assumed as drawn in

FIG. 1 BASIC MODEL: ORGANIZATIONAL PERFORMANCE, MARKET ORIENTATION, AND INTRA-ORGANIZATIONAL INFORMATION FLOW



the figure because the previous studies contend that they are highly correlated, and that intelligence generation is a prerequisite for intelligence dissemination, while the latter in turn is a prerequisite for responsiveness (Maltz & Kohli, 1996; Sinkula, Baker, & Noordewier, 1997).

### III. *Methods*

#### 1. **Data**

In order to test these hypotheses, we conduct a path analysis based on a questionnaire survey of Japanese business organizations. The data we use in our analysis were collected by the Organizational Deadweight Project, which has conducted questionnaire survey research every two years since 2005.<sup>1</sup> We will use data from the third Organizational Deadweight Project survey that collected data from January to March of 2009 because it is the only survey in the series that contained market orientation measurements.

We selected a business unit (BU) as the unit of analysis and adopted a multi-level survey research design. That is, we measured the BU's characteristics by averaging the responses of at least six middle-level managers responding to the same questionnaire. We sent a set of questionnaires to a company, asking the coordinator of the company to select three middle managers (average age = 46.37 years, as of Jan. 1, 2009) and three lower middle managers (average age = 39.15 years, as of Jan. 1, 2009): a total of six middle managers from three major functional departments. We also asked the companies to select the most promising, top-notch middle-level managers as the respondents, because observation of the BU's characteristics would be affected by how the respondents are rated in their organization, as well as by the real differences among the BUs.

Because this kind of survey design assigns heavy responsibilities to the collaborating companies, we first formed a research consortium and promised the companies involved that they would be given a detailed research report for each BU. Twenty-one companies joined the third Project, all of them are large established firms, and listed in the First Section of the Tokyo Stock Exchange. The total number of BUs represented is 139, with questionnaires collected from middle managers numbering 882.<sup>2</sup> The average number of BUs per company is 6.6, ranging from a minimum of 1 to a maximum of 22.

Our sample BUs are mainly from manufacturing (electronics, chemicals and pharmaceuticals, foods and beverages, etc.), with several BUs from retailing and transportation services. The sizes of BUs are also wide-ranging, with the smallest having 10 full-time employees and the largest, 6,281. The average BU has 489 employees. The BU's annual sales (fiscal 2007) range from 1 billion yen (about \$11 million if \$1 = ¥90) to 2.89 trillion yen (about \$32.1 billion), with an average of 137.9 billion yen (\$1.53 billion).

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<sup>1</sup> The Organizational Deadweight Project first started as an exploratory research project focusing on questions like identifying the kind of internal coordination problems facing Japanese companies and the antecedent conditions for such internal coordination problems.

<sup>2</sup> In addition to this number, we also collected an almost-identical questionnaire from each BU's general manager. There were 139 general managers, making the grand total of questionnaires 1,021.

## 2. Variables and Dimensions at the Individual Level

Because our questionnaires are answered by individuals but we take the BU as the unit of analysis, we average the answers of the six middle-level managers by BU and treat these variables and dimensions as BU characteristics. Before conducting path analyses at the level of BU, we would first like to explicate our measurements at the individual level and then check some indices of inter-rater reliability when constructing BU level variables.

**Market Orientation.** We adopted Jaworski and Kohli's MARKOR as a measurement of market orientation (Jaworski & Kohli, 1993). Table 1 shows the three dimensions of market orientation, the corresponding three to five questions, the results of a confirmatory factor analysis, and the coefficient alpha on the individual questionnaire data. As discussed in the previous section, MARKOR has three dimensions: (1) intelligence generation, (2) intelligence dissemination, and (3) responsiveness. Items concerning these three dimensions have relatively high path coefficients, and Cronbach's alphas are over .70 except for intelligence dissemination. We average these items by respondent and get three dimensions of market orientation at the individual level. We adopt the same procedures even for the dissemination dimension, because we would like to give priority to the theoretical construct, and the goodness of fit indices in the confirmatory factor analysis are acceptable.

As shown in Table 1, the confirmatory factor analysis shows a relatively good level of fit, with AGFI (Adjusted Goodness of Fit) over .955 and RMSEA less than .05. Even though the confirmatory factor analysis could not achieve the desirable level of chi-square ( $p=.000$ ), it is widely known that chi-square is sensitive to the number of cases and not a useful index when  $N$  is large (say, around 1,000) (Toyoda, 1992). Because our database contains 869 cases, after deleting cases missing data on market orientation, we would like to adopt this model considering relatively good indices of fit other than chi-square.

**Information Flow.** We developed original measurements of information flow within an organization. Table 2 contains the four dimensions of intra-organizational information flow, the corresponding two to three questions, the results of a confirmatory factor analysis, and the coefficient alpha with the individual questionnaire data. As discussed in the previous section, we selected four dimensions of intra-organizational information flow: (i) downward strategic information flow, (ii) upward strategic information flow, (iii) lateral information flow of inter-functional information, and (iv) informal information flow ratio.

All the question items on these dimensions are operationalized in a similar format. For example, as regards the downward strategic information flow of BU strategy, we asked the respondents, "Please assume that the total amount of information on the BU strategy that would be necessary for you to do your task properly is equal to 100 percent. What percentage of it do you believe you receive?" Wordings for the other items are shown in Table 2. These questions present a ten-point scale, which starts from 1 (= less than 10 percent) and 2 (= ten and more than 10 to less than 20), with a 10 percent interval for every 1 point, through to 10 (= 90 and more than 90 percent). Downward information flow of strategy is operationalized by two items related to corporate and BU strategy. Because both corporate strategy and BU strategy are intrinsically formal rather than informal or emergent, we designate this dimension as downward information flow of formal strategy in the following pages.



TABLE 1. CONFIRMATORY FACTOR ANALYSIS OF MARKET ORIENTATION

Dimension	Variable ID (& Error Variable ID)	Questionnaire Item:	Path Coefficient (standardized)	S.E.	C.R.	<i>p</i>	alpha
Market Orientation (1)	11	In this business unit, we meet with customers at least once a year to find out what products or services they will need in the future.	.649	1.000			
	12	In this business unit, we do a lot of in-house market research.	.727	.083	14.057	***	
	13	We poll end users at least once a year to assess the quality of our products and services.	.565	.087	12.513	***	.721
	14	We often talk with or survey those who can influence our end users' purchases (e.g. retailers, distributors).	.448	.080	10.309	***	
Market Orientation (2)	21	A lot of informal "hall talk" in this business unit concerns our competitors' tactics or strategies.	.485	1.000			
	22	Marketing personnel in our business unit spend time discussing customers' future needs with other functional departments.	.627	.120	10.070	***	.579
	23	When one department finds our something important about competitors, it is slow to alert other departments. (Reversed)	.564	.125	9.731	***	
Market Orientation (3)	31	It takes us forever to decide how to respond to our competitors' price changes. (Reversed)	.524	1.000			
	32	Principles of market segmentation drive new product development efforts in this business unit.	.476	.823	.078	10.594	***
	33	For one reason or another we tend to ignore our customers' product or service needs. (Reversed)	.743	.222	.090	13.502	***
	34	The product lines we sell depend more on internal politics than real market needs. (Reversed)	.701	.309	.099	13.196	***
Responsiveness	35	Customer complaints fall on deaf ears in this business unit. (Reversed)	.678	.179	.091	12.993	***
	N=869						
Correlations (standardized) between:							
Response ← → Intelligence Dissemination:			554				
Response ← → Intelligence Generation:			676				
Intelligence Generation ← → Intelligence Dissemination:			470				
e13	← →	e14:	.350				
e12	← →	e32:	.207				
e22	← →	e32:	.257				
***. <i>p</i> < .001							
NPAR			$\chi^2$	D.F.	<i>p</i>		
Response ← → Intelligence Dissemination:			30	149.872	48	.000	
Intelligence Generation ← → Intelligence Dissemination:			470				
GFI	AGFI	CFI	RMSEA				
.973	.955	.959	.049				

TABLE 2. CONFIRMATORY FACTOR ANALYSIS OF INFORMATION FLOW

Dimension	Variable ID	Questionnaire Item:	Path Coefficient (standardized)	C.R.	<i>p</i>	alpha	
Downward Information Flow of Formal Strategy	41	Q11 We would like to ask you how much information are coming and going. Please choose one point that you think intuitively best from the ten-point scale below ("less-than 10%" to "more-than 90%", one point every ten percent). Please assume that the total amount of information on the corporate strategy that would be necessary for you to do your task properly is equal to 100 percent. What percentage of it do you believe you receive?	.684	1.000		.713	
	42	Please assume that the total amount of information on the BU strategy that would be necessary for you to do your task properly is equal to 100 percent. What percentage of it do you believe you receive?	.816	1.046	.062	16.834	***
Upward Information Flow of Emergent Strategy	51	Please assume that the total amount of information (or intent) you have with regard to what strategic direction your BU should follow is equal to 100 percent. What percentage of it do you believe your BU's general manager receives?	.717	1.000		.714	
	52	Please assume that the total amount of information (or intent) your subordinates have with regard to what strategic direction your BU should follow is equal to 100 percent. What percentage of it do you believe you receive?	.792	.873	.052	16.909	***
Lateral Information Flow of Inter-functional Information	61	Please assume that the total amount of information on other functional areas that would be necessary for you to do your task properly is equal to 100 percent. What percentage of it do you believe you receive?	.789	1.000		.687	
	62	Please assume that the total amount of information on your functional area that would be necessary for your colleagues in other functional departments to do their tasks properly is equal to 100 percent. What percentage of it do you believe they receive?	.669	.852	.061	13.984	***
Informal Information Flow Ratio	71	Assuming that the total information you have on your corporation's strategy as a whole (answer to the question 41) is equal to 100 percent, what percentage of it is gained from your informal network rather than from your formal bosses and/or formal meetings in your company?	.789	1.000		.803	
	72	Assuming that the total information you have on your BU's strategy (answer to the question 42) is equal to 100 percent, what percentage of it is gained from your informal network rather than from your formal bosses and/or formal meetings in your company?	.833	1.045	.054	19.518	***
	73	Assuming that the total information you have on other functional areas (answer to the question 61) is equal to 100 percent, what percentage of it is gained from your informal network rather than from formal integrators and/or formal meetings in your company?	.664	.885	.049	18.061	***
<b><i>N</i> = 874</b>							
<b>Correlations (standardized) between:</b>							
Information Flow of Formal Strategy ↔ Upward Information Flow of Emergent Strategy:			.762			.000	
Upward Information Flow of Emergent Strategy ↔ Lateral Communication of Inter-functional Information:			.654				
Lateral Communication of Inter-functional Information ↔ Informal Communication Rate:			-.141				
Information Flow of Formal Strategy ↔ Lateral Communication of Inter-functional Information:			.666			.051	
Information Flow of Formal Strategy ↔ Informal Communication Rate:			-.247				
Upward Information Flow of Emergent Strategy ↔ Informal Communication Rate:			-.090				
*** <i>p</i> < .001							

Upward information flow is operationalized with two items. One item asks how much one's boss receives one's strategic proposals, and the other item asks how much one receives one's subordinates' proposals. Because strategic proposals from below in a hierarchy usually lead to emergent strategies, we call this dimension the upward information flow of emergent strategy.

Lateral information flow of inter-functional information is measured with two items, one of which concerns reception and the other issuance. The informal information flow ratio is operationalized with three items, related to the ratio of information about corporate strategy, BU strategy, and inter-functional information, respectively, as received through informal channels.

As shown in Table 2, Cronbach's alphas for all the dimensions are from fair to good, and the confirmatory factor analysis shows a relatively high goodness of fit. Again, chi-square ( $p=.000$ ) of this model is large because of the large sample size ( $N=874$ ), but AGFI is equal to .966 and RMSEA .051, suggesting that the fitness of the model is relatively good. The arithmetic means of two or three items by respondent are treated as the four dimensions at the individual level.

**Organizational Performance.** We operationalized organizational performance with subjective measures. Even though subjective measures would be inclined to suffer from common method variance (Miller, 2001), it is easy to control for industry differences. We measured BU sales growth rate and BU profitability by asking the respondents, "When compared with the major three competitors of your BU, which is the most appropriate evaluation of your BU?" We used a seven point scale, ranging from 1 (substantially inferior to the major three competitors) to 7 (substantially superior to the major three competitors).

### 3. Variables and Dimensions at the BU Level

We then calculate the arithmetic mean of individual-level dimensions and variables of six middle managers by BU, and use these as BU level dimensions and variables. Before averaging these individual variables by BU, we attempt to confirm whether the responses of the middle-level managers in the same BUs are related. There are several inter-rater reliability scales, among which we selected within-group inter-rater reliability ( $R_{wg}$ ) and intra-class correlation (2) ( $ICC(2)$ ) (Suzuki & Kitai, 2007).  $R_{wg}$  is defined as  $R_{wg} = (\sigma_E^2 - S_x^2) / \sigma_E^2$ , where  $\sigma_E^2$  is the theoretical variance under uniform distribution and  $S_x^2$  is the observed variance within a BU.  $R_{wg}$  is first calculated by BU, and then the BUs'  $R_{wg}$ 's are averaged into  $R_{wg}$  of the scale as a whole.  $ICC(2)$  is defined as  $ICC(2) = (MSB - MSW) / MSB$ , where MSB is the mean square between BUs and MSW is the mean square within the BU. As could be easily understood by reading these definitions,  $R_{wg}$  is a measurement of an agreement against theoretical randomness, whereas  $ICC(2)$  is comparative measurement against other observations. Thus,  $ICC(2)$  is more sensitive to other common sources of variance in the dataset than is  $R_{wg}$ .

Table 3 shows the descriptive statistics and inter-rater reliability of the dimensions discussed so far. The table shows that, even though some  $ICC(2)$ 's are low, almost all of the  $R_{wg}$  are around an acceptable level (.70). One of them (the upward information flow) barely exceeds .50, but we use this because we would like to give priority to theoretical constructs.

Table 4 depicts correlations between the variables and dimensions we use in the hypothesis

TABLE 3. DESCRIPTIVE STATISTICS AND INTER-RATER RELIABILITY

Variables	<i>N</i>	Min.	Max.	Average	SD	Min. (%)	Max. (%)	Average (%)	Rwg (within-group inter-rater reliability)	ICC(2) (intra-class correlation(2))
BU Sales (fiscal 2007, Million Yen)	128	1,040	2,886,200	137,877.3	381492.594					
Growth Rate of BU Sales relative to 3 Largest Competitors	139	1.50	6.17	3.89	0.797				0.747	0.746
Profitability of BU relative to 3 Largest Competitors	139	1.50	6.00	3.83	0.953				0.714	0.802
Market Orientation (1) * <sub>1</sub> Intelligence Generation	139	2.58	6.17	4.25	0.696				0.731	0.659
Market Orientation (2) Intelligence Dissemination * <sub>1</sub>	139	2.83	5.94	4.28	0.486				0.784	0.408
Market Orientation (3) Responsiveness * <sub>1</sub>	139	3.07	6.00	4.54	0.557				0.778	0.550
Downward Information Flow of Formal Strategy * <sub>2</sub>	139	5.08	9.50	7.05	0.868	45.83	90.00	65.53	0.676	0.438
Upward Information Flow of Emergent Strategy * <sub>2</sub>	139	3.33	8.88	5.81	1.039	28.33	83.75	53.11	0.501	0.392
Lateral Information Flow of Inter-functional Information * <sub>2</sub>	139	4.00	8.00	6.38	0.672	35.00	75.00	58.76	0.672	0.013
Informal Information Flow Ratio * <sub>2</sub>	139	2.00	6.58	3.96	0.839	15.00	60.83	34.57	0.630	0.267

\*<sub>1</sub>: When calculating  $R_{wg}$ ,  $N=877$  (missing data are deleted)

\*<sub>2</sub>: When calculating  $R_{wg}$ ,  $N=874$  (missing data are deleted)  
otherwise  $N=882$

testing. It would be important to note that the downward and upward strategic information flows are highly correlated (.610), suggesting that these dimensions may have an underlying common causal factor, e.g., good interpersonal relationships between boss and subordinates. But we prefer to use these two dimensions because of the traditional caveats that emphasize that information upward and downward are quite different in quality (Dansereau & Markham, 1987).

We also use company dummy variables in the path analyses, because our data contains, on average, several BUs from the same companies. In addition, BU sales (fiscal 2007, logarithm) may influence the growth rate because BUs with large enough sales may not enjoy high growth rates compared with their smaller competitors. But it turns out that BU sales are not selected in all four stepwise regression analyses below.

In order to simplify the models of path analysis, we would like to reduce the number of company dummy variables included in the model. We first conduct a stepwise regression analysis ( $P_{in}=0.05$ ,  $P_{out}=0.10$ ), and select company dummy variables necessary to control possible company biases in the path analyses.

We would like to start our path analyses with these independent variables selected in the stepwise regression models. First, we would like to test the model of one-step causal relationships between the three dimensions of market orientation as independent variables, and two variants of organizational performance, i.e., relative growth rate (model 1) and relative

TABLE 4. CORRELATION TABLE\*1

Variable ID (Error ID)	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) 000	BU Sales (fiscal 2007, logarithm)*2	1									
(2) 001	Growth Rate of BU Sales relative to 3 Largest Competitors (Perceived by the Respondents)	.028	1								
(3) 002	Profitability of BU relative to 3 Largest Competitors (Perceived by the Respondents)	-.022	.767**	1							
(4) 003	Market Orientation (1) Intelligence Generation	.123	.372**	.324**	1						
(5) 004	Market Orientation (2) Intelligence Dissemination	.084	.409**	.402**	.528**	1					
(6) 005	Market Orientation (3) Responsiveness	.346	.000	.000	.000	.000	1				
(7) 006	Downward Information Flow of Formal Strategy	.057	.543**	.483**	.486**	.564**	.382**	1			
(8) 007	Upward Information Flow of Emergent Strategy	.525	.000	.000	.000	.000	.000	.000	1		
(9) 008	Lateral Information Flow of Inter-functional Information	-.013	.275**	.266**	.054	.280**	.318**	.610**	.360**	1	
(10) 009	Informal Information Flow Ratio	.885	.001	.002	.527	.001	.000	.000	.000	.000	1
		-.082	.297**	.208*	.057	.272**	.352**	.487**	-.169*	-.285**	
		.358	.000	.014	.506	.001	.000	.000	.000	.000	
		-.015	.269**	.174*	.169*	.372**	.352**	.487**	.360**	.360**	
		.865	.001	.040	.047	.000	.000	.000	.000	.000	
		-.017	-.115	-.121	-.075	-.151	-.128	-.313**	-.169*	-.285**	
		.848	.178	.156	.383	.076	.133	.000	.047	.001	

\*1 Each upper line contains Pearson product-moment correlation coefficients, and each lower line contains probabilities. \*:  $p < .05$ , \*\*:  $p < .01$ \*2  $N = 139$ , except BU Sales ( $N = 128$ )

profitability (model 2) as the dependent variable. Then we will go on to the model of two-step causal relationships among the organizational information flows, the market orientations, and the organizational performance (model 3 for relative growth rate, model 4 for relative profitability).

## IV. Results

### 1. Model 1 and 2: One-step Causal Relationships

Figure 2 (a) shows a saturated model of path analysis between relative growth rate and the three dimensions of market orientation. Because this is a saturated model, the adjusted  $R^2$  (.317) is the only index of its goodness of fit to data. It is important to note that only the path coefficient from responsiveness to relative growth rate (.429) is statistically significant, whereas the other two path coefficients (.104 and .113) do not achieve statistical significance even at the 10 percent level.

Strong direct impact of responsiveness on a performance variable can also be observed in model 2 of relative profitability (Figure 2 (b)). The path coefficient is .334, statistically significant at the 0.1 percent level. The path from intelligence dissemination to relative profitability is barely significant at the 10 percent level in this model, and the path from intelligence generation to relative profitability is almost nil. Because this model is not a saturated model, ordinary indices of goodness of fit are available. Chi-square is small enough ( $p=.958$ ) thanks to the small number of BUs (139), and AGFI (.903), RMSEA (.000), etc., are all at a good-to-acceptable level.

Although the three dimensions of market orientation are highly correlated with one another, only responsiveness has a consistently strong direct relationship with performance variables when considering these three dimensions in the same causal model simultaneously. This result may be obtained partly because only responsiveness (i.e., the dimension of action) is directly connected to organizational performance, and the other two dimensions can lead to these performances only via the intermediary variable of responsiveness. Thus, H1 is partially supported by the path analyses.

### 2. Model 3 and 4: Two-step Causal Relationships

Figures 3 and 4 depict the results of model 3 and model 4 respectively.<sup>3</sup> For simplicity, company dummy variables are not drawn in the figures. The path coefficients and correlations between company dummy variables and other variables in the models are shown in Table A1 for model 3 and Table A2 for model 4 in the appendix.

Both of these models have favorable indices of goodness of fit. For example, the chi-square of model 3 (72.779) is low enough to be statistically insignificant ( $p=.781$ ), its AGFI is .904, and RMSEA is .000. Also, the chi-square of model 4 (114.201) is low enough ( $p=.958$ ), AGFI is .903, and RMSEA is .000. All of these models' indices mean that they are

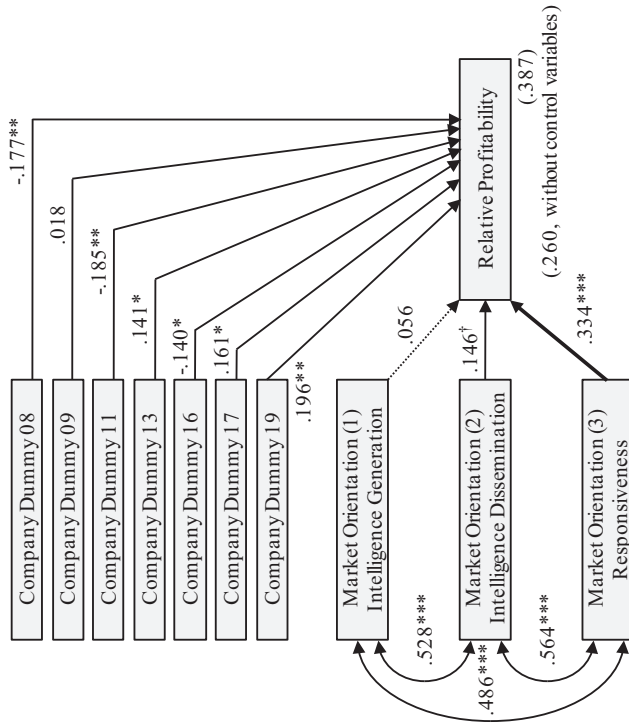
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<sup>3</sup> Company dummy variable 09 is deleted from model 4 because it does not have statistically significant relationships in model 2 (path coefficient=.018).

FIG. 2 RESULTS OF MODEL 1 AND 2

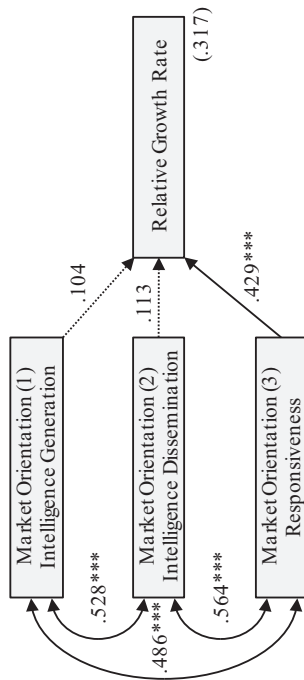
- Numbers near arrows are standardized path coefficients.  
 - Adjusted  $R^2$  are in parentheses.

†: significant at 10%  
 \*: significant at 5%  
 \*\*: significant at 1%  
 \*\*\*: significant at 0.1%



(b) Model 2: Perceived Profitability and Market Orientation

D.F.: 42  
 $\chi^2$ : 40.387  
 $p$ : .962  
 GFI: .951  
 AGFI: .924  
 CFI: 1.000  
 RMSEA: .000



(a) Model 1: Perceived Growth Rate and Market Orientation

TABLE 5. STANDARDIZED PATH COEFFICIENTS FROM INFORMATION FLOW TO PERFORMANCE VARIABLES

Dimensions of Information Flow	Model A (All Four Paths Included)		Model B (One Path at a Time)	
	Growth Rate	Profitability	Growth Rate	Profitability
Downward Information Flow of Formal Strategy	-.001 (.992)	.123 (.185)	.092 (.230)	.103 (.145)
Upward Information Flow of Emergent Strategy	.134 (.130)	.004 (.965)	.143 <sup>†</sup> (.057)	.051 (.467)
Lateral Information Flow of Inter-functional Information	.033 (.701)	-.120 (.178)	.070 (.370)	-.023 (.771)
Informal Information Flow Ratio	-.013 (.856)	-.103 (.133)	-.037 (.608)	-.105 (.102)

Standardized path coefficients are in the upper line and the corresponding *p*'s are in the parentheses.

<sup>†</sup> significant at the 10 percent level.

acceptable.

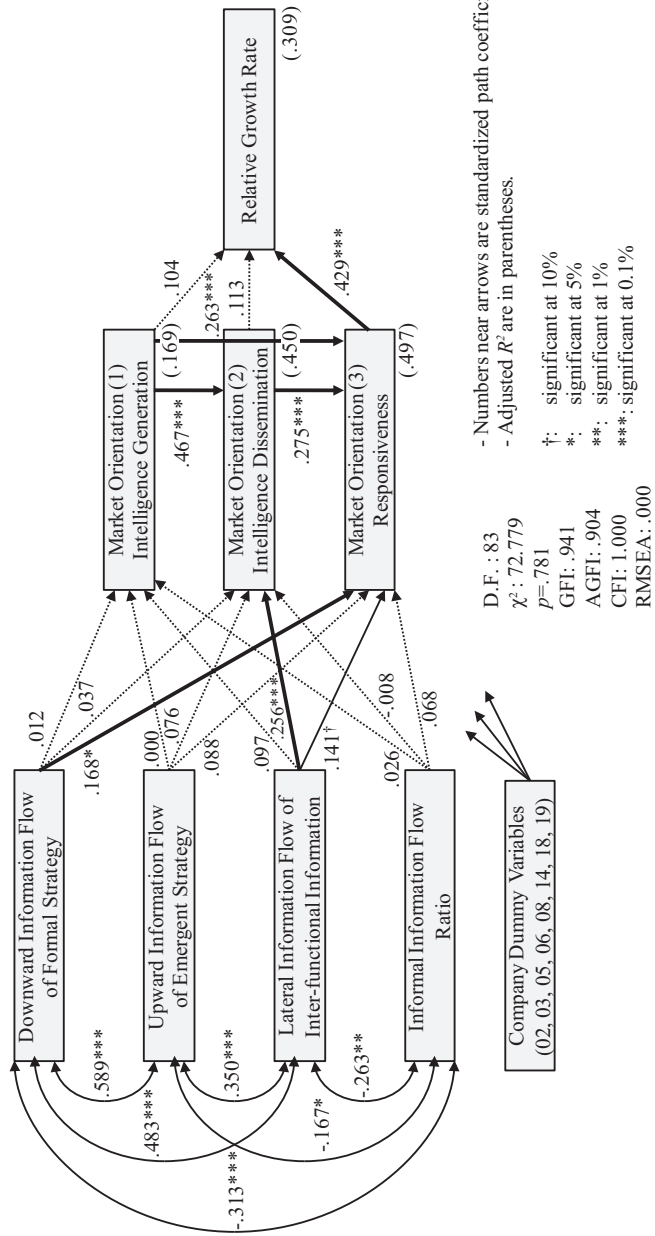
We would like to add that we can confirm the mediating role of market orientation between intra-organizational information flows and organizational performance. If we simultaneously add four direct paths from the dimensions of information flow to the performance variables in models 3 and 4 (model A), as shown in Table 5, no paths reached the strength of statistical significance at the 10 percent level, while the original path coefficients from the downward information flow to responsiveness and the lateral information flow to dissemination and responsiveness remain as before. The exception is the upward information flow in model B (one path at a time) of growth rate. In this case, the path coefficient is .143 and significant at the 10 percent level, suggesting upward information flow's potential contribution to growth. Otherwise, no direct paths have significant relationships. This is one of the important pieces of evidence that support the fertility of bridging the lack of interactions between market orientation research and the middle management perspective (and/or knowledge creation theory).

There are several points to be emphasized with regard to the results of these models. First, the path from the downward information flow of formal strategy to responsiveness is statistically significant at the 5 percent level (.168 in model 3 and .166 in model 4). Because the responsiveness dimension is the most important one in determining performance measures, this significant relation is worthy of attention, and we would like to contend that H2 is partially supported.

In contrast to this statistical significant relationship, upward information flow of emergent strategy does not have any statistically significant relationship with any of the market orientation dimensions. H3 is not supported by the results of this study. Contrary to our predictions based on the middle management perspective and Nonaka's knowledge creation theory, upward information flow of emergent strategy does not improve market orientation of any kind (Nonaka, 1988; Wooldridge & Floyd, 1990). However, because this lack of statistical significance may be due to the high correlation existing between downward and upward information flows, or due to the existence of other mechanisms linking this information flow to the organizations' performance, we must remain conservative in discarding any belief in the

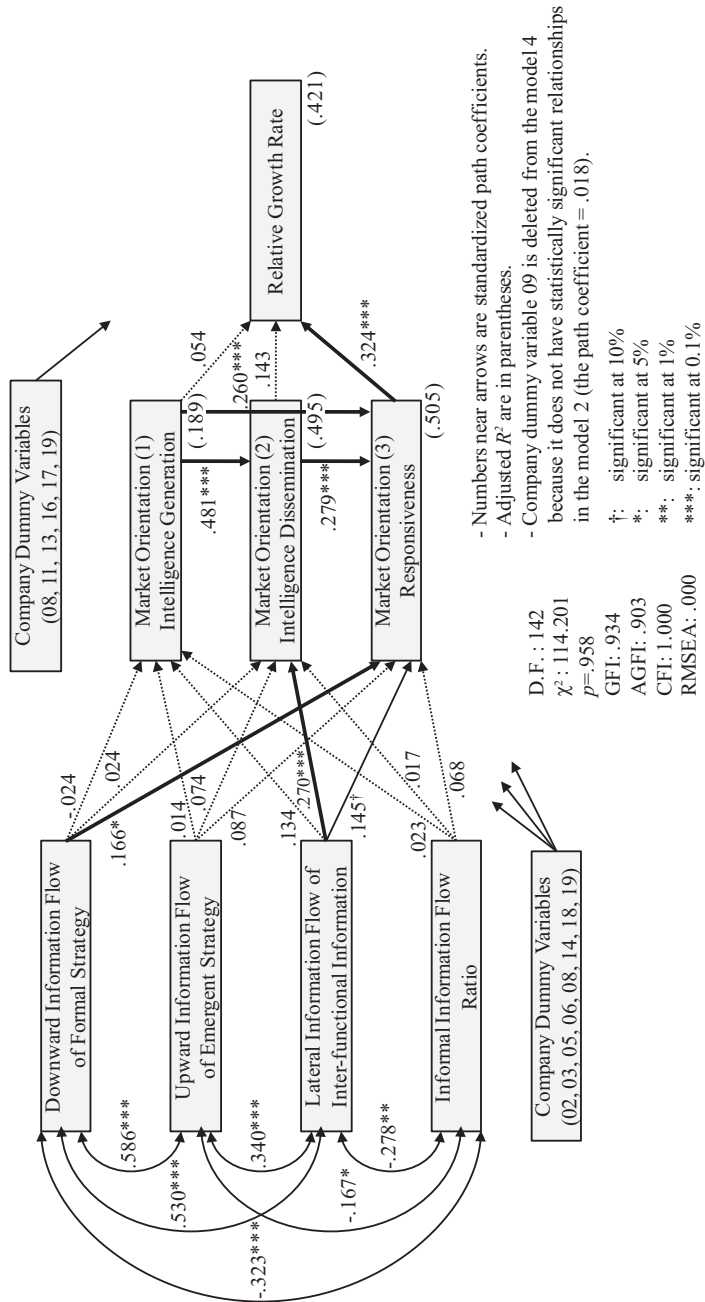


FIG. 3 RESULTS OF MODEL 3: PERCEIVED GROWTH RATE, MARKET ORIENTATION, AND INTRA-ORGANIZATIONAL INFORMATION FLOW



- Numbers near arrows are standardized path coefficients.  
 - Adjusted R² are in parentheses.

FIG. 4 RESULTS OF MODEL 4: PERCEIVED PROFITABILITY, MARKET ORIENTATION, AND INTRA-ORGANIZATIONAL INFORMATION FLOW



importance of upward information flow of emergent strategy.

The lateral information flow of inter-functional information is reconfirmed as one of the most important factors that explain the organizations' adaptability to their market (Homburg et al., 2000; Nonaka, 1988, 1994). Even though it does not determine intelligence generation (.097 in model 3 and .134 in model 4), its paths to intelligence dissemination and responsiveness are statistically significant, with the former being much stronger (.256, .270) than the latter (.141, .145). Thus, we may be able to argue that H4 is supported by the results. Because intelligence dissemination has a strong effect on responsiveness, the standardized total effect of lateral information flow on responsiveness is greater than that of downward information flow (.249 vs. .183 for growth rate and .273 vs. .164 for profitability). These results suggest that an organization with rich lateral information flow of inter-functional information in general is not only good at disseminating market information but also good at generating actions based on it.

Contrary to the belief in the importance of informal information flow, its ratio has statistically significant negative relations with other dimensions of information flows, and has almost no relationship to any of the market orientation dimensions. This result does not support H5. The negative correlations between the informal information flow ratio and the other three information flows would point to the idea that development of informal communication networks within an organization is not only a cause of information sharing, but also the result of insufficient formal information sharing through hierarchy, formal coordinating devices (e.g., integrators and formal meetings), and so on. It may be that organizational members who are not given enough information through formal channels devote extra efforts to build an informal network to collect necessary information. In this case, a high informal information flow ratio would be detrimental to fostering market orientation.

Finally, it is important to note that intelligence generation is not determined by these models. Intelligence generation, which is closely related to the information inflow from the environment, seems to be determined by factors other than intra-organizational information flows (Allen, Tushman, & Lee, 1979; Floyd & Wooldridge, 1997).

In sum, we are able to contend that H1, H2, and H4 are more or less supported by the results, though H3 and H5 are not supported. We confirmed that there exist statistical relationships between the variables of middle management perspective (or knowledge creation theory) and market orientation research, to be explored more deeply in the future.

## V. *Conclusion and Discussion*

This paper empirically confirmed that fertile research opportunities exist in investigating the relationship between the market orientation of organizations and their organizational information flow. Intra-organizational information flow does not directly affect the organization's performance. Those relationships are mediated by the organization's market orientation. Also, we could confirm that there exist some robust relationships between intra-organizational information flow and market orientation, suggesting that the market orientation research tradition and middle management perspective (and knowledge creation theory) should be bridged and integrated (Deshpandé & Farley, 1998; Floyd & Wooldridge, 1997, 2000; Homburg et al., 2000; Jaworski & Kohli, 1993; Nonaka, 1988, 1994; Nonaka et al., 2000).

We also found that the most important aspect of market orientation is responsiveness, and the most important information flow that in turn determines that responsiveness is downward strategic information flow and the lateral information flow of other functional departments. Our analyses did not support a positive contribution of upward information flow and informal information flow. The results of this study suggest that a highly market-oriented organization is rich both in downward information flow of formal strategy and in lateral information flow of inter-functional information through formal channels.

As suggested in the previous section, informal information flow may have both functional and dysfunctional aspects. When we interpret it as a causal factor, our belief tells us that the development of an informal information network would create much information flow within an organization, and contribute to organizational adaptation to its environment. But, looking at it from the other way around, the development of an informal information network can be interpreted as being caused by a lack of information flow through formal channels of the organization. This ambivalence of informal information flow would suggest that there must be some variables that determine whether it operates as a functional factor or a dysfunctional one.

In addition to the informal information flow, we could not find any positive relationship between the upward information flow and market orientation. As suggested in the previous section, this lack of statistical significance may stem from the high correlation between the downward information flow of formal strategy and the upward information flow. Or it may be that there exist some other mechanisms that link the upward information flow and market orientation.

Even though there are many challenges still to be met, we are ever more convinced that the market orientation research and middle management perspective (and knowledge creation theory) should be bridged. There remains a huge, fertile area of research between them.

APPENDIX TABLE A1

## (1) Path Coefficients of Model 3

	Path	Path Coefficient (standardized)	<i>p</i>
Market Orientation (1) Intelligence Generation	<--- Downward Information Flow of Formal Strategy	0.012	0.913
Market Orientation (1) Intelligence Generation	<--- Upward Information Flow of Emergent Strategy	0.000	0.997
Market Orientation (1) Intelligence Generation	<--- Lateral Information Flow of inter-functionla Information	0.097	0.295
Market Orientation (1) Intelligence Generation	<--- Informal Information Flow Ratio	0.026	0.754
Market Orientation (1) Intelligence Generation	<--- Company Dummy_02	-0.247	0.002
Market Orientation (1) Intelligence Generation	<--- Company Dummy_05	0.224	0.004
Market Orientation (1) Intelligence Generation	<--- Company Dummy_06	-0.196	0.011
Market Orientation (2) Intelligence Dissemination	<--- Downward Information Flow of Formal Strategy	0.037	0.666
Market Orientation (2) Intelligence Dissemination	<--- Upward Information Flow of Emergent Strategy	0.076	0.348
Market Orientation (2) Intelligence Dissemination	<--- Lateral Information Flow of inter-functionla Information	0.256	***
Market Orientation (2) Intelligence Dissemination	<--- Informal Information Flow Ratio	-0.008	0.910
Market Orientation (2) Intelligence Dissemination	<--- Market Orientation (1) Intelligence Generation	0.467	***
Market Orientation (2) Intelligence Dissemination	<--- Company Dummy_19	0.169	0.007
Market Orientation (2) Intelligence Dissemination	<--- Company Dummy_05	0.061	0.350
Market Orientation (2) Intelligence Dissemination	<--- Company Dummy_14	-0.201	0.002
Market Orientation (3) Responsiveness	<--- Downward Information Flow of Formal Strategy	0.168	0.041
Market Orientation (3) Responsiveness	<--- Upward Information Flow of Emergent Strategy	0.088	0.247
Market Orientation (3) Responsiveness	<--- Lateral Information Flow of inter-functionla Information	0.141	0.055
Market Orientation (3) Responsiveness	<--- Informal Information Flow Ratio	0.068	0.287
Market Orientation (3) Responsiveness	<--- Market Orientation (2) Intelligence Dissemination	0.275	***
Market Orientation (3) Responsiveness	<--- Market Orientation (1) Intelligence Generation	0.263	***
Market Orientation (3) Responsiveness	<--- Company Dummy_19	0.074	0.229
Market Orientation (3) Responsiveness	<--- Company Dummy_08	-0.190	0.002
Market Orientation (3) Responsiveness	<--- Company Dummy_05	0.068	0.274
Market Orientation (3) Responsiveness	<--- Company Dummy_03	-0.169	0.005
Market Orientation (3) Responsiveness	<--- Company Dummy_18	-0.099	0.101
Perceived Growth Rate	<--- Market Orientation (1) Intelligence Generation	0.105	0.220
Perceived Growth Rate	<--- Market Orientation (2) Intelligence Dissemination	0.112	0.215
Perceived Growth Rate	<--- Market Orientation (3) Responsiveness	0.425	***

\*\*\*:  $p < .001$ 

## (2) Correlations in Model 3

	Correlation between	Correlation (standardized)	<i>p</i>
Lateral Information Flow of inter-functionla Information	<--> Informal Information Flow Ratio	-0.263	0.002
Upward Information Flow of Emergent Strategy	<--> Informal Information Flow Ratio	-0.167	0.048
Downward Information Flow of Formal Strategy	<--> Informal Information Flow Ratio	-0.313	***
Upward Information Flow of Emergent Strategy	<--> Lateral Information Flow of inter-functionla Information	0.350	***
Downward Information Flow of Formal Strategy	<--> Lateral Information Flow of inter-functionla Information	0.483	***
Downward Information Flow of Formal Strategy	<--> Upward Information Flow of Emergent Strategy	0.589	***
Upward Information Flow of Emergent Strategy	<--> Company Dummy_14	-0.202	0.004
Lateral Information Flow of inter-functionla Information	<--> Company Dummy_02	-0.204	0.007

\*\*\*:  $p < .001$

APPENDIX TABLE A2

## (1) Path Coefficients of Model 4

	Path	Path Coefficient (standardized)	<i>P</i>
Market Orientation (1) Intelligence Generation	<-- Downward Information Flow of Formal Strategy	-0.024	0.827
Market Orientation (1) Intelligence Generation	<-- Upward Information Flow of Emergnet Strategy	0.014	0.881
Market Orientation (1) Intelligence Generation	<-- Lateral Information Flow of inter-funcionla Information	0.134	0.163
Market Orientation (1) Intelligence Generation	<-- Informal Information Flow Ratio	0.023	0.779
Market Orientation (1) Intelligence Generation	<-- Company Dummy_02	-0.235	0.003
Market Orientation (1) Intelligence Generation	<-- Company Dummy_05	0.226	0.003
Market Orientation (1) Intelligence Generation	<-- Company Dummy_06	-0.190	0.013
Market Orientation (1) Intelligence Generation	<-- Company Dummy_19	0.157	0.044
Market Orientation (2) Intelligence Dissemination	<-- Downward Information Flow of Formal Strategy	0.024	0.777
Market Orientation (2) Intelligence Dissemination	<-- Upward Information Flow of Emergnet Strategy	0.074	0.335
Market Orientation (2) Intelligence Dissemination	<-- Lateral Information Flow of inter-funcionla Information	0.270	***
Market Orientation (2) Intelligence Dissemination	<-- Informal Information Flow Ratio	0.017	0.788
Market Orientation (2) Intelligence Dissemination	<-- Market Orientation (1) Intelligence Generation	0.481	***
Market Orientation (2) Intelligence Dissemination	<-- Company Dummy_19	0.156	0.012
Market Orientation (2) Intelligence Dissemination	<-- Company Dummy_05	0.053	0.397
Market Orientation (2) Intelligence Dissemination	<-- Company Dummy_14	-0.214	***
Market Orientation (2) Intelligence Dissemination	<-- Company Dummy_17	-0.156	0.01
Market Orientation (3) Responsiveness	<-- Downward Information Flow of Formal Strategy	0.166	0.048
Market Orientation (3) Responsiveness	<-- Upward Information Flow of Emergnet Strategy	0.087	0.245
Market Orientation (3) Responsiveness	<-- Lateral Information Flow of inter-funcionla Information	0.145	0.058
Market Orientation (3) Responsiveness	<-- Informal Information Flow Ratio	0.068	0.288
Market Orientation (3) Responsiveness	<-- Market Orientation (2) Intelligence Dissemination	0.279	***
Market Orientation (3) Responsiveness	<-- Market Orientation (1) Intelligence Generation	0.260	***
Market Orientation (3) Responsiveness	<-- Company Dummy_19	0.074	0.242
Market Orientation (3) Responsiveness	<-- Company Dummy_08	-0.189	0.002
Market Orientation (3) Responsiveness	<-- Company Dummy_05	0.067	0.274
Market Orientation (3) Responsiveness	<-- Company Dummy_03	-0.168	0.005
Market Orientation (3) Responsiveness	<-- Company Dummy_18	-0.098	0.101
Perceived Profitability	<-- Market Orientation (1) Intelligence Generation	0.054	0.504
Perceived Profitability	<-- Market Orientation (2) Intelligence Dissemination	0.143	0.103
Perceived Profitability	<-- Market Orientation (3) Responsiveness	0.324	***
Perceived Profitability	<-- Company Dummy_17	0.155	0.019
Perceived Profitability	<-- Company Dummy_16	-0.137	0.034
Perceived Profitability	<-- Company Dummy_13	0.135	0.036
Perceived Profitability	<-- Company Dummy_11	-0.181	0.005
Perceived Profitability	<-- Company Dummy_08	-0.173	0.009
Perceived Profitability	<-- Company Dummy_19	0.189	0.004

\*\*\*:  $p < .001$ 

## (2) Correlations in Model 4

Correlation between		Correlation (standardized)	<i>P</i>
Lateral Information Flow of inter-funcionla Information	<--> Informal Information Flow Ratio	-0.278	***
Upward Information Flow of Emergnet Strategy	<--> Informal Information Flow Ratio	-0.167	0.048
Downward Information Flow of Formal Strategy	<--> Informal Information Flow Ratio	-0.323	***
Upward Information Flow of Emergnet Strategy	<--> Lateral Information Flow of inter-funcionla Information	0.340	***
Downward Information Flow of Formal Strategy	<--> Lateral Information Flow of inter-funcionla Information	0.530	***
Downward Information Flow of Formal Strategy	<--> Upward Information Flow of Emergnet Strategy	0.586	***
Lateral Information Flow of inter-funcionla Information	<--> Company Dummy_11	-0.317	***
Lateral Information Flow of inter-funcionla Information	<--> Company Dummy_02	-0.210	0.002
Upward Information Flow of Emergnet Strategy	<--> Company Dummy_14	-0.194	0.006
Lateral Information Flow of inter-funcionla Information	<--> Company Dummy_19	-0.154	0.017
Downward Information Flow of Formal Strategy	<--> Company Dummy_16	-0.120	0.044

\*\*\*:  $p < .001$

*REFERENCES*

- Allen, T., Tushman, M., & Lee, D. M. S. 1979. Technology transfer as a function of position in the spectrum from research through development to technical service. *Academy of Management Journal*, 22(4): 694-708.
- Baker, W. E., & Sinkula, J. M. 1999. The synergistic effect of market orientation and learning orientation on organizational performance. *Journal of the Academy of Marketing Science*, 27(4): 411-417.
- Cano, C. R., Carrillat, F. A., & Jaramillo, F. 2004. A meta-analysis of the relationship between market orientation and business performance: Evidence from five continents. *International Journal of Research in Marketing*, 21: 179-200.
- Dansereau, F., & Markham, S. E. 1987. Superior-subordinate communication: Multiple levels of analysis. In F. M. Jablin, L. L. Putnam, K. H. Roberts, & L. W. Porter (Eds.), *Handbook of organizational communication: An interdisciplinary perspective* : 343-388. Thousand Oaks, CA: Sage.
- Deshpandé, R., & Farley, J. U. 1998. Measuring market orientation: Generalization and synthesis. *Journal of Market Focused Management*, 2: 213-232.
- Floyd, S. W., & Wooldridge, B. 1997. Middle management's strategic influence and organizational performance. *Journal of Management Studies*, 34(3): 465-485.
- Floyd, S. W., & Wooldridge, B. 2000. *Building strategy from the middle: Reconceptualizing strategy process*. Thousand Oaks, CA: Sage.
- Galbraith, J. R. 1977. *Organization design*. Reading, MA: Addison-Wesley.
- Homburg, C., Workman, Jr. J. P., & Jensen, O. 2000. Fundamental changes in marketing organization: The movement toward a customer-focused organization structure. *Journal of the Academy of Marketing Science*, 28(4): 459-478.
- Hurley, R. F., & G. Hult, T. M. 1998 "Innovation, Market Orientation, and Organizational Learning: An Integration and Empirical Examination," *Journal of Marketing*, 62: 42-54.
- Imai, K., Nonaka, I., & Takeuchi, H. 1985. Managing the new product development process: How Japanese companies learn and unlearn. In K. B. Clark, R. H. Hayes, & C. Lorenz (Eds.), *The uneasy alliance: Managing the productivity-technology dilemma*: 337-375. Cambridge, MA: Harvard Business School Press.
- Jaworski, B. J., & Kohli, A. K. 1993. Market orientation: Antecedents and consequences. *Journal of Marketing*, 57: 53-70.
- Jaworski, B. J., & Kohli, A. K. 1996. Market orientation: Review, refinement, and roadmap. *Journal of Market Focused Management*, 1: 119-135.
- Kirca, A. H., Jayachandran, S., & Bearden, W. 2005. Market orientation: A meta-analytic review and assessment of its antecedents and impact on performance. *Journal of Marketing*, 69: 24-41.
- Kohli, A. K., & Jaworski, B. J. 1990. Market orientation: The construct, research propositions, and managerial implications. *Journal of Marketing*, 54: 1-18.
- Kraut, R. E., Fish, R. S., Root, R. W., & Chalfonte, B. L. 1993. Informal communication in organizations: Form, function, and technology. In R. Baecker (Ed.), *Groupware and computer-supported co-operative work*: 287-314. San Francisco, LA: Morgan Kaufmann.
- Lascu, D-N., Manrai, L. A., Manrai, A. K., & Kleczek, R. 2006. Interfunctional dynamics and firm performance: A comparison between firms in Poland and the United States.

- International Business Review*, 15: 641-659.
- Maltz, E., & Kohli, A. K. 1996. Market intelligence dissemination across functional boundaries. *Journal of Marketing Research*, 33: 47-61.
- Menguc, B., & Auh, S. 2008. Conflict, leadership, and market orientation. *International Journal of Research in Marketing*, 25: 34-45.
- Miller, K. 2001. Quantitative research methods. In F. M. Jablin, & L. L. Putnam (Eds.), *The new handbook of organizational communication: Advances in theory, research, and methods*: 137-160. Thousand Oaks, CA: Sage.
- Narver, J. C., & Slater, S. F. 1990. The effects of market orientation on business profitability. *Journal of Marketing*, 54: 20-35.
- Nonaka, I. 1988. Toward middle-up-down management: Accelerating information creation. *Sloan Management Review*, 29(3): 57-73.
- Nonaka, I. 1994. Dynamic theory of organizational knowledge creation. *Organization Science*, 5(1): 14-37.
- Nonaka, I., Toyama, R., & Konno, N. 2000. SECI, *ba* and leadership: A unified model of dynamic knowledge creation. *Long Range Planning*, 33: 5-34.
- Pappas, J. M., & Wooldridge, B. 2007. Middle managers' divergent strategic activity: An investigation of multiple measures of network centrality. *Journal of Management Studies*, 44(3): 323-341.
- Sinkula, J. M. 1994. Market information processing and organizational learning. *Journal of Marketing*, 58: 35-45.
- Sinkula, J. M., Baker, W. E., & Noordewier, T. 1997. A framework for market-based organizational learning: Linking values, knowledge, and behavior. *Journal of the Academy of Marketing Science*, 25(4): 305-318.
- Slater, S. F., & Narver, J. C. 1995. Market orientation and the learning organization. *Journal of Marketing*, 59: 63-74.
- Suzuki, R., & Kitai, A. 2005. A note on the multilevel analysis of group and organization (*Soshiki koudouron niokeru shudan tokusei no bunseki shuhou*). *Kobe University Discussion Paper Series*, 45. (In Japanese).
- Tompkins, P. K., & Wanca-Thibault, M. 2001. Organizational communication: Prelude and prospects. In F. M. Jablin, & L. L. Putnam (Eds.), *The new handbook of organizational communication: Advances in theory, research, and methods*: xvii-xxxi. Thousand Oaks, CA: Sage.
- Toyoda, H. 1992. *Covariance structure analysis with SAS (SAS niyoru kyoubunsan kouzou bunseki)*. Tokyo: Tokyo Daigaku Shuppankai. (In Japanese).
- Watson, A., & Wooldridge, B. 2005. Business unit manager influence on corporate-level strategy formulation. *Journal of Management Issues*, 17(2): 147-161.
- Whittaker, S., Frohlich, D., & Daly-Jones, O. 1994. Informal workplace communication: What is it like and how might we support it? *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*:131-137.
- Wooldridge, B., & Floyd, S.W. 1990. The strategy process, middle management involvement, and organizational performance. *Strategic Management Journal*, 11: 231-241.
- Wooldridge, B., Schmid, T., & Floyd, S. W. 2008. The middle management perspective on strategy process: Contributions, synthesis, and future research. *Journal of Management*, 34 (6): 1190-1221.