# ABSORPTIVE CAPACITY, ADAPTATION, AND PERFORMANCE: AN INTRA-ORGANIZATIONAL PERSPECTIVE

JUSTIN J.P. JANSEN
FRANS A.J. VAN DEN BOSCH
HENK W. VOLBERDA

Department of Strategic Management and Business Environment
Rotterdam School of Management/ Erasmus University Rotterdam
P.O. Box 1738
3000 DR Rotterdam
The Netherlands

Tel: +31 (0)10 408 22 10
Fax: +31 (0)10 408 90 13
E-mail: jjansen@fbk.eur.nl

February 15, 2003

*Paper submitted to*

*OKLC Conference*

*Barcelona, April 13-14, 2003*

ACADEMIC TRACK

# ABSORPTIVE CAPACITY, ADAPTATION AND PERFORMANCE: AN INTRA-ORGANIZATIONAL PERSPECTIVE


## ABSTRACT

This study examines how business units manage the ratio of realized to potential absorptive capacity and reveals how absorptive capacity drives performance differences. Results from 462 business units within 150 branches show that cross-functional interfaces, participation and job-rotation especially enhance a unit's potential absorptive capacity. Formalization and socialization tactics particularly develop a unit's realized absorptive capacity. Regarding consequences of absorptive capacity, our findings show that superior financial performance originates from a unit's ability to nurture and harvest potential absorptive capacity. Moreover, our study suggests that potential and realized absorptive capacity have different roles in enabling explorative and exploitative adaptations. Lower ratios of realized to potential absorptive capacity are associated with explorative adaptations, whereas higher ratios are related to exploitative adaptations. In this regard, our study shows how managing potential and realized absorptive capacity provides sources of sustainable competitive advantage.



Keywords:

Potential and realized absorptive capacity, combinative capabilities, adaptation, and performance

## INTRODUCTION

The increasing turbulence of the business environment has focused attention on knowledge as the dominant source of competitive advantage (Grant, 1996; Kogut & Zander, 1992). To survive external selection pressures, firms should recognize new outside knowledge, assimilate it, and apply it to commercial ends. This dynamic capability, referred to as absorptive capacity (Cohen & Levinthal, 1990), is seen as a promising explanation of innovation (Stock, Greis & Fisher, 2001; Tsai, 2001), business performance (Lane, Salk & Lyles, 2001; Tsai, 2001), intra-organizational transfer of knowledge (Gupta & Govindarajan, 2000; Szulanski, 1996), interorganizational learning (Lane & Lubatkin, 1998), and knowledge search (Shenkar & Li, 1999). Additionally, absorptive capacity clarifies how firms cope with the competitive landscape by mediating explorative and exploitative adaptations (Lewin, Long, & Carroll, 1999; March, 1991).

The last decade has witnessed a proliferation of contributions to the concept of absorptive capacity. Empirical studies have applied the concept to units, firms, and dyads. Conceptually, Zahra & George (2002) have introduced a 'dynamic capabilities' perspective of absorptive capacity and have substantiated between potential and realized absorptive capacity. *Potential absorptive capacity* (PACAP) enables a unit's receptiveness to external knowledge and captures a unit's ability to acquire, analyze, interpret, and understand new external knowledge. On the other hand, *realized absorptive capacity* (RACAP) reflects a unit's capacity to transform and exploit new and existing knowledge by incorporating it into its operations. The distinction highlights the separate, but complementary roles of both subsets of absorptive capacity. Moreover, it enables the examination how units develop competitive advantages by managing the *efficiency factor* of absorptive capacity – the ratio of realized absorptive capacity to potential absorptive capacity (Zahra & George, 2002).

Despite various theoretical and empirical contributions, few have captured the richness and multidimensionality of the concept of absorptive capacity (Zahra & George, 2002). Recent research has only started exploring non-linear relationships by substantiating between different components of absorptive capacity (Lane et al., 2001; Matusik & Heeley, 2001) and referring to dimensions of absorptive capacity (Van den Bosch et al., 1999). Moreover, absorptive capacity has been largely modeled as a predictor of several consequences without considering "..what aspects of absorptive capacity are distinctly organizational.." (Cohen & Levinthal, 1990: 131). The objective of this study was to address these issues and to advance the absorptive capacity literature in three ways. Above all, we extend and empirically validate the theoretical contribution of Zahra and George (2002). We develop measures for potential and realized absorptive capacity and apply the ratio of realized to potential absorptive capacity. Hence, we are able to test whether units achieve higher performance when RACAP approaches PACAP (Zahra & George, 2002: 191). In this paper, we define the ratio of realized to potential absorptive capacity by (RACAP/(PACAP + RACAP). The ratio ranges between 0 (units that only focus on developing PACAP) and 1 (units that only focus on developing RACAP) with 0.5 meaning that RACAP approaches PACAP. Second, we investigate the hypothesized effects of a unit's ratio of realized to potential absorptive capacity on financial performance, explorative, and exploitative adaptations. However, we go beyond existing literature by proposing and testing linear and non-linear relationships between the ratio and assumed outcomes. Third, we entangle how units manage the ratio of realized to potential absorptive capacity. We identify various organizational antecedents of absorptive capacity and examine their relationships with the ratio. Managers of units are able to invest in certain organizational antecedents and reconfigure a unit's path dependent ratio of RACAP to PACAP (Eisenhardt & Martin, 2000; Zahra & George, 2002). In this way, this research sheds light on the relative importance of organizational antecedents that are posited to increase or decrease a unit's ratio of realized to potential absorptive capacity.

Figure 1 presents our theoretical framework. In the next section, we discuss organizational antecedents and explain their relationships with the ratio of RACAP to PACAP. Subsequently, various relationships with outcomes of absorptive capacity are hypothesized. After discussing our research method, we present the empirical findings. We conclude with a discussion of the results, implications, and issues for further research.

Insert Figure 1 about here

## THEORETICAL OVERVIEW AND HYPOTHESES

### Organizational Antecedents of Absorptive Capacity

The ability of units to absorb new external knowledge depends on the level of prior related knowledge and intensity of effort (Cohen & Levinthal, 1990; Kim, 1998). Several empirical studies have indeed confirmed the importance of prior related knowledge. However, exposure to related external knowledge is not sufficient to internalize it successfully (Pennings & Harianto, 1992). Units need to invest considerable time and effort in acquiring, assimilating and applying new external knowledge commercially (Kim, 1998). That is, absorptive capacity also depends on internal mechanisms or organizational antecedents (Cohen & Levinthal, 1990; Lane & Lubatkin, 1998; Van den Bosch et al., 1999). Examples of these internal mechanisms are structure of communication, character and distribution of expertise, gatekeeping or boundary-spanning roles, cross-functional interfaces and job-rotation (Cohen & Levinthal, 1990: 131-135). Lyles and Salk (1996) and Lane et al. (2001) mentioned a firm's adaptability and flexibility. Next to organizational form, Van den Bosch et al. (1999: 556) introduced combinative capabilities as organizational antecedents of absorptive capacity (cf. Kogut and Zander, 1992) and differentiated between coordination, system and socialization capabilities. We assume that that each of the combinative capabilities influences a unit's PACAP or RACAP.

**Coordination capabilities**. Coordination capabilities ensue from lateral relations within units. They can be explicitly designed or emerge from interaction processes through cross-functional interfaces, participation and job-rotation (Galbraith, 1973; Van den Bosch et al., 1999; Volberda, 1998). Units use *cross-functional interfaces* like liaison personnel, task forces, and teams to enable systematic knowledge exchange (Gupta & Govindarajan, 1991, 2000; Zahra & George, 2002). Cross-functional interfaces are beneficial to creating a desirable amount of redundancy and developing cross-function absorptive capacities (Cohen & Levinthal, 1990: 134; Daft & Lengel, 1986). Cross-functional interfaces contribute to a unit's ability to overcome differences, interpret issues, and build understanding and agreement (Daft & Lengel, 1986). They promote non-routine, reciprocal information processing and facilitate gathering interpretations and identifying trends (Egelhoff, 1991; Zahra & George, 2002). Cross-functional interfaces, thus, are particularly conducive to the unit's "capacity for making novel linkages and associations" (Cohen & Levinthal, 1990: 133) that constitutes a unit's potential absorptive capacity. Therefore, they decrease a unit's ratio of realized to potential absorptive capacity.

*Hypothesis 1. The more cross-functional interfaces are used, the lower a unit's ratio of realized to potential absorptive capacity*

*Participation* in decision-making indicates the extent to which subordinates form part of higher-level decision making processes. Participation appears to have a positive effect on the ability of units to innovate, or more specifically, to initiate new ideas or activities (Pierce & Delbecq, 1977). As Hage and Aiken (1967: 510) make clear, it allows for the interplay between a variety of perspectives within a firm and leads to a rich internal network of diverse knowledge structures. Moreover, participation increases the range of prospective 'receptors' to the environment (Cohen & Levinthal, 1990). These receptors selectively act on new external knowledge and serve as both filter and facilitator of new external knowledge (Aldrich & Herker, 1977; Cohen & Levinthal, 1990). As

Zahra and George (2002) discuss, exposure to external knowledge sources through 'receptors' largely influences a unit's acquisition and assimilation capabilities that constitute its potential absorptive capacity. Accordingly, we propose

*Hypothesis 2. The higher the degree of participation, the lower a unit's ratio of realized to potential absorptive capacity*

*Job rotation* enhances the merging of diverse knowledge structures within units, which elicits explorative learning and encourages innovation (Cohen & Levinthal, 1990; McGrath, 2001). In addition, it enhances the awareness of where useful knowledge resides and increases the intensity of effort in various experiences. Such a diverse mosaic of prior related knowledge enables the ability of units to acquire and assimilate new external knowledge that is associated with potential absorptive capacity. Specifically,

*Hypothesis 3. The higher the degree of job rotation, the lower a unit's the ratio of realized to potential absorptive capacity*

**System capabilities**. In addition to coordination capabilities, units develop system capabilities to transform and exploit knowledge in a programmed way. System capabilities constitute a unit's processes to institutionalise new external knowledge (Crossan, Lane & White, 1999). We differentiate between two organizational mechanisms that enable the development of system capabilities; formalization and routineness. *Formalization* is the degree to which rules, procedures, instructions, and communications are formalized or written down (Khandwalla, 1977; Pugh et al., 1968). Formalization is generally established to coordinate activities and respond to organizational phenomena in a known way (Daft & Lengel, 1986). As formalization contributes to the codification of new knowledge into technology or formal rules and procedures, formalization makes knowledge easier to apply and accelerates its diffusion (Argote, 1999; Zander & Kogut, 1995). Thus,

formalization contributes to efficiently transforming and exploiting new external knowledge (Van den Bosch et al., 1999). The necessity of rules, procedures and manuals to perform efficiently and without disruptive changes makes them most suitable for developing a unit's realized absorptive capacity. Therefore,

*Hypothesis 4. The higher the degree of formalization, the higher a unit's ratio of realized to potential absorptive capacity*

Firms pursue *routineness* to leverage the learning of individuals and ensure that inputs are transformed into outputs (Crossan et al., 1999; Perrow, 1967). Routineness captures the degree of invariability of tasks (Bacharach & Aiken, 1977; Hage & Aiken, 1969; Perrow, 1967). Routinized tasks are repetitious and encounter lower frequencies of unexpected and novel events (Withey, Daft, & Cooper, 1983). Accordingly, they decrease task uncertainty and, subsequently, the amount of information to be processed (Galbraith, 1973; Van de Ven, Delbecq & Koenig, 1976). Adler, Goldoftas & Levine (1999) found sequential nonroutine and routine tasks within manufacturing processes in the automotive industry. Following nonroutine experimentation, improving ongoing operations requires routineness. Accordingly, routine tasks are associated with efficiency and exploitation underlying RACAP, while nonroutine tasks are associated with flexibility and innovation (PACAP; Volberda, 1998). Thus,

*Hypothesis 5. The higher the degree of routineness, the higher a unit's ratio of realized to potential absorptive capacity*

**Socialization capabilities**. Cohen and Levinthal note that "absorptive capacity is not resident in any single individual but depends on the links across a mosaic of individual capabilities" (1990: 133). That is, absorptive capacity is embedded within the shared social context of units (Tsai, 2000, 2001). Socialization capabilities emerge from such a social context and produce a shared ideology

(Van den Bosch et al., 1999). Moreover, they specify tacitly understood rules and lead to the development of a network of linkages within units. The relational density of such a network, or *connectedness*, serves as a governance mechanism and facilitates the exchange of information and knowledge (Jaworski & Kohli, 1993; Nahapiet & Ghoshal, 1998; Rowley, Behrens & Krackhardt, 2000; Tsai, 2002). Moreover, it leads to established norms of cooperative behavior (Walker, Kogut & Shan, 1997). Although dense networks are conducive to developing trust and cooperation, they often provide redundant information and foster the commonality of knowledge across individuals (Cohen & Levinthal, 1990; Grant, 1996; Rowley et al., 2000). The more connectedness among individuals within units, the more it might ultimately diminish the diversity of background and undercut a unit's potential absorptive capacity (Cohen & Levinthal, 1990: 134; Sethi, Smith & Park, 2001; Zahra & George, 2002). Although connectedness inhibits broad knowledge searches without a well-defined solution space (PACAP), it facilitates the commercial application of knowledge (RACAP; Jaworski & Kohli, 1993; Rowley et al., 2000). Accordingly,

*Hypothesis 6. The higher the degree of connectedness, the higher a unit's ratio of realized to potential absorptive capacity*

In addition to creating a dense network of linkages, units use *socialization tactics* to structure the socialization experiences of individuals (Ashforth & Saks, 1996: 149). They offer newcomers specific information and encourage them to interpret and respond to situations in a predictable way (Jones, 1986). Socialization tactics effect the establishment of interpersonal relationships, role behavior, personal affinity and the congruence of values, needs and beliefs among individuals within units (Ashforth & Saks, 1996; Feldman, 1981; Van Maanen & Schein, 1979). Moreover, newcomers learn a unit-specific language that facilitates the comprehension of background knowledge and communication with others (Chao et al., 1994; Cohen & Levinthal, 1990; Fisher, 1986). However, although well-established languages or symbols might propagate

effective communication between individuals, they impede the ability to tap into new external knowledge sources (Cohen & Levinthal, 1990: 133). Rather, collective socialization tactics lead to custodial role orientations and the acceptance of the status quo (Jones, 1986: 264).

*Hypothesis 7. The more socialization tactics are used, the higher a unit's ratio of realized to potential absorptive capacity*

**Consequences of Absorptive Capacity**

Cohen & Levinthal (1990) indicated that absorptive capacity not only determines a unit's ability to recognize and assimilate new external knowledge, but also involves the commercial application of new external knowledge. In other words, absorptive capacity determines important organizational outcomes, such as new product development (Stock et al., 2001; Tsai, 2001), business performance (Lane, Salk & Lyles, 2001; Tsai, 2001) and explorative or exploitative adaptations (Lewin et al., 1999). Units differ in their ability to manage the ratio of RACAP to PACAP and, subsequently, differ in their outcomes. In this paper, we distinguish between two important consequences of absorptive capacity; financial performance and adaptation.

**Financial Performance**. Absorptive capacity influences a unit's ability to increase financial performance (Tsai, 2001). Though, potential and realized absorptive capacity have conceptually different, but complementary roles in capturing value from absorptive capacity (Zahra and George, 2002: 191-196). Processes underlying RACAP generate income through transforming and exploiting knowledge into products and services. Processes underlying PACAP reduce sunk investments by increasing the relevance of products and services (Sorensen and Stuart, 2000; Yli-Renko, Autio, & Sapienza, 2001). Units that combine processes underlying potential and realized absorptive capacity obtain increasing financial performance (Zahra and George, 2002: 191). An overemphasis on developing potential absorptive capacity or realized absorptive capacity impedes

exploiting or renewing knowledge stocks that may lead to competence traps. Based on these arguments, we suggest that units characterized by a moderate level of the ratio are likely to sustain superior financial performance. Accordingly, we expect an inverted U-shaped relationship between the ratio of realized to potential absorptive capacity and financial performance.

*Hypothesis 8. There will be an inverted U-shaped relationship between the ratio of realized to potential absorptive capacity and a unit's financial performance*

**Unit Adaptation**. As Lewin et al. (1999) make clear, absorptive capacity mediates explorative and exploitative adaptations. Explorative adaptations involve experimenting with new approaches, ideas, technologies and finding new practices. They are associated with the ability of units to access and integrate knowledge flexibly within and across their boundaries (Henderson & Cockburn, 1994). Investments in acquiring and assimilating new external knowledge increase explorative adaptations by experimenting with and complex searching for new external knowledge (March, 1991; McGrath, 2001). In addition, explorative adaptations originate from combining and interpreting existing knowledge in a different manner (Henderson & Clark, 1990; Kogut & Zander, 1992). However, units that build on existing knowledge (i.e. realized absorptive capacity) show less impact on subsequent innovations than units that obtain knowledge from outside (i.e. potential absorptive capacity; Rosenkopf and Nerkar, 2001). Units that develop potential absorptive capacity increase the distinctiveness of their innovations (Yli-Renko et al., 2001) that is associated with explorative adaptations. Accordingly, units that heighten their ratio of realized to potential absorptive diminish explorative adaptations.

*Hypothesis 9. The higher the ratio of realized to potential absorptive capacity, the lower a unit's explorative adaptations*

Exploitative adaptations constitute improving existing processes and technologies aimed at efficiency and cost reduction (Lewin et al., 1999: 536; March, 1991). The cumulative transformation and exploitation of knowledge through the processes underlying realized absorptive capacity are associated with exploitative adaptations. In this regard, Zahra & George (2002) mention exploitation as a dimension of realized absorptive capacity. They state that it allows units "…to refine, extend and leverage existing competencies.." (ibid: 190). Exploitative adaptations are largely associated with a unit's ability to transform and exploit knowledge into its operations. Thus, units that increase their ratio, i.e. increase the relative proportion of realized absorptive capacity, increase exploitative adaptations. Accordingly,

*Hypothesis 10. The higher the ratio of realized to potential absorptive capacity, the higher a unit's exploitative adaptations*

## METHOD

The empirical research was conducted at a large European multi-unit financial services firm. The firm is one of the three largest financial services firms in the Netherlands and ranks within the top 25 on the Fortune Global 500 in terms of total revenue in the banking industry. It is abroad-based financial service provider that consists of autonomous local banks or branches throughout the Netherlands. In 2002, a questionnaire was developed and was distributed to 769 business units in 220 branches. For each of the 220 branches, the managers of business units were asked to participate. Finally, 462 completed and usable questionnaires were returned, representing an effective response rate of 60.1 %. The respondents had an average age of 41 (s.d. = 7.24) and mean company tenure of 7.7 years (s.d. = 8.14).

### Measures

**Ratio of Realized to Potential Absorptive Capacity**. To construct the measure for the ratio of realized to potential absorptive capacity, we took several steps. First, following Cohen and Levinthal (1990) and Zahra and George (2002), we used 26 items to measure the four processes underlying potential and realized absorptive capacity. We used acquisition and assimilation as indicators for potential absorptive capacity and transformation and exploitation as indicators for realized absorptive capacity (Zahra and George, 2002). Items were measured on a seven-point disagree/agree scale and were based on existing items in the literature regarding absorptive capacity (Szulanski, 1996), and market orientation (Jaworski & Kohli, 1993). Six items pertained to acquisition, seven to assimilation, five to transformation, and eight to exploitation of new external knowledge. Confirmatory factor analysis (CFA) suggested that a four-factor model of absorptive capacity provided a good fit to the data ($?^2$/df = 2.27, goodness-of-fit index (GFI) = .91, comparative fit index (CFI) = .91, root-mean-square error of approximation (RMSEA) = .05). Second, composite scales were created for each of the processes (reliabilities: acquisition, .81; assimilation, .74; transformation, .66; and exploitation, .71). Next, we calculated the ratio of RACAP to PACAP by (RACAP / (RACAP+PACAP)). In this way, the ratio of RACAP to PACAP ranges between 0 and 1 with 0.5 indicating that a unit's RACAP approaches PACAP.

**Unit Performance**. To relate the ratio of realized to potential absorptive capacity to a unit's performance, we included a unit's *financial performance*. The financial performance measure was based on a managerial assessment of performance. Such subjective measures of performance are not uncommonly used in research on business units of large corporations (cf. Dess, & Robinson, 1984; Slater & Narver, 1994). Previous research has found a strong correlation between these subjective measurements and their objective counterparts (Dess & Robinson, 1984; Pearce, Robbins, & Robinson, 1987; Roth, Schweiger, & Morrison, 1991; Venkatraman & Ramanujam, 1987). Items for financial performance were based on Jaworski and Kohli (1993) and Zou and Cavusgil (2002).

Managers were asked to evaluate and compare several aspects of their unit's financial performance with corresponding business units in reference branches and neighboring competitors. The resulting scale for financial performance was unidimensional and reliable (a = .82).

**Unit adaptation**. A six-item scale measured *explorative adaptation.* Items were generated by carefully examining existing literature (March, 1991; Lewin et al., 1999). Confirmatory factor analysis showed that the resulting scale was unidimensional and reliable (a = .80). To measure *exploitative adaptation*, we followed the same procedure as with explorative adaptation. We included a five-item scale that was unidimensional and close to the cut-off value of .70 that indicates high reliable constructs (Nunnally, 1978; a = .66).

**Independent Variables**

**Coordination capabilities**. To measure the extent to which units used *cross-functional interfaces*, we followed the same procedure as Gupta and Govindarajan (2000). Based on Galbraith (1973) and Nadler and Tushman (1987), we asked managers to indicate the extent to which their unit used liaison personnel, temporary task forces, couples, and permanent teams to coordinate activities. The final measure was a weighted average of the four items. The weights ranged from 1 for liaison personnel to 4 for permanent teams (mean = 4.38; s.d. = 1.20). We used the subconstruct of participation in decision-making (Hage & Aiken, 1967) to measure *participation*. As Dewar, Whetten and Boje (1980) indicate, the scale is found to be both reliable and valid. Correspondingly, our measure was unidimensional and reliable (a = .79). *Job rotation* was measured with two items that tapped into the extent employees were rotated between different functions within and between subunits (a = .77).

**System capabilities**. To measure *formalization*, we used a five-item formalization scale (a = .73) from Desphandé and Zaltman (1982). *Routineness* tapped into the extent to which tasks within units were invariable, uniform or predictable (Whitney, Daft & Cooper, 1983). Accordingly, based on Perrow's work on unit technology, routineness was measured by the exceptions subscale of Whitney, Daft and Cooper (1983). The measure proved unidimensional and reliable (a = .73)

**Socialization capabilities**. *Connectedness* was measured with a four-item scale adapted from Jaworski and Kohli (1993: 59). They developed a scale for connectedness that measured the extent to which individuals in a subunit were networked to various levels of the hierarchy in other subunits. The resulting scale was unidimensional and reliable (a = .74). We used two categorizations of Van Maanen and Schein's model (1979: 232) to measure *socialization tactics*: collective versus individual and serial versus disjunctive tactics. Jones (1986) operationalized these two constructs (cf. Ashforth & Saks, 1996). CFA suggested that the two measures for socialization tactics were indeed separate factors and provided a good fit to the data. The measure for socialization tactics was constructed by averaging the measures for collective socialization tactics (a = .74) and serial socialization tactics (a = .76).

**Control Variables**. During the empirical study, we controlled for possible confounding effects by including various relevant variables. First of all, several studies have indicated that *unit size* might determine a unit's ability to innovate and sustain performance (Tsai, 2001). Accordingly, we included the logarithm of the number of employees within the business unit to account for unit size. Second, in accordance with the reasoning to include unit size, we included *branch size* as well. The size of the branch may affect a unit's market power over competitors. Moreover, larger branches may devote more resources to a unit's activities underlying potential absorptive capacity. Branch

size was calculated by the logarithm of the number of employees within a particular branch. Third, a *unit's age* was included since age may influence knowledge acquisition and exploitation (Lane & Lubatkin, 1998). Older units may have an experience advantage, or younger units may have an enhanced ability for knowledge acquisition (Autio, Sapienza, & Almeida, 2000). A unit's age was measured by the number of years the business unit existed. Fourth, *client focus* was included to control for profit potential of different products and services provided by the business units. Thus, we included a control variable for client focus, using a dummy variable indicating if the business unit provided products and services for business clients (coded as 1) or private clients (coded as 0). Fifth, the *geographic area* in which the unit is situated may affect financial performance and adaptation. Accordingly, we included a dummy variable, geographic area, to account for geographic effects like market concentration (urban area was coded 1; rural area was coded 0). Sixth, environmental aspects such as dynamism can trigger a unit to develop PACAP that influences a unit's performance (Zahra and George, 2002). Therefore, a validated scale that captures environmental dynamism was adapted from Volberda and Van Bruggen (1997). A five-item scale measured *environmental dynamism* and tapped into the extent units encounter changes within their environment. The scale was unidimensional and reliable (a = .84).

## ANALYSIS AND RESULTS

Table 1 presents descriptive statistics and correlations for the study variables. Table 1 shows that the organizational mechanisms constituting the three combinative capabilities were significantly related. Since we were concerned about issues of multicollinearity, we calculated variance inflation factors (VIF) in each of the regression equations. The maximum VIF within the models was 1.64, which is well below the rule-of-thumb cut-off of 10 (Neter, Wasserman & Kutner, 1990). Multicollinearity problems were thus not evident in our analyses. In order to test for

violations in the assumptions of the OLS regression, we used plots to examine for heteroskedasticity in the data.

Insert Table 1 about here

Table 2 presents the results of the hierarchical regression analysis for the organizational antecedents and the ratio of realized to potential absorptive capacity. Model 1 introduces the control variables. As expected, the control variables had a significant effect on the ratio, with an adjusted $R^2$ of 0.28 ($p<.001$). There are clearly systematic differences in the ratio across units, with units serving private clients showing higher ratios of realized to potential absorptive capacity. Units focusing on business clients were more engaged in developing PACAP than units serving private clients. Size and age of a unit also positively influenced the ratio of realized to potential absorptive capacity. In accordance with the arguments of Zahra and George (2002), environmental dynamism triggers units to develop PACAP, thereby lowering the ratio of realized to potential absorptive capacity. Next, model 2 introduces coordination capabilities. Hypothesis 1 stated a negative relationship between cross-functional interfaces and a unit's ratio of realized to potential absorptive capacity. As shown in model 2, the coefficient was negative and significant ($p<.01$); hypothesis 1 is supported. Hypothesis 2, which predicted that participation negatively influences the ratio, was also supported ($p<.001$). Hypothesis 3 predicted a negative relationship between job-rotation and the ratio of realized to potential absorptive capacity. As shown, the coefficient for job-rotation was negative and significant ($p<.05$). Hypothesis 3 was supported. The above relationships indicated that coordination capabilities are particularly conducive to a unit's capacity for developing potential absorptive capacity and lower the ratio of realized to potential absorptive capacity.

Model 3 introduces the relationships between the indicators of system capabilities, i.e. formalization and routineness, and the ratio of realized to potential absorptive capacity. Hypothesis 4, which predicted a positive relationship between formalization and the ratio, was supported

(p<.01). Hypothesis 5, which predicted a positive influence of routineness on the ratio, was partially confirmed. The coefficient for routineness was positive, but moderately significant (p<.10). As expected, system capabilities particularly enhanced a unit's ability to develop realized absorptive capacity.

Model 4 adds the variables relating to socialization capabilities. As shown in table 2, the sixth hypothesis that connectedness positively influences a unit's ratio of realized to potential absorptive capacity, was not supported. The coefficient for connectedness showed the predicted positive sign, but was not significant (p>.10). To explain this finding, we performed two additional regression analyses with PACAP and RACAP as dependent variables. The results revealed that connectedness significantly enhanced the development of both PACAP (p<.01) and RACAP (p<.01), thereby not showing a relationship with the ratio. Hypothesis 7, which stated a positive relationship between socialization tactics and the ratio, was supported. The relationship was positive and significant (p<.001). Socialization tactics, thus, particularly dominated a unit's ability to develop realized absorptive capacity and increased the ratio of realized to potential absorptive capacity.

Insert Table 2 about here

Table 3 shows the results of the regression analyses estimating the effects of the ratio of realized to potential absorptive capacity on a unit's financial performance and explorative and exploitative adaptation. Hypothesis 8 proposed an inverted U-shaped relationship between the ratio of realized to potential absorptive capacity and a unit's financial performance. As shown in model 5, the coefficient of the linear term (p<.05) as well as the coefficient of the quadratic term (p<.05) were negative and significant. Accordingly, the relationship between the ratio and financial performance was nonlinearly decreasing instead of curvilinear; hypothesis 8 was not supported. Apparently, units with RACAP approaching PACAP do not necessarily obtain superior

performance. Our findings reveal that potential absorptive capacity plays a decisive role in capturing value from absorptive capacity and sustaining superior performance. Model 6 indicates the influence of the ratio of realized to potential absorptive capacity on explorative adaptations. Hypothesis 9, which predicted a negative relationship between the ratio and explorative adaptation, was supported. The negative coefficient ($p<.001$) indicates that the processes underlying realized absorptive capacity deplete the possibility of units to perform explorative adaptations. Hypothesis 10, which predicted a positive relationship between the ratio of realized to potential absorptive capacity and exploitative adaptation, was also confirmed. The coefficient in model 7 was positive and significant ($p<.01$). It supports the hypothesized positive relationship between the ratio and exploitative adaptations.

Insert Table 3 about here

## DISCUSSION AND CONCLUSION

This paper is one of the first empirical studies that assesses potential and realized absorptive capacity and investigates organizational and performance implications of the ratio of realized to potential absorptive capacity. In this way, it empirically validates the theoretical contribution of Zahra and George (2002), which posits that absorptive capacity consists of two complementary but distinct components, i.e. potential and realized absorptive capacity. By investigating consequences and antecedents of the ratio of realized to potential absorptive capacity, we are able to show how absorptive capacity drives performance differences and what organizational antecedents are necessary to develop and harvest potential and realized absorptive capacity.

### Theoretical and Practical Implications

The first *contribution of our study* is that we find distinct organizational and performance implications of different ratios of realized to potential absorptive capacity. This confirms that

absorptive capacity indeed has two distinct components or dimensions. In their study on learning in international joint ventures, Lane et al. (2001: 1156) mentioned that the absorptive capacity of IJV's may have two components. Their study suggested that the abilities of IJV's to understand and assimilate external knowledge are interdependent yet distinct from the ability to apply the knowledge. Our study finds further support for this notion by including the processes of units to acquire and assimilate new external knowledge as indicators for potential absorptive capacity and the ability of units to transform and exploit new external knowledge as indicators for realized absorptive capacity (Zahra and George, 2002).

Second, our study reveals how organizational antecedents of absorptive capacity influence the ratio of realized to potential absorptive capacity. Particularly, it shows that organizational mechanisms underlying coordination capabilities, i.e. cross-functional interfaces, participation in decision-making and job-rotation negatively influence the ratio. Of the organizational mechanisms underlying system and socialization capabilities, formalization, routineness, and socialization tactics are positively related to the ratio. Connectedness enhances the development of both PACAP and RACAP, and shows no significant relationship with the ratio. Sheremata (2000) explains that connectedness allows employees in units to strengthen the links, increase communication, and integrate dispersed knowledge. However, connectedness also ensures support and encourages employees to search into the unit-wide knowledge base for new ideas and knowledge (Atuahene-Gima, 2003). Accordingly, connectedness contributes to the underlying processes of both potential and realized absorptive capacity.

Third, our study provides insights into the relationships between the ratio of realized to potential absorptive capacity and financial performance. Contrary to our prediction, the ratio of realized to potential absorptive capacity shows a non-linearly decreasing relationship with financial performance. In other words, the more units develop processes underlying realized absorptive capacity as opposed to processes underlying potential absorptive capacity, the more they decrease

their financial performance. Two possibilities could be consistent with this deviant result. First, potential absorptive capacity could provide units with more important strategic advantages of continually renewing and exploiting knowledge bases than realized absorptive capacity. In this regard, Sorenson and Stuart (2000) suggest that greater reliance on existing knowledge leads to more innovations, but that those innovations are less relevant. This explanation further supports literature that stresses the decisive role of new external knowledge acquisition to building competitive advantages (Henderson and Cockburn, 1994; Rosenkopf and Nerkar, 2001; Yli-Renko et al., 2001). Another explanation for the deviant finding could be that, in our research context, not enough units reached such a low level of the ratio, i.e. a high proportion of potential absorptive capacity, for the negative effects of potential absorptive capacity to become significant. Future research may help to further clarify this matter and enhance our understanding of the partial effects of potential and realized absorptive capacity on financial performance.

Fourth, the present study provides empirical support for the hypothesis that potential absorptive capacity particularly induces explorative adaptations. Since potential absorptive capacity enhances a unit's ability to renew its knowledge stock, it generates higher impact on subsequent innovations and develops a unit's ability to create breakthrough inventions (Ahuja and Lampert, 2001; Rosenkopf and Nerkar, 2001). Realized absorptive capacity, on the other hand, depletes the possibility of units to perform explorative adaptations. Processes underlying realized absorptive capacity are associated with a unit's ability to build upon existing competences and increase a unit's exploitative adaptations. Our results extend Tsai's (2001) and Stock's et al. (2000) claim that absorptive capacity is related to product innovation. The distinct influences of potential and realized absorptive capacity on adaptation suggest that future research includes dimensions of adaptation or innovation as consequences of absorptive capacity. While Zahra and George (2002) associate realized absorptive capacity with product and process innovation, our study shows that realized

absorptive capacity is associated with exploitative adaptation, and potential absorptive capacity is associated with explorative adaptations.

**Suggestions for Future Research**

The present study provides several issues for *future research.* Although our empirical analysis provides acceptable support for our theoretical reasoning, a proportion of the variance remains unexplained. Future research may incorporate additional organizational antecedents of absorptive capacity such as organizational form (Van den Bosch et al., 1999), decision-making processes (Cohen & Levinthal, 1990), and incentive systems.

While providing important insights into organizational antecedents of absorptive capacity, our study does not address the processes involved in changing the ratio of realized to potential absorptive capacity. In this regard, it would be useful to conduct in-depth studies to better understand the factors that influence the initiation and implementation of change efforts directed at improving a unit's absorptive capacity. Longitudinal data may uncover how firms break away from path dependences, change their ratio and perform explorative and exploitative adaptations. Moreover, empirical studies could examine the relationship between the ability of units to reconfigure their combinative capabilities and their performance. From the research of traditional publishing firms moving into the emerging multimedia complex, it appeared that the development of system capabilities can facilitate the process of reducing existing socialization capabilities (Van den Bosch et al., 1999). In this sense, future research could relate the speed of changing the configuration of combinative capabilities to sustainable competitive advantage.

## REFERENCES


Adler, P.S., Goldoftas, B., Levine, D.I. 1999. Flexibility versus Efficiency? A Case Study of Model Changeovers in the Toyota Product System. *Organization Science*, 10: 43-68

Argote, L. 1999. *Organizational Learning: Creating, Retaining and Transferring Knowledge*. Boston, BA: Kluwer Academic Press

Ashforth, B.E., & Saks, A.M. 1996. Socialization Tactics: Longitudinal Effects on Newcomer Adjustments. *Academy of Management Journal*, 39: 149-178

Atuahene-Gima, K. 2003. Effects of Centrifugal and Centripetal Forces on Product Development Speed and Quality: How Does Problem Solving Matter? *Academy of Management Journal*: forthcoming

Autio, E., Sapienza, H.J., & Almeida, J.G. 2000. Effects of Age at Entry, Knowledge Intensity, and Imitability on International Growth. *Academy of Management Journal*, 43: 909-924

Bacharach, S.B., & Aiken, M. 1977. Communication in Administrative Bureaucracies. *Academy of Management Journal*, 20: 365-377

Chao, G.T., O'Leary-Kelly, A.M., Wolf, S., Klein, H.J., & Gardner, P.D. 1994. Organizational Socialization: Its content and Consequences**.** *Journal of Applied Psychology*, 79: 730-743

Cohen, W., & Levinthal, D. 1990. Absorptive Capacity: Anew Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35: 128-152

Cohen, W., & Levinthal, D. 1994. Fortune favors the Prepared Firm. *Management Science*, 4: 227-251

Crossan, M.M., Lane, H.W., & White, R.E. 1999. An Organizational Learning Framework: From Intuition to Institution. *Academy of Management Review*, 24: 522-537

Daft, R.L., & Lengel, R.H. 1986. Organizational Information Requirements, Media Richness and Structural Design. *Management Science*, 32: 554-571

Deshpandé, R., & Zaltman, G. 1982. Factors affecting the use of Market Research Information: A path Analysis. *Journal of Marketing Research*, 19: 14-31

Dess, G.G., & Robinson, R.B. 1984. Measuring organizational performance in the absence of objective measures: The case of the privately held firm and the conglomerate business unit. *Strategic Management Journal*, 5: 265-273

Dewar, R.D., Whetten, D.A., & Boje, D. 1980. An Examination of the Reliability and Validity of the Aiken and Hage Scales of Centralization, Formalization, and Task Routiness, *Administrative Science Quarterly*, 25: 120-128

Eisenhardt, K.M., & Martin, J.A. 2000. Dynamic Capabilities: What are they?. *Strategic Management Journal*, 21: 1105-1121

Feldman, D.C. 1981. The Multiple Socialization of Organization Members. *Academy of Management Review*, 6: 309-318

Fisher, C.D. 1986. Organizational Socialization: An Integrative Review. *Research in Personnel and Human Resource Management*, 4: 101-145

Galbraith, J.R., 1973. *Designing Complex Organizations*. Reading: Addison-Wesley

Grant, R.M. 1996. Prospering in dynamically-competitive environments: Organizational capability as knowledge creation. *Organization Science*, 7, 375-387.

Gupta, A.K., & Govindarajan, V. 2000. Knowledge Flows within Multinational Corporations. *Strategic Management Journal*, 21: 473-496

Hage, J., & Aiken, M. 1969. Routine Technology, Social Structure, and Organization Goals. *Administrative Science Quarterly*, 14: 366-376

Henderson, R., & Cockburn, I. 1994. Measuring Competence? Exploring Firm Effects in Pharmaceutical Research. *Strategic Management Journal*, 15: 63-84

Jaworski, B.J., & Kohli, A.K. 1993. Market Orientation: Antecedents and Consequences. *Journal of Marketing*, 57: 53-70

Jones, G.K., Lanctot Jr., A., & Teegen, H.J. 2000. Determinants and Performance Impacts of External Technology Acquisition. *Journal of Business Venturing*, 16: 255-283

Jones, G.R. 1986. Socialization tactics, Self Efficacy, and Newcomer Adjustments to Organizations. *Academy of Management Journal*, 29: 262-279

Khandwalla, P.N. 1977. *Design of Organizations.* New York: Harcourt Brace Jovanovich

Kim, L. 1998. Crisis Construction and Organizational Learning: Capability Building in Catching-up at Hyundai Motor. *Organization Science*, 9: 506-521

Kogut, B., & Zander, U. 1992. Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology. *Organization Science*, 3: 383-397

Lane, P.J., & Lubatkin, M. 1998. Relative Absorptive Capacity and Interorganizational Learning. *Strategic Management Journal*, 19: 461-477

Lane, P.J., Salk, J.E., & Lyles, A. 2001. IJV Learning and Performance. *Strategic Management Journal*, 22: 1139-1161

Lane, P.J., Koka, & Pathak, 2002. *A Thematic Analysis and Critical Assessment of Absorptive Capacity Research.* Paper presented at the Annual Academy of Management Conference, Denver, CO.

Lewin, A.Y., Long, C.P, & Caroll, T.N. 1999. The Coevolution of New Organizational Forms. *Organization Science*, 10: 535-550

Lyles, M.A., & Salk, J.E. 1996. Knowledge Acquisition from foreign Parents in International Joint-ventures. *Journal of International Business Studies*, 27: 905-927

March, J.G. 1991. Exploration and Exploitation in Organizational Learning. *Organization Science*, 2: 71-87

Matusik, S.F., & Heeley, M.B. 2001. *An Examination of Multiple Components of Absorptive Capacity in the Software Industry.* Paper presented at the Annual Academy of Management, Washington, D.C.

McGrath, R.G. 2001. Exploratory Learning, Innovative Capacity, and Managerial Oversight. *Academy of Management Journal*, 44: 118-131

Mowery, D.C., Oxley, J.E., & Silverman, B.S. 1996. Strategic Alliances and Interfirm Knowledge Transfer. *Strategic Management Journal*, 17: 77-91

Nadler, D.A., & Tushman, M.L. 1987. *Strategic Organization Design.* New York: Scott, Foresman

Nelson, R., & Winter, S. 1982. *An Evolutionary Theory of Economic Change.* Cambridge, MA: Harvard University Press.

Neter, J., Wasserman, W., & Kutner, M.H. 1990. *Applied Linear Statistical Models.* Homewood, IL: Irwin

Nunnally, J.C. 1978. *Psychometric Theory.* New York, NY: McGraw-Hill

Pennings, J.M., & Harianto, F. 1992. The Diffusion of Technological Innovation in the Commercial Banking Industry. *Strategic Management Journal*, 13: 29-46.

Perrow, C. 1967. A Framework for the comparative analysis of organizations. *American Sociological Review*, 32: 194-208

Pearce, J., Robbins, D., & Robinson, R. 1987. The Impact of Grand Strategy and Planning Formality on Financial Performance. *Strategic Management Journal*, 8: 55-76

Pierce, J.L., & Delbecq, A.L. 1977. Organization Structure, Individual Attitudes and Innovation. *Academy of Management Review*, 2: 27-37.

Rosenkopf, L., & Nerkar, A. 2001. Beyond Local Search: Boundary-spanning, Exploration, and Impact in the Optical Disk Industry. *Strategic Management Journal*, 22: 287-306

Roth, K., Schwieger, D.M., & Morrison, A.J. 1991. Global Strategy Implementation at the Business Unit Level: Operational Capabilities and Administrative Mechanisms. *Journal of International Business Studies*, 3: 369-402

Rowley, T., Behrens, D., & Krackhardt, D. 2000. Redundant Governance Structures: An Analysis of Structural and Relational Embeddedness in the Steel and Semiconductor Industries. *Strategic Management Journal*, 21: 369-386

Sethi, R., Smith, D.C., & Park, C.W. 2001. Cross-Functional Product Development Teams, Creativity, and the Innovativeness of New Consumer Products. *Journal of Marketing Research*, 38: 73-85

Shenkar, O., & Li, J. 1999. Knowledge Search in International Cooperative Ventures. *Organization Science*, 10: 134-143

Sheremata, W.A. 2000. Centrifugal and Centripetal Forces in Radical New Product Development under Time Pressure. *Academy of Management Review*, 25: 389-408

Slater, S.F., & Narver, J.C. 1994. Does Competitive Environment Moderate the Market Orientation-Performance Relationship? *Journal of Marketing*, 58: 46-55

Sorenson, J.B., & Stuart, T.E. 2000. Aging, Obsolescence, and Organizational Innovation. *Administrative Science Quarterly*, 45: 81-112

Stock, G.N., Greis, N.P., & Fischer, W.A. 2001. Absorptive Capacity and New Product Development. *The Journal of High Technology Management Research*, 12: 77-91

Szulanski, G. 1996. Exploring Internal Stickiness: Impediments to the Transfer of Best Practices within the firm. *Strategic Management Journal*, 17: 27-44

Tsai, W. 2000. Social Capital, Strategic Relatedness and the Formation of Intraorganizational Linkages. *Strategic Management Journal*, 21: 925-939

Tsai, W. 2001. Knowledge Transfer in Intra-organizational Networks: Effects of Network Position and Absorptive Capacity on Business Unit Innovation and Performance. *Academy of Management Journal*, 44: 996-1004

Tsai, W. 2002. Social Structure of 'Coopetition' within a Multiunit Organization: Coordination, Competition, and Intraorganizational Knowledge Sharing. *Organization Science*, 13: 179-190

Van de Ven, A.H., Delbecq, A.L., & Koenig, R. 1976. Determinants of coordination modes within organizations. *American Sociological Review*, 41: 322-338

Van den Bosch, F.A.J., Volberda, H.W., & de Boer, M. 1999. Coevolution of Firm Absorptive Capacity and Knowledge Environment: Organizational Forms and Combinative Capabilities. *Organization Science*, 10: 551-568

Van den Bosch, F.A.J., Volberda, H.W., & Van Wijk, R. 2003. External knowledge, Absorptive Capacity, and Firm Performance. In: M. Easterby-Smith and M. Lyles (eds.), *Companion to Organisational Learning and Knowledge*, Oxford: Blackwell.

Van Maanen, J., & Schein, E.H. 1979. Toward a Theory of Organizational Socialization. In: B.M. Staw (Ed.), *Research in Organizational Behavior*, Vol. 1: 209-264. Greenwich, CT: JAI Press

Venkatraman, N., & Ramanujam, V. 1987. Measurement of business economic performance: An examination of method convergence. *Journal of Management*, 13: 109-122

Volberda, H.W. 1998. *Building the Flexible Firm: How to Remain Competitive*. New York: Oxford University Press

Volberda, H.W., & Van Bruggen, G.H. 1997. Environmental Turbulence: A Look into its Dimensionality. *NOBO Onderzoeksdag 1997*, Enschede

Walker, G., Kogut, B., & Shan, W. 1997. Social Capital, Structural Holes and the Formation of an Industry Network. *Organization Science*, 8: 109-125

Withey, M., Daft, R.L., & Cooper, W.H. 1983. Measures of Perrow's Work Unit Technology: An Empirical Assesment and a New Scale. *Academy of Management Journal*, 26: 45-63

Yli-Renko, H., Autio, E., & Sapienza, H.J. 2001. Social Capital, Knowledge Acquisition, and Knowledge Exploitation in Young Technology-based Firms. *Strategic Management Journal*, 22: 587-613

Zahra, S.A., & George, G. 2002. Absorptive Capacity: A Review, Reconceptualization, and Extension. *Academy of Management Review*, 27: 185-203

Zander, U., & Kogut, B. 1995. Knowledge and the Speed of the Transfer and Imitation of Organizational Capabilities: An Empirical Test. *Organization Science*, 6: 76-92

Zou, S., & Cavusgil, S.T. 2002. The GMS: A Broad Conceptualization of Global Marketing Strategy and Its Effect on Firm Performance. *Journal of Marketing*, 66: 40-56

Figure 1 Theoretical Framework

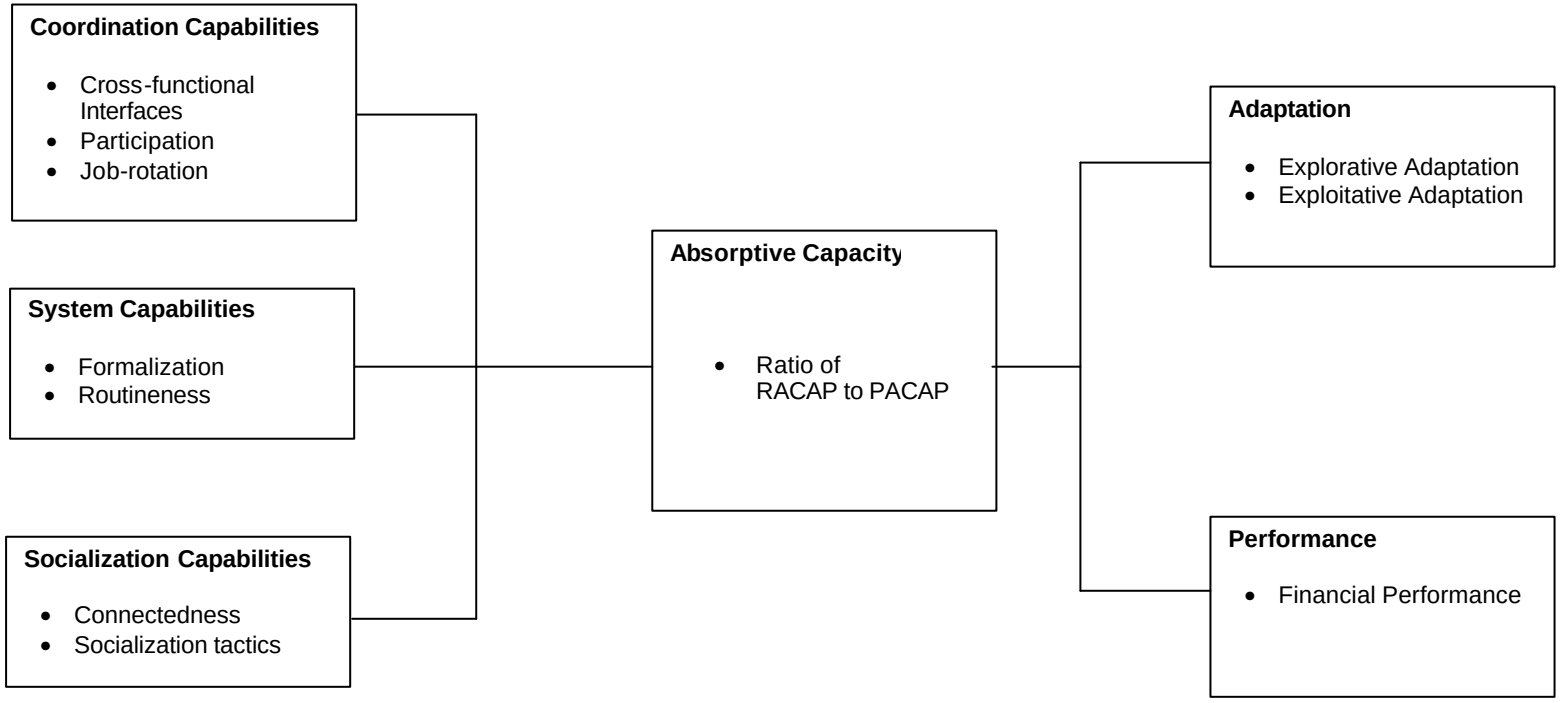

Table 1 Means, Standard Deviations, and Correlations[a]

| | Mean | St. dev | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Ratio realized to potential AC | 0.55 | 0.05 | | | | | | | | | | | | | | | | | |
| (2) Cross-functional Interfaces | 4.38 | 1.20 | -.36 | | | | | | | | | | | | | | | | |
| (3) Participation | 3.87 | 1.05 | -.28 | .23 | (.79) | | | | | | | | | | | | | | |
| (4) Job-rotation | 2.18 | 1.08 | -.11 | .16 | .11 | (.77) | | | | | | | | | | | | | |
| (5) Formalization | 5.53 | 0.74 | .18 | .01 | -.11 | -.04 | (.73) | | | | | | | | | | | | |
| (6) Routineness | 3.26 | 0.97 | .27 | -.19 | -.15 | .01 | -.02 | (.73) | | | | | | | | | | | |
| (7) Connectedness | 5.61 | 0.78 | -.02 | .08 | .04 | .01 | .14 | -.15 | (.74) | | | | | | | | | | |
| (8) Socialization tactics | 4.63 | 0.70 | .18 | .09 | .04 | .20 | .28 | .05 | .14 | (.75) | | | | | | | | | |
| (9) Financial performance | 4.46 | 1.15 | -.27 | .10 | .17 | -.06 | .01 | -.23 | .21 | .06 | (.82) | | | | | | | | |
| (10) Explorative adaptation | 3.91 | 1.08 | -.35 | .21 | .17 | .19 | .03 | -.27 | .16 | .13 | .39 | (.80) | | | | | | | |
| (11) Exploitative adaptation | 4.67 | 0.70 | .16 | .00 | .02 | .10 | .18 | .09 | .02 | .25 | .09 | .09 | (.66) | | | | | | |
| (12) Unit size[b] | 1.43 | 0.28 | .18 | .10 | -.12 | .17 | -.03 | .14 | -.12 | .05 | -.22 | -.17 | .14 | | | | | | |
| (13) Branch size[b] | 2.10 | 0.18 | -.04 | .11 | -.09 | .10 | .01 | -.05 | .03 | .08 | .09 | .17 | -.04 | .33 | | | | | |
| (14) Unit age | 3.23 | 2.35 | .13 | -.15 | -.07 | -.07 | .02 | .10 | .09 | -.01 | .02 | -.11 | .02 | -.02 | -.12 | | | | |
| (15) Client focus | 0.34 | 0.47 | -.48 | .40 | .10 | .01 | -.14 | -.22 | .06 | -.12 | .19 | .19 | -.03 | -.03 | .03 | -.06 | | | |
| (16) Geographic area | 0.54 | 0.50 | -.03 | .04 | -.13 | .12 | -.03 | -.04 | .06 | -.04 | -.02 | .12 | -.11 | .16 | .41 | -.06 | .04 | | |
| (17) Environmental dynamism | 4.65 | 1.13 | -.10 | .05 | .01 | .13 | .02 | -.13 | .08 | .04 | .12 | .26 | .01 | -.02 | .23 | .01 | -.09 | .19 | (.84) |

[a] n = 462. Numbers in parentheses on the diagonal are Cronbach's alphas of the composite scales. All correlations above |.08| are significant at $p < .05$.
[b] log number of full-time employees

Table 2
Results of Hierarchical Regression Analysis: Effects of Organizational Antecedents[a]

| | Ratio of Realized to Potential Absorptive Capacity | | | |
|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 4 |
| Coordination Capabilities | | | | |
| Cross-functional Interfaces | | -0.15** | -0.16*** | -0.17*** |
| Participation | | -0.17*** | -0.15*** | -0.16*** |
| Job-rotation | | -0.09* | -0.09* | -0.11** |
| System Capabilities | | | | |
| Formalization | | | 0.11** | 0.07 |
| Routineness | | | 0.07† | 0.07† |
| Socialization Capabilities | | | | |
| Connectedness | | | | 0.02 |
| Socialization tactics | | | | 0.15*** |
| Control variables | | | | |
| Unit size | 0.19*** | 0.21*** | 0.20*** | 0.21*** |
| Branch size | -0.05 | -0.06 | -0.06 | -0.07 |
| Unit age | 0.11** | 0.07† | 0.06 | 0.06 |
| Client focus | -0.47*** | -0.39*** | -0.36*** | -0.35*** |
| Geographic area | 0.02 | 0.00 | 0.01 | 0.02 |
| Environmental dynamism | -0.13** | -0.09* | -0.08* | -0.09* |
| Adjusted $R^2$ | .28*** | .35*** | .36*** | .38*** |
| ? $R^2$ | | .07*** | .02** | .02** |

[a] Standardized regression coefficients are reported, n=462
† p <.10
* p < .05
** p < .01
*** p < .001

Table 3
Results of Regression Analysis: Consequences of Realized to Potential Absorptive Capacity[a]

| | Financial Performance | Explorative Adaptation | Exploitative Adaptation |
|---|---|---|---|
| | Model 5 | Model 6 | Model 7 |
| Absorptive Capacity | | | |
| Ratio RACAP to PACAP | -0.12* | -0.25*** | 0.18** |
| Ratio RACAP to PACAP squared | -0.11* | | |
| Control variables | | | |
| Unit size | -0.25*** | -0.17*** | 0.14** |
| Branch size | 0.19*** | 0.15** | -0.05 |
| Unit age | 0.04 | -0.06 | -0.02 |
| Client focus | 0.15** | 0.06 | 0.08 |
| Geographic area | -0.08 | 0.03 | -0.13* |
| Environmental dynamism | 0.10* | 0.22*** | 0.07 |
| Adjusted $R^2$ | .16*** | .21*** | .05*** |

[a] Standardized regression coefficients are reported, n=462
† p < .10
* p < .05
** p < .01
*** p < .001