The Role of Intellectual Capital in Knowledge Transfer

Abstract
- The purpose of the study
- Research method used – Regression analysis
- Highlight results and findings
- Contribution of this study
- Brief on management implications

Index terms
- Human capital, intellectual capital, knowledge transfer performance, organizational capital, relational capital

I. INTRODUCTION

Knowledge Transfer as a critical resource for supporting firm’s competitive advantage [16], [31], [50], [62], [64]

In-house knowledge development & external knowledge => copes rapid technological changes [9], [33], [44], [57]

Strategic Alliance (adequate but challenging way) a vehicle for developing internal competency [3], [17], [59], [60]

Discussion on how the determinants such Alliance Characteristics and Partner Interaction affect the alliances
The Role of Intellectual Capital in Knowledge Transfer

I. INTRODUCTION (Insufficient Researched Areas)

- Intellectual Capital Issues in interfirm collaboration contexts
- Intellectual Capital effects on organizational outcomes in the topics of human resources
  - [75]
  - Innovation [12], [54], [61]
  - High-tech entrepreneurship [25], [27], [76]
- Little research on examining the role of (Intellectual Capital) => through (Strategic Alliance) => (Knowledge Transfer)

I. INTRODUCTION

- Knowledge Transfer (KT) - operational definition
  - A process that requires commitment of resources, managerial time, attentions, and effects [9], [49]
  - How to make it effective (better outcomes)
- Human Capital (HC) & Organizational Capital (OC)
  - Valuable assets and contexts
  - In the creation and acquisition of knowledge
  - Found in previous studies as the determinants of the Dependent Variables [11], [27], [61], [74], [76]

The Role of Intellectual Capital in Knowledge Transfer

I. INTRODUCTION (Focus of this Study)

- Address this issues (IC => SA => KT)
- Investigate different aspect of IC (Human Capital, Organization Capital, Relational Capital) => Impact
  => the performance of Knowledge Transfer in the context of interfirm cooperation

- Relational Capital (RC)
  - Good relationships with partners in terms of mutual trust, respect, friendship
  - Enabling, assisting factor for KT
  - The authors argue this KT performance would be “Regulated” by RC
  - RC or Innovation Capital was treated as mediator between HC&OC and Dependent Variable [11], [76]
I. Introduction

- Resource-based framework
  - The Firm is viewed as a nexus of resources and capabilities that are not freely bought and sold in the spot market [35], [55], [66]
- Resources and Capabilities have been labeled
  - Distinctive Competence [52],[56]
  - Core competence [48]
  - Firm specific competences [45]
- This Study Focuses on
  - The mediating effects of RC between HC & OC and KT
  - Proposed “Figure 1. Research Model and Hypotheses”

II. Research Background and Hypotheses

- A. Intellectual Capital
- B. Human Capital & Relational Capital
- C. Organizational Capital & Relational Capital
- D. Relational Capital and Knowledge Transfer Performance
- E. Mediating Role of Relational Capital in Knowledge Transfer

Figure 1. Research Model and the Hypotheses

II. Research Background and Hypotheses

- A. Intellectual Capital (IC)
  - The importance of IC to the competitive advantages of firms in the rapid changing knowledge-based economy
  - Competency-base perspective
  - Describe how firm-specific resources and capabilities enable the organizations to acquire and assimilate knowledge from their partners in the KT period
  - Literature review on previous studies and finding/results
II. Research Background and Hypotheses

A. Intellectual Capital (some common practices)
1. HC and OC were commonly used as the determinants of the Dependent Variables (Knowledge Transfer outcomes or performance)
2. Relational Capital or Innovation Capital was treated as Mediators between HC and OC and the Dependent Variables
3. Resource-based view was commonly used to explain the hypotheses in the prior studies

B. Human Capital and Relational Capital

- Human Capital (HC)
  - Refers to the tacit knowledge and skills resides in the minds of the managers and employees [7], [24], [41], [81], [73]

- Relational Capital (RC)
  - Refers to the level of mutual trust, respect, and friendship that arises out of close interaction between the employees and their partners involved in the knowledge transfer project [13], [32]

Hypothesis 1:
- The greater the human capital embedded in the employees of the firms, the greater is the relational capital with the partners during the knowledge transfer period.

C. Organizational Capital and Relational Capital

- Organizational Capital (OC)
  - Refers to the levels of institutionalized knowledge and codified embodied in the organizational-level repository, such as information system and organizational structure, which can support employees in doing their work [67], [74]

Hypothesis 2:
- The greater the organizational capital embodied in the organizational repository of the firms, the greater is the relational capital with the partners during the knowledge transfer period.

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Examining the role of IC in KT through interfirm cooperation projects

The mediating effects of RC between HC & OC and KT

Competence-based perspective was used to describe how firm-specific resources and capabilities enable the organizations to acquire and assimilate knowledge from their partners in the knowledge transfer period.
II. Research Background and Hypotheses

D. Relational Capital and Knowledge Transfer Performance

Hypothesis 3:
- The greater the relational capital with the partners, the greater is the degree of knowledge transfer performance achieved.

E. Mediating Role of Relational Capital in Knowledge Transfer

Hypothesis 4:
- Relational Capital positively mediates the linkage of human capital and knowledge transfer performance.

Hypothesis 5
- Relational Capital positively mediates the linkage of organizational capital and knowledge transfer performance.

III. Research Methodology

A. Data Collection and Sample

- Questionnaire survey approach to collect data
- Test the validity of the model and research hypotheses
- Four Variables (in questionnaire)
  - Human Capital
  - Organizational Capital
  - Relational capital
  - Knowledge transfer performance

- 5-point Likert-style response (Level of agreement)
  - 1-Strongly disagree, 2-Disagree, 3-Neither agree nor disagree, 4-Agree, 5-Strongly agree

- 7-point Likert-style response (Level of agreement)
  - 1-Strongly disagree, 2-Disagree, 3-Somewhat disagree, 4-Neither agree nor disagree, 5-Somewhat agree, 6-Agree, 7-Strongly agree
III. Research Methodology

A. Data Collection and Sample

- Population of Study
  - 500 Taiwanese Firms listed in the Yearbook - China Credit Information Service Incorporation

- Sampling Methods
  - Stratified Random Sampling
  - Select 100 firms in each of the five 1000 levels
  - 500 questionnaires were distributed
  - To be completed by managers who are familiar with the topics of this study

After two weeks
- Follow-up letters & phone calls

Completed Surveys
- 103 returned questionnaires, 6 incomplete
- 97 valid surveys – used for the Quantitative Analysis
- 19.4% response rate

Survey Bias Analysis

- Non-response Bias Test
  - Comparing the characteristics of the respondents to those of the original population
  - The calculated t-Statistics of the number of Employees (t = -1.77, p = 0.08) and Revenue (t = -0.75, p = 0.46) are all statistically insignificant
  - Suggesting there are no significant differences between the respondent and non-respondent groups

- Common method bias
  - Common method variance – tested using Harman’s one factor test
  - Principal Component Factor Analysis on the questionnaires measurement yields
    - Six factors with eigenvalues greater than 1.0 that account for 71.88% of the total variance
    - The first factor accounts for 21.46% of the variance
  - Common method bias is unlikely to be a serious problem in the data [46]
III. Research Methodology

B. Measures

Three Variables to be Measured
- Dependent Variable, Independent Variables, Control variables

Dependent Variable (KT Performance) with Four-item scale was developed to measure the degree to which the acquired knowledge contributes to the firm’s innovativeness in terms of:
  - Strengthen Innovative Capabilities
  - Shortening Innovation Processes
  - Inducing Innovative Activities
  - Accomplishing Satisfied Results

Cronbach’s alpha coefficient (α = 0.92)
  - Was computed to assess the internal consistency reliability of the measure, which is above the suggested value of 0.72 [21]

Independent Variable
- Organizational Capital (Independent Variable)
  - Based on prior studies [11], [61]
  - 12-items were developed to measure the extent to which the organization’s knowledge and codified experience stored in:
    - Corporate Culture
    - Organizational Structure
    - Operation Process, and
    - Information System

Cronbach’s alpha coefficient (α = 0.95)

Relational Capital (Independent Variable)
- Based on prior study [32]
- A 5-item scale were developed to measure the extent to which the respondents interact with their partners in terms of… during the knowledge transfer period.
  - Close Interaction
  - Mutual Respect
  - Mutual Trust
  - Personal Friendship
  - Reciprocity

Cronbach’s alpha coefficient (α = 0.93)
III. Research Methodology

B. Measures

- Control Variables
  - **Firm Size** and **Firm Age** may influence knowledge transfer performance
  - Firms in **Different Industries** may behave differently in the process of KT

- **Firm Size**
  - Measured as the amount of annual sales in NT dollars

- **Firm Age**
  - The number of years from the founding date

- **Industry Type** (dummy variable)
  - 0 – Service Industry
  - 1 – Manufacturing Industry

IV. Analysis and Results

Table I – Means, Standard Deviations, and Correlations

- The values of "Variance Inflation Factor" associated with each of the predictors range from 1.005 to 3.430 which fall within acceptance limits [21]
- Suggesting no need for concern with respect to multicollinearity
IV. Analysis and Results

- Model Statistics
  - R-square
    - The coefficient of determination
  - Adjusted R-square
    - A modification of R2 that adjusts for the number of explanatory terms in a model
  - F (F-test)
    - The F Statistics for analysis of variance
      - \( F = \frac{\text{Explained Variance}}{\text{Unexplained Variance}} \)
      - \( F = \frac{\text{Between-Group Variability}}{\text{Within-Group Variability}} \)
- N – used sample

V. Discussion and Conclusion

- The findings/results provide support for the arguments that IC facilitates KTP
  - The three dimensions of IC (OC, HC, and RC) have significant effects, directly or indirectly, on KTP
  - More specifically, it proves the proposed research model, in Figure 1: OC/HC => RC => KTP
- The implication of the findings is that firms involved in KT need to
  - Actively manage their Organizational capital and Human Capital
  - To stimulate Relational Capital with the partners

APPENDIX I. Measurement Items

Please answer the following questions based on the situations when your company executed the knowledge transfer project.

1) Knowledge transfer performance (4 items, \( \alpha = 0.92 \))
   - (1 = Strongly disagree, 7 = Strongly agree)
     - a) The transferred knowledge can strengthen the innovative capabilities of our company.
     - b) The transferred knowledge can shorten the innovation processes of our company.
     - c) The transferred knowledge can induce innovation activities at our company.
     - d) The transferred knowledge can achieve satisfied innovation results at our company.
APPENDIX I. Measurement Items

2) Human Capital (12 items, $\alpha = 0.83$)
(1 = Strongly disagree, 7 = Strongly agree)

a) Employees have suitable education to fulfill their jobs.
b) Employees are well trained.
c) Employees hold suitable work experience for accomplishing their job successfully.
d) Employees are well-skilled professionally to accomplish their job successfully.
e) No one knows this job better than our employees.

APPENDIX I. Measurement Items

3) Organizational Capital (12 items, $\alpha = 0.834$
(1 = Strongly disagree, 7 = Strongly agree)

a) Employees realize the relationships among authority, responsibility, and benefit.
b) Employees effectively construct information system.
c) Employees effectively utilize information system.
d) Employees know well about the contents of company’s culture.
e) Employees recognize clearly about the company’s perspective.
f) Employees can implement a valid controlling system.

Note: "**" represents reverse item
APPENDIX I. Measurement Items

3) Organizational Capital (12 items, \( \alpha = 0.834 \))
(1 = Strongly disagree, 7 = Strongly agree)
  g) Employees can operate an efficient business process.
  h) Employees can operate a high-quality production.
  i) Employees can achieve high operation efficiency.
  j) Employees can contribute mutual support and cooperation.
  k) Employees can conveniently access to enterprise information.
  l) Employees can effectively share their knowledge with each other.

APPENDIX I. Measurement Items

4) Relational Capital (5 items, \( \alpha = 0.93 \))
(1 = Strongly disagree, 7 = Strongly agree)
  a) Employees have close interaction with the partners.
  b) Employees have mutual respect with the partners.
  c) Employees have mutual trust with the partners.
  d) Employees have personal friendship with the partners.
  e) Employees have high reciprocity with the partners.

APPENDIX I. Measurement Items

5) Background Information
  a) What year was our firm established? ________
  b) What were the annual sales for our firm? _____________
  c) What industry type does our firm belong to? Manufacturing __
     Service _____